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A clinical study of suicide in patients admitted in psychiatry unit in Assiut University

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Abstract

Background: This study was performed for clinical study of suicide including risk factors in psychiatric patients admitted in psychiatric unit of Assiut University Hospital (AUH).

Results: We found that frequency of suicidal attempts is more in MDD (major depressive disorder), bipolar disorders followed by schizophrenia. And frequency of suicidal attempts in patients with multiple previous attempts before this one was higher in patients with mood disorders (53.8%) than psychotic and substance-induced disorders (32.3%, 13.8% respectively), with statistically significant difference in patients with MDD as well as there was significant treatment outcome on suicidal behavior.

Conclusion: The frequency of suicidal attempts is more in MDD (major depressive disorder), bipolar disorders followed by schizophrenia. There was significant severity of suicidal behavior in patients with psychotic disorders in comparison to patients with substance-induced disorder or mood disorders.

Keyword: Suicide, Suicide attempts, Major depressive disorder, Bipolar disorder schizophrenia, Substance-induced disorders

Background

Suicide (Latin suicide, from Sui caedere, “to kill oneself”) is the act of intentionally causing one’s own death. Suicide is often carried out as a result of despair, the cause of which is frequently attributed to a mental disorder such as depression, bipolar disorder, schizophrenia, borderline personality disorder, alcoholism, or drug abuse [1].

Factors that affect the risk of suicide include psychiatric disorders, drug misuse, psychological states, cultural, family and social situations, and genetics. Mental illness and substance misuse frequently co-exist. Other risk factors include having previously attempted suicide, the ready availability of a means to commit the act, a family history of suicide, or the presence of traumatic brain injury. For example, suicide rates have been found

to be greater in households with firearms than those without them [2].

Stress factors such as financial difficulties or troubles with interpersonal relationships often play a role. Efforts to prevent suicide include limiting access to firearms, treating mental illness and drug misuse, and improving economic circumstances [3].

Socio-economic problems such as unemployment, poverty, homelessness, and discrimination may trigger suicidal thoughts. About 15–40% of people leave a suicide note. Genetics appears to account for between 38 and 55% of suicidal behaviors. War veterans have a higher risk of suicide due in part to higher rates of mental illness [4].

Suicide prevention is a term used for the collective efforts to reduce the incidence of suicide through preventive measures. Reducing access to certain methods, such as firearms or toxins, reduces the risk.

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Treatment of drug and alcohol addiction, depression, and those who have attempted suicide in the past may also be effective. Some have proposed reducing access to alcohol as a preventive strategy (such as reducing the number of bars) [5].

In young adults who have recently thought about suicide, cognitive behavioral therapy appears to improve outcomes. Economic development through its ability to reduce poverty may be able to decrease suicide rates. Efforts to increase social connection especially in elderly males may be effective, the World Suicide Prevention Day is observed annually on September 10 with the support of the International Association for Suicide Prevention and the World Health Organization [6].

In those with mental health problems, a number of treatments may reduce the risk of suicide. Those who are actively suicidal may be admitted to psychiatric care either voluntarily or involuntarily. Possessions that may be used to harm oneself are typically removed. If a person is at low risk, out-patient mental health treatment may be arranged. Short-term hospitalization has not been found to be more effective than community care for improving outcomes in those with borderline personality disorder who are chronically suicidal [7].

There is tentative evidence that psychotherapy, specifically, dialectical behavior therapy reduces suicidality in adolescents, as well as in those with borderline personality disorder. It may also be useful in decreasing suicide attempts in adults at high risk. Evidence however has not found a decrease in completed suicides [8].

There is controversy around the benefit versus harm of antidepressants. In young persons, the newer antidepressants such as SSRIs appear to increase the risk of suicidality from 25 per 1000 to 40 per 1000. Lithium appears effective at lowering the risk in those with bipolar disorder and unipolar depression to nearly the same levels as the general population. Clozapine may decrease the thoughts of suicide in some people with schizophrenia [9].

