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Burden, epidemiological patterns, and clinical impacts of road traffic collisions in Satna District, Madhya Pradesh, India

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Abstract

Background: In India, transportation via roads remains one of the most efficient ways to move goods and people, particularly in densely populated areas. However, rapid motorization and urban expansion—driven by economic growth—have intensified exposure to dangerous traffic conditions. **Methods:** This study investigates the burden, epidemiological patterns, and clinical impