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ORIGINAL ARTICLE

Pattern and Characteristics of Violent Asphyxial Deaths: A Prospective Study from Belagavi Region

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ABSTRACT

Background: Violent asphyxial deaths constitute a major proportion of medico-legal fatalities in India, with hanging and drowning being the most common mechanisms. Regional epidemiological data are essential for forensic interpretation and prevention strategies.

Aim: To study the pattern and characteristics of violent asphyxial deaths in the Belagavi region with respect to demographic, environmental, and socio-economic factors, and to evaluate the effects of neck constriction in different forms of asphyxia.

Materials and Methods: A prospective autopsy-based study was conducted over 18 months (November 2012–April 2014) at the Department of Forensic Medicine and Toxicology, Belagavi Institute of Medical Sciences, Karnataka. Out of 1,176 medico-legal autopsies, 175 cases of violent asphyxial deaths were included. Data regarding age, sex, marital status, residence, season, motive, manner of death, and type of asphyxia were collected from police records, circumstantial history, and detailed postmortem examination. Statistical analysis was performed using descriptive statistics and chi-square test.

Results: Violent asphyxia constituted 14.88% of all autopsies. Hanging (62.28%) was the most common type, followed by drowning (28.57%). Suicidal deaths

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predominated (78.86%). Males were more commonly affected (73.71%), with the highest incidence in the 21–30 year age group. Married individuals and rural residents constituted the majority. A significant seasonal variation was observed, with maximum cases during summer. Hyoid bone fracture was noted in 20% of cases.

Conclusion: Hanging and drowning remain the predominant modes of violent asphyxial deaths, mainly suicidal in nature, affecting young adult males from rural and socio-economically stressed backgrounds.

KEYWORDS

• Violent asphyxia • Hanging • Drowning • Suicide • Autopsy study • Forensic medicine

INTRODUCTION

Mechanical asphyxia encompasses various forms such as hanging, ligature strangulation, manual strangulation (throttling), suffocation (including smothering, gagging, and choking), compressive asphyxia, and drowning.[1,2] Each of these mechanisms interferes with oxygen exchange, resulting in hypoxia and ultimately death. The pattern, prevalence, and circumstances surrounding such deaths provide critical insights into both medico-legal and public health aspects within a population.

According to the National Crime Records Bureau (NCRB, 2010), poisoning accounted for the highest proportion of suicides in India (33.1%), followed by hanging (31.4%) and drowning (6.2%).[3] The World Health Organization (WHO, 2012) reported that India had the highest number of suicides in the Southeast Asia region, totaling 258,075 deaths (158,098 men and 99,977 women), revealing a marked gender disparity and significant public health burden.[4] In 2022, India reported approximately 171,000 suicides, representing a rate of 12.4 per 100,000 population the highest ever recorded. Karnataka alone reported 13,606 suicides and a rate of 20.2 per 100,000, significantly above the national average.[5]

Belagavi, the second capital and largest district of Karnataka, comprises 11 talukas with a diverse urban–rural population.[6] The Belagavi Institute of Medical Sciences (BIMS) is the only government medical college in the district, conducting 800–900 medico-legal autopsies annually through its Department of Forensic Medicine and Toxicology. Given its wide catchment area and representative demographic structure, Belagavi serves as an ideal setting for epidemiological assessment of asphyxial deaths.

To date, region-specific and systematic studies examining the epidemiological profile of violent asphyxial deaths in and around Belagavi are limited. In this context, the present study was undertaken to comprehensively evaluate the pattern, distribution, and determinants of violent asphyxial deaths in this region. The findings are expected to enhance medico-legal interpretation during forensic investigations and provide locally relevant evidence to support the formulation of preventive strategies. By identifying demographic vulnerabilities, socio-economic stressors, and mechanism-specific injury patterns, this study seeks to contribute data that may assist in targeted public health planning, mental health outreach, and risk-reduction interventions for populations vulnerable to violent asphyxial deaths.

AIM AND OBJECTIVES

Aim: To analyze the pattern and characteristics of violent asphyxial deaths in the Belagavi region, with particular emphasis on demographic, environmental, and socio-economic factors influencing their occurrence.

Objectives

1. To study the pattern of violent asphyxial deaths with respect to age, sex, occupation, motive, manner of death, rural–urban distribution, literacy status, season and time of occurrence, socio-economic background, and marital status.
2. To examine the effects of constriction on underlying neck structures in cases of hanging, throttling, and strangulation.

MATERIALS AND METHODS

Study Design and Setting

A **prospective observational study** was conducted on **175 cases of violent asphyxial deaths** over a period of **18 months** (November 2012 to April 2014) at the Department of Forensic Medicine and Toxicology, **Belagavi Institute of Medical Sciences**, Belagavi, Karnataka. The objective was to evaluate the **epidemiological profile, medico-legal characteristics, and patterns of violent asphyxial deaths** with respect to age, sex, occupation, motive, manner of death, place of residence (rural/urban), literacy status, season and time of occurrence, socioeconomic status, and marital status.

Case Selection and Data Sources

All asphyxial deaths subjected to medico-legal autopsy during the study period were screened. Relevant information was obtained from **police inquest reports, autopsy requisition forms, hospital records, statements from relatives, and discussions with investigating officers**. Data were recorded using a **predesigned and pretested proforma** to ensure uniformity and completeness.

Variables Studied

The following variables were analyzed:

- **Demographic variables:** age, sex, marital status, religion, occupation, educational status, socioeconomic status (based on approximate annual income), and rural/urban residence.
- **Medico-legal variables:** police station, legal section invoked, manner of death (suicidal, homicidal, accidental, or undetermined), and probable motive/circumstances (e.g., illness, depression, financial stress, family disputes).
- **Temporal variables:** season and time of occurrence of death.
- **Autopsy variables:** type of asphyxial death and associated external and internal findings.

Autopsy Examination

All cases underwent **standard medico-legal autopsy procedures** as per established forensic guidelines. The **type of asphyxial death** was categorized as hanging, drowning, strangulation, throttling, smothering, gagging, choking, or compressive/traumatic asphyxia.

- **Hanging:** documentation of ligature mark characteristics, facial congestion, cyanosis, subconjunctival and petechial hemorrhages, dribbling of saliva, carotid intimal tears, and fractures of the hyoid bone, thyroid cartilage, or cricoid cartilage.
- **Drowning:** presence of froth at the mouth and nostrils, water in the stomach, blood in paranasal sinuses, cadaveric spasm, and lung findings (wet or dry lungs).
- **Other forms of asphyxia:** assessment of facial congestion, petechial hemorrhages, subconjunctival hemorrhages, neck injuries, and fractures of neck structures where applicable.

Inclusion and Exclusion Criteria

Inclusion criteria:

- All cases of violent asphyxial deaths subjected to medico-legal autopsy during the study period.

Exclusion criteria:

- Putrefied bodies where reliable assessment of asphyxial signs was not possible.
- Cases of **neonatal birth asphyxia**.
- Asphyxial deaths due to **environmental or atmospheric suffocation**, as facilities for atmospheric sampling were not available.

Statistical Analysis

Data were entered into **Microsoft Excel** and analyzed using **SPSS software (version XX)**.

- **Descriptive statistics** were used to summarize data, expressed as **frequencies, percentages, and ratios**.
- **Chi-square (χ^2) test** was applied to assess associations between categorical variables such as type of asphyxial death and age group, sex, manner of death, residence (rural/urban), marital status, season, and socioeconomic status.
- When expected cell frequencies were <5, **Fisher's exact test** was used.
- A **p-value <0.05** was considered statistically significant.

RESULTS

During the study period (November 2012 to April 2014), a total of 1,176 medico-legal autopsies were conducted at Belagavi Institute of Medical Sciences. Among these, 175 deaths (14.88%) were attributed to violent asphyxia, making it the third most common cause of death.

Demographic Profile

Of the 175 victims, 129 were males (73.71%) and 46 were females (26.29%), yielding a male-to-female ratio of approximately 3:1. The highest incidence of violent asphyxial deaths occurred in the 21–30-year age group (59 cases; 33.71%), followed by 31–40 years (34 cases; 19.43%) and 41–50 years (30 cases; 17.14%). Together, these age groups accounted for nearly 70% of all cases. Deaths at the extremes of age were uncommon, with only one case (0.57%) reported in the 0–1-year age group and three cases (1.71%) in individuals aged 81–90 years. (Table 1 & 2)

Table 1: Sex-wise Distribution of Violent Asphyxial Deaths (n = 175)

Sex	Number of Cases (n)	Percentage (%)
Male	129	73.71
Female	46	26.29
Total	**175**	**100.00**

Footnote: Male-to-female ratio = 3:1.

Table 2: Age-wise Distribution of Violent Asphyxial Deaths (n = 175)

Age Group (years)	Number of Cases (n)	Percentage (%)
0–10	3	1.71
11–20	12	6.86
21–30	59	33.71
31–40	34	19.43
41–50	30	17.14
51–60	18	10.29
>60	19	10.86
Total	**175**	**100.00**

Footnote: Chi-square test showed significant variation across age groups ($\chi^2 = 147.94$, $p < 0.01$).

Educational Status of Victims

Analysis of educational status revealed that a majority of victims had low to moderate levels of formal education. Matriculate individuals constituted the largest group, accounting for 93 cases (53.14%). This was followed by undergraduates in 30 cases (17.14%) and illiterate individuals in 28 cases (16.00%). Graduates represented the smallest proportion, with only 7 cases (4.00%). Educational status could not be ascertained in 7 cases (4.00%). Overall, the distribution demonstrates a higher occurrence of violent asphyxial deaths among individuals with lower educational attainment. Statistical analysis revealed a **significant association between educational status and manner of death** (χ^2 test, $p < 0.05$), with suicidal asphyxial deaths occurring more frequently among individuals with lower educational attainment.

Marital Status of Victims

As shown in **Figure 1**, married individuals constituted the majority of victims, accounting for 100 cases (57.0%). Unmarried individuals, including children, comprised 61 cases (35.0%). Marital status could not be ascertained in 14 cases (8.0%).

Statistical analysis demonstrated a significant difference in the distribution of violent asphyxial deaths according to marital status (**$\chi^2 = 9.21$, df = 1, $p < 0.01$**).

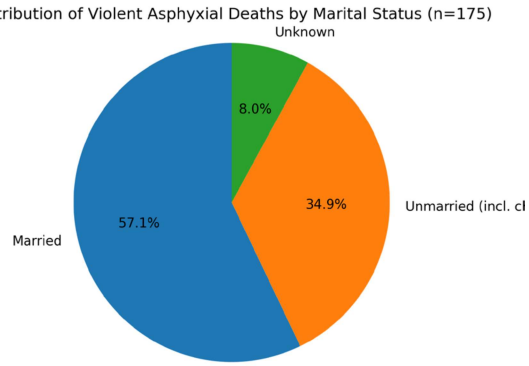

Figure 1: Pie chart showing the distribution of violent asphyxial deaths according to marital status

Area-wise and Sex-wise Distribution of Violent Asphyxial Deaths

As presented in **Table 3**, a higher proportion of violent asphyxial deaths was recorded from rural areas. Rural males constituted the largest subgroup (**77 cases; 44.00%**), followed by urban males (**43 cases; 24.57%**). Female deaths were fewer, with **21 cases (12.00%)** from rural areas and **25 cases (14.29%)** from urban areas.

When analyzed irrespective of sex, rural cases (**n = 98; 56.00%**) outnumbered urban cases (**n = 68; 38.86%**), resulting in a rural-to-urban ratio of **1.44:1**. Additionally, **2 cases (1.14%)** were reported as custodial (prison) deaths, and in **7 cases (4.00%)** the identity of the deceased could not be established.

Chi-square analysis demonstrated a **statistically significant difference** in the area-wise distribution of violent asphyxial deaths ($\chi^2 = 151.42$, $p < 0.01$).

Table 3: Area-wise and Sex-wise Distribution of Violent Asphyxial Deaths (n = 175)

Area / Sex	Male n (%)	Female n (%)	Total n (%)
Rural	77 (44.00)	21 (12.00)	98 (56.00)
Urban	43 (24.57)	25 (14.29)	68 (38.86)
Prison	2 (1.14)	–	2 (1.14)
Unknown identity	–	–	7 (4.00)
Total	**122 (69.71)**	**46 (26.29)**	**175 (100)**

Chi-square = 151.42; p < 0.01 (statistically significant)

Motive-wise Distribution of Violent Asphyxial Deaths

As shown in **Table 4**, academic or financial stress was the most frequently identified motive, accounting for **86 cases (49.14%)**. Alcohol addiction and substance-related behavioral disturbances were noted in **26 cases (14.86%)**. In **30 cases (17.14%)**, the motive could not be ascertained; these included accidental deaths, unidentified bodies, and homicidal cases with no documented predisposing factors.

Chi-square analysis demonstrated a **statistically significant association** between **motive and manner of death** ($\chi^2 = 152.10$, $p < 0.01$).

Table 4: Motive-wise Distribution of Violent Asphyxial Deaths (n = 175)

Motive	Number of Cases (n)	Percentage (%)
Academic / Financial stress	86	49.14
Alcohol addiction	26	14.86
Family / marital conflict	20	11.43
Mental illness / depression	13	7.43
Unknown / others	30	17.14
Total	**175**	**100.00**

Footnote: Motive distribution differed significantly by manner of death ($\chi^2 = 152.10$, $p < 0.01$).

Type and Manner of Asphyxial Deaths

The distribution of violent asphyxial deaths according to type and manner of death is shown in **Table 3**. Hanging was the most frequent type of asphyxia, accounting for 109 cases (62.28%), followed by drowning in 50 cases (28.57%). Other types included strangulation (7 cases; 4.00%), throttling (4 cases; 2.29%), traumatic asphyxia (3 cases; 1.71%), smothering (1 case; 0.57%), and choking (1 case; 0.57%). Hanging and drowning together constituted 159 cases (90.85%) of all violent asphyxial deaths.

With respect to the manner of death, suicide was the most common manner, observed in 138 cases (78.86%), followed by accidental deaths in 19 cases (10.86%), homicidal deaths in 15 cases (8.57%), and undetermined manner in 3 cases (1.71%). Hanging was predominantly suicidal, whereas all cases of strangulation, throttling, and smothering were homicidal. Traumatic asphyxia and choking were exclusively accidental. Drowning showed a mixed distribution across suicidal, accidental, and undetermined manners. A statistically significant association was found between the type of asphyxia and the manner of death ($\chi^2 = 212.02$, $df = 18$, $p < 0.001$).

Sex-wise Distribution of Type and Manner of Asphyxial Deaths

Sex-wise distribution revealed a marked male predominance, with 129 males (73.7%) and 46 females (26.3%), resulting in a male-to-female ratio of approximately 3:1 (**Table 3**). Suicidal asphyxial deaths were more frequent among males (104 cases; 59.4%) compared to females (34 cases; 19.4%). Homicidal deaths were also higher among males (11 cases; 6.3%) than females (4 cases; 2.3%). Accidental asphyxial deaths occurred in 11 males (6.3%) and 8 females (4.6%).

