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Original Article

A Statistical Study of Gender Differentials and Patterns in Suicidal Deaths

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ABSTRACT

Background: In India suicide is a national social issue. India accounts for a large proportion of all suicide deaths globally. Patterns and rates of suicide differ in various populations and cultures. Thus, we aimed to report time trends of suicide deaths, and the association between various attributes such as gender, age of suicide victims, pattern of suicide, etc. **Material and Method:** This retrospective study, data were obtained from cases of suicide reported to the Department of Forensic Medicine & Toxicology, Dr. Baba Saheb Ambedkar Medical College and Hospital, New Delhi, over a period of 5 years from January 2014 to December 2018. **Result:** A total of 4973 autopsies were conducted of which suicidal cases contributed to 15.76% (784) of cases. Out of 784 suicidal cases, 530 (67.61%) were male and 254 (32.39%) were female. Most of the victims (38.5%) were from the age group 20-30 years. A significant interaction effect between pattern of suicide and age-group was found. Hanging was most common pattern of suicide followed by poisoning in both sex groups. **Conclusion:** Male preponderance (67.61%) in suicidal cases was found in this study, and the most involved age group was 21-30 years which is similar to findings found in different other countries.

Keywords: Age, Gender difference, Material used, Suicide pattern, Suicide

INTRODUCTION

In India suicide is a national social issue. It is attributed as the 10th leading cause of death worldwide. An estimated 817 000 suicide deaths occurred globally in 2016, accounting for 1.5% of all deaths, with a global suicide death rate (SDR) of 11 per 100 000 population (seven per 100 000 for women and 15 per 100 000 for men) [1,2]. In the year 2015, India recorded 1,33, 623 suicides, an increase of 1.4% from 2014's 1, 31,666 suicides [3].

India accounts for a large proportion of all suicide deaths globally [1]. World's 18% of population is living in India out of which 42% of the population is aged 15–39 years of age and suicide occurring [4], addressing suicides in India makes a global difference.

Suicide attempts are four times more frequent among females [5,6,7]. Researchers have attributed the difference between attempted and completed suicides among the sexes to males using more lethal means to end their lives [8,9,10]. The extent of suicidal thoughts is not clear [7, 11].

The role that gender plays as a risk factor for suicide has been studied extensively. The most common assumption about this sex difference in the lethality of suicide methods is that women just aren't as serious about killing themselves as men-that it's instead a "cry for help" or they're "just doing it for attention." While females show higher rates of non-fatal suicidal behavior and suicide ideation (thoughts) [7, 11], and reportedly attempt suicide more frequently than males do [5,6], males have a much higher rate of completed suicides [12,13].

Suicide is often carried out as a result of despair, the cause of which is frequently attributed to a mental disorder such as depression, borderline personality disorder, alcoholism or drug abuse, stress factors such as financial difficulties or troubles with interpersonal relationships. A suicide attempt possesses self-initiated, potentially injurious behavior, the presence of intent to die and non-fatal outcome [14]. The choice of method used to commit suicide depends on availability of means, knowledge about lethal effectiveness, and the victim's motivation and intent.

Patterns and rates of suicide differ in various populations and cultures. It has been reported that developing countries have lower suicide rates, possibly because of a lower level of environmental stress but the Indians have a very high suicide rate [15].

Young and middle-aged adults die of suicides predominantly; and suicide is the second leading cause of death worldwide among those aged 15–29 years, and the third leading cause among those aged 15–39 years [16, 17].

In this paper, we study the recent trends in the number of suicides in Delhi and briefly review various risk factors for suicide. The main objective of this study is to explore the association between various attributes such as gender, age of suicide victims, pattern of suicide, etc.

MATERIAL AND METHODS

This retrospective study, data were obtained from cases of suicide reported to the Department of Forensic Medicine and Toxicology, Dr. Baba Saheb Ambedkar Medical College and Hospital, New Delhi, over a period of 5 years from January 2014 to December 2018. A total of 4973 autopsies were conducted of which suicidal cases contributed to 15.76% (784) of cases. The study included all documented suicidal cases reported to mortuary (Dept. of Forensic Medicine & Toxicology), Dr. Baba Saheb Ambedkar Medical College and Hospital, New Delhi, India. Data from autopsy reports along with information from police investigation reports and history obtained from relatives were analyzed according to age groups, gender, type of ligature, occupation, place and time of death, place of incident, autopsy findings, manner of death, details of toxicology report and previous psychiatric history. Data collected was entered in the computer database, analysis done using SPSS software version 17.

