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## ORIGINAL ARTICLE / RESEARCH

## Profile of Suicidal Autopsies in a Militancy-Affected State of India

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### ABSTRACT

**Background:** Suicidal behavior is a major public health problem. **Aims:** To know the socio-demographic factors affecting suicidal attempts and the modes of suicidal death. **Design:** The retrospective observational study. **Setting:** Forensic Medicine and Toxicology Department of a tertiary care hospital. **Subjects and Methods:** All autopsies performed between January 2001 to December 2005 were analysed for total number of autopsies performed, allegedly suicide autopsies, mode of suicidal deaths, variation in suicidal deaths in relation to age, sex, place of residence and religion.

**Statistical Analysis Used:** Chi-square test was used to analyse the variability of suicidal deaths with age, sex, place of residence and religion. P-value <0.05 was considered statistically significant. **Results:** Out of total 3485 autopsies 16.24% (566) were allegedly suicidal autopsies. 335 (59.18%) and 231 (40.82%) victims were males and females respectively (p=0.080). 223 (39.39%) and 343 (60.61%) victims were from urban and rural area respectively (p=0.030). Majority of the victims [373 (65.90%)] were between 20-40years of the age. 463 (81.80%), 64 (11.30%), 37 (3.54%) and 2(0.35%) victims were from Hindus, Muslims, Sikhs and Christian religion (p< 0.0001). Poisoning was found to be the most common mode of suicide [243 (42.93%)], followed by burns [168 (29.69%)], hanging [52 (9.18%)], railway trauma cases [23 (4.06%)] and gunshot [23 (4.06%)]. **Conclusion:** It is important to have awareness about trends, risk factors and methods used for committing suicide in order to make remedial measures against this preventable cause of death.

**Key words:** Suicidal trends, risk factors, autopsies.

### Introduction

Suicide is termination of one's life intentionally as a result of violence directed against self.

Suicide is an indicator of the mental health and social wellbeing of society and a major cause of injury-related death in the population. Self inflicted violence accounts for around half of the 1.6 million violent deaths that occur every year worldwide and about 63% of global deaths from self harm in the Asia Pacific region.[1] Most of

these deaths occur in rural areas, where easy access to highly toxic pesticides turns many impulsive acts of self poisoning into suicide [1].

In India over the span of ten years (1988-1998) death due to suicide increased by 62.9% involving all age groups [2]. Recording suicidal deaths in developing countries represent only the tip of the iceberg due to unreliable population counts, non reporting of deaths, variable standards in certifying deaths due to social

stigma and various others religious, political and legislative reasons [3]. However, it is important to have awareness about trends, risk factors and methods used for committing suicide in order to make remedial measures against this preventable cause of death. For the last two decades due to increased militancy in our state, there is increased stress and depression in the population, which could be an important cause for suicidal attempts among the population. As no study has been conducted in this region regarding the suicidal trends; hence, the present study was conducted to determine the profile of suicidal autopsies in the tertiary care institute of the state.

### Materials and Methods

The present retrospective study was conducted in the Forensic Medicine and Toxicology Department of a tertiary care hospital to know the socio-demographic factors affecting suicidal attempts and the modes of suicidal death over a period of five years (from January 2001 to December 2005). The institution caters not only to the city population, but also satellite population from nearby villages, kashmiri migrant camps and medico-legal cases referred from adjoining rural and semi urban areas. All the reported deaths and autopsies performed in the mortuary of the institution over the past five years were analysed for the suicidal deaths. International Statistical Classification of Diseases and Related Health Problems ICD-10 classification was used to categorize the methods of suicidal death. By using the WHO international proforma of death certification, and highlighting the terminology used within the ICD-10, it tells the doctor to identify the

underlying cause of death, defined as "all those diseases, morbid conditions, or injuries which either resulted in or contributed to death and the circumstances of the accident or violence which produced any such injuries" [4]. The year wise data thus collected was analysed for total number of autopsies performed, allegedly suicide autopsies, mode of suicidal deaths, variation in suicidal deaths in relation to age, sex, place of residence and religion.