Suicide rates differ significantly between countries and over time. As a percentage of deaths in 2008, it was Africa 0.5%, South-East Asia 1.9%, America 1.2%, and Europe 1.4%. Rates per 100,000 were Australia 8.6, Canada 11.1, China 12.7, India 23.2, United Kingdom 7.6, USA 11.4, and South Korea 28.9. It is ranked as the 10th leading cause of death in the USA in 2009 at about 36,000 cases a year with about 650,000 people seen in emergency departments yearly due to attempting suicide. The country's rate among men in their 50's rose by nearly half in the decade 1999–2010. Lithuania, Japan, and Hungary have the highest

rates. The countries with the greatest absolute numbers of suicides are China and India accounting for over half the total. In China suicide is the 5th leading cause of death [10].

Methods

Patients

One hundred patients (54 males and 46 females) participated in the study; they were admitted in the psychiatry unit of neurology and psychiatry department of Assiut University Hospital (AUH).

Selection criteria of the patients are as follows:

Inclusion criteria

- 1) Patients who fulfilled the criteria for the diagnosis of psychiatric disorders according to DSM-5 criteria [11].
- 2) Both sexes are included in the study.

Exclusion criteria

- 1) History of major neurological deficits or trauma.
- 2) Patients with chronic or serious medical condition that may affect cognition.
- 3) Patients who are their relatives refused to give informed consent.

Study design

It is a descriptive prospective study. The protocol and study design of this thesis were to be approved by the local ethical committee in the faculty of medicine, Assiut University. An informed consent was obtained from all the patients' first degree relatives.

Duration

The study took place from 1 March 2015 till 31 December 2015.

Methods

All patients were interviewed guided by a psychiatric interview sheet of neurology and psychiatry department in Assiut University Hospital. It includes a detailed personal, family, medical, prenatal, scholastic, and past records as well as a detailed history of present illness including onset (acute or gradual), course (episodic or continuous), duration, symptoms, and reasons for seeking psychiatric help and past medication. Also, all patients were subjected to Sheehan suicidality tracking scale (S-STSS) [11]. Suicide risk assessment scale: scale for impact of suicidality management, assessment and planning of care (SIS-MAP) [12], and disability rating scale (DRS)

[14], after written informed consent obtained from each first degree relatives for his or her patients, also Sheehan suicidality tracking scale (S-STTS) was applied to patients at admission and on discharge.

Statistical analysis

Data entry and data analysis were done using SPSS version 22 (Statistical Package for Social Science). Data were presented as number, percentage, mean, and standard deviation. Chi-square test was used to compare between qualitative variables. Mann-Whitney test was used to compare quantitative variables between two groups and Kruskal-Wallis test to compare quantitative variables among more than two groups, Wilcoxon signed-rank test was done to compare between pre- and post-treatment in case of non-parametric data. Spearman correlation was done to measure the correlation between quantitative variables. *P* value considered statistically significant, when *P* < 0.05.

Results

Tables 1, 2, 3, 4, and 5

Table 1 Demographic characteristics of the studied sample

	Total (n = 100)		Male (n = 54)		Female (n = 46)		P value
	No.	%	No.	%	No.	%	
Age							
< 25 years	33	33.0	15	27.8	18	39.1	0.603 N.S
25- < 30 years	21	21.0	12	22.2	9	19.6	
30- < 35 years	17	17.0	11	20.4	6	13.0	
≥ 35 years	29	29.0	16	29.6	13	28.3	
Mean ± SD (range)	30.34 ± 10.78 (12.0-61.0)		31.15 ± 10.25 (19.0-61.0)		29.39 ± 11.42 (12.0-55.0)		0.420 N.S
Education							
Illiterate	15	15.0	4	7.4	11	23.9	0.000**
Read and write	31	31.0	9	16.7	22	47.8	
Primary education	48	48.0	35	64.8	13	28.3	
High education	6	6.0	6	11.1	0	0.0	
Occupation							
Not working	63	63.0	18	33.3	45	97.8	0.000**
Manual worker	27	27.0	27	50.0	0	0.0	
Office worker	10	10.0	9	16.7	1	2.2	
Marital status							
Single	48	48.0	31	57.4	17	37.0	0.063 N.S
Married	44	44.0	21	38.9	23	50.0	
Divorced	3	3.0	2	3.7	1	2.2	
Separated	3	3.0	0	0.0	3	6.5	
Widow	2	2.0	0	0.0	2	4.3	

N.S no significant difference (*P* > 0.05)

**Significant difference (*P* < 0.01)

Discussion

The socio-demographic data of the studied group showed that there was no statistically significant relation between age and the risk of suicide in which the mean age of the patients in the study was 30.34 ± 10.78 years, which is close to that in a study in which the mean age was 36.3 years [15]. Seventy-one percent of the patients < 35 years of age, with decreasing frequency with increasing age, with patients older than 35 years of age representing 29% of the sample, which is in agreement with studies reporting suicide to be more among young individuals than the elderly [16].

There was a high percentage of suicide in the age group 15–44 years in studies carried out in Egypt [16]. Among Arabs, suicide was more in the age group 20–40 years [17].

There was no statistically significant difference between sex and the risk of attempted suicide in the study. The male-to-female ratio was 1.17:1, which is close to the results of studies that showed no major difference regarding gender [17, 18].

However, a higher predominance of suicide rates in males over suicide rates in females was found to be 3.2:1 in 1950, 3.6:1 in 1995, and expected to become 3.9:1 in 2020 [20].

Table 2 Psychiatric diagnoses among the studied sample

Diagnosis	Total (n = 100)		Male (n = 54)		Female (n = 46)		P value
	No.	%	No.	%	No.	%	
Mood disorders	61	61.0	27	50.0	34	73.9	0.015*
MDD	41	41.0	14	25.9	27	58.7	0.001**
MD.BPI. depression	16	16.0	12	22.2	4	8.7	0.066 N.S
MD.BPI. mania	4	4.0	1	1.9	3	6.5	0.499 N.S
Psychotic disorders	24	24.0	12	22.2	12	26.1	0.652NS
Brief-psychotic disorder	2	2.0	0	0.0	2	4.3	0.406 N.S
Schizophreniform disorder	1	1.0	0	0.0	1	2.2	0.936 N.S
Schizophrenia disorder	12	12.0	9	16.7	3	6.5	0.212 N.S
Schizoaffective disorder	9	9.0	3	5.6	6	13.0	0.340 N.S
Substance-induced disorder							
Tramadol induced depression	15	15.0	15	27.8	0	0.0	0.000**

MDD major depressive disorder, MD. BPI. mania: mood disorder bipolar I manic episode, MD. BPI. depression: mood disorder bipolar I depressive episode, N.S no significant difference ($P > 0.05$)

*Significant difference ($P < 0.05$)

**Significant difference ($P < 0.01$)

The differences in male-to-female ratios can often be attributed to the use of more lethal suicide attempt methods, greater aggressiveness, and higher intent to die among men [20]. In contrast, women outnumbered men in terms of suicide attempts at a ratio of 2.2:1 [21].

In our study, 6% of the patients of the study at risk for suicide had high education with the highest risk of 79% for primary education; the group of patients with high education group had the lowest suicide risk with significant statistical difference P value = 0.000. A similar figure was found by [22]. Where the primary education group constituted 51.7% of their suicide cases, students showed the highest suicide risk (40%) [19].

Table 3 History of previous suicidal attempts and methods used among patients in the studied sample

	No. (n = 100)	%
History of previous suicidal attempts		
Previous suicidal attempts	65	65.0
No previous suicidal attempts	35	35.0
Methods of suicidal attempts		
Cut wrist	24	24.0
Jump from height	13	13.0
Burning	4	4.0
Stabbing self	5	5.0
Jump in front of moving vehicle	1	1.0
Drug overdose	18	18.0
Poison intake	10	10.0
Drowning	5	5.0
Hanging	20	20.0

Suicide mortality was also found to be more in the lower education group [18]. A higher suicide risk was found among those with primary to secondary level education and among students [23].