The association between sex and manner of death was statistically significant ($\chi^2 = 27.41$, $df = 3$, $p < 0.001$). A significant association was also observed between sex and type of asphyxia ($\chi^2 = 31.78$, $df = 6$, $p < 0.001$).

Table 5: Sex-wise, Type-wise & Manner-wise Distribution of Violent Asphyxial Deaths (n = 175)

Type of Asphyxia	Sex	Homicide n (%)	Suicide n (%)	Accidental n (%)	Unknown n (%)	Total n (%)
Hanging	Male	1 (0.9)	87 (79.8)	–	–	88 (80.7)
	Female	1 (0.9)	20 (18.3)	–	–	21 (19.3)
	Total	**2 (1.8)**	**107 (98.2)**	–	–	**109 (62.3)**
Drowning	Male	1 (2.0)	17 (34.0)	9 (18.0)	3 (6.0)	30 (60.0)
	Female	–	14 (28.0)	6 (12.0)	0	20 (40.0)
	Total	**1 (2.0)**	**31 (62.0)**	**15 (30.0)**	**3 (6.0)**	**50 (28.6)**
Strangulation	Male	7 (100)	–	–	–	7 (100)
	Female	–	–	–	–	0
	Total	**7 (100)**	–	–	–	**7 (4.0)**
Throttling	Male	2 (50)	–	–	–	2 (50)
	Female	2 (50)	–	–	–	2 (50)
	Total	**4 (100)**	–	–	–	**4 (2.3)**
Traumatic Asphyxia	Male	–	–	1 (33.3)	–	1 (33.3)
	Female	–	–	2 (66.7)	–	2 (66.7)
	Total	–	–	**3 (100)**	–	**3 (1.7)**
Smothering	Male	–	–	–	–	–
	Female	1 (100)	–	–	–	1 (100)
	Total	**1 (100)**	–	–	–	**1 (0.6)**
Choking	Male	–	–	1 (100)	–	1 (100)
	Female	–	–	–	–	–
	Total	–	–	**1 (100)**	–	**1 (0.6)**
Grand Total	Male	**11 (6.3%)**	**104 (59.4%)**	**11 (6.3%)**	**3 (1.7%)**	**129 (73.7%)**
	Female	**4 (2.3%)**	**34 (19.4%)**	**8 (4.6%)**	–	**46 (26.3%)**
	Overall	15 (8.6%)	138 (78.9%)	19 (10.9%)	3 (1.7%)	175 (100%)

Season-wise Distribution of Violent Asphyxial Deaths

As summarized in **Table 6**, the occurrence of violent asphyxial deaths varied significantly across seasons (**$\chi^2 = 36.09$, df = 6, $p < 0.01$**). The highest number of cases was recorded during the **summer season (February–May)** with **71 cases (40.57%)**, followed by **winter (November–January)** with **53 cases (30.29%)**. The **lowest number of cases** was observed during **autumn (September–October)**, accounting for **19 cases (10.86%)**.

Hanging was the most frequently observed type of asphyxia in all seasons, while drowning constituted the second most common type, with higher counts during summer and winter. Other forms of asphyxia were infrequent and showed no marked seasonal variation.

Sex-wise analysis demonstrated male predominance across all seasons. Males constituted **74.6% of cases during summer**, whereas during winter, females accounted for **32.1% of cases**. The association between **sex and season** was statistically significant (**$\chi^2 = 8.96$, df = 3, $p = 0.029$**).

