

# Major Predisposing Factors Influencing the Suicide by Hanging: A Retrospective Study from a Tertiary Care Government Hospital in Kerala State, South India

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## ABSTRACT

**Introduction:** A variable incidence of hanging is found as second major group among the total number of autopsies done in the Department of Forensic Medicine, Govt. Medical College, Calicut, Kerala state, South India. The incidences are found to be varying according to the social and economic status of the society. This retrospective study was done in a tertiary care Government Hospital to find the major predisposing factors influencing the suicide by hanging.

**Material and Methods:** Case history were taken in detail from questionnaires to the relations of the deceased and from Police. The results were analyzed on the basis of history, postmortem findings and results of laboratory investigations.

**Results:** The age group 16-25 was found to be the most prevalent (75%) for suicidal hanging. Among the religion, Hindu religion showed the highest (80%) number. More cases were found among the manual labourers and lower middle class people. People without children were more prone to suicide by hanging. Among the precipitating factors, mental illness was the highest factor. Fracture of hyoid bone was found during autopsy in majority of cases of complete hanging.

**Conclusion:** Psychological upset and educational status played an important role in suicidal hanging. The highest incidence was seen among those with lower educational status. Hence, proper identification of such people and presenting them to effective counselling may reduce the incident rate.

**Keywords:** Autopsy, Ecchymosis, Psychological, Suicide

## INTRODUCTION

Despite the evolution of sophisticated methods to commit suicide, hanging still remains one of the commonest methods to commit suicide across the world.<sup>1</sup> History of committing this form of suicide dates back to time immemorial. In India, it has been known that between one third and one half of suicides in both genders in Kolkata and in Punjab State and the male suicides in Chennai are due to hanging.<sup>2</sup> According to Ralph hanging is due to constriction of neck as a result of suspension in such a manner that the weight of the body, or a part of the body, of the victim pulls upon the ligature.<sup>3</sup> Hanging is thus distinguished from strangulation by constricting force. This distinction has practical importance because hanging raises a presumption of suicide, whereas strangulation is usually homicidal. A variable incidence of hanging is found as the second major group among the total number of autopsies done in Departments of Forensic Medicine of various Medical Colleges across the country. At present cases of hanging were diagnosed from history of

the case as given by the relations, details of investigation from Police and the autopsy findings. A case of partial hanging may appear as homicidal hanging and it can be distinguished only by an expert forensic pathologist. The idea that most people commit suicide because of losses like – money, job, and house – is popular but not borne out of facts. Regarding the influence exerted by social and financial factors, mental illness and physiological changes during menstruation on suicidal hanging are scant at present. Psychological upset may be the usual predisposing factor.<sup>4,5</sup> Despite these predisposing factors, no data are existing to highlight the prevalence of suicide by hanging in various societies. Therefore, this study was aimed to find the predisposing factors among the death by hanging reported at the tertiary care Government Hospital in North Kerala, South India.

## MATERIAL AND METHODS

A retrospective study was conducted in the department of Forensic Medicine, Government Medical College Hospital, Calicut, Kerala state, South India among the cases of death presented during a period of 3 years. The study was approved by Institutional Ethics Committee. A total number of 50 cases of hanging were studied and the autopsy findings recorded. A detailed history had been taken as answers of a questionnaire to the relations of the deceased and Police. The results were analyzed on the basis of history and postmortem findings.

## RESULTS

Distribution of cases according to the age was depicted in table 1. The age group 16-25 was found to be the most prevalent (75%), while 56-65 was the least (8%). Males were 66% and the ratio of males to females was 1.5:1. Rural community cases were 82%, while only 16% were urban. Religious based cases are given in table 2. Among the

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**How to cite this article:** Thomas Zachariah, Joseph T John. Major predisposing factors influencing the suicide by hanging: a retrospective study from a tertiary care government hospital in Kerala State, South India. International Journal of Contemporary Medical Research 2019;6(1):A5-A7.

**DOI:** <http://dx.doi.org/10.21276/ijcmr.2019.6.1.32>

	16-25	26-35	36-45	46-55	56-65	66-75
Number	17	9	7	6	4	7
Percentage	34	18	14	12	8	14

**Table-1:** Age wise classification of cases

	Hindus	Muslims	Christians	Unknown	Total
Number	40	5	4	1	50
Percentage	80	10	8	2	100

**Table-2:** Distribution of cases based on religion

	Manual Labour	Household duties	Clerk	Student	Business	Driver	Nil	Unknown
Number	26	9	2	1	1	2	8	1
Percentage	52	18	4	2	2	4	16	2

**Table-3:** Occupation wise distribution of cases:

	Lowest income group (Rs.0-300)	Lower classes (Rs.301-500)	Lower middle class (Rs.501-1000)	(Rs.1000 & above)	Unknown
Number	9	8	24	8	1
Percentage	18	16	48	16	2