The influence of the level of education on suicide risk may be attributed to three different pathways. First, because those with a low education level cannot seek better jobs and accumulate material wealth, they may have a greater risk of suicide mortality because of lower job security and poor monetary conditions [24].

Second, education might have an independent effect on suicide, irrespective of occupation, and income [25]. Third, selection and recruitment into education might have an impact. Those with mental disorders and chronic severe illness as a proximal cause of suicide at younger ages might have left school without any qualification and might be less likely to have the opportunity for further education [23].

Among the study sample, 63 % were unemployed, whereas the other 37% were working; 10% were skilled

Table 4 Relationship between frequency of previous suicidal attempts and disability in the studied sample

Frequency attempt	DRS	P value
	Mean \pm SD	
No attempts	7.34 \pm 2.13	0.430 N.S
Once	8.45 \pm 2.07	
Twice or more	9.00 \pm 1.91	
No attempts	7.34 \pm 2.13	0.006**
Attempts	8.55 \pm 2.04	

DRS disability rating scale

**Significant difference ($P < 0.01$)

Table 5 Severity of suicidal behavior in different diagnoses in the studied sample

	Diagnosis			P value
	Mood disorders Mean ± SD	Psychotic disorders Mean ± SD	Substance-induced disorder Mean ± SD	
Suicidal ideation	7.33 ± 1.01	7.33 ± 0.92	7.47 ± 0.83	0.897 N.S
Suicidal intent factor	25.00 ± 5.83	29.21 ± 2.96	26.67 ± 3.83	0.002**
Suicidal planning score	10.79 ± 3.43	12.21 ± 1.82	11.33 ± 2.53	0.131 N.S
Suicidal behavioral score	6.30 ± 5.49	9.54 ± 3.82	6.53 ± 5.59	0.106 N.S
Pre S-STS	32.97 ± 12.33	40.79 ± 6.73	33.93 ± 8.79	0.009**
Suicidal ideation post	1.82 ± 1.15	2.29 ± 1.08	1.60 ± 0.99	0.107 N.S
Suicidal intent factor post	2.67 ± 2.15	3.71 ± 1.78	2.40 ± 1.92	0.027*
Suicidal planning score	0.67 ± 0.98	0.79 ± 0.72	0.53 ± 0.92	0.310 N.S
Suicidal behavior score	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	--
Post S-STS	2.67 ± 2.10	3.71 ± 1.78	2.20 ± 1.78	0.018*
DRS	8.02 ± 1.89	9.46 ± 1.91	6.47 ± 2.23	0.000**
SIS-MAP	44.92 ± 10.86	50.96 ± 7.30	44.67 ± 11.51	0.066 N.S

Pre S-STS pre Sheehan suicidality tracking scale, Post S-STS post Sheehan suicidality tracking scale, DRS disability rating scale, SIS-MAP scale for impact of suicidality management, assessment, and planning of care, N.S No significant difference ($P > 0.05$)

*Significant difference ($P < 0.05$)

**Significant difference ($P < 0.01$)

workers, whereas the rest 27% were unskilled workers with significant statistical difference P value = 0.000. In other studies, it was found that unemployed suicide victims represented 53% of the study sample [26].

Manual workers and unemployed individuals are at the highest risk of suicide [18]. Being unemployed was associated with a twofold to threefold increased relative risk of death by suicide compared with being employed [27].

In the study sample, only 44% were married, whereas 56% of the patients were either single (48%), divorced, separated, or widowed (8%) with no significant difference P value = 0.062 This was not very different from a study in Bahrain, in which 58.6% of the patients were single and divorced [22].

As reported by [26], study where patients showed a higher tendency to be single (43%). This difference can be explained by the stigma of being divorced in the Arab world so they would prefer emotional separation and still married over the divorce.