Table 6: Season-wise Distribution of Violent Asphyxial Deaths by Sex (n = 175)

Season	Hanging		Hanging Total n (%)	Drowning		Drowning Total n %	Others		Others Total (n) (%)	Season Total n (%)
	M (n)	F (n)		M (n)	F (n)		M (n)	F (n)		
Feb–May (Summer)	32	10	42 (24.0%)	10	7	**17 (9.7%)**	8	4	**12 (6.9%)**	**71 (40.6%)**
Jun–Aug (Monsoon)	20	7	27 (15.4%	3	2	**5 (2.9%)**	0	0	**0 (0%)**	**32 (18.3%)**
Sep–Oct (Autumn)	7	1	8	5	6	**11 (6.3%)**	0	0	**0 (0%)**	**19 (10.9%)**
Nov–Jan (Winter)	29	3	32	12	5	**17 (9.7%)**	3	1	**4 (2.3%)**	**53 (30.3%)**
Total	**88**	**21**	**109**	**30**	**20**	**50 (28.6%)**	**11**	5	**16 (9.1%)**	**175 (100%)**

Note: These male–female totals align with the study population (129 males, 46 females).

Comparative Prominent Postmortem Findings: Strangulation/Throttling versus Hanging

A comparative analysis of postmortem findings was performed between **strangulation/throttling cases (n = 16)** and **hanging cases (n = 109)** (Table 7 and 8, respectively).

Petechial hemorrhages were observed in **all strangulation/throttling cases (100%)**, compared with **37 hanging cases (33.94%)**, demonstrating a markedly higher frequency in neck compression due to assault. Subconjunctival hemorrhage and facial congestion were each present in **68.75%** of strangulation/throttling cases, whereas these findings were documented in only **15.60%** and **8.26%** of hanging cases, respectively.

Cyanosis showed an inverse pattern, being significantly more frequent in hanging (**89.91%**) than in strangulation/throttling (**25.00%**). Dribbling of saliva, a classical feature of antemortem hanging, was present in **72.48%** of hanging cases and was **absent in strangulation/throttling**.

Structural neck injuries were more frequent in strangulation/throttling. Hyoid bone fractures were identified in **31.25%** of strangulation/throttling cases compared to **18.35%** of hanging cases, while thyroid cartilage fractures were noted in **12.50%** and **1.83%**, respectively. Contusions of deep neck tissues were observed in **12.50%** of strangulation/throttling cases but were not a prominent feature in hanging. Carotid intimal tears were documented only in hanging cases (**8.26%**).

On statistical comparison, the distribution of key postmortem findings differed significantly between the two groups. Petechial hemorrhages, subconjunctival hemorrhage, and facial congestion were significantly associated with strangulation/throttling, whereas cyanosis and dribbling of saliva were significantly associated with hanging (**χ^2 test, $p < 0.01$**).

Table 7: Postmortem Findings in Strangulation & Throttling (n = 16)

Postmortem Findings	No. of Cases	Percentage (%)
Subconjunctival hemorrhage	11	68.75%
Cyanosis	4	25.00%
Petechial hemorrhages	16	**100%**
Facial congestion	11	68.75%
Hyoid bone fracture	5	31.25%
Thyroid cartilage fracture	2	12.50%
Contusions in neck tissues	2	12.50%

Table 8: Prominent Postmortem Findings in Hanging Deaths (n = 109)

Postmortem Findings	No. of Cases	Percentage (%)
Subconjunctival haemorrhage	17	15.60%
Cyanosis	98	89.91%
Petechial hemorrhage	37	33.94%
Facial congestion	9	8.26%
Dribbling of saliva	79	72.48%
Carotid intimal tear	9	8.26%
Hyoid bone fracture	20	18.35%
Thyroid cartilage fracture	2	1.83%

DISCUSSION

Overall Incidence of Violent Asphyxial Deaths

In the present study, violent asphyxial deaths accounted for **14.5%** of all medico-legal autopsies. This incidence is comparable to that reported by **Azmak,**[7] suggesting a similar burden in comparable populations. However, it is higher than the proportions documented by **Momanchand et al.**[8] (7%) and **Salachin**[9] (9.3%). Such variation across studies may reflect regional differences in socio-economic stressors, occupational exposure, urban–rural composition, and reporting practices.

