

# Epidemiological Evaluation of Suicidal Deaths due to Hanging: A Retrospective Medicolegal Study in Sylhet

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## ABSTRACT

**Background:** Suicidal hanging is the most common method of suicide in developing countries, especially among young people. During conventional autopsies, it is one of the significant causes of unnatural deaths in Bangladesh. This study was performed to determine the epidemiological evaluation of suicidal deaths due to suicidal hanging at the mortuary of the Forensic Medicine Department of Sylhet MAG Osmani Medical College, Sylhet.

**Materials and methods:** An autopsy record-based retrospective study carried out to ascertain the epidemiological evaluation of 340 cases of suicidal hanging deaths from January 2015 to December 2018 in the Department of Forensic Medicine, Sylhet MAG Osmani Medical College, Sylhet.

**Results:** Hanging was more common in the age ranges of 10-19 years (33.0%) and 20-29 years (29.1%), accounting for nearly two-thirds (62.1%) of all deaths. The incidence was higher in females (59.3%) than males (46.7%). Gowainghat (12.1%) and Kotwali (9.5%) had the highest incidences of victims. The most common autopsy findings were that the subcutaneous tissues underneath the ligature mark were found to be pale, white, hard and glistening in 94.2% of cases, cyanosis was found in 89.8% of cases, dribbling of saliva was seen in 66.3% of cases and subconjunctival petechial haemorrhage was observed in 46.0% of cases. Asphyxia (93.3%) was the most common cause of suicidal hanging deaths identified during autopsy.

**Conclusion:** The majority of victims were female and young individuals were especially vulnerable to suicidal ideation, attempts and suicide by hanging. To reduce suicides, awareness programs, psychological counseling and suicidal behavioral treatment are recommended.

**Key words:** Epidemiology; Poison; Suicidal hanging deaths.

## Introduction

Suicide by hanging is a communal method of suicide in the current world.<sup>1,2</sup> It becomes a worsening public health issue for Southeast Asian countries.<sup>3</sup> According to World Health Organization (WHO) reports, in 2019 suicidal deaths were estimated to account for 1.3% of all deaths among all sexes globally.<sup>4</sup> It was considered

the 4<sup>th</sup> highest cause of mortality in both sexes of young people aged 15-29 years.<sup>4,5</sup>

Suicide is a tragic event that has an impact on the people left behind, families, communities and even states.<sup>6</sup> Most prevalent risk factors such as psychiatric disorders (Depression, bipolar disorder, post-traumatic stress disorder, etc.) social (Domestic violence, divorce, dowry, socioeconomic instability, etc.) and biological factors (Sexual assaults, rape, illegal pregnancy, extramarital affairs, etc.) are inciting suicidal thoughts and behaviours across all age groups.<sup>7,8</sup>

After suicidal poisoning, hanging is one of the most common means of suicide recognized in medical-legal proceedings in Bangladesh.<sup>9</sup> Asphyxia caused by constriction of the neck while the body is suspended, either from the weight of the body or the head alone, is referred to as "hanging" and is a mechanical instance of asphyxia.<sup>10,11</sup> Asphyxia, venous congestion, cerebral ischaemia, cerebral anaemia, shock and fracture or dislocation of the cervical vertebrae are identified as leading causes of death from hanging in autopsy.<sup>12,13</sup>

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**Materials and methods**

This is a record-based retrospective observational study of autopsies was conducted from January 2015 to December 2018. A total of 430 cases of deaths (93 in 2015, 107 in 2016, 101 in 2017 and 129 in 2018 respectively) were identified due to hanging, all were considered due to suicide. The cases were analyzed based on the inquest reports, hospital records and autopsy examination findings. All medicolegal cases were referred from 17 different police stations located in Sylhet district. Data were collected using a pre-designed schedule from autopsy registers and reports. These were based on socio-demographic characteristics, autopsy findings and causes of death from the autopsy examination reports.

