

Factors associated with suicide methods among non-fatal suicide attempters in a general hospital

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Abstract

Background: Suicide is a major public health concern. A number of socio-demographic and clinical variables interplay in determining the chosen method and hence influence the outcome of suicidal behavior. **Materials and Methods:** Two hundred subjects fulfilling the inclusion and exclusion criteria were recruited in the study. The socio-demographic details were recorded in the semi structured proforma. Detailed assessment of Psychiatric morbidity and attempted suicide was done by clinical interview and validated by M.I.N.I.-Plus 5.0 and Beck Suicide Intent Scale. Data was analyzed using SAS Version 9.2 & SPSS Version 17.0. **Results:** In the present study, the three most common method of attempting suicide was by poison consumption (50.5%), followed by drug overdose (35%) and hanging (9.5%). Most of the study participants who attempted suicide by poison consumption and drug overdose were in the age group of 11-40 years ($P=0.010$ and $P=0.050$) and female gender had the highest risk of attempting suicide by poison consumption ($P=0.005$). Most of the subjects in the drug overdose group belonged to urban domicile ($P=0.023$). Majority of the attempters were first time attempters with low intentionality, low lethality and high impulsivity. Psychosocial factors played an important precipitating role and the most common psychiatric morbidity was adjustment disorder followed by MDD. The influence of alcohol prior to the attempt was significant in the poison consumption group ($P=0.040$). **Conclusions:** There are various demographic, clinical and psychosocial factors that play a determinantal role in the choice of method in non-fatal suicide attempters and understanding the interplay of these factors can help devising better preventive strategies in the future.

Keywords: Drug overdose, Hanging, Poison consumption, Suicide method

Introduction

Suicide is one of the major causes of unnatural death worldwide. Every year more than 8,00,000 people take their own life and there are many more people who attempt suicide. Suicide does not just occur in high-income countries, but is a global phenomenon in all regions of the world. In fact, 75% of global suicides occurred in low and middle-income countries in 2012 [1]. In India, the number of suicides in the country

during the decade (2003–2013) has recorded an increase of 21.6% (1,34,799 in 2013 from 1,10,851 in 2003) according to National Crime Records Bureau (NCRB) data [2]. The All India rate of suicides was 11.0 per one lakh population during the year 2013 and the suicide rate in Karnataka was 18.5 per one lakh population [2]. However, we are aware of the fact that the suicide rates published by the NCRB has its own methodological flaws and the numbers are just the tip of the iceberg, furthermore the prevalence of non-fatal suicidal behaviors is about 20 times that of the suicide rates [1].

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Though an act of suicide attempt is a highly individualistic behavior; its determinants are multidimensional. Incidence of suicide and the methods used vary from country to country due to the variations in cultural, religious and social background. A number of socio-demographic and clinical variables interplay in determining the outcome of suicidal behavior. While numerous factors contribute to the choice of a suicide method, societal patterns of suicide can be understood from basic concepts such as the social acceptability of the method (i.e. culture and tradition) and its availability (i.e. opportunity) [3].

The current study was conducted with an aim to study various factors associated with suicide methods among non-fatal suicide attempters in a general hospital setting.

Materials and Methods

This was a cross-sectional hospital-based study conducted from 2013 to 2015 at Department of Psychiatry, Vydehi Institute of Medical Sciences and Research Center, Bangalore. 'Any act of self-damage inflicted with self-destructive intentions, however vague and ambiguous' was taken as a suicide attempt for the purpose of the study [4].

Two hundred cases of suicide attempters referred from various departments were included after obtaining a written informed consent.

Patients whose injuries were considered to be accidental in origin with no suggestion of self-harm intention, and those succumbed to their injuries, were excluded from the study.

The patients were interviewed once their general condition improved. Next Of Kin (NOK) of each patient were interviewed with the patients' consent for any additional information. Confidentiality of the

information obtained was ensured to the patient. Patients who did not consent for the study and who were critically ill to co-operate for assessment were excluded from the study. The study protocol was approved by the Institutional Ethics Committee.

Tools used:

1. Informed Consent

2. Semi-structured proforma for recording socio-demographic variables, details of suicide attempt, contributing psycho-social factors, medical and psychiatric history.

3. Kuppuswamy's socioeconomic status scale [5]

4. MINI International Neuropsychiatric Interview (M.I.N.I Plus-5.0) [6]

5. Beck Suicide Intent Scale [7]

Written informed consent was taken following an explanation about nature and purpose of the study in a language best understood by the patient and NOK. A detailed history, physical examination and mental status examination were recorded in a proforma designed for the study.

Socio-demographic and clinical factors contributing to the attempt was documented with the help of a composite semi-structured proforma.

The assessment of suicide was done by clinical interview and supported by Beck Suicide Intent Scale.

The Psychiatric morbidity was assessed independently by a consultant psychiatrist and validated by M.I.N.I. Plus-5.0 and coded as per International Classification of Disorders (ICD-10).

