

Correlation between Age with Manner and Cause of Unnatural deaths in Reproductive Age Group Females: A Prospective Cross-Sectional Study

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Abstract

Background: Unnatural deaths among women is rarely emphasized but it's an important public health index of the community and society. Reproductive age group is an important marker for human development and any imbalance in this age group can affect overall social and economic development as well as health of the next generation; and thereby the Society.

Material and Methods: The present study was conducted in the Department of Forensic Medicine and Toxicology, Rajendra Institute of Medical Sciences, Ranchi, Jharkhand from April 2021 to March 2022 (i.e., 12 months). Total autopsies conducted during this period were 3840. Out of these, 225 cases were women in reproductive age group as per the selection criteria of the study planned.

Conclusion: Maximum number of cases (24%) belonged to the age group of 15-19 years, followed by 20-24 years(23.55%) and 40-44 years age (14.67%) and the most common manner of death was accidental. In the age group of 15-19 years, burn was the most common cause of death, with hanging being the most common cause of death in the age group of 20-24 years. The most common manner of death was accidental (59.1%), followed by suicidal (28.9%) and homicidal (8%). Unnatural deaths in women of reproductive age group constituted 5.86% of the total cases autopsied in the study period, with burns (mostly accidental), road traffic accidents and suicidal hanging being the most common causes of death. Accordingly, multifaceted preventive strategies using bottom-up approach right from the basic levels of health care system need to be formulated to buoy up the physical, mental and social well being of this very important group of society.

Key words: Unnatural death, Reproductive age group females, Manner of death, Cause of death.

Introduction

The reproductive age in females, conventionally

delineated as being between 15 and 44 years, represents a pivotal phase distinguished by

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numerous health and fertility-related dimensions.¹ This specific age bracket is essential for comprehending the complexities of women's health trajectories, fertility trends, and the influence of socio-demographic variables on reproductive well-being. Any discrepancies within this demographic cohort may adversely impact the health outcomes of future generations, as well as social and economic development, consequently influencing societal structures. The status of females and girls within societal constructs, alongside the manner in which they are treated, serves as a pivotal determinant of societal advancement.

In India, women of reproductive age comprise 22.2% of the total demographic population.² The mortality rate among Indian women is alarmingly elevated, particularly during childhood and reproductive years, with the predominant causes being attributed to natural factors. Women of reproductive years often face the highest risk of death from communicable illnesses, complications in maternal health, anemias, and cancers. Furthermore, the prevalence of unnatural deaths within this reproductive age cohort is notably high as compared to the global average figures, and occurrences of unnatural fatalities among women are not rare within the context of Indian society.³ Such incidents typically encompass accidents, homicides, and suicides. The National Family Health Survey (NFHS-5) results, which took place between 2019 and 2021, show that 31.2% of young women aged 15-19, 20.5% of those aged 20-29, 17.5% of women aged 30-39, and 9.3% of the 40-49 age group of all the deaths in the prior two years were from accidents, violence, poisoning, homicides, or suicides, while other deaths were linked to natural causes.⁴

Any civilization may be evaluated by the status accorded to women within its social framework. One of the numerous elements that substantiate the prominence of India's ancient culture is the esteemed position afforded to women. The societal landscape is undergoing significant transformations concerning the acceptance of women as professionals, as primary earners within households, as autonomous thinkers, as providers for families, and as individuals bearing the profound responsibility of childbirth. A

considerable number of women in India pursue careers as educators, healthcare professionals, aviators, engineers, flight attendants, military personnel, among various other vocations. They also participate actively in the realms of politics and governance. Although there has been improvement in women's situations, issues such as troubled marriages, dowry customs, economic exploitation, acts like murder and sexual crimes, as well as the adverse effects of not being educated and uninformed, must be decisively eliminated to allow women to secure their appropriate standing in society.

A complex interplay of social, economic, and cultural influences impacts the mortality rate among women in their reproductive years, which is reflected in different manifestations including suicides, homicides, and accidents. The engagement in violent acts against women is a recognized public health dilemma worldwide, presenting in assorted forms and intensities, with homicide marking the most critical point on the violence spectrum against women. Such violence may transpire within a myriad of contexts and situational frameworks. Diverging from prevalent notions, statistical evidence demonstrates that women are 11 to 12 times more prone to being murdered by someone familiar rather than by a total stranger.⁵

A marked escalation in the incidence of unnatural fatalities, particularly during the initial years of matrimony, has been documented in recent years, which constitutes a significant blemish on the esteemed traditions of our society.⁶ The most salient factor contributing to such fatalities appears to be the incessant demands for dowry (in cash or kind) imposed by husbands and/or in-laws, which can culminate in the murder or maltreatment of the bride, ultimately leading to her suicide.⁷ The National Burns Programme reports that from an estimated 140,000 annual burn injury deaths, 91,000 are women, a statistic that is higher than maternal mortality.⁸ In India, the unnatural mortality rate is at 0.67 per 1000, where male statistics show 0.84 and female statistics show 0.49 per 1000 across all age groups.⁹