RESULT

Out of 784 cases, 530 (67.61%) were male and 254 (32.39%) were female. Most of the victims (38.5%) were from the age group 20-30 years followed by 184 (23.5%) from ages 31-40 years (Table 1).

Table 1: Distribution of cases between gender and age-group

Age group (years)	Male	Female	Total
>20	77(14.5%)	74(29.0%)	151(19.3%)
21–30	199(37.5%)	103(40.9%)	302(38.5%)
31–40	134(25.3%)	50(19.4%)	184(23.5%)
41–50	69(13.0%)	10(4.0%)	79(10.1%)
51–60	27(5.1%)	10(4.0%)	37(4.7%)
61–70	20(3.8%)	6(2.4%)	26(3.3%)
>70	4(0.8%)	1(0.4%)	5(0.6%)
Total	530	254	784(100%)

Table 2: Calculation of the Chi square tests on age and sex group

	Value	d.f.	Sig
Pearson Chi-Square	39.880	12	<0.001
Likelihood Ratio	42.098	12	<0.001
N of Valid Cases	784		

A significant interaction shown between gender and age-class was found in suicidal cases (Pearson Chi-Square, $p < 0.001$), (Table 2).

Out of 784 cases, 613 (78.18%) hanged themselves while 164 (20.91%) were consumed poison. Most of the hanging victims were from the age group 21-30 years followed by 145 from ages 31- 40 years (Table 3).

A significant interaction effect between pattern of suicide and age-group was found in in suicidal cases (Pearson Chi-Square, $p < 0.001$), (Table 4).

Dopatta/Chunni (orna) was the commonest (49.23%) type of ligature material used for hanging purpose (Table 2) followed by poison. Most of the victims were from the age group 21-30 years followed by 31-40 years (Table 5).

Table 4: Calculation of the Chi square tests on pattern of suicide and age-group

	Value	df	Sig
Pearson Chi-Square	210.490	24	<0.001
Likelihood Ratio	53.837	24	<0.001
Linear-by-Linear Association	21.494	1	<0.001
N of Valid Cases	784		

A significant interaction effect between material used and age-group was found in suicidal cases (Pearson Chi-Square, $p < 0.001$), (Table 6).

Out of 254 females, 149(58.7%) used Dopatta/Chunni (orna) as ligature material for suicide purpose while in male percentage were less as compare to female. However, firearm cases only seen in male (Table 7).

Table 3: Distribution of cases between pattern of suicide and age-group

Pattern of Suicide	Age Group (Year)							Total
	< 20	21– 30	31 – 40	41 – 50	51 – 60	61 – 70	>70	
Hanging	122	254	145	48	25	16	3	613(78.18%)
Poisoning	29	46	36	31	10	10	2	164(20.91%)
Fall from height	0	0	2	0	2	0	0	4(00.51%)
Burn	0	0	1	0	0	0	0	1(00.12%)
Firearm	0	2	0	0	0	0	0	2(00.25%)
Total	151	302	184	79	37	26	5	784

Table 5: Distribution of cases between material used and age-group

Material Used	Age Group							Total
	< 20	21–30	31–40	41–50	51–60	61–70	>70	
Chunni	80	166	90	21	15	11	3	386
Saree	7	16	7	0	2	1	0	33
Clothe	12	36	31	10	2	2	0	93
Rope	19	29	16	12	5	2	0	83
Electric Wire	4	7	1	5	1	0	0	18
Poison	29	46	36	31	10	10	2	164
Fall from Height	0	0	2	0	2	0	0	4
Firearm	0	2	0	0	0	0	0	2
Burn	0	0	1	0	0	0	0	1
Total	151	302	184	79	37	26	5	784

Table 6: Calculation of the Chi square tests on material used and age-group

	Value	df	Sig
Pearson Chi-Square	157.024	48	<0.001
Likelihood Ratio	83.649	48	<0.001
Linear-by-Linear Association	18.720	1	<0.001
N of Valid Cases	784		

A significant interaction effect between material used and age-group was found in suicidal cases (Pearson Chi-Square, $p < 0.001$) (Table 8).

