Section: Forensic Medicine

Original Research Article

PATTERN OF UNNATURAL DEATHS AMONGST ADOLESCENTS AUTOPSIED AT BENGALURU

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Received *: 19/02/2025*
Received in revised form *: 04/05/2025*
Accepted *: 21/05/2025*

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DOI: 10.70034/ijmedph.2025.2.256

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (2); 1422-1426

ABSTRACT

Background: Adolescent (10-19 years age) mortality is a potential loss of life for families and society as a whole, and it is a reflection of the socioeconomic and health care conditions at the national and regional levels. Due to a shift in patterns over the past few decades from diseases to social etiologies, unnatural deaths are now the primary cause of death among today's adolescents. Aim of this study was to determine the pattern of unnatural deaths among adolescents and to analyse the causes and methods involved.

Materials and Methods: The present descriptive retrospective study was conducted in the department of Forensic Medicine, Bengaluru, from December 2014 to May 2016, with data collected from postmortem records of all the unnatural deaths in adolescents (10–19 years old) brought for medico-legal autopsies. After analyzing, the data was tabulated and graphs were used to tabulate the results.

Results: Amongst 399 cases of adolescent unnatural deaths; majority of victims were females (Male: Female ratio- 0.94:1), mostly in the late adolescent age group (15–19 years), utmost died during night hours. Majority were purposeful (Intentional) deaths, mostly suicidal in nature, with hanging and depression being commonest method and causative factor respectively; whereas most unintentional deaths were caused by traffic accidents. Homicides were seen only in males.

Conclusion: This study found important informative factors of teenage death, thus recognizing the unique challenges faced during the second decade of life and also emphasized on the importance of development of strategies for laying the foundations of good adolescent's health.

Keywords: Adolescent, unnatural, unintentional deaths, suicide.

INTRODUCTION

The World Health Organisation (WHO) defines an adolescent as a person between the ages of 10 and 19 years old. Around 1 in every 6 persons in the world is an adolescent; that is 1.2 billion people are aged 10 to 19.[1] In India, adolescents comprise nearly one fifth of the total population (21.4%).[2] This phase of life which has recently gained recognition as a distinct phase with its own special needs. This phase is characterized by acceleration of physical, psychological and behavioral changes; thus bringing about transformation from childhood to adulthood. Despite adolescence being thought of as a healthy phase of life, there is significant morbidity and mortality in this phase. Much of this is preventable or treatable. Adolescents develop their behaviour related to diet, physical activity, substance use, and sexual activity, thus protecting individuals & community health.[3] Adolescent risk behaviour may lead to mental (suicide being a leading cause of death in Indian adolescents) or physical health concerns, such as unintentional injuries and exposure to

violence, sexual risk behaviour (unsafe sexual behaviour that may result in health consequences, such as unintended pregnancy and sexually transmitted diseases), and tobacco, alcohol, and illicit substance use. Due to evolution in generation patterns from diseases to social aetiologies, unnatural deaths are now the primary cause of death among today's adolescents. Adolescents died more often from accidental causes than from diseases during the past ten years.[4-6] Injuries (including road traffic injuries), interpersonal violence, self-harm and maternal conditions are amongst the leading causes of death among adolescents.[7] Since adolescents are known for their optimism, drive, and ambition; lowering the rates of unnatural deaths among this age group-is a top health objective. Hence investigating unnatural adolescent deaths in Bangalore was the goal of this study.

Aims and Objectives

1. To determine the pattern of unnatural deaths among adolescents.
2. To analyse the causes and methods of unnatural deaths among adolescents.

MATERIALS AND METHODS

Source of Data: All unnatural deaths among those aged 10 to 19 autopsied from December 2014 to May 2016, at Department of Forensic Medicine of the Victoria & Bowring and Lady Curzon Hospitals (BMC & RI), Bengaluru.

Study Design: Descriptive Retrospective study

Method of Collection of Data: The present descriptive retrospective study was conducted in the department of Forensic Medicine and Toxicology of a tertiary care center, Bengaluru, for a period from 2014 to 2016. Data was collected from December 2014 to May 2016 from postmortem reports of all the cases brought for medico-legal autopsies with alleged history of unnatural deaths. Additional information was gathered from hospital records and inquest reports. Numerous epidemiological characteristics were recorded, including age, sex, socioeconomic level, and others. Every details was recorded in a standardized Proforma designed for this study. Further comparative evaluation of data was analyzed. Data were tabulated and graphs were used to tabulate the results.

Inclusion Criteria

Unnatural deaths (both men and women) among those aged 10 to 19.

Exclusion Criteria

Decomposed and mutilated bodies where cause of death could not be established (Obscure and negative autopsies).

Operational Definitions

Unnatural death: It is defined as all those human deaths that cannot be labelled as death due to any natural causes. It includes accidental, homicidal and suicidal deaths.[8] Unnatural deaths includes death caused due to criminal intent of a person behind or result of negligent act or planned omission of some person and also those where there is no illegal intent at all but death followed due to some accident or mishap.

'Younger' (Early) adolescence- within the age range of 10-14 years.

'Older' (Late) adolescence - in the age group 15-19 years.[9]

Ethical Clearance: Prior approval was obtained from Institutional Ethical Committee.

RESULTS

Amongst 7219 total cases that were autopsied during the period 2014-16, 5522 (76.5%) deaths were unnatural deaths. Out of 5522 cases of unnatural deaths, 399 cases (7.22%) were of adolescent age in the group of 10-19 years.

Out of 399 cases (100%) included in our study, 194 (48.62%) cases were males and 205 cases (51.38%) were females. [Figure 1] Male:Female ratio (M:F ratio) was 0.94:1. 73 cases (18.3%) were in the early adolescent age group (10–14 years) [M:F ratio: 0.97:1], whereas 326 cases (81.7%) were in the late adolescent age group (15–19 years) [M:F ratio: 0.94:1]. [Figure 2]

In our study, the maximum number i.e., 166 cases (41.60%) of unnatural deaths among adolescents occurred during the night times, followed by 101 cases (25.31%) during afternoon, 76 cases (19.04%) in the morning, and 56 cases (14.03%) during the evening. [Figure 3]

Amongst 399 unnatural deaths, there were 148 (37.10%) cases of inadvertent (unintentional) deaths and 251 (62.90%) cases of purposeful (Intentional) deaths. [Figure 4] Amongst intentional deaths, 4 cases (1.60%) were homicidal and 247 cases (98.40%) were suicidal in nature. [Figure 5] Overall out of 399 cases, hanging with 114 cases (46.15%) was the most common form of suicide followed by Burns with 79 cases (31.98%), poisoning in 45 cases (18.21%), drowning in 4 cases (1.61%), railway in 3 cases (1.21%), and fall from height in 2 cases (0.80%); whereas burns (68 cases) was the commonest method of suicide in females in our study.[Figure 6] In case of homicidal deaths, all were male victims, while in the case of suicidal deaths, 81 victims were males and 166 were females. [Figure 5] With respect to reasons for suicide, depression accounted for 103 cases (41%) of suicides, family disputes for 37 cases (15%), examination failure for 35 cases (14%), love failure or affair for 34 cases (13.8), dowry-related reasons for 14 cases (5.6%), unidentified reasons for 13 cases (5.2%), and chronic illness or disease for 11 cases (4.4%). [Figure 7]

58 (39.19%) of the 148 unintentional deaths were caused by traffic accidents, 30 (20.27%) by accidental burn or scald injuries, 18 (12.16%) by accidental drowning, 15 (10.13%) by accidental railway injuries, 14 (9.45%) by electrocution, and 11 (7.43%) by fall/wall collapse. One instance (0.67%)

involved a blast explosion, and one case (0.67%) involved a snake bite. Among unintentional deaths, 39 were women and 109 were men. [Figure 8]

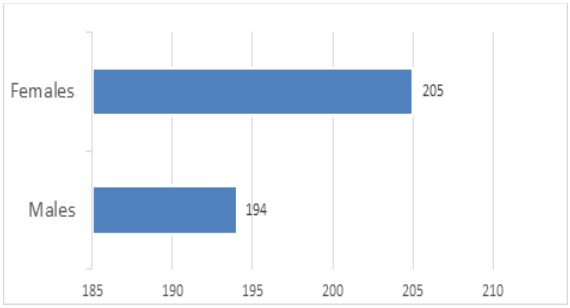

Figure 1: Sex distribution of Adolescent unnatural deaths

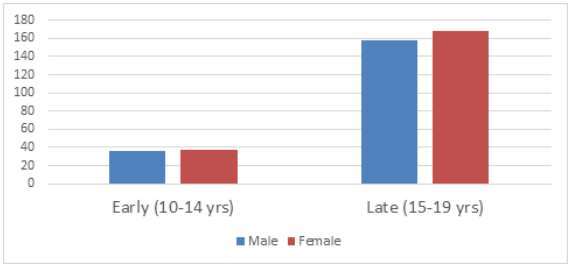

Figure 2: Age group distribution of Adolescent unnatural deaths

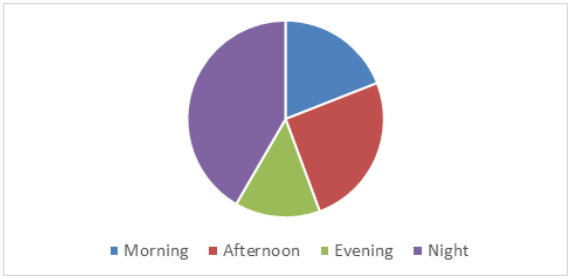

Figure 3: Diurnal Variations of Adolescent unnatural deaths

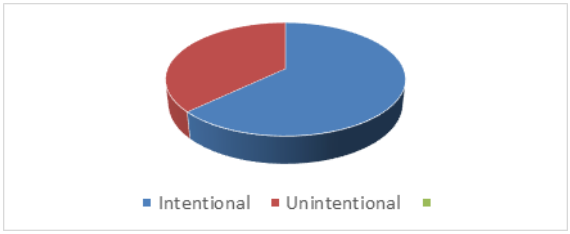

Figure 4: Type of Unnatural Adolescent Deaths

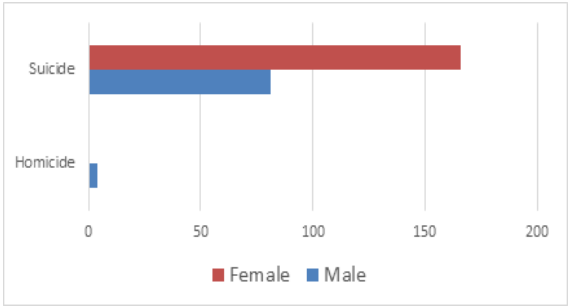

Figure 5: Type of Intentional Death with respect to sex distribution

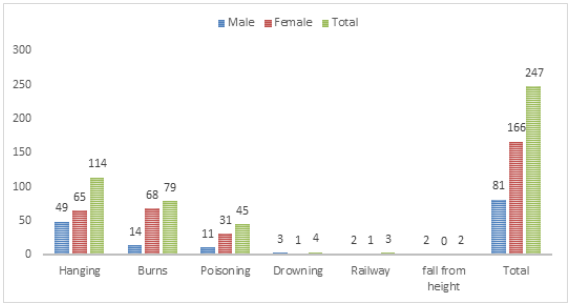

Figure 6: Methods employed to commit suicide based on sex distribution

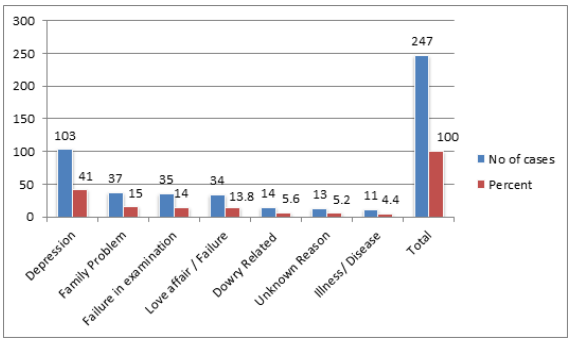

Figure 7: Reasons for committing suicide

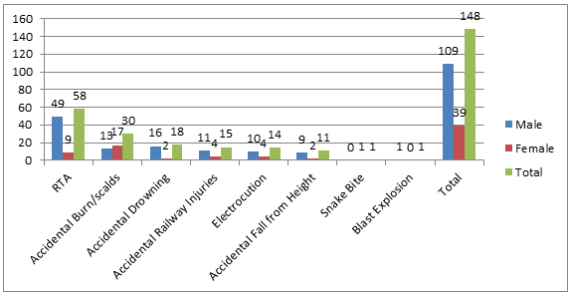

Figure 8: Type of Unintentional Death with respect to sex distribution

DISCUSSION

A descriptive retrospective study was undertaken at the Department of Forensic Medicine, at Bengaluru, to determine the profile of unnatural deaths among adolescents and to analyze the causes and methods of unnatural deaths among adolescents, from Dec 2014 to May 2016. A total number of 399 cases of unnatural deaths among adolescents of age group 10-19 years were included in our study.

Majority of deceased were females (51.38%) in our study; whereas in a study by Sachin Sonawane et al,[10] males (82%) were predominantly involved. The rationale behind girl preponderance may be due to the fact that girls are more likely than boys to suffer from psychological problems, including anxiety and depression, and this gender gap becomes noticeable in early adolescence when puberty begins. Social variables, such as women's subordinate place in society, can lead to feelings of frustration and helplessness, which can exacerbate mental illness. The results indicate that, in the Indian setting, psychosocial factors may have a greater impact on

girls than on boys.[11] In our study, Male:Female ratio (M:F ratio) was 0.94:1, similar to study by Chakrabarty P et al (1:1.23).[9] In contrast, in a study by Sachin Sonawane et al,[10] male to female adolescent victims ratio was 4:1. This could be attributed to hormonal influence and lower educational levels of girls; and the socio-cultural disparity that exists in India.