Type of Asphyxia

Hanging was the most frequent type of violent asphyxia (**62.28%**), followed by drowning (**28.57%**). These findings are consistent with reports by **Gurudut et al.**[10], **Ajay et al.**[11], **Srinivasa Reddy et al.**[12], **Azmak**[7], and **Kumar Shubhendu et al.**[13], where hanging emerged as the predominant mode. In contrast, studies by **Chormunge Vijay et al.**[14] and **Gorea et al.**[15] reported drowning as the leading cause, likely influenced by geographic and occupational factors such as proximity to water bodies. The predominance of suicidal drowning in the present study differs from **Chormunge Vijay et al.**[14], who observed a higher proportion of accidental drowning.

Manner of Death and Its Association with Type

Suicide was the predominant manner of death (**78.86%**), followed by accidental (**10.86%**) and homicidal (**8.57%**) deaths. This distribution closely mirrors findings by **Sahoo**[16], **Fimate**[17], and **Kaushal Kishore and Bhoopendra Singh**[18], reinforcing the contribution of self-harm to asphyxial fatalities in India. Hanging was almost exclusively suicidal, whereas strangulation, throttling, and smothering were homicidal, and traumatic asphyxia and choking were accidental. This strong type–manner association, also documented in earlier studies[15], underscores the medico-legal relevance of mechanism-specific interpretation.

Sex-wise Distribution

A marked male predominance (**73.71%**) was observed, consistent with findings by **Salachin**[9] (75.6%) and **Momanchand et al.**[8] (80.3%). Higher exposure to occupational stress, substance use, and socio-cultural expectations among males may contribute to this disparity. The predominance of males was evident across suicidal, accidental, and homicidal categories, indicating a broad gender-linked vulnerability.

Age-wise Distribution

Young adults constituted the most affected group, with the highest incidence in the **21–30-year** age group, followed by **31–40 years**. Similar age clustering has been reported in Indian studies[15,16] and reflects the impact of academic, occupational, and financial pressures during economically productive years. The relatively low incidence at the extremes of age suggests differing exposure and vulnerability profiles.

Area-wise Distribution

The rural predominance observed in the present study aligns with **Azmak**[7] and highlights the influence of limited mental health resources, economic instability, and occupational stress in rural settings. The higher rural-to-urban ratio emphasizes the need for region-specific preventive strategies.

Seasonal Variation

A peak during summer months followed by winter mirrors patterns described by **Ajay et al.**[11] Seasonal stressors such as heat, agricultural uncertainty, and financial obligations may contribute to this trend. The consistent predominance of hanging across seasons supports its accessibility and cultural familiarity as a means of self-harm.

Educational Status and Motive

Lower educational attainment was common among victims, similar to findings by **Gargi et al.**[19] and **Fimate.**[17] Academic and financial stress emerged as the leading motive, consistent with trends in contemporary Indian suicide epidemiology.[19,17] These observations highlight the role of socio-economic vulnerability rather than isolated psychiatric illness.

Postmortem Findings in Hanging

Cyanosis and dribbling of saliva were the most frequent findings, supporting their diagnostic value in antemortem hanging, as described by **Clément et al.**[20] and **Ahmad and Hossain.**[21] Hyoid and thyroid cartilage fractures were less frequent and predominantly age-related,

consistent with ossification patterns reported in the literature.[20]

Postmortem Findings in Strangulation and Throttling

Petechial hemorrhages and subconjunctival hemorrhage were consistently observed, reflecting intense venous obstruction, similar to findings by **Demirci et al.**[22] and **Momin et al.**[23] Although fracture rates were lower than those reported by **Verma and Lal,**[24] differences in force application and victim age may explain this variation.

Ethical Considerations

The study was conducted as part of routine medico-legal autopsy work. Confidentiality of personal identifiers was strictly maintained, and the study adhered to institutional and ethical standards applicable to forensic research.

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