Regarding the diagnosis in the studied sample, 61% had mood disorders, 41% of them had major depressive disorder (MDD), 16% had mood disorder bipolar I depressive episode, and 4% had mood disorder bipolar I manic episode. On the other hand, 24% of the patients had psychotic disorders, 12% of them had schizophrenia, 2% brief psychotic disorder, 9% schizoaffective disorder, and only 1% had schizophreniform disorder. Also 15% of our patients had substance-induced disorders.

This was consistent with study of [12] in which mood disorders were 57%, substance-induced disorders 8%, and psychotic disorders 27.3%. It was also consistent with other studies as in a study done by [22], who found

that mood disorders were at higher risk for suicide than other psychiatric illnesses.

There were no cases diagnosed with mental disorders due to brain damage, anxiety disorders, or mental subnormality in this work as the studied sample were among inpatients in Assuit University Hospital in which there were no admitted cases with such diagnoses during the time frame of the study.

Patients having a psychiatric illness for more than 5 years have increased risk of suicidality [22].

In this study, we recruited 100 patients with 54 male patients and 46 female patients.

In patients with mood disorders, MDD (major depressive disorder) was highly significant among females (58.7%) P value = 0.001, also we found that MD. BP I mania (mood disorder, bipolar I mania) was slightly higher in females than males (6.5%, 1.9% respectively).

In contrast, MD. BPI depression (mood disorder, bipolar I depression) was higher in males than females (22.2%, 8.7% respectively). This is close to Arsenault-Lapierre who found that the risk of mood disorders, specifically, depressive disorders, is greater in female suicides, and whereas mood disorders represented 59.4 % of the female diagnoses and 47.4 % of the male diagnoses ($P = 0.089$) [28].

However, [29] reported that male gender is predominant in patients with bipolar disorder who attempt suicide. In patients with psychotic disorders, the results showed that schizoaffective disorder, brief psychotic disorder, and schizophrenia form and were slightly higher in females than males (13%, 4.3%, 2.2%, 5.6%, 0.0% respectively).

On the other hand, schizophrenia disorder was slightly higher among male patients than females (16.7%, 6.5% respectively).

This was close to [30] who found that in patients with psychosis the following risk factors for attempted suicide in the general community were being females.

All patients with tramadol-induced disorders were males with highly significant difference P value = 0.000

However, [31] found that young male SUD (substance-used disorder) patients may have psychosocial features associated with suicidality in common with female.

In the study sample, almost 35% of the patients did not have a history of previous suicidal attempts, whereas 65% had attempted suicide; 11% of suicide attempters were repeaters.

This was close to [32] in which 24.7% of the patients did not have a history of previous suicidal attempts, whereas 75.3% had attempted suicide; 50% of suicide attempters were repeaters.

Comparison of the frequencies of suicidal attempts between the patients showed that 81.5% of patients tried to commit suicide once, whereas 18.5% committed suicide twice and more. These results were similar to the findings of other studies which reflected that previous suicide attempts had a higher risk of suicidality [33].

A suicide attempt is a risk factor for completed suicide; the risk in individuals followed up for 5–37 years was 7–13% [34], roughly corresponding to a 30–40 times increased risk of death from suicide in those who had attempted suicide compared with the general population [35].

The present study shows that frequency of suicidal attempts in patients with multiple suicide attempts before this one was more in MDD (major depressive disorder), bipolar disorders followed by schizophrenia in which patients with MDD with multiple previous attempts before this one was (30.8%), bipolar disorders (23.1%), schizophrenia (16.9%), while patients with no previous attempts before this one were higher in MDD (60%), tramadol-induced depression (17.1%), followed by bipolar disorders (14.3%) with P value = 0.005.

This is to some extent consistent with [35] who postulated that the rates of suicide after a previous suicide attempt were particularly increased among men and women with schizophrenia or bipolar and unipolar disorder. Population attributable fractions, expressing the impact of coexistent psychiatric disorder on suicide in people who had previously attempted suicide, suggested a modest but significant impact for other depression in women, schizophrenia in men, and bipolar and unipolar disorder in both sexes.

This also is close to Virkkunen 1974 [36] who reported that the life-time frequency of suicide attempts was high (between 23% and 42%) for all categories of psychotic

disorders, with the exception of schizophreniform disorder. Although the risk of suicide is highest during the first 10 years of schizophrenia [36].