**Table-4:** Classification of cases based on Monthly Income

Number of children	Nil	1-2	3-5	More than 5	Details not known
No. of cases	17	11	14	7	1
Percentage	34	22	28	14	2

**Table-5:** Showing classification of cases based on number of their children

	Alcohol	Financial crisis	Crime trial	Love affair	Mental illness	Other disease	Marital problems	Unknown
Number	6	6	2	1	12	11	3	9
Percentage	12	12	4	2	24	22	6	18

**Table-6:** Precipitating causes

religions, Hindu religion showed the highest (80%) number. Majority of hanging took place indoors (60%) and in 62% of cases the act was committed during night. This reflects the eagerness to avoid relations and friends, seeing the act being committed. Complete hanging was observed in 88% of cases, while partial hanging in 12%. Among the 12% partial hanging cases, the deceased was found kneeling in one case whereas in other 5 cases feet were found resting on the ground. More cases were found among the manual labourers (Table 3) and lower middle class people (Table 4). Majority of the victims were married (74%). Among them, those who had arranged marriage showed higher incidence of 64% while in the other group there was only 6%. In 10% of marriages of both types, the cause of suicide was the death of a spouse. People without children were more prone to suicide by hanging (Table 5). Among the precipitating factors, mental illness was the highest factor (Table 6). Mental illness (24%) was found as the major cause to commit suicide by hanging followed by other diseases (22%). Several of the deceased in this study were frantic on suffering from chronic chest pain, headache and abdominal complaints believed as the forerunner of some incurable illness as cancer. Some were under treatment for joint pain, urinary complaints,

and abdominal pain. Marital disharmony due to adultery played a role in committing suicide by hanging. In 18% of cases there was no apparent cause. Financial difficulties and alcohol addiction contributed 12% each, to the causation. In 4% cases the deceased were facing criminal trials. In one case desperate love affair led to suicide, while in three cases marital problems resulted in suicide.

## DISCUSSION

Fifty cases of hanging were studied in detail regarding history, autopsy findings, laboratory investigations and chemical analysis. The lowest age of the deceased in the present study was 16 years and the highest 75 years, among genders Males were dominant. This observation was consistent with the report by Uzun et al.<sup>6</sup> Recent study from Bangladesh population also revealed that hanging was the commonest mode of suicide among the early adult and unmarried people.<sup>7</sup> Educational status seemed to play an important role in suicidal hanging. The higher incidence was seen among those with lower educational status and the reverse is true in case of degree holders. Unemployment and financial crisis collectively were proved to be a major cause to commit suicide by hanging. The increase in financial and educational

level correlated with the lower incidence of suicidal ideation.<sup>8</sup> Mental illness was found as the major cause followed by other diseases. The type of mental illness mainly constituted was depression, followed by schizophrenia in this study. However, reasonable conclusions regarding the relationship between type of mental illnesses and suicide can be arrived at only after study on a bigger sample.

Ligature was made of materials of easy availability as dhothi, lungi, coir rope, sari and plastic rope. Ligature mark was mostly either simple or grooved incomplete abrasion directed obliquely upwards and backwards and in majority of cases placed above the thyroid cartilage. Only protrusion of tongue was present in most of the cases. The glove and stocking distribution of postmortem staining was noticed in more than three fourth of the cases. Soft tissues underneath the ligature mark were found pale, firm and glistening in 13 of the cases. Infiltration of blood in the midline structures was not found in any of the cases. Ecchymosis was not found in any of the cases. Fractures of hyoid bone were extremely rare and were found only in one case. Also, thyroid cartilage was found fractured only in one case. Fracture of the thyroid cartilage was found as the major prevalent laryngohyoid fractures found in an earlier study.<sup>9</sup>

Cyanosis and congestion of visceral organs were found in most of the cases. These could not be detected clearly in eight cases, due to decomposition. Histopathological examination of skin, subcutaneous tissues and vessels from neck revealed focal loss of epithelium, separation of epidermis from dermis, focal collection of lymphocytes and other inflammatory cells, invasion of hair follicles deep into subcutaneous tissue and infiltration of dermis by subcutaneous fat. Focal loss of intima, separation of intima and media from adventitia, bulging of intima and media into the lumen of the vessel, periadventitial haemorrhage and infiltration of intima with lymphocytic and foamy cells and a few areas of lipid accumulation were found in neck vessels.

## CONCLUSION

Suicides by hanging were common among Hindus with a general male preponderance. Illiterates or those with only primary education, belonging to rural areas were predominated. Higher incidence was found among those in the lower middle income group. Mental illness and other diseases were the important predisposing factors.

## ACKNOWLEDGEMENTS

The author acknowledges the valuable help of Dr. Ajith TA, Professor, Department of Biochemistry, Amala Institute of Medical Sciences, Thrissur, Kerala, India during the preparation of this manuscript.

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**Source of Support:** Nil; **Conflict of Interest:** None

**Submitted:** 09-12-2018; **Accepted:** 30-12-2018; **Published:** 25-01-2019