Statistics: Data was analyzed using SAS Version 9.2 & SPSS Version 17.0.

Results

Descriptive Analyses: The current study had a sample of 200 cases. The study decedents ranged in age from 13 to 75 years old.

Majority of the suicide attempters were in the age group of 21-30 years (52.5%) and females (63%) outnumbered males (37%). Almost 51% were married, over 45% were single, 3.5% were separated, and 0.5% were divorced.

Most of the study subjects hailed from urban/semi-urban background (68%), belonged to Hindu religion (92%) and were from middle socioeconomic strata (66%). (Table-1)

Table-1: Socio-demographic Characteristics (N=200).

Variable	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Age				
11-20	48	24.00	48	24.00
21-30	105	52.50	153	76.50
31-40	29	14.50	182	91.00
41-50	9	4.50	191	95.50
51-60	6	3.00	197	98.50
61-70	2	1.00	199	99.50
71-80	1	0.50	200	100.00
Sex				
Female	126	63.00	126	63.00
Male	74	37.00	200	100.00
Marital Status				
Married	102	51.00	103	51.50
Unmarried	90	45.00	200	100.00
Separated	7	3.50	110	55.00
Divorced	1	0.50	1	0.50
Domicile				
Urban	131	65.50	200	100.00
Rural	58	29.00	58	29.00
Semi-urban	11	5.50	69	34.50
Religion				
Hindu	184	92.00	188	94.00
Muslim	12	6.00	200	100.00
Christian	4	2.00	4	2.00
Occupation				
Agriculturist	13	6.50	13	6.50
Business	10	5.00	23	11.50
Daily wages	10	5.00	33	16.50
Employed	26	13.00	59	29.50
Factory	4	2.00	63	31.50
Govt.	3	1.50	66	33.00
House wife	17	8.50	83	41.50
Private	30	15.00	118	59.00
Software	8	4.00	126	63.00
Student	33	16.50	159	79.50
Unemployed	41	20.50	200	100.00
Others	5	2.50	88	44.00
SES				
High	22	11.00	22	11.00
Low	46	23.00	68	34.00
Middle	132	66.00	200	100.00

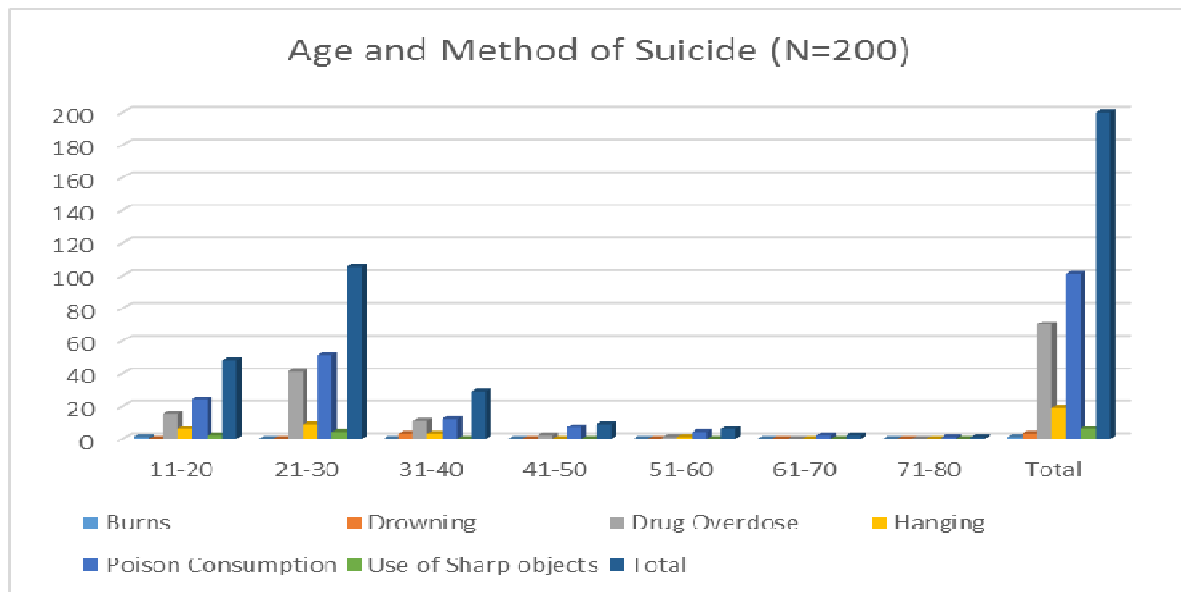


Fig 1: Age distribution and methods (N=200).