Materials and Methods

In this current cross-sectional analysis, research was executed within the Department of Forensic Medicine and Toxicology at the Rajendra Institute of Medical Sciences in Ranchi, Jharkhand, over the course from April 2021 to March 2022 (a total of twelve months), primarily aimed at studying the trends of unnatural fatalities and determining possible causes among women of reproductive age. The study specifically aimed to delineate the patterns and identify the most prevalent modes of unnatural deaths among women aged 15 to 44 years. Unnatural deaths of women within the reproductive age group (15-44 years), substantiated by medico-legal autopsy and credible historical accounts, were incorporated into the analysis, while natural fatalities, unidentified individuals, and decomposed remains were excluded.

A total of 3840 autopsies were performed during the designated timeframe. Among these, 225 instances pertained to females within the reproductive age bracket, in accordance with the selection criteria

established for the current study. Comprehensive data regarding age, circumstances of death, and other pertinent details were systematically compiled using a preformatted proforma from all 225 female subjects in the reproductive age group (15-44 years) through thorough interviews conducted with investigative officers, examination of hospital records, and discussions with relatives and acquaintances of the deceased, following the acquisition of consent from the legal guardians of the deceased individuals. The collated data was categorized according to various parameters aligned with the objectives of the present study. A standard autopsy protocol was adhered to, and relevant samples and viscera underwent chemical analysis as well as histopathological examinations, with the resultant findings meticulously documented. Data entry was performed utilizing Microsoft Office Excel. Afterward, the information underwent scrutiny through the Statistical Package for Social Science tailored for Windows operating systems and frequency tables and proportions were generated.

Table 1: Distribution according to the age of the deceased and cause of death

Age Group [Years]	Burn		Drown- ing		Electro- cution		Fall from Height		Fire arm		Hang- ing		Light- ening		Medical Disease		Pois- oning		RTA		Snake- bite		Stab		Strangu- lation		Elephant Trample		Others		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
15-19	18	33.3	02	3.7	01	1.9	00	00	01	1.9	10	18.5	00	00	02	3.7	11	20.4	05	9.3	03	5.6	01	1.9	00	00	00	00	00	00	54	100
20-24	15	28.3	02	3.8	00	00	00	00	01	1.9	16	30.2	01	1.9	02	3.8	03	5.7	09	17	02	3.8	02	3.8	00	00	00	00	00	00	53	100
25-29	13	37.1	02	5.7	01	2.9	00	00	00	00	03	8.6	00	00	03	8.6	02	5.7	07	20	00	00	03	8.6	01	2.9	00	00	00	00	35	100
30-34	12	40	00	00	00	00	01	3.3	00	00	02	6.7	01	3.3	00	00	00	00	11	36.7	00	00	01	3.3	01	3.3	00	00	01	3.3	30	100
35-39	03	15	01	05	01	05	03	15	00	00	00	00	01	05	01	05	01	05	07	35	00	00	01	05	00	00	00	00	01	05	20	100
40-44	04	12.1	03	9.1	00	00	02	6.1	02	6.1	03	9.1	00	00	01	03	01	03	14	42.4	02	6.1	00	00	00	00	01	03	00	00	33	100
Total	65	28.9	10	4.4	03	1.3	06	2.7	04	1.8	34	15.1	03	1.3	09	04	18	08	53	23.6	07	3.1	08	3.6	02	0.9	01	0.4	02	0.9	225	100

