

A Statistical Study of Gender Differentials and Patterns in Suicidal Deaths**Dharmendra Kumar¹, Pritee Kumari², Smriti Sinha³, Ritu⁴**¹Associate Professor, Department of Forensic Medicine and Toxicology, Radha Devi Jageshwari Memorial Medical College and Hospital, Turki, Muzaffarpur, Bihar, India²Assistant Professor, Department of Microbiology, Radha Devi Jageshwari Memorial Medical College and Hospital, Turki, Muzaffarpur, Bihar, India³Assistant Professor, Department of Obstetrics and Gynaecology, Madhubani Medical College and Hospital, Madhubani, Bihar, India⁴Associate Professor, Department of Forensic Medicine and Toxicology, Patna Medical College and Hospital, Patna, Bihar, India

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Abstract**Background:** Suicide is a widespread social problem in India. A significant percentage of all suicide deaths worldwide occur in India. Different populations and civilizations have different suicide rates and patterns. Therefore, our goal was to document suicide mortality trends over time as well as the relationships between different characteristics including gender, age of suicide victims, suicide pattern, etc.**Method:** Data for this retrospective analysis came from suicide cases that were reported between June 2023 and November 2025 to the Department of Forensic Medicine at Radha Devi Jageshwari Memorial Medical College and Hospital in Turki, Muzaffarpur, and Bihar.**Result:** Suicidal cases accounted for 15.76% (784) of the 4973 autopsies that were performed. Of the 784 suicidal cases, 254 (32.39%) were female and 530 (67.61%) were male. The majority of victims (38.5%) were in the 20–30 age range. Age group and suicide pattern were found to have a significant interaction effect. In both sex categories, hanging was the most frequent suicide pattern, followed by poisoning.**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.**DOI:** 10.25258/ijcpr.18.2.237This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Suicide in India is a major public health crisis with incidences reaching record highs, exceeding 171,000 recorded deaths in 2023. The suicide rate, which has shown a rising trend, was approximately 12.4 per 100,000 population in 2022.[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 [2], addressing suicides in India makes a global difference. Suicide attempts are four times more frequent among females [3,4,5].

Researchers have attributed the difference between attempted and completed suicides among the sexes to males using more lethal means to end their lives [6,7,8]. The extent of suicidal thoughts is not clear [5, 9]. 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) [5,9], and reportedly attempt suicide more frequently than males do [5,6], males have a much higher rate of completed suicides [10,11].

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 [12]. 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 [13]. 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 [14, 15]. 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

Data for this retrospective analysis came from suicide cases that were reported between June 2023 and November 2025 to the Department of Forensic

Medicine at Radha Devi Jageshwari Memorial Medical College and Hospital in Turki, Muzaffarpur, and Bihar. 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 (Department of FMT), 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 22.

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%)

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

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
No. of Valid Cases	784		

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).

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(0.51%)
Burn	0	0	1	0	0	0	0	1(0.12%)
Firearm	0	2	0	0	0	0	0	2(0.25%)
Total	151	302	184	79	37	26	5	784

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

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
No. of Valid Cases	784		

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

Material Used	Age Group (Year)							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

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

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
No. of Valid Cases	784		

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 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%)

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

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
No. of Valid Cases	784		

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 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%)

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

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
No. of Valid Cases	784		

Discussion

Out of total 4973 cases autopsied in 784 (15.76%) cases manner of death was suicide. In another study conducted by Kumar and Verma [16] in Lucknow (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 [17] 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. [18] (32.25%), Patel et al. [19] (32.98%), Kanak Chandra et al. [17] (33.10%) and Vijayakumari et al. [20] (38.5%) respectively whereas, Azmak et al [21] 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 [22] 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 [23]. 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. [18] (70.32%), Momin et al. [24] reported 66.6% male cases with male to female ratio of 1.5:1. However Saisudeer et al. [25] reported in his study that more cases were of female. Dinesh Rao [26] 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. [17], Kurtulus et al. [27] Jayaprakash and Sreekumaran [28], Abd-Elwahab et al. [29], Suminska Ziermann [30] and Al Madni et al. [31], 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. [18] 76.77%, Dinesh Rao [26] 70.45% and Saisudheer et al. [25] 82% in their studies respectively. 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 Patel et al. [19], Ahmad et al. [22]. In contrast, in the study of Kanak Chandra et al. [17] commonest choice of ligature material used was nylon rope 216 (50.36%) and least preferred choice was the bedsheet (0.93%). In another study done by Udhayabanu et al. [18] and Vijayakumari et al. [20] saree and nylon materials (saree, dupatta and rope) used as a preferred choice of ligature material. Udhayabanu et al. [18] 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. 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. [18], Ahmad et al. [22], and Kanak Chandra et al. [17] 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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