In this study, it was found that violent suicidal methods constituted 67% of the suicidal methods used; cutting of wrists was the most commonly used violent method, used by almost 24% of the patients, a number similar to another study that found that 25% of the patients had attempted to cut their wrists [15]. Also, cutting of wrists was found to be the most common violent method [37], followed by hanging (20%). This is not consistent with Guwaili [15], it was only 3%. Only 4% of suicide attempts were made by burning, whereas another study in Egypt found that among violent methods 36% of patients attempted suicide by burning [15].

Drug overdose was the most commonly used nonviolent method (18%), followed by poison intake (10%); self-poisoning by a drug overdose or poison ingestion represented 80% of the nonviolent suicide methods [15]. Overdose by tablet ingestion was the most commonly used method in nonviolent suicide attempts (80%) [38].

A study in Lebanon found that about 95% of individuals who attempted suicide used self-poisoning [37]. Most individuals (77% men, 90% women) used self-poisoning in their suicide attempts [39]. This can be attributed to easy accessibility and availability of poisons and over-the-counter drugs in Egypt.

Our study also found that patients used violent methods was slightly higher in MDD (44.8%), bipolar disorders (16.4%) followed by schizophrenia (14.9%) while the nonviolent methods were slightly higher in MDD (33.3%), bipolar disorders (27.3%) followed by schizoaffective disorder (18.2%).

Suicidal intent factor was higher in psychotic disorders 29.21 ± 2.96 which was a significant difference in comparison to mood disorders and substance-induced disorders (P value = 0.002), the same was found in total score of pre Sheehan suicidality tracking scale (pre S-STS) which was 40.79 ± 6.73 in psychotic disorders with (P value = 0.009). This showed its impact on treatment outcome evaluated by post Sheehan suicidality tracking scale (post S-STS) as the score for suicidal intent factor was 3.71 ± 1.78 in psychotic disorders with (P value = 0.027) in comparison to mood disorders and substance-induced disorders, post Sheehan suicidality tracking scale (post S-STS) score was 3.71 ± 1.78 with (P value = 0.018), this means a marked improvement in treatment, but treatment outcome was better in mood and substance-induced disorders in comparison to psychotic disorders; this was consistent with [13, 21] who found a high risk for suicide in schizophrenia, schizotypal, and delusional disorders [40].

Disability was higher in psychotic disorders evaluated by disability rating scale (DRS) in which (P value =

0.000) which can be explained by the severity of psychotic disorders [41].

Conclusion

The frequency of suicidal attempts is more in MDD (major depressive disorder), bipolar disorders followed by schizophrenia. There was significant severity of suicidal behavior in patients with psychotic disorders in comparison to patients with substance-induced disorder or mood disorders.

Abbreviations

AUH: Assiut University Hospital; MDD: Major depressive disorder; DSM-5: Diagnostic and Statistical Manual of Mental Disorders fifth edition; S-STs: Sheehan suicidality tracking scale; DRS: Disability rating scale

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Authors' contributions

WH contributed in the conception, the design of the work, and interpretation of the data. MN contributed in the interpretation of data and the creation of new software used in the work. HK contributed in the design of the work and interpretation of the data. AA and SO contributed in the acquisition, analysis, and revising the manuscript. All authors have read and approved the manuscript.

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Availability of data and materials

The datasets that were generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

Before starting data collection, approvals to conduct the study were obtained from the Ethical Review Committee of Assiut Faculty of Medicine and the administrative authority in Neurological and Psychiatric Hospital at Assiut University. Prior to the interview, written informed consent was obtained from the literate participants and was signed in the presence of a witness for illiterate ones. Privacy and secrecy of all data were assured by ensuring the anonymity of the questionnaire, interviewing the participants separately in a closed room, and keeping data files in a safe place.

Consent for publication

Not applicable

Competing interests

All authors declare no actual or potential conflict of interest whether financial, personal, or otherwise related to this manuscript.

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