Table 2: Clinical Characteristics of Suicide attempters (N=200)

Variable	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Nature of Attempt				
Burns	1	0.50	1	0.50
Drowning	3	1.50	4	2.00
Drug Overdose	70	35.00	74	37.00
Hanging	19	9.50	93	46.50
Poison consumption	101	50.50	194	97.00
Use of sharp objects	6	3.00	200	100.00
No. of attempts				
1	167	83.50	167	83.50
2-5	30	15.00	197	98.50
>5	3	1.50	200	100.00
Lethality				
High	63	31.50	63	31.50
Low	137	68.50	200	100.00
Intentionality				
High	83	41.50	83	41.50
Low	117	58.50	200	100.00
Planned/Impulsive				
Impulsive	167	83.50	167	83.50
Planned	33	16.50	200	100.00
Communicated with family members/friends				
No	155	77.50	155	77.50
Yes	45	22.50	200	100.00
Influence of alcohol				
No	183	91.50	183	91.50
Yes	17	8.50	200	100.00

Relevant descriptive information about clinical characteristics of suicide attempters is presented in Table 2. In the present study, the most common method of attempting suicide was by poison consumption (50.5%), followed by drug overdose (35%), while 9.5% preferred hanging as the method, 3% used sharp objects and 1.5% attempted drowning and 0.5% attempted self-immolation. The age wise distribution of various attempts is depicted in Fig 1. Majority of them were first time attempters (83.5%). Most of the attempts were impulsive in nature (83.5%) and 77.5% of attempters had not communicated to the family members. Most of the attempts were of low lethality (68.5%) and low intentionality (58.5%). In our evaluation of various psychosocial factors; 23.5% of them had marital discord, 23% had interpersonal conflict, 16.5% suffered financial losses, 13.5% of them had family dispute, 10.5% had property dispute, 7% of them had health related issues, 3.5% of young population had scholastic issues and 2.5% of them had occupational related stressors. (Table 3 and Fig 3). In our study we found 48% of subjects had psychiatric diagnosis as assessed by M.I.N.I.-Plus. Most common diagnosis was Adjustment disorder (20.5%), followed by Major Depressive Disorder (13.5%), 3.5% of them had Dysthymia has the current diagnosis, 2.5 % of them suffered from Schizophrenia and 2% of them had Recurrent Depressive Disorder has the diagnosis. 3.5% had Alcohol Dependence syndrome and 1.5 % suffered from Acute stress reaction. One subject each had a diagnosis of Delusional disorder and Schizoaffective disorder. (Table-3 and Fig 2)

Table-3: Psychiatric Morbidity and Psychosocial Stressors (N=200).

Psychiatric Diagnosis	n	%
Alcohol Dependence Syndrome	7	3.5
Schizophrenia & Related	5	2.5
Schizoaffective Disorder	1	0.5
Delusional Disorder	1	0.5
MDD	27	13.5
RDD	4	2
Dysthymia	7	3.5
Adjustment Disorder	41	20.5
Acute Stress Reaction	3	1.5
Nil	104	52
Psychosocial stressors	n	%
Property Dispute	21	10.50
Family Dispute	27	13.50
Financial Issue	33	16.50
Health Related	14	7.00
Interpersonal conflicts	46	23.00
Marital discord	47	23.50
Occupational problems	5	2.50
Scholastic pressure	7	3.50

Fig- 2: Psychiatric Morbidity and methods (N=96).

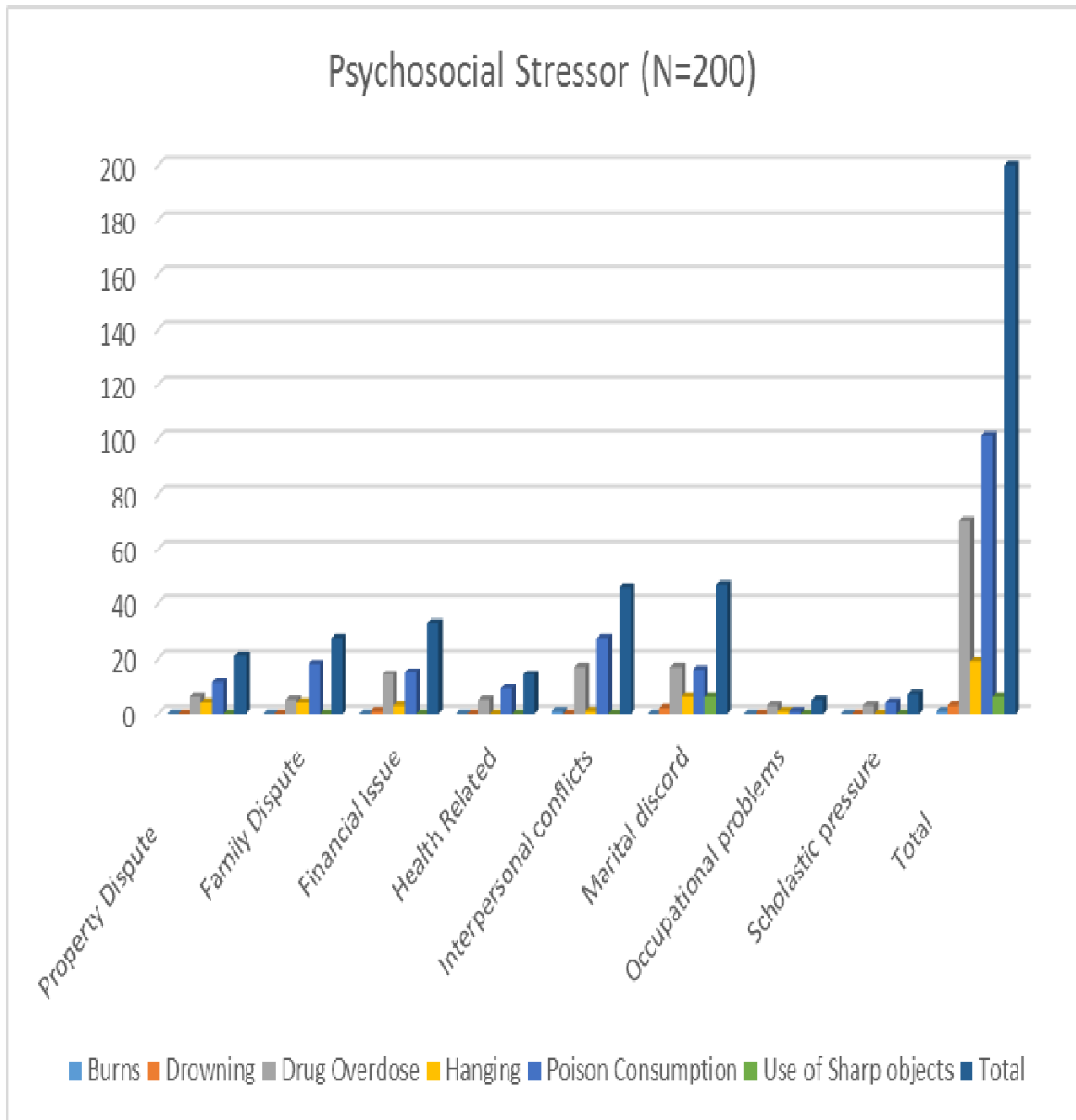


Fig 3: Psychosocial stressors and methods (N=200).

Bivariate Analysis (Table 4 and Table 5): The most common method of suicide attempt in both the genders was poison consumption (Males- 62.2%, Females- 43.7%), followed by drug overdose (Males- 29.7%, Females- 38.1%). However, there was no statistically significant difference (P=0.058) between the two genders when compared with the method of attempt. Bivariate analyses of Marital status and method of attempt revealed that there was no significant difference between married, unmarried and divorced subjects. There was no significant statistical difference with respect to domicile and SES when compared with various modes of attempts. Most of the non-fatal attempters were first time attempters with low lethality, low intentionality and high impulsivity and there were no significant differences when compared with the various methods of attempt.

Table 4: Bivariate Analysis- Socio-demographic Characteristics (N=200).

Variable		Method of attempt						Total n (%)	P Value
		Burns n (%)	Drowning n (%)	Drug Overdose n (%)	Hanging n (%)	Poison Consumption n (%)	Use of sharp objects n (%)		
Gender	Female	1 (0.8%)	3 (2.4%)	48 (38.1%)	13 (10.3%)	55 (43.7%)	6 (4.8%)	126 (63%)	P=0.058 Fisher's Exact Test
	Male	0 (0%)	0 (0%)	22 (29.7%)	6 (8.1%)	46 (62.2%)	0 (0%)	74 (37%)	
	Total	1 (0.5%)	3 (1.5%)	70 (35%)	19 (9.5%)	101 (50.5%)	6 (3%)	200 (100%)	
Marital Status	Divorced	0 (.0%)	0 (.0%)	0 (.0%)	0 (.0%)	1 (100.0%)	0 (.0%)	1 (0.5%)	P=0.162 Fisher's Exact Test
	Married	0 (.0%)	3 (2.9%)	38 (37.3%)	13 (12.7%)	46 (45.1%)	2 (2.0%)	102 (51.0%)	
	Separated	0 (.0%)	0 (.0%)	1 (14.3%)	2 (28.6%)	4 (57.1%)	0 (.0%)	7 (3.5%)	
	Unmarried	1 (1.1%)	0 (.0%)	31 (34.4%)	4 (4.4%)	50 (55.6%)	4 (4.4%)	90 (45.0%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	
Domicile	Rural	1 (1.7%)	0 (.0%)	26 (44.8%)	3 (5.2%)	26 (44.8%)	2 (3.4%)	58 (29.0%)	P=0.355 Fisher's Exact Test
	Semi-urban	0 (.0%)	0 (.0%)	3 (27.3%)	0 (.0%)	8 (72.7%)	0 (.0%)	11 (5.5%)	
	Urban	0 (.0%)	3 (2.3%)	41 (31.3%)	16 (12.2%)	67 (51.1%)	4 (3.1%)	131 (65.5%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	
SES	High	0 (.0%)	0 (.0%)	9 (40.9%)	1 (4.5%)	12 (54.5%)	0 (.0%)	22 (11.0%)	P=0.307 Fisher's Exact Test
	Low	0 (.0%)	2 (4.3%)	10 (21.7%)	4 (8.7%)	27 (58.7%)	3 (6.5%)	46 (23.0%)	
	Middle	1 (.8%)	1 (.8%)	51 (38.6%)	14 (10.6%)	62 (47.0%)	3 (2.3%)	132 (66.0%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	

Table-5: Bivariate Analysis- Clinical Characteristics of Suicide attempters (N=200).