The data were checked and cleaned by Microsoft Excel 2010. Descriptive statistics such as mean and percent were computed for the continuous variables of the victims. The data were presented with tables and charts. Ethical permission was taken appropriately from the Department of Forensic Medicine, Sylhet MAG Osmani Medical College, Sylhet.

**Results**

A total of 430 medicolegal autopsies were conducted at the mortuary of Sylhet MAG Osmani Medical College during the study period. Table 1 depicts the age groups of the cases. The incidence of hanging was higher in the age groups of 10-19 years (33.0%) and 20-29 years (29.1%), which was considered about two-thirds (62.1%) of the total deaths.

Figure 1 shows the distribution of cases with respect to gender. The incidences of hanging were higher in females (59.3%) than males (46.7%).

Figure 2 illustrates the locality of the victims. Most of the victims resided in Gowainghat (12.1%), and Kotwali (9.5%). A significant number of victims' residences were in other parts of the Sylhet district (10.2%).

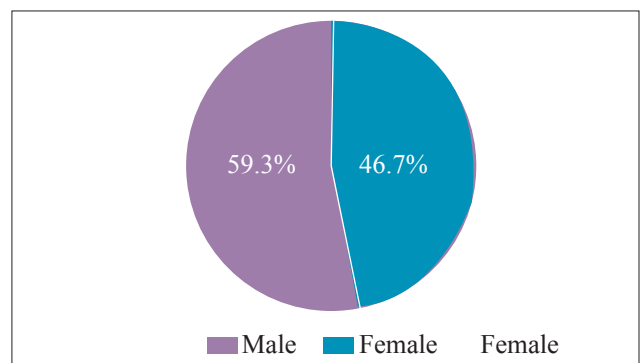
Figure 3 illuminates the names of the police stations where suicidal hanging dead bodies were registered. Most of the dead bodies came into the mortuary under Kotwali (15.6%) and Gowainghat (13.7%).

Table II demonstrates the autopsy findings of the victims. Subcutaneous tissues underneath the ligature mark were found to be pale, white, hard, and glistening in 94.2% of cases; cyanosis was found in 89.8% of cases; dribbling of saliva was seen in 66.3% of cases; and subconjunctival petechial haemorrhage was observed in 46.0% of cases.

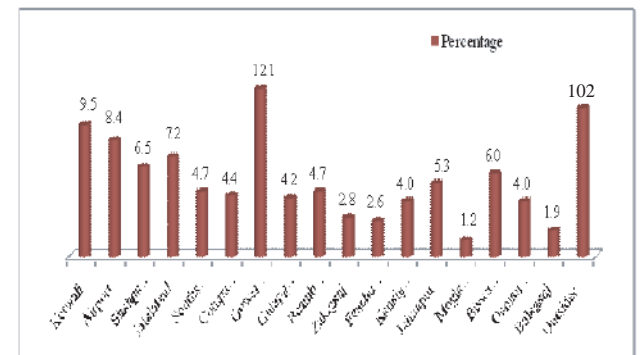
Table III describes the causes of suicidal hanging deaths found in autopsy. During the analysis of autopsy reports, the most common finding was asphyxia (93.3%), followed by asphyxia and apoplexy combined (9.8%) and delayed complications (8.4%).

**Table I** Distribution of the age groups of cases (n=430)

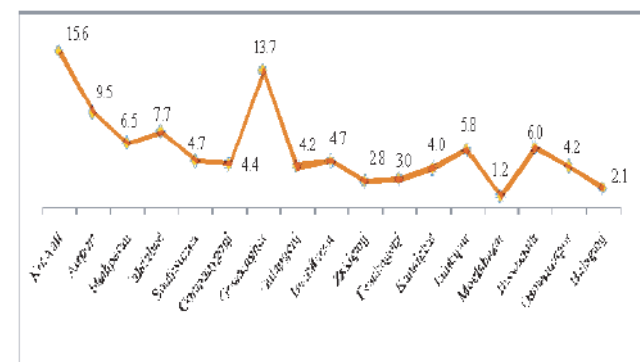
Age group (Years)	Incidences				Total cases (n=430)	Percent (%)
	2015 (n=93)	2016 (n=107)	2017 (n=101)	2018 (n=129)		
10-19	32	34	32	44	142	33.0
20-29	42	22	28	33	125	29.1
30-39	06	03	19	32	60	20.0
40-49	06	39	06	05	56	13.0
50-59	03	02	08	06	19	4.4
≥ 60	04	07	08	09	28	6.5



