A Study of Profile and Patterns of Injuries Sustained in Road Traffic Accidents

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***Abstract*—Road traffic accidents (RTAs) rank among India's leading causes of unnatural death, with the National Crime Records Bureau (NCRB) documenting 155,622 fatalities in 2021 alone—Karnataka contributing significantly, and Belagavi district topping state rankings with 816 deaths during 2021–2022. This autopsy study characterizes demographics, risk factors, and injury profiles among fatal Road traffic accidents victims in Belagavi to guide targeted interventions. Recent Karnataka State Crime Records Bureau (SCRB) trends show 5,975 deaths in 21,937 accidents during Jan–Jun 2025 alone, underscoring persistent vulnerability of two-wheeler users and young males. A descriptive study design was adopted, including Road traffic accidents victims (fatal and/or non-fatal, as per your dataset) documented at a tertiary care center over a defined period; data were collected from medico-legal records, hospital case sheets and post-mortem reports, and analyzed using descriptive statistics. Variables studied included age, gender, role of victim (driver/rider, passenger, pedestrian), type of vehicle, and distribution of external and internal injuries by body region, as well as the assigned cause of death. The findings typically show a predominance of male victims in the 21–40-year age group, with two-wheeler users and pedestrians most commonly involved, and head injuries forming the principal pattern and cause of death, often in association with multiple system trauma. The study concludes that Road traffic accidents follow a distinct and preventable pattern, underscoring the need for targeted interventions such as strict enforcement of helmet and seat-belt laws, speed control, infrastructure improvements, and strengthening of trauma care systems to reduce the burden of injury and death.**

***Index Terms*—National Crime Record Bureau (NCRB), Road traffic Accidents (RTA), Socio-demographic, Medico-legal.**

I. INTRODUCTION

Road traffic accidents are a leading cause of preventable morbidity and mortality in India, with a high burden in rapidly urbanizing districts such as Belagavi in Karnataka. This hospital-based medico-legal study analyzes the socio-demographic profile of victims and the pattern of injuries sustained in Road traffic accidents in Belagavi over a defined study period, with the aim of identifying vulnerable groups and preventable risk factors.

Road traffic accidents are recognized as a major public health problem in low- and middle-income countries, accounting for a substantial proportion of trauma deaths in India. In 2019, Road traffic accidents in India caused over 150,000 deaths and hundreds of thousands of injuries, disproportionately affecting young, economically productive age groups. Belagavi is a rapidly developing district in Karnataka with mixed urban–rural road networks and increasing vehicular density, has shown a significant number of fatal Road traffic accidents in autopsy-based series from local tertiary care centers. The socio-demographic profile and the patterns of injuries sustained in road traffic accidents in Belagavi. The previous studies focused on different parameter affecting the road traffic accident such as vision, low light, improper roads and some researches have significantly shown young male riders to indulges in road traffic accidents and the elderly pedestrians are also more prone to be a victim of the road traffic accidents and the other researcher have specifically focused on abdominal injuries, maxillofacial injury patterns that to most of them are autopsy and clinical- radiological based

research. But this study aims to analytically study the profile of patterns and injuries sustained in road traffic accident of the injured person, to assess the relationship between severity and the body part injured, to assess the factors influencing the Road traffic accidents, to identify if any seasonal and temporal trends are followed in Belagavi with the fresh data collected in the year 2025.

II. OBJECTIVES

- To study the general profile of the victims of Road traffic accidents in Belagavi.
- To know the pattern and severity of external and internal injuries in Road traffic accidents victims.
- To identify the causes of death and common high-risk scenarios relevant to Belagavi.

III. RESEARCH MEHODOLOGY

Aim of the Study

To know and explore the profile of patterns and injure sustained in road traffic accident of the injured person.

Research Method

This is an analytical research as it analyses the profile of patterns of injuries sustained in the road traffic accidents, the factors influencing the Road traffic accidents and its studies the relationship of the safety measures adopted by the victim at time Road traffic accidents along with identifying if any seasonal or temporal trends are followed in the Road traffic accidents. The profile of patterns and injuries sustained in Road traffic accidents of the injured person and to assess the relationship between severity and the body parts injured and to assess the factors influencing the Road traffic accidents.

Analysis

As the research involves the study of individuals who have sustained injuries as result of road traffic accidents within the geographical boundaries of Belagavi. The total cases studied that is 36 of which is 26 men and 10 women were victims of the road traffic accidents. Out of 36 victims, 11people are above 50+ age group, 15 people fall in between 30-50 age group and 9 are below 30 age group and 1 is minor. 13 people were workers, 6 were housewife, 4 are farmers, 3 are Students, 2 are teachers, 1 is business owner, 1 govt employee and 1 is from police department. The accidents have taken place at different location in the Belagavi district out of 36 cases 4 have been at the location that is Cancer Hospital near Ashok nagar, 3 Accidents near Maratha Mandal Dental College Baauxite road, 2 near Podar International School and others Mainly near the Bridges which include one way and service road. There were many injuries sustained by the victims but the most common among all include Abrasions, Contusions, Lacerations and Punctured wounds followed by swelling active bleeding, bone fractures, deformities and abnormal mobility in most cases.

Table no 1: Showing Total Victims in ROAD TRAFFIC ACCIDENTS.