Variable		Method of attempt						Total n (%)	P Value
		Burns n (%)	Drowning n (%)	Drug Overdose n (%)	Hanging n (%)	Poison Consumption n (%)	Use of sharp objects n (%)		
No. of Attempts	>5	0 (.0%)	0 (.0%)	1 (33.3%)	1 (33.3%)	1 (33.3%)	0 (.0%)	3 (1.5%)	P=0.057 Fisher's Exact Test
	1	1 (.6%)	3 (1.8%)	56 (33.5%)	11 (6.6%)	91 (54.5%)	5 (3.0%)	167 (83.5%)	
	2-5	0 (.0%)	0 (.0%)	13 (43.3%)	7 (23.3%)	9 (30.0%)	1 (3.3%)	30 (15%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	
Lethality	High	0 (.0%)	2 (3.2%)	15 (23.8%)	5 (7.9%)	38 (60.3%)	3 (4.8%)	63 (31.5%)	P=0.088 Fisher's Exact Test
	Low	1 (.7%)	1 (.7%)	55 (40.1%)	14 (10.2%)	63 (46.0%)	3 (2.2%)	137 (68.5%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	
Intentionality	High	1 (1.2%)	2 (2.4%)	24 (28.9%)	6 (7.2%)	45 (54.2%)	5 (6.0%)	83 (41.5%)	P=0.076 Fisher's Exact Test
	Low	0 (.0%)	1 (.9%)	46 (39.3%)	13 (11.1%)	56 (47.9%)	1 (.9%)	117 (58.5%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	
Planned/Impulsive	Impulsive	1 (.6%)	2 (1.2%)	63 (37.7%)	17 (10.2%)	80 (47.9%)	4 (2.4%)	167 (83.5%)	P=0.182 Fisher's Exact Test
	Planned	0 (.0%)	1 (3.0%)	7 (21.2%)	2 (6.1%)	21 (63.6%)	2 (6.1%)	33 (16.5%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	
Influence of Alcohol	No	1 (.5%)	3 (1.6%)	61 (33.3%)	16 (8.7%)	96 (52.5%)	6 (3.3%)	183 (91.5%)	P=0.283 Fisher's Exact Test
	Yes	0 (.0%)	0 (.0%)	9 (52.9%)	3 (17.6%)	5 (29.4%)	0 (.0%)	17 (8.5%)	
	Total	1 (.5%)	3 (1.5%)	70 (35.0%)	19 (9.5%)	101 (50.5%)	6 (3.0%)	200 (100.0%)	

Bivariate Analysis of the three most common methods (Table 6 and Table 7): Each outcome variable was modeled in terms of the odds of decedents using a particular method (coded as 1) and all other methods (coded as 0).

Analysis was carried out only on the three most common methods of attempted suicide viz; Drug overdose, Poison consumption and Hanging. Most of the study participants who attempted suicide by poison consumption were in the age group of 11-40 years (43.5%) and was statistically significant (P= 0.010) and similar pattern was also followed with the drug overdose group (P=0.050).

Gender specific analysis revealed that female gender had the highest risk of attempting suicide by poison consumption and it was statistically significant (P=0.005). Most of the subjects in the drug overdose group belonged to urban domicile and the results were statistically significant (P=0.023).

Most of the study participants who attempted poison consumption belonged to middle SES (P=0.043) and were unmarried or divorced (p=0.028)

Majority of attempters who used poison consumption (P=0.006) and hanging (P=0.004) as the chosen method were first time attempters.

Most of the subjects belonging to the drug overdose group (P=0.010) and poison consumption group (P=0.021) had low lethality, and subjects who had attempted by drug overdose also exhibited low intentionality (P=0.038). Majority of the attempters who preferred drug overdose (P=0.031) and poison consumption (P=0.039) were impulsive attempters and subjects who attempted poison consumption under the influence of alcohol was statistically significant (P=0.040).

Table 6: Bivariate Analysis of socio-demographic variables of the three most common methods (N=200).