### Statistics

All the parameters were expressed in number and percentage. Chi-square test was used to analyse the variability of suicidal deaths with age, sex, place of residence and religion. P-value <0.05 was considered statistically significant.

### Results

Total 3485 autopsies were conducted over the period of five years with 16.24% (566) allegedly suicidal autopsies. Maximum number [194 (26.86%)] of allegedly suicidal autopsies were performed during the year 2002, followed by 116 (18.23%) in year 2005 and 106 (15.51%) in year 2001 ([Table/Fig 1]). Out of the total allegedly suicidal autopsies 335 (59.18%) victims were male and 231 (40.82%) were female. Male predominance in suicidal deaths was observed through out the period of five years ([Table/Fig 1]). However, no statistically significant difference was found between two sexes ( $p=0.080$ ).

Out of the total allegedly suicidal autopsies 223 (39.39%) and 343 (60.61%) victims were from urban and rural area respectively ( $p=0.30$ ). However, during the year 2005 more allegedly suicidal autopsies were performed on the victims from urban [62 (53.45%)] than rural areas [54 (46.55%)] ([Table/Fig 1]). Majority of the victims [373 (65.90%)] were between 20-40 years of the age. 80 (14.13%) and 113 (19.96%) allegedly suicidal autopsies were performed on victims in the age group of  $\leq 19$  years and  $> 40$  years respectively. Predominance of suicidal deaths (60.30-74.52%) in the age group of 20-40 years was observed during all the five years ( $p < 0.0001$ ) ([Table/Fig 2]).

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**[Table/Fig 1]** Allegedly Suicidal Autopsies from year 2001 to 2005 with sex and residential area distribution

Year	Total autopsies	Total ASA n (%)	ASA in males n (%)	ASA in females n (%)	ASA in urban population n (%)	ASA in Rural population n (%)
2001	683	106 (15.51%)	59 (55.66%)	47 (44.34%)	40 (37.73%)	66 (62.26%)
2002	722	194 (26.86%)	111 (57.21%)	83 (42.79%)	75 (38.65%)	119 (61.34%)
2003	786	84 (10.68%)	48 (57.14%)	36 (42.86%)	26 (30.95%)	58 (69.05%)
2004	658	66 (10.03%)	39 (59.09%)	27 (40.91%)	20 (30.30%)	46 (69.70%)
2005	636	116 (18.23%)	78 (67.24%)	38 (32.76%)	62 (53.45%)	54 (46.55%)
Total	3485	566(16.24% of total autopsies)	335 (59.18%)	231 (40.82%)	223 (39.39%)	343 (60.61%)

ASA = Allegedly suicidal autopsies, n= number.

**[Table/Fig 2]** Age and religion wise distribution of allegedly suicidal autopsies between year 2001 and 2005

Year (total ASA)	≤19 years n (%)`	20–40 years n (%)	>40 years n (%)	Hindus n (%)	Muslims	Sikh n (%)	Christian n (%)
2001 (106)	14 (13.20%)	79 (74.52%)	13 (12.26%)	87 (82.07%)	12 (11.32%)	7 (6.60%)	–
2002 (194)	30 (15.46%)	117 (60.30%)	47 (24.22%)	116 (59.79%)	2.2 (11.34%)	5 (2.57%)	1 (0.51%)
2003 (84)	14 (16.66%)	55 (65.47%)	15 (17.85%)	69 (82.14%)	10 (11.90%)	5 (5.95%)	–
2004 (66)	14 (21.21%)	40 (60.60%)	12 (18.18%)	52 (78.78%)	7 (10.60%)	7 (10.60%)	–
2005 (116)	8 (6.89%)	82 (70.68%)	26 (22.41%)	89 (76.72%)	13 (11.20%)	13 (11.20%)	1 (0.86%)
Total (566)	80 (14.13%)	373 (65.90%)	113 (19.96%)	463 (81.80%)	64 (11.30%)	37 (3.54%)	2 (0.35%)

ASA=Allegedly suicidal autopsies, n= number.

Out of the total allegedly suicidal autopsies 463 (81.80%), 64 (11.30%), 37 (3.54%) and 2 (0.35%) were performed on Hindus, Muslims, Sikhs and Christian respectively (p< 0.0001) ([Table/Fig 2]). Predominance of suicidal deaths in Hindu (59.79%-82.14%) religion was observed throughout the period of five years,

followed by Muslims (10.60% -11.90%), Sikhs (2.57%-11.20%) and Christian (0.51%-0.86%) ([Table/Fig 2]). No statistically significant difference was found between males and females; however, statistically more victims belong to rural area, Hindu religion and age group between 20-40 years ([Table/Fig 3]).

**[Table/Fig 3]** Factors influencing suicidal deaths between year 2001 and 2005

Factors influencing suicidal inclination	Allegedly suicidal autopsies number (%)	p-Value
Rural and urban area	Urban = 223 (39.39%) Rural = 343 (60.61%)	0.030*
Religion	Hindu= 463 (81.80%) Sikh= 37 (3.54%) Muslim =64 (11.30%) Christian = 2 (0.35%)	<0.0001*
Age	≤19 years = 80 (14.13%) 20–40 years = 373 (65.90%) >40 years = 113 (19.96%)	<0.0001*
Sex	Male = 335 (59.18%) Female = 231 (40.81%)	0.080

\*Statistically significant difference, P-value calculated using chi square test.

Poisoning was found to be the most common mode of suicide [243 (42.93%)], followed by burns [168 (29.69%)], hanging [52 (9.18%)],

railway trauma cases [23 (4.06%)] and gunshot [23 (4.06%)]. Miscellaneous modes for suicide were used in 4.31% to 23.71% of allegedly suicidal autopsies during the year 2001-2005 ([Table/Fig 4]).

**Discussion**

More than 4,00,000 people commit suicide all around the world every year [5]. It is amongst the top ten causes of death for all ages in most countries of the world. Nearly one lakh Indians are dying of suicide every year, which is about 20% of the world suicide population [5]. In general, males are more than four times likely to commit suicide than females [5]. In our study 59.18% of the victims of suicidal death were male and 40.82% were female indicating narrow gap between male and female suicide rate in India. Majority of the victims (65.90%) were between 20-40years of the age and 60.61% from rural back ground in the present study. Similar, trends were also reported earlier from India and other countries, but with male predominance.

**[Table/Fig 4]** Reported modes employed to commit suicide in allegedly suicidal autopsies conducted between year 2001 and 2005

Year (total ASA)	Poisoning n (%)	Gunshot n (%)	Burns n (%)	Hanging n (%)	Railway trauma cases n (%)	Miscellaneous n (%)
2001 (106)	46 (43.39%)	3 (2.83%)	26 (24.52%)	14 (13.20%)	10 (9.43%)	7 (6.80%)
2002 (194)	70 (36.08%)	3 (1.54%)	60 (30.42%)	12 (9.52%)	3 (1.90%)	46 (23.71%)
2003 (84)	42 (50%)	2 (2.38%)	23 (27.38%)	8 (9.52%)	2 (2.38%)	7 (8.33%)
2004 (66)	27 (40.90%)	0	23 (34.84%)	8 (12.12%)	3 (7.57%)	5 (4.31%)
2005 (116)	58 (50%)	0	36 (31.03%)	10 (8.60%)	5 (4.31%)	7 (7.57%)
Total (566)	243 (42.93%)	23 (4.06%)	168 (29.69%)	52 (9.18%)	23 (4.06%)	72 (12.72%)

ASA=Allegedly suicidal autopsies, n= number.

A 25-year autopsy study (1972-1997) of acute poisoning deaths from a tertiary care hospital in northern India revealed that majority (68%) of

subjects were between the ages of 14 and 30 years and there was a male preponderance (69%) [6]. In an other study from Maharashtra during

the five years period, 1997-2001 acute poisoning is the leading most cause of unnatural deaths and third common cause of emergency hospitalizations in this rural part of India [7]. Majority of the victims were male 67% and about 83% of them were from rural residence. Insecticides were responsible for 35% of clinical and 55.4% of fatal cases [7].

Another study from North India (1997-98) showed male to female ratio of 3:1 among poisoning cases admitted (76.47% of the victims committed suicide) with 45.59% victims between 21-30 years of the age and 51.47% from urban population [8]. Similarly a study from south India reported 72% of the poisoning cases admitted between January 2001 to May 2003 as intentional with 70% males and 30% females cases showing predominance in the age group of 21-30 years (36%) [9]. A study from north India reported 91.4% cases of poisoning as suicidal with majority of the patients young (mean age 27years), males (twice than females) and from rural areas [10]. Similarly, studies from New- Zealand reported highest suicide rate between 25-34 years of age with higher suicide death rate in males than females [11]. In US also, suicide is the eighth leading cause of death for men and four times more male are likely to die from suicide than females [12].

However, a few studies reported increased trends in female suicidal attempts [2],[13],[14]. A study from India (1991-1997) reported nearly equal suicide rates for young women and men as shown in our study [13]. Similarly, a study from north India in adolescent population reported suicidal deaths with Female: Male ratio of 1.24:1 [2]. This gender disparity may be because of occurrence of psychological disorders like depression anxiety more often in girls than boys in early adolescence with onset of puberty. Moreover, social factors like subordinate role of females in developing society can generate feeling of helplessness and frustration which contribute to psychiatric illness. Similarly, suicide is the fifth leading cause of death in China, with predominance of suicidal deaths in females (15-34 years) than males [14]. Out of the total allegedly suicidal autopsies 81.80%, 11.30%, 3.54% and 0.35% were performed on Hindus, Muslims, Sikhs and Christian respectively. The predominance of victims from Hindu religion in the present study may be because of the fact that the institution caters

adjoining kashmiri migrant camps, rural and suburban areas, which are richly populated with followers of Hindu religion.

The selection of methods for committing suicide involves availability and sociocultural acceptability of the methods along with accessibility to necessary aids or equipment and possibility of translation of decision impulse without any delay [15–17]. Poisoning was found to be the most common mode of suicide (2.93%), followed by burns, hanging, railway trauma cases and gunshot in the present study. Similarly, Joseph *et al.* also reported poisoning and hanging as the commonest method of suicide in rural India [18]. However, in a study from Delhi (India) commonest method used for committing suicide was hanging followed by poisoning [2]. In US fire arm was reported to be the most common mode (60%) committing suicide [19].

Suicidal behaviour is a major public health problem. There is no one explanatory theory of suicidal behaviour and various combinations of sociological and biological/medical interventions are required to reduce associated mortality and morbidity [20],[21]. In the present study trend of suicidal attempts was more seen in the middle age group, Hindu religion and rural background. However, the major lacunae of the present analysis was that the autopsy reports failed to provide the information about basic etiological factors behind the act of suicide like history of any psychiatric disorder and any socioeconomic factor like failure in examination, family problem, illness, love affair, dowry dispute, poverty and unemployment.

Suicide attempters are ten times more than the suicide completers [5]. The first step in preventing suicide is to identify and understand the risk factors like, previous suicide attempt, history of mental disorders, history of alcohol and substance abuse, family history of suicide, family history of child maltreatment, feelings of hopelessness, impulsive or aggressive tendencies, barriers to accessing mental health treatment and loss (relational, social, work, or financial) [20]. Hence, periodically such epidemiological studies are required to find out the hidden socio-demographic factors behind suicidal behaviour; so that appropriate measures will be taken against this major public health problem.

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