

Original Research Article

Profile of unnatural deaths in a teaching hospital of West Bengal, India

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ABSTRACT

Background: Enquiry into unnatural deaths with all its manners being, suicidal, accidental or homicidal depends on circumstantial evidences for acceptable judgment in court of law. Objectives were to study socio-demographic characteristics of the study and to find out influencing factors, if any, behind these sudden, suspicious, undesirable deaths.

Methods: A record-based, descriptive study with cross-sectional design was conducted for first six months of 2017 in NRS medical college hospital among 1603 unnatural deaths undergone police inquest. Besides the records obtained from medical record section, findings were corroborated from mortuary. Data were analyzed in SPSS 22.0 and Epi Info 7.0.

Results: Mean age of the deceased was 37.18±17.42 years. Regarding cause of injury, more than 1/3rd (36.6%) was attributed to poisoning, followed by burn injury (24.8%), road traffic accidents (22.8%), fall from height (6.9%) and others the rest. Majority (68.3%) died within twenty hours of reaching the health care facility. More than half of the deceased committed suicide followed by accident and suicide the least. Binary logistic regression revealed, unnatural deaths inflicted by selves or others, i.e. suicide or homicide respectively, had statistically significant ($p<0.05$) association to productive age, urban residence, burn and RTA, longer survival and conservative nature of management.

Conclusions: As suicide was found to comprise lion share of unnatural deaths, development and implementation of addressing the issue at all the levels, starting from individual to community is the need of the hour.

Keywords: Mortuary, Suicide, Record-based, Unnatural death

INTRODUCTION

Chamber's twentieth century dictionary defines death as 'the extinction of life'. Medico-legally death is an inevitable permanent and irreversible cessation of physiological functions of the most vital and inter-dependable organs of the body, like as heart, lungs and brain.¹ People die naturally at the end of life either due to old age and/or because of disease or infirmity. Apart from these, there remains a wide spectrum of death, which

because of their sudden, suspicious and unexplained nature, are called as "unnatural death". These entail suicidal, homicidal and accidental deaths.

According to Durkheim, the term suicide is applied to all cases of death resulting directly or indirectly from a positive or negative act of the victim himself, which he knows will produce this result.² The Government of India classifies a death as suicide if it meets the following three criteria.³

1. It is an unnatural death.
2. The intent to die originated within the person.
3. There is a reason for the person to end his or her life. The reason may have been specified in a suicide note or unspecified.

If one of these criteria is not met, the death may be classified as death because of illness, murder or otherwise.

About 800,000 people die by suicide worldwide every year, of these 135,000 (17%) are residents of India, a nation with 17.5% of world population. Between 1987 and 2007, the suicide rate increased from 7.9 to 10.3 per 100,000, with higher suicide rates in southern and eastern states of India including West Bengal.^{3,4}

Homicide is defined as unlawful death purposefully inflicted on a person by another person.⁵ In 2016, number of homicides for India was 42,678. The global homicide rate, measured as the victims of homicide per 100,000 people, declined from 7.2 in 1992, to 6.1 in 2017, the report said.⁶

Nearly 1.25 million people die in accidents, road crash or otherwise each year, on average 3,287 deaths a day. Majority of accidents are attributed by road traffic injuries as a result of which approximately 1.35 million people die each year.⁷ The National Crime Records Bureau (NCRB) 2016 report states there were 496,762 roads, railways and railway crossing-related traffic collisions in 2015.⁸

There happen a number of conditions where circumstances of death itself raise the suspicion of its nature, where it becomes necessary to differentiate between suicide and homicide, even accidents often. Investigation of death is necessary to punish the offender by a criminal court, to pay compensation by the defendant party to the heirs of the deceased person and to remit the wrongly accused person.

In the current context there is paucity of literature on corroborative studies regarding apparent influencing factors behind unnatural deaths brought to mortuary of a medical college of West Bengal. With this backdrop, the current study was conducted to assess socio-demographics of deceased from unnatural deaths and to find out the possible contributing factors behind these undesirable and unforeseen occurrences, if any.

METHODS

A record-based descriptive study with cross-sectional design was conducted for six months in Nil Ratan Sarkar Medical College of West Bengal. The police morgue of NRS medical college is running since the year 1914 and near around 2500 post mortems are conducted in each year (Medical Record Section, Nil Ratan Sarkar Medical College and Hospital). From the medical record section,

with extensive efforts, the records in the form of the bed head ticket (BHT) which undergone any kind of police inquest, hence considered to have unnatural manner of death were sorted out and considered as data for the current study. In the total six months, i.e. from January to June, 2018, 1603 cases were found. From the BHT, age, gender, religion, caste, residence of the deceased was noted in a pre-designed, pre-tested semi-structured questionnaire. There were different forms of injuries as burn, fall from height, road traffic accidents, organophosphorus and other poisoning, hanging, physical assault, electrocution, animal or insect bite and drowning were noted. Period of survival from time of injury inflicted to death and nature of treatment received following admission were also documented. The co-principle investigator visited the mortuary time-to-time for the purpose of corroboration of findings with post-mortem records and accordingly they were found as suicidal, homicidal or accidental in manner.

The study was embarked upon ethical clearance from institutional ethics committee of NRS medical college.

Data were entered in Microsoft Excel spread sheet. Analysis was done with the help of software SPSS 22.0 free version, Epi Info™ free version 7 and Micro Soft Excel. Descriptive statistics were expressed by mean, SD and proportion and graphically by component bar and pie diagrams. Chi-square test was done for gender wise distribution of cause of injury and $p < 0.05$ was considered significant at 95% of confidence interval. Binary logistic regression was used for showing association between natures of death and influencing factors.

RESULTS

Total number of deceased under study was 1603. Mean age was 37.18 ± 17.42 years. 985 (61.4%) were male and rest 608 (38.6%) were female. Majority (88.1%) was Hindu and 11.9% were Muslim. Records revealed that 38.3% were from rural background and 61.7% were urban residents. Regarding cause of injury, majority (36.6%) was attributed to poisoning, organophosphorus and others, followed by burn injury accounting for 24.8%, road traffic accidents 22.8%, fall from height 6.9% and others by hanging, physical assault, animal/insect bite, drowning and electrocution injuries. More than half of the victims (67.1%) succumbed to death within 24 hours and only 32.8% survived beyond 24 hours. 87.8% were managed conservatively and only 12.2% received surgical management.

Among the deceased 50.5% committed suicide, 45.5% were accidental deaths and 3.9% were detected to be homicidal in nature shown in Figure 1.

Unnatural deaths, in all its manners were maximum in most productive age groups (20-60 years). Commitment of suicides, besides productive age group, was more among adolescents shown in Figure 2. Homicidal deaths

were least in extremes of age, i.e. those among those below 19 years and above 60 years of age. Accidents were also highest in productive age population.

Omnibus χ^2 at d.f. 4 shows significant p-value and individual χ^2 test was done with help of Epi info (version 7) in reference to fall from height.

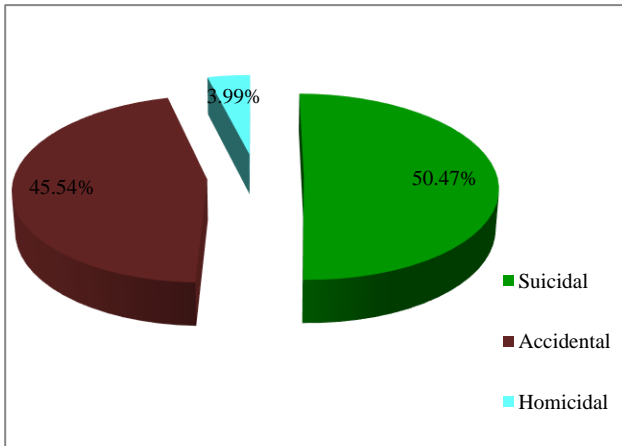


Figure 1: Pie diagram showing distribution of unnatural deaths according to nature of death.

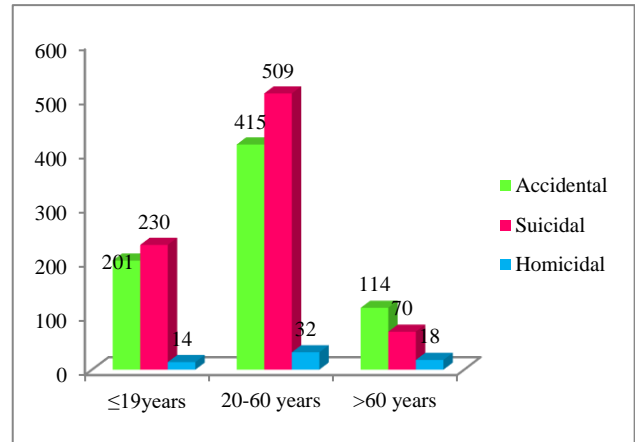


Figure 2: Multiple bar diagram showing age wise distribution of nature of death.

Table 1: Gender wise distribution of cause of injury for unnatural deaths (n=1603).

Cause of injury	Gender		Omnibus χ^2 at df of 4 p value	χ^2 at df 1 p value	Odds ratio	95% CI	
	Male (%)	Female (%)				Lower	Upper
OP and other poisoning	344 (58.7)	242 (41.3)		15.56	0.14	0.06	0.41
Burn	141 (35.4)	257 (64.6)		17.68, <0.001	0.23	0.11	0.46
RTA	295 (80.6)	71 (19.4)		12.81 <0.001	0.16	0.12	0.56
Fall from height	85 (76.6)	26 (23.4)		*	*	*	*
Others	120 (84.5)	22 (15.5)		17.06, 0.006	0.28	0.07	0.56

*Hanging, physical assault, animal/insect bite, drowning and electrocution.

Table 2: Binary logistic regression showing association between nature of death and influencing factors (n=1603).

Variables	Category	Sample size	B	Sig.	AOR	95% CI for AOR	
						Lower	Upper
Age of the deceased in years	≤14 and ≥65	602	*	*	1.00	*	*
	15-64	1001	1.087	<0.001	1.05	1.54	12.00
Gender	Male	985	*	*	1.00	*	*
	Female	618	-.274	<0.001	0.09	2.03	17.06
Residence	Rural	614	*	*	1.00	*	*
	Urban	989	.181	0.01	1.32	2.35	12.11
Cause of injury	Burn and RTA	764	0.60	0.04	2.98	0.09	4.01
	Poisoning & others	839	*	*	1.00	*	*
Period of survival	<24	1076	*	*	1.00	*	*
	≥24	527	0.97	0.007	1.40	1.03	12.76
Nature of treatment	Conservative	1407	0.82	0.11	2.05	1.79	9.34
	Surgical	196	*	*	1.00	*	*

The Table 1 revealed that compared to the deceased who fell from height, organophosphorus poisoning in males 0.16 (CI- 0.06-0.41) times more, those who had burn injury were 0.23 times (CI- 0.11-0.46) less in number than females while those having road traffic deaths were 0.26 (CI- 0.12-0.56) times more among males, and other

types of injuries as mentioned 0.28 (CI- 0.07-0.56) times more among males. The difference was statistically significant in all (p<0.05).

Logistic regression revealed that, statistical significant association with unnatural cause like suicidal and

homicidal to have with productive age groups (AOR 1.05, 95% CI- 1.54-12.00), urban residence (AOR 1.32, 95% CI- 2.35-12.11), burn and RTA (AOR 2.98, 95% CI- 0.09-4.01), survival beyond 24 hours (AOR 1.40, 95% CI- 1.03-12.76), conservative management (AOR 2.05, 95% CI- 1.79-9.34). Females were found to have protective effects significantly (AOR -0.274, 95% CI- 2.03-17.06) as shown in Table 2.

DISCUSSION

The current study was conducted among 1603 deaths which took place either due to intentional injury by self, i.e. suicidal or by others, i.e. homicidal or caused by unintentional injury in accidental manner. As in current study unnatural death affected the most productive age groups also in study by Prithvirajsinh et al and Buchade et al.^{9,10} Similar findings were also reported from South-West Nigeria by Esan et al and from Dhaka by Khan et al.^{11,12} Regarding gender distribution, similar findings of male preponderance was by Santosh et al where 80% of the deceased were male, Bansal from Ahmedabad found more than 2/3rd of the victims to be male, Khan also got similar unnatural death pattern in Dhaka city.¹²⁻¹⁴ But Chakrabarty et al from Bankura got female preponderance and Prithvirajsinh et al got huge number of female burn patients over all the age groups.^{9,15} As in current study, Hindus comprised majority in study by Bansal in Gujarat, Chakrabarty P from West Bengal and Kumar A from Varanasi in contrast to findings of Muslim predominance in Bangladesh by Khan et al.^{12,14-16}

As in the present study rural victims outnumbered the urban victims in studies by Haralkar et al, Bariar LM, Singh et al, Chakrabarty et al.^{15,17-19} Regarding the cause of death, the current study findings had similarities to that conducted in North India by Sharma et al and Chakrabarty et al but different from Davidson et al, Sahoo et al, Santosh et al and Kanchan et al.^{13,15,20-23} Period of survival to be within 24 hours was in accordance to the current study was also found in Buchade et al and Mangal et al but it varied to be more fatal on arrival to health facility especially in burn victims in study by Memchoubi et al.^{10,24,25} As suicide attributed manner of death in majority followed by accidents and homicides in the present study, Santosh et al got majority of accidents followed by suicide and homicide which was similar to that by Chakrabarty et al, Kitulwatte et al whereas Khan et al reported accidents were majority followed by homicide and suicides in Dhaka.^{12,13,15,26} Esan et al as similar to the present study had significant positive association of suicide and homicide to productive age groups only; none of the other parameters were found to have any significant association in the binary logistic regression.¹¹

Limitations

The study was conducted over a short period of time so that sample size was reasonably short which might be

considered as inadequate in extrapolation of the findings over the entire community. Being a retrospective record-based study, there was limitation of information which could be influencing and thereby preventable factors for unnatural deaths. To overcome these, investigators exercised extensive efforts on corroboration of findings from medical record section to those from mortuary of the Institution besides having a future research plan of longitudinal study on the topic.

CONCLUSION

Unnatural deaths, with all its aspects have medico-legal-social and preventive facets. The current study have revealed majority of unnatural deaths to be suicidal in nature even when majority of victims were found to be from rural background and all kinds of unnatural deaths affecting the most productive age group population. Accidents also attributed a substantial portion of deceased. All these may indicate towards a need for development of policy with a multipronged approach directed towards community with special emphasis to this particular age group in order to address indicators of social and mental health more effectively.

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