Variable		Method of attempt								
		Drug Overdose n (%)	Other Methods n (%)	P Value	Poison Consumption n (%)	Other Methods n (%)	P Value	Hanging n (%)	Other Methods n (%)	P Value
Age	11-40	67 (33.5%)	115 (57.5%)	P=0.050*	87 (43.5%)	95 (47.5%)	P=0.010*	18 (9%)	164 (82%)	P=0.317
	41-80	3 (1.5%)	15 (7.5%)		14 (7%)	4 (2%)		1 (0.5%)	17 (8.5%)	
Gender	Female	48 (24%)	78 (39%)	P=0.060	55 (27.5%)	71 (35.5%)	P=0.005*	13 (6.5%)	113 (56.5%)	P=0.177
	Male	22 (11%)	52 (26%)		46 (23%)	28 (14%)		6 (3%)	68 (34%)	
Marital Status	Married	38 (19%)	64 (32%)	P=0.059	46 (23%)	56 (28%)	P=0.028*	13 (6.5%)	89 (44.5%)	P=0.119
	Unmarried	31 (15.5%)	59 (29.5%)		50 (25%)	40 (20%)		4 (2%)	86 (43%)	
	Separated / Divorced	1 (0.5%)	7 (3.5%)		5 (2.5%)	3 (1.5%)		2 (1%)	6 (3%)	
Domicile	Rural	26 (13%)	32 (16%)	P=0.023*	26 (13%)	32 (16%)	P=0.074	3 (1.5%)	55 (27.5%)	P=0.094
	Urban	44 (22%)	98 (49%)		75 (37.5%)	67 (33.5%)		16 (8%)	126 (63%)	
SES	High	9 (4.5%)	13 (6.5%)	P=0.066	12 (6%)	10 (5%)	P=0.043*	1 (0.5%)	21 (10.5%)	P=0.102
	Low	10 (5%)	36 (18%)		27 (13.5%)	19 (9.5%)		4 (2%)	42 (21%)	
	Middle	51 (25.5%)	81 (40.5%)		62 (31%)	70 (35%)		14 (7%)	118 (59%)	

*P<0.05

Table-7: Bivariate Analysis of clinical variables of the three most common methods (N=200)

Variable		Method of attempt								
		Drug Overdose n (%)	Other Methods n (%)	P Value	Poison Consumption n (%)	Other Methods n (%)	P Value	Hanging n (%)	Other Methods n (%)	P Value
No. of Attempts	1	56 (28%)	111 (55.5%)	P=0.096	91 (45.5%)	76 (38%)	P=0.006*	11 (5.5%)	156 (78%)	P=0.004*
	≥2	14 (7%)	19 (9.5%)		10 (5%)	23 (11.5%)		8 (4%)	25 (12.5%)	
Lethality	High	15 (7.5%)	48 (24%)	P=0.010*	38 (19%)	25 (12.5%)	P=0.021*	5 (2.5%)	58 (29%)	P=0.187
	Low	55 (27.5%)	82 (41%)		63 (31.5%)	74 (37%)		14 (7%)	123 (61.5%)	
Intentionality	High	24 (12%)	59 (29.5%)	P=0.038*	45 (22.5%)	38 (19%)	P=0.077	6 (3%)	77 (38.5%)	P=0.131
	Low	46 (23%)	71 (35.5%)		56 (28%)	61 (30.5%)		13 (6.5%)	104 (52%)	
Planned/ Impulsive	Impulsive	63 (31.5%)	104 (52%)	P=0.031*	80 (40%)	87 (43.5%)	P=0.039*	17 (8.5%)	150 (75%)	P=0.219
	Planned	7 (3.5%)	26 (13)		21 (10.5%)	12 (6%)		2 (1%)	31 (15.5%)	
Influence of Alcohol	No	61 (30.5%)	122 (61%)	P=0.058	96 (48%)	87 (43%)	P=0.040*	16 (8%)	167 (83.5%)	P=0.147
	Yes	9 (4.5%)	8 (4%)		5 (2.5%)	12 (6%)		3 (1.5%)	14 (7%)	

*P≤0.05

Discussion

Though the act of attempting suicide is a distinctive behavior, the methods adopted have various confounding individual factors. The current study had a sample of 200 cases and the most common method of attempting suicide was by poison consumption (50.5%), followed by drug overdose (35%), while 9.5% preferred hanging as the method, 3% used sharp objects and 1.5% attempted drowning and 0.5% attempted self-immolation. In this discussion we will concentrate on the three most common methods adopted in the present study viz, poison consumption, drug overdose, hanging and will discuss the role of various demographic and psychosocial factors.

A. Poison Consumption: This study found that poison consumption (50.5%) was the most common method of suicide. Poisoning is globally accepted as the most common method of suicide attempt, which is confirmed by data reported by WHO and EURO [8]. Most of the study participants who attempted suicide by poison

consumption were in the age group of 11-40 years (43.5%) and this was statistically significant (P= 0.010) (Table 6). About 37.8% of suicides in India are carried out by those below the age of 30 years, and 71% of suicides in India are among people who are below the age of 44 years as mentioned by other authors [9]. Similar figures also emerge in the current edition (2014) of NCRB data, which suggest that about 66.3% of subjects who attempted suicide were in the age group of 18-45 years [2]. This is of huge concern because of its socio-economic implications on the society. Deliberate self-poisoning has become an increasingly common response to emotional distress in young adults. Agrochemical pesticides have been reported as the most common cause of acute poisonings in the region, while most of the fatalities are associated with organophosphate compounds [10]. In the present study, females (27.5%) outnumbered males (23%) with respect to poison consumption as the chosen method and when compared with other methods it was statistically significant (P=0.005). This "Gender Paradox" has been