In our study, majority of the cases (81.71%) were in the age group of 15-19 years (late adolescence). Similarly it was observed in studies by Meshram VP et al (81.11%),[12] Sachin Sonawane et al (75%),[10] and Chakrabarty P et al (60%).[9] Dis-aggregation by age and gender revealed that older adolescents and males were more impacted by fatal injuries than their female and younger counterparts. In this study, maximum number (41.60%) of unnatural deaths among adolescents occurred during night times. In contrast, in a study by Sachin Sonawane et al,[10] maximum unnatural deaths occurred at the time of evening (33.33%).

Most (62.90%) of adolescent unnatural deaths in our study were purposeful (Intentional) deaths, mostly (98.40%) suicidal in nature. This was in accordance to the study done by Parasuraman S et al,[13] where many deaths were purposeful. In contrast, accidental (unintentional) deaths were more in studies by Sachin Sonawane et al (71%),[10] and Pejavar SR et al(58.10%).[14] Since suicide is the leading cause of death for teenagers, purposeful deaths outnumber unintentional deaths.[15]

All of the victims in homicidal (1.60%) deaths were men. Males are more likely to die by homicide because of behavioral characteristics including hyperactivity, hostility, and antisocial behavior that are linked to a higher risk of injury. In our study, out of 247 victims in suicidal deaths, 166 victims (67.2%) were women, and 81 victims (32.8%) were men; similar to study by Sachin Sonawane et al (52.2%).[10] In general, males committed suicide at a higher rate than females according to NCRB, but in our study, adolescent females (67.2%) committed suicide at a higher rate than males, in accordance with Literature from Low & Middle Income Countries (LMIC),[16] indicating women were more likely to commit suicide at a younger age. This is probably due to our study focuses mostly on urban areas, where women are more sensitive to take their own lives for various personal reasons.

Hanging (46.15%) with 114 cases out of 247 suicide cases was the most common form of suicide in this study which is in accordance with study by Sachin Sonawane et al (95.7%),[10] and Rana S et al (41.8%).[17] A region's suicide rate is determined by a number of factors, including the method's accessibility and availability,[18] just like poisoning is the most popular way for people to end their lives in rural areas because poisons are readily available and a higher rate of drowning out in coastal areas. In high income countries like USA, firearms remained the leading cause of suicidal deaths in males whereas females succumbed to hanging.[19] The victim's motivation and intent, the availability of resources, and knowledge regarding the method's efficacy all influence the choice of suicide technique. Hanging as suicide technique was used in our study due to easy availability of materials to victims confined to urban homes leading to painless death.

In the present study, suicides (41%) were mostly due to depression similar to studies by Senapati RE et al where depression was found as the most occurrent risk factor.[20]

In this study, most (39.19%) of the 148 unintentional deaths were caused by traffic accidents, similar to study done by Chakrabarty P et al (45.8%).[9] Male and female teenage injury-related mortality rates are highest for traffic injuries and burns, respectively; similarly males (73.64%) were the major victims of the unintentional deaths compared to females (26.36%) similar to study done by Chakrabarty P et al,[9] probably because of their behavioural characteristics like hyperactivity & risk taking behavior.

CONCLUSION

Adolescent mortality is a potential loss of life for families and society as a whole, and it is a reflection of the socioeconomic and health care conditions at the national and regional levels. In summary, this study found important and informative factors of teenage death. 399 cases (7.22%) out of 5522 cases of unnatural deaths were of adolescent age (10-19 years). 194 (48.62%) cases were males and 205 cases (51.38%) were females. Male: Female ratio (M:F ratio) was 0.94:1. 73 cases (18.3%) were in the early adolescent age group (10–14 years) [M:F ratio: 0.97:1], whereas 326 cases (81.7%) were in the late adolescent age group (15–19 years) [M:F ratio: 0.94:1]. Maximum victims (41.60%) died during night hours. Most (62.90%) of adolescent unnatural deaths were purposeful (Intentional) deaths, mostly (98.40%) suicidal in nature. Hanging (46.15%) was the most common form of suicide, where depression (41%) being the commonest causative factor. All the homicidal victims (1.60%) were males. Most (39.19%) unintentional deaths were caused by traffic accidents.

Investing in adolescents is vital to achieve the Sustainable Development Goals (SDGs) as each one of these relates directly or indirectly to adolescent development; as recognized by Ministry of Health and Family Welfare, Government of India (MoHFW, GoI) by launching the Rashtriya Kishor Swasthya Karyakram (RKSK) across India in 2014.

Recommendations: This study recognized the unique challenges faced during the second decade of life and emphasized on the importance of development of strategies for laying the foundations of good health of adolescents. For which, they need information, including age-appropriate comprehensive sexuality education; opportunities to develop life skills; health services including

psychiatric and psychological interventions that are acceptable, equitable, appropriate and effective; and safe and supportive environments; thus curbing adolescent fatalities. Proper parental guidance and suitable moral support should be provided for the same.

Because data on adolescent mortality in developing nations like ours is limited; hence every autopsy center should take up further studies on unnatural adolescent fatalities.

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