**Figure 1** Sex wise distribution of the victims (n=430)



**Figure 2** Distribution of the locality of the victims (Police station) (n=430)



**Figure 3** Distribution of the victim's autopsy referred from the police station (n=430)

**Table II** Distribution of the victims according to their autopsy findings (n=430)

Postmortem Findings	Frequency (n)	Percentage (%)
Skin and subcutaneous tissue underneath the ligature mark found pale, white, hard, glistening	405	94.2
Cyanosis	386	89.8
Dribbling of saliva	285	66.3
Subconjunctival petechial haemorrhage	198	46.0
Tongue bite	112	26.0
Injury to subcutaneous tissue underneath the ligature mark	28	6.5
Injury to the neck muscles	22	5.1
Post mortem artifacts	16	3.7

\*Multiple responses

**Table III** Causes of death according to autopsy findings (n=430)

Causes of death	Frequency (n)	Percentage (%)
Asphyxia (Respiratory failure)	401	93.3
Asphyxia and Apoplexy (Combined)	42	9.8
Apoplexy	14	3.3
Cerebral anemia	06	1.4
Vagal shock	02	0.5
Delayed complications (Cerebral ischemia, aspiration pneumonia, sepsis etc.)	36	8.4

\*Multiple responses.

### Discussion

The incidences of hanging was higher in the age groups of 10-19 years (33.0%) and 20-29 years (29.1%), which was considered about two-thirds (62.1%) of the total deaths. It was found that individuals below the age of 30 were the most prone for hanging suicide in our country.<sup>14,15</sup> Among people aged 15 to 29 worldwide, suicide is the most significant cause of unnatural death, according to data from the WHO.<sup>4</sup> The incidence of hangings decreases with advancing age, which was observed in this study.<sup>16</sup> The incidence of hanging was higher in females (59.3%) than males (46.7%). High rates of female suicide indicate a significant psychological and socioeconomic burden on developing countries.<sup>15,17</sup> Most of the victims resided in Gowainghat (12.1%), and other parts of the Sylhet district (10.2%). These are rural parts of Sylhet. Due to lack of knowledge and awareness about the prevention of suicide, suicidal ideation and attempts are higher in rural areas than urban areas.<sup>18</sup>

Regarding the distribution of autopsy findings of the victims, the most common autopsy findings were that the subcutaneous tissues underneath the ligature mark were found to be pale, white, hard and glistening in 94.2% of cases; cyanosis was found in 89.8% of cases,

dribbling of saliva was seen in 66.3% of cases and subconjunctival petechial haemorrhage was observed in 46.0% of cases. The autopsy results coincided with the studies in multiple instances.<sup>15,19,20</sup>

The foremost finding of the causes of suicidal hanging deaths found during autopsy was asphyxia (93.3%), followed by asphyxia and apoplexy combined (9.8%) and delayed complications (8.4%). The other studies reveal nearly comparable findings.<sup>21,22</sup>

### Conclusion

This study revealed that younger age groups are more vulnerable to committing suicide by hanging and females are more vulnerable. It has also been observed that geographical dispersion has a substantial impact on suicidal ideation and suicide. Improving mental health and social well-being are essential for preventing suicide. Suicidal behaviours must be treated appropriately through psychological counseling and intervention.

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### Disclosure

The authors declared no competing interest.

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