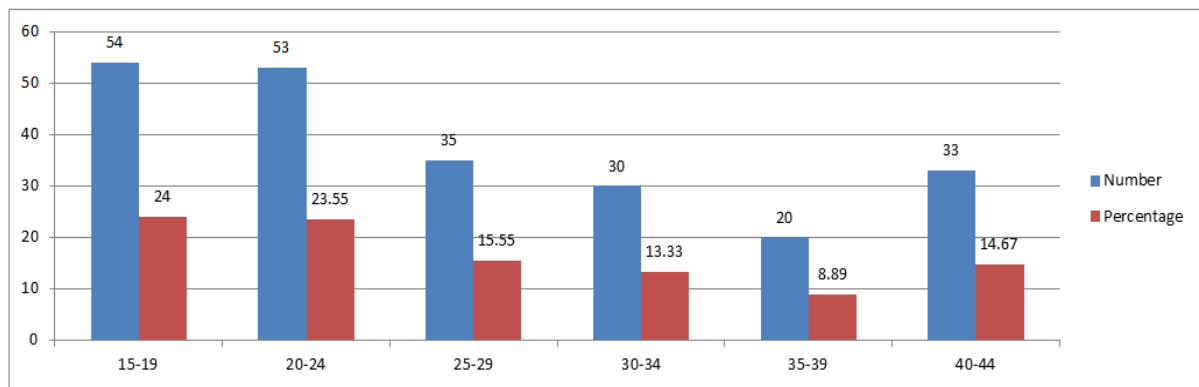


Figure 1: Distribution of cases according to Age

Table 2: Distribution of cases according to age and manner of death

			Manner of death				Total
			Accidental	Homicidal	Suicidal	Suspicious	
Age group	15-19	Frequency	28	3	21	2	54
		%	51.9%	5.6%	38.9%	3.7%	100.0%
	20-24	Frequency	26	4	21	2	53
		%	49.1%	7.5%	39.6%	3.8%	100.0%
	25-29	Frequency	18	4	10	3	35
		%	51.4%	11.4%	28.6%	8.6%	100.0%
	30-34	Frequency	21	3	6	0	30
		%	70.0%	10.0%	20.0%	0.0%	100.0%
	35-39	Frequency	14	2	3	1	20
		%	70.0%	10.0%	15.0%	5.0%	100.0%
	40-44	Frequency	26	2	4	1	33
		%	78.8%	6.1%	12.1%	3.0%	100.0%
	Total	Frequency	133	18	65	9	225
		%	59.1%	8.0%	28.9%	4.0%	100.0%

Table 3: Distribution of cases According to Age and Manner / Cause of Death

		15-19	20-24	25-29	30-34	35-39	40-44	Total
Suicide (no.= 65)	Hanging	10	16	3	2	0	3	34
	Drowning	0	1	0	0	1	0	2
	Poisoning	9	2	2	0	1	1	15
	Burns	2	2	5	4	1	0	14
	Fall from Height	0	0	0	0	0	0	0
Homicide (no.= 18)	Firearm	1	1	0	0	0	2	4
	Stab / Cut Throat	1	2	3	1	1	0	8
	Manual / Ligature Strangulation	0	0	1	1	0	0	2
	Burn	1	1	0	0	0	0	2
	Others	0	0	0	1	1	0	2
Accidental (no=133)	RTA	5	9	7	11	7	14	53
	Snake Bite	3	2	0	0	0	2	7
	Fall from Height	0	0	0	1	3	2	6
	Electrocution	1	0	1	0	1	0	3
	Poisoning	2	1	0	0	0	0	3
	Lightening	0	1	0	1	1	0	3
	Burns	15	12	8	8	2	4	49
	Drowning	2	1	2	0	0	3	8
Elephant Trampled	0	0	0	0	0	1	1	
Suspicious (no.=9)	Medical diseased	2	2	3	0	1	1	9
Total		54	53	35	30	20	33	225
Percentage		24	23.55	15.55	13.33	8.89	14.67	100

Results and Discussion

The largest proportion of cases [54 (24%)] was identified within the demographic of individuals aged 15-19 years, wherein thermal injuries emerged as the predominant etiology of mortality, succeeded by the age cohort of 20-24 years [53 (23.55%)], characterized by asphyxiation via hanging as the leading cause of death. Conversely, the age category of 35-39 years exhibited the least incidence of cases [20 (8.89%)] {Figure No. 01 & Table No. 01}. The preponderance of cases was attributed to accidents [133 (59.1%)], trailed by instances of suicide [65 (28.9%)] and homicide [18 (8%)], with the manner of death being classified as suspicious in 09 (4%) cases {Table No. 02}.

Road traffic accidents constituted a significant portion of cases, accounting for 53 (23.55%), followed by thermal injuries [49 (21.78%)]. Majority of the women succumbing to accidental burns belonged to the 15-24 years age group. Societal conventions regarding engagement in household duties and the assumption of gastronomic proficiency, in conjunction with the difficulties encountered in adapting to unfamiliar settings such as the domicile of in-laws, marked by a dearth of opportunities for respite and the undertaking of meal preparation despite an absence of expertise in culinary skills, may represent the probable determinants leading to the prevalence of accidental burns among young women. Suicidal asphyxiation via hanging represented 34 (15.11%) of the aggregate cases. Out of the overall cases, 15 (6.67%) involved suicide through poisoning, and 14 (6.22%) were due to thermal injuries. Within the context of homicide, the majority of cases were attributed to stab wounds [08 (3.55%)], with firearm-related injuries comprising [04 (1.78%)]. Among the autopsied suspicious deaths, all were ultimately determined to be natural causes of death {Table No. 03}.