regularly emphasized in literature and studies have shown that women have higher rates of suicidal behavior, i.e. ideation, planning and suicide attempts compared to men [11]. However, the rates of completed suicide are in general higher in men, the 2014 NCRB data reports the overall male: female ratio of suicide victims for the year to be 67.7:32.3 [2]. In India, according to the 2014 NCRB data the share of 'Poisoning' as a means, adopted by suicide victims was 26% [2]. Factors like feasibility, accessibility, credibility and rapidity of action could be behind the choice of method for the attempt. Studies show that consumption of pesticides, such as the readily available agricultural pesticides, is the commonest means of suicide and attempted suicide in India [12,13,14] In the present study, majority of the attempters (75%) who consumed poison, hailed from urban/semi urban background. Sociocultural and historical features of communities such as shared norms, traditions, values, and interests; networks of community support; social cohesion and social capital; and mobility into and out of communities have been proposed to explain urban-rural differences in suicide [15]. Other factors like easy accessibility to health care in urban areas can also explain the high rates of non-fatal suicide survivors from urban population. In our study, unmarried and divorced/separated cases who attempted suicide by poison consumption outnumbered married subjects and the difference was statistically significant ($P=0.028$). Marital status can be both a protective and a risk factor for suicide however divorced, separated, widowed, and single people are more likely to commit suicide than married people; persons living alone are at particular risk and the findings have been replicated by various studies [9,12,16]. In comparison to other methods, majority of the subjects belonged to middle socio-economic status (SES) and the difference was statistically significant ($P=0.043$). It can be argued that there is a significant relationship between family friction, betrothal, school failure, unemployment, poverty, inability daily work, illness, addiction, loneliness and social class and people from middle and low SES have higher risk of attempting suicide by poison consumption [17]. In comparison between methods, most of the attempters by poison consumption were first time attempters ($P=0.006$) with low lethality ($P=0.021$) and low intentionality ($P=0.077$). Immediate life events played an important role in the present study which precipitated an impulsive act of suicidal attempt in a majority of the attempters, similar findings have been replicated by other authors as well [18]. Studies report that non-fatal suicide attempters usually have low

intent and attempt less lethal methods in general [19]. Self-poisoning is considered as a less lethal method in comparison to other methods like hanging, jumping from heights, drowning and use of firearms [8]. Most of the attempts were impulsive in nature ($P=0.039$), in young individual's impulsiveness and short term triggers such as relational conflicts may often set off suicidal events when they are superimposed on long-term underlying reasons that account for the vulnerability for suicidal behavior in stressful situations. Many young suicide attempters report that they spent only minutes between the decision and the actual attempt indicating a high degree of impulsiveness [20]. In general, an acute situational crisis of deep despair, hopelessness and unbearable suffering can also precipitate suicidality impulsively. A significant proportion of the attempters were under the influence of alcohol at the time of attempt ($P=0.040$). Most research on alcohol use and suicide has focused on suicidal ideation or attempted suicide rather than completed suicide, because of the methodological difficulties involved in investigating completed suicide [21]. The lifetime prevalence suicide of attempts in patients with alcohol dependence is high. About 40% of all patients seeking treatment for alcohol dependence report at least one suicide attempt at some point in their lives and impulsive suicide attempts are common in patients with an alcohol use disorder [22]. Alcohol abuse may lead to suicidality through disinhibition, impulsiveness and impaired judgment, but it may also be used as a means to ease the distress associated with committing an act of suicide [23]. In our study we found 48% of subjects had psychiatric diagnosis as assessed by M.I.N.I.-Plus. Mental disorders occupy a premier position in the matrix of causation of suicide. Studies in India show varying results with rates of psychiatric disorders ranging from 9.5 to 24.9% [24,25]. Among persons who attempted poison consumption, the most common diagnosis was Adjustment disorder followed by Major Depressive Disorder (MDD) and Dysthymia (Fig 2). Although Adjustment disorder has been regarded as a "transitional or marginal diagnostic category", there are also reports of it being a common and serious condition among young adults. Gradus et al found that Adjustment disorder was more common among those hospitalized for a suicide attempt than among youths with no history of suicide attempt and those with Adjustment disorder had 12 times the rate of suicide as those without a preceding Adjustment disorder [26]. According to Portzky et.al. the suicidal process in suicide victims diagnosed with Adjustment disorder appears to be short and rapidly evolving without any

prior indications of emotional or behavioral problems [27]. Affective disorders play an important etiological role in the phenomenology of attempted suicide. According to Srivastava et. al. in a study of patients with MDD with suicidal ideation, incidence of suicidal attempt was 16.6%, all attempters were <30 years old [28]. Psychosocial stressors play a pivotal role in predisposing and/or precipitating a suicidal attempt. In the present study most of the subjects who attempted by poison consumption had interpersonal conflicts followed by family dispute and marital discord (Fig 3). The Interpersonal theory includes the assumption that thwarted belongingness is a dynamic cognitive-affective state, rather than a stable trait, that is influenced by both interpersonal and intrapersonal factors. These include an individuals' actual interpersonal environments, activated interpersonal schemas and current emotional states [29]. Negative life events play an important etiological role in attempted suicide and negative interaction needs to be understood in the framework of a model of vulnerability, support, coping, and problem-solving. Indian society, being socio-centric, lays importance on interpersonal relationships [30].

B. Drug Overdose: The second most common method of suicide in our study was drug overdose (35%). Most of the drugs used were either easily available, as in the case of over-the-counter drugs or drugs that were prescribed to treat various physical and mental health conditions. In general suicide means by drug overdose is common in developed countries, where analgesics and tranquilizers are commonly used [31]. Most of the study participants who attempted suicide by drug overdose were in the age group of 11-40 years (33.5%) (Table 6, Fig 1) and this was statistically significant ($P=0.050$). As with other methods, females (38%) surpassed males (29%) with drug overdose. According to Vijayakumar L, women tend to use self-poisoning for suicidal acts and it is over the counter medications which often have low lethality [12]. Females are less frequently the victims of fatal suicides, which indicate that they tend to be the "attempters" and "survivors" rather than "performers" of suicides. This finding may be associated with many factors, amongst which the mode of suicide attempt seems to be important. As in our study, females attempted with less lethal form i.e drug overdose rather than other violent forms. The EAAD study also showed that more than a quarter of female suicides involved intentional self-poisoning with drugs, while for male's drug self-poisoning accounted for less than 10% [32]. Majority of attempters by drug overdose hailed from urban background (22%) and

when compared to other methods, this was statistically significant ($P=0.023$) (Table 6). In most developing countries, drug overdoses are mainly reported in cities. Several Asian countries, such as Malaysia, Singapore and Viet Nam, have reported the increasing use of medicinal drugs in self-poisoning and this is now the commonest mode of self-harm in urban areas of Malaysia and Viet Nam [33,34]. Most of the subjects belonging to the drug overdose group had low lethality ($P=0.010$) and also exhibited low intentionality ($P=0.038$) and majority of them were impulsive attempters ($P=0.031$). (Table 6). Studies report that non-fatal suicide attempters usually have low intent and attempt less lethal methods in general [19]. In young individual's impulsiveness and short term triggers such as relational conflicts may often set off suicidal events when they are superimposed on long-term underlying reasons that account for the vulnerability for suicidal behavior in stressful situations (Fig 3). Many young suicide attempters report that they spent only minutes between the decision and the actual attempt indicating a high degree of impulsiveness [20]. The most common psychiatric morbidity was Adjustment disorder followed by MDD (Fig 2). The commonly used prescribed or non-prescribed drugs for drug overdose are Benzodiazepines and psychotropic agents and it is well known phenomenon that an important factor for choosing a particular method is availability and acceptability. In this context easily available drugs of choice in case of patients with psychiatric diagnosis, particularly affective disorders in addition to the already vulnerable mental state drives the person for the attempt. The relatively rarity of fatal outcomes with drug overdose may be due to less lethality and effective toxicological aid.

C. Hanging: The third commonest method of attempt in our study was Hanging (9.5%). Hanging is consistently reported as one of the common methods of suicide in Asian population and is also considered as a more lethal method [2,35]. It is generally assumed that the use of hanging and other traditional suicide methods is largely governed by their acceptability and by sociocultural norms [3]. Hanging, for example, is a selective method because: it is violent; it needs some preparation and it needs some degree of courage and determination. Typically, the greater the obstacles, the lower the acceptability of the method [3]. However since the paper discusses about non-fatal suicide attempts, there is an underrepresentation of hanging as a method. Usually in cases of suicide completers hanging is one of the common methods used. According to the

NCRB data, percentage share of Hanging as a method was 41.8% in 2014 [2]. In the present study with respect to Hanging as a chosen method there was no significant statistical differences among various demographic and clinical variables.

Conclusion

There are substantial differences in the pattern of suicide methods and these reflect the interplay of different determinants of suicidal behavior in non-fatal suicide attempters. In the present study, the three most common method of attempting suicide was by poison consumption (50.5%), followed by drug overdose (35%) and 9.5% preferred hanging. To conclude; the study of suicidal behavior, the methods chosen and its outcome is very interesting because the act of suicide is a preventable behavior and if we can decipher the various factors associated with this behavior a major public health concern can be addressed and better preventive strategies can be evolved.

Limitations: The current study is an observational cross sectional hospital based study with a small sample size and hence the results cannot be generalized. In this regard, a community-based sample may be more representative and may avoid referral biases and better understanding of various contributory factors.

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