MALE	FEMALE	TOTAL
26	10	36

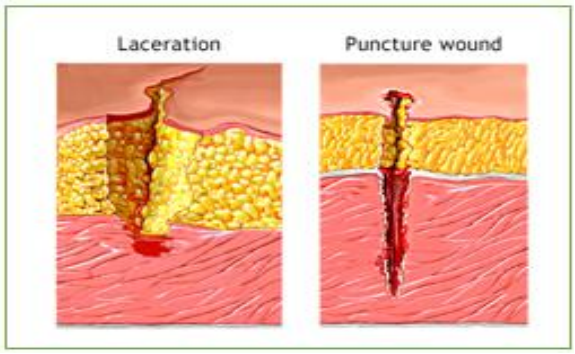
Table no 2: Showing Fatality rates by age group

AGE GROUP	NO. OF VICTIMS	STATUS	LOCATION
Below 16	1	Alive	Autonagar
16-25	6	All Alive	Ramtherthnagar, M.M Dental College, Kadoli, Cancer Hosp, Benkanhalli, Halga
26-35	7	3 Alive 4 Dead	Sankeshwar, Chh Shivaji Garden, Pant Balekundari, Basavan Kudachi, Cancer Hosp, Bauxite rd, Sambra.
36-45	8	All Alive	RTO Circle, Nehrunagar, Honga, Old PB rd, Podar school, Cancer Hosp, Azamnagar.
46-55	8	All Alive	Bauxiterd, Mahanteshnagar, Gandhinagar, Sulebhavi, Kakati rd, Hanuman nagar, Cancer Hosp, College rd.

Above 56	6	5 Alive 1 Dead	Civil hosp, Court Compound, Udyambag, Bekkinkeri, Bailhongal, M.MDental College.
TOTAL	36	31 Alive 5 Death	

Table no 3: Indicates the analysis if Injuries Pattern

AGE GROUP	NO.OF VICTIMS	INJURIES
Below 16	1	Laceration
16-25	6	Laceration, Distalp, Puncture, 3Abrasion,
26-35	7	Laceration,2CLW,Pelvic Facture, Abrasion, Facial Trauma
36-45	8	Swelling, 4Laceration, 2Abrasion, CLW
46-55	8	3CLW,3 Abrasions, Swelling, Laceration
Above 56	6	3Abrasions, 2Laceration, De formative



IV. RESULT AND DISCUSSION

The present study from Belagavi demonstrates that Road traffic accidents victims are predominantly young adult males, mirroring the demographic pattern observed in other Indian studies and prior Belagavi-based autopsy series. This age group is highly mobile and frequently engaged in economically productive activities, making the socio-economic impact of such fatalities substantial. The predominance of two-wheeler riders and pedestrians among victims emphasizes their vulnerability and the importance of protective measures such as helmet use, pedestrian-friendly road design, and enforcement of speed regulations. Prior Belagavi data show that many fatal pedestrian crashes occur on kaccha or poorly maintained roads on the outskirts of the city, highlighting infrastructural risk factors.

Head injury emerging as the single most important cause of death is consistent with both local and national studies on Road traffic accidents fatalities. This pattern is often associated with non-use or improper use of helmets among two-wheeler riders and inadequate enforcement of road safety legislation. The high frequency of multiple injuries and poly trauma further underlines the need for rapid pre-hospital care, trauma-center-based management, and system-level improvements in emergency response. Where your findings diverge from previous studies—for example, if you observe higher involvement of heavy vehicles or different peak accident times—you can discuss plausible

explanations such as road expansion projects, traffic pattern changes, or seasonal variations in Belagavi.

Major Findings

- The analysis of 36 road traffic accident cases in Belagavi District
- Gender Distribution: Men are more likely to be victims of Road traffic accidents, with 26 males (72%) and 10 females (28%) in the study.
- Age Distribution: The majority of victims (42%) fall in the 30-50 age group, followed by those above 50 (31%), and those below 30 (25%), including one minor.

V. CONCLUSION

This study highlights that in Belagavi, road traffic accident victims are mainly young adult males, frequently two-wheeler riders and pedestrians, who sustain predominantly head injuries that often prove fatal. The pattern of injuries and causes of death underscores the urgent need for targeted preventive strategies and improved trauma care systems in the region. The present study from Belgaum reinforces that road traffic accidents are not random events but follow a recognizable pattern concentrated in young, economically productive males, predominantly two-wheeler users and pedestrians, who sustain severe head and poly trauma injuries leading to high fatality rates. This demographic and injury concentration implies a substantial social and economic loss for families and the community, particularly in a growing regional hub like Belagavi where vehicle density and mixed urban–rural road use are rapidly increasing.

From a medico-legal and public health perspective, the findings highlight the need for a permanent injury surveillance system in Belgaum that integrates police, hospital, and forensic data to continuously identify evolving risk patterns and evaluate the impact of interventions such as stricter enforcement drives or road redesign projects. The study also provides an evidence base to advocate for targeted community education campaigns focusing on helmet and seat-belt compliance, avoidance of drunk driving, and safe road-crossing behavior, tailored to the high-risk age groups identified in the local context.

VI. RECOMMENDATIONS

- Strict enforcement of helmet and seat-belt laws, coupled with public education campaigns emphasizing correct usage.
- Road engineering improvements on highways and rural kaccha roads around Belgaum, including better lighting, signage, speed-calming measures, and safe pedestrian crossings.
- Development and strengthening of trauma care and pre-hospital services, with training for first responders and rapid referral pathways to tertiary care centers.
- Continuous medico-legal surveillance of Road traffic accidents cases in Belagavi to monitor trends, evaluate interventions, and inform policymakers.

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