Out of 530 males, 425(80.18%) hanged themselves for suicide purpose while 188(74.01%) females out of 254. However, within females the poisoning cases were more as compare to male group. Hanging was most common pattern of suicide followed by poisoning in both sex groups (Table 9).

Table 8: Calculation of the Chi square tests on material used and age-group

	Value	df	Sig
Pearson Chi-Square	52.890	8	<0.001
Likelihood Ratio	61.442	8	<0.001
N of Valid Cases	784		

A significant interaction effect between material used and age-group was not found in suicidal cases (Pearson Chi-Square) (Table 10).

DISCUSSION

The present retrospective study was conducted between 2014 and 2018. Out of total 4973 cases autopsied in 784 (15.76%) cases manner of death was suicide. In another study conducted by Kumar and Verma [18] in Lucknow

Table 7: Distribution of cases between material used and sex

Material Used	Male	Female	Total
Chunni	237 (44.5%)	149 (58.7%)	386 (49.23%)
Saree	18 (3.4%)	15 (5.9%)	33 (4.2%)
Clothes	84 (15.8%)	09 (3.5%)	93 (11.9%)
Rope	70 (13.2%)	13 (5.1%)	83 (10.6%)
Electric Wire	16 (3.0%)	02 (0.8%)	18 (2.3%)
Poison	99 (18.7%)	65 (25.6%)	164 (20.9%)
Fall from Height	04 (0.8%)	00 (0.0%)	04 (0.5%)
Firearm	02 (0.4%)	00 (0.0%)	02 (0.3%)
Burn	00 (0.0%)	01 (0.4%)	01 (0.13%)
Total	530 (100%)	254 (100%)	784 (100%)

Table 9: Distribution of cases between pattern of pattern of suicide and sex

Pattern of Suicide	Male	Female	Total
Hanging	425 (80.18%)	188 (74.01%)	613 (78.18%)
Poisoning	99 (18.7%)	65 (25.6%)	164 (20.9%)
Fall from height	04 (0.8%)	00 (0.0%)	04 (0.5%)
Burn	02 (0.4%)	00 (0.0%)	02 (0.3%)
Firearm	00 (0.0%)	01 (0.4%)	01 (0.13%)
Total	530 (100%)	254 (100%)	784 (100%)

Table 10: Calculation of the Chi square tests on pattern of suicide and sex

	Value	df	Sig
Pearson Chi-Square	8.22	4	0.084
Likelihood Ratio	10.142	4	0.038
N of Valid Cases	784		

(India) a total of 4405 cases were autopsies in a five year period out of which only 10% of cases were of suicide due to hanging. Similarly in 2017 Kanak Chandra [19] conducted a retrospective study of five year periods in which deaths due to hanging comprised of 17.24% of the autopsies conducted.

In the present study most of the suicidal victims were in the age group of 21-30 years (38.5%). Similar observation, with regards to age in hanging cases were documented by Udhayabanu *et al.* [20] (32.25%), Patel *et al.* [21] (32.98 %), Kanak Chandra *et al.* [19] (33.10%) and Vijayakumari *et al.* [22] (38.5 %) respectively whereas, Azmak *et al* [23] reported that most of the cases in his study were between the age group of 30–39 years (20.8%).

In this study, cases in age group between 21-30 years accounted for the maximum number, with 38.50% of all cases. The reason can be related to failures in overcoming stress and to meet the demands of life such as unemployment, marital disharmony and financial problems, leading to mental distress, depression, and feeling of worthlessness resulting in taking such extreme steps to end the life. Sometimes the victims leave behind a suicidal note, which indicates the exact causes behind these suicides.