Similar observations were reported in studies conducted by Srivastava AK, Arora P⁷ and Radhika RH & Ananda K¹⁰, where a significant proportion of victims were identified within the age demographic of 18-25 years. However, within their analysis, instances of suicide represented 81% of the overall cases, with accidental fatalities constituting 13%. Kulshrestha P et al¹¹ and Dere RC, Col. Rajoo KM¹² indicated that the majority of fatalities were recorded in the age bracket

of 26-30 years. The research conducted by Parmar, Pragnesh B. et al¹³ revealed that the preponderance of deaths was found in the 18-22 years age interval. In the study carried out by Dhoble, S.V., Dere, R.C., Jaiswani, A.K. et al¹⁴, the demographic most adversely affected was identified as 14-25 years. Zine KU et al³ further documented that the predominant cases (53.7%) were classified as accidental, followed by suicidal cases (40.4%) and homicidal cases (5%). However, in his analysis, burns comprised the highest proportion of cases (49.4%), succeeded by poisoning (15.8%), road traffic accidents (12%), and drowning (10%).

The study executed by Jagadish Rao Padubidri et al¹⁵ categorized suicide as the most prevalent manner of death (45.4%), followed closely by accidents (43.6%), in addition to poisoning (42.3%), hanging (34.9%), and burns (11.4%) as the leading causes of mortality. Kumar S et al¹⁶ identified accidents as the predominant manner of death, followed by suicides. Studies conducted outside India like those by Subedi, Nuwadatta et al¹⁷ observed that suicides (67.59%) were the most common, followed by accidents (19.80%), and by Zaghoul, Nancy & Megahed, Haidy¹⁸ reported that homicide was the most prevalent manner of death, followed by accidental occurrences. Divergent socio-cultural practices, in contrast to the Indian paradigm, in the contexts of Nepal and Egypt, respectively, may elucidate the underlying reasons for the observed phenomena.

Conclusion

A thorough analysis unfolded at the Rajendra Institute of Medical Sciences (RIMS) in Ranchi, targeting the evaluation of non-natural death rates among women in their reproductive years between April 2021 and March 2022, intending to explore the reasons and recommend strategies to mitigate these events. The predominant demographic of the female subjects was identified as being within the 15-24 years age range, with accidental deaths emerging as the most frequent manner of death, followed by suicides; specifically, road traffic incidents and burns were noted as the leading causes of accidental fatalities, whereas hanging, poisoning, and burns were recognized as the primary causes of suicides, in that specified order.

The dearth of precedents regarding this study within the tribal state of Jharkhand hinders the development of comprehensive policies and preventative strategies that aim to tackle the socio-economic challenges faced by women. The incidence of road traffic accidents and unintentional burn incidents, as evidenced by this study, can be ascribed to the augmented participation of women in the reproductive age demographic, particularly among younger individuals, in income-generating activities within this region. In a manner analogous to other tribal regions such as Chhattisgarh and the northeastern states, women similarly engage predominantly in labor and participate equivalently in income-generating activities, whether by operating tea stalls, managing small budget-friendly eateries and tiffin services, or by providing services as domestic helpers and caregivers, among other roles.

The phenomenon of suicide, recognized as a significant social challenge, can be effectively mitigated by enhancing the self-esteem and resilience of women from the adolescent stage. The incidences of suicide stemming from marital discord and dowry-related fatalities can be curtailed through the discouragement of premature marriages, the provision of pre-marital counseling, and the impartation of life skills aimed at harmonizing career pursuits with marital responsibilities.

Limitations of the Study

The analysis articulated in this research acknowledges that the prevalence of unnatural deaths among females is frequently underestimated on a global scale, thereby obstructing a comprehensive understanding of the entirety of unnatural mortality within the reproductive age demographic and potentially resulting in a disjointed analysis of the determinants contributing to these fatalities. Furthermore, the research utilizes a descriptive approach, which may hinder the capacity to delineate causal linkages or assess the efficacy of proposed preventive strategies aimed at mitigating unnatural deaths in adult females. The exclusion of unrecognized and decomposed remains may limit the comprehensiveness of the results and could inadvertently overlook significant incidents that might provide further elucidation regarding the trends linked to unnatural female fatalities.

Future Research Recommendations

There exists a pressing necessity for scholarly investigations that assess the efficacy of policies designed to foster female economic autonomy, as well as to support mental health strategies, community-based interventions, and educational initiatives aimed at transforming societal attitudes towards women. Empirical research could evaluate the ramifications of these initiatives on the diminution of unnatural mortality rates among women, thereby supplying policymakers with substantiated evidence to enact efficacious interventions. Subsequent research may also aim to elucidate the psychological and sociocultural variables contributing to the elevated prevalence of unnatural deaths within the reproductive age demographic, with particular emphasis on the influences of mental stress, familial relationships, and societal expectations on their overall well-being. This inquiry could encompass qualitative studies that delve into the personal narratives and lived experiences of victims and their families, thereby enhancing comprehension of the fundamental issues that precipitate such tragic outcomes.

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• Conflicts of interest statement : None.

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