In 2010 Ahmad and Hossain [24] founded that in Bangladesh the percentage of the suicidal victims from the age group 20-30 years was 45.51% which is higher in comparison to our study. In both developed and developing countries the suicide rate among young people appears to be rising [25]. Our study showed male preponderance with males accounting for 530 (67.61%) of all the cases. Similar observation with regards to sex in hanging were recorded by Udhayabanu *et al.* [20] (70.32%), Momin *et al.* [26] reported 66.6% male cases with male to female ratio of 1.5:1. However Saisudeer *et al.* [27] reported in his study that more cases were of female. Dinesh Rao [28] reported that males and females were equally affected contributing to 128 and 136 cases respectively, and the majority belonged to 31-40 years (50.765%) and the least affected age group was from those below the first decade and above 6th decade. The observations made by Kanak Chandra *et al.* [19], Kurtulus *et al*. [29] Jayaprakash and Sreekumaran [30], Abd-Elwahab *et al.* [31], Suminska Ziermann [32] and Al Madni *et al.* [33], showed male preponderance with male to female ratio 3:1.

The male preponderance in India can be explained with the fact that in Indian society males are expected to be more responsible for the earning and bearing the burdens of life and at many times the sole bread earner of their family. When they fail in doing so by one or other reason they take the extreme step of committing suicide. The present study showed 74.13% of cases were married individuals. Similar findings were reported by Udaya Bhanu *et al.* [20] 76.77%, Dinesh Rao [28] 70.45% and Saisudheer *et al.* [27] 82% in their studies respectively.

In our study hanging was the most common method of suicide followed by poisoning. Similarly studies conducted in Lithuania [34] and Turkey (Istanbul) [35] also showed that these registered suicides cases, hanging was the commonest method of suicide in their countries.

In our study out of 613 cases of hanging 62.96% cases chunni/dupatta were used as ligature material. Similar observation in respect to ligature material used in hanging were also recorded by Sharma *et al.* [36], Patel *et al.* [21], Ahmad *et al.* [24]. In contrast, in the study of Kanak Chandra *et al.* [19] commonest choice of ligature material used was nylon rope 216 (50.36%) and least preferred choice was the bedsheet [4] (0.93%).

In another study done by Udhayabanu *et al.* [20] and Vijayakumari *et al.* [22] saree and nylon materials (saree, dupatta and rope) used as a preferred choice of ligature

material. Udhayabanu *et al.* [20] observed that saree was the most common ligature material used in 74 (47.74%) cases followed by nylon rope in 25(16.12%) cases and dhoti in 21(13.04%) cases.

Overall, softer materials are being more commonly used than the harder ones. The wide nature of deviations in the choice of ligature material depends on the dressing fashion of the population and occupation. It was observed that saree in the southern part of India and dupatta among females from northern India are widely used and are easily available in the house and hence the obvious choice in these regions. Whereas in the UK (Benne with) [37] the commonest choice were hard materials like rope, belt, cord and cable etc. Hence factors like sex of the victim, culture, geographic location and place of the act play an important role in this. Moreover, firearms play important role as a method of suicide, which are not commonly available in our country.

According to the alleged history from the investigation officer and relatives of the deceased majority of the hanging cases, the site of incidence was indoor spaces with 550 (89.72%) at home, while only 63 (10.28%) cases were outside home. Similarly, Udhayabanu *et al*. [20], Ahmad *et al.* [24], Kanak Chandra *et al.* [19] and Sharija *et al.* [38] in their study founded that most of hanging cases were found hung in indoor places in 93.45%, 97.93%, 86.71 and 71.27%, respectively. Indoor spaces being the commonest site for the hanging suggest that the victims did not want to be noticed by others and thus foil their suicide attempt.

CONCLUSION

Hanging is a most common method of suicide in our society. Male preponderance (67.61%) in suicidal cases was found in this study, and the most involved age group was 21-30 years which is similar to findings found in different other countries. The fact that most suicidal hangings was seen among young age individuals, it imposes a burden on our society. More concern should be focused on young individuals to raise the awareness about hanging, further a well designed and comprehensive programme is needed to identify the causative factors and prevention of suicidal behaviors. In addition, grooming of children at home to build a healthy child and make them mentally strong to face the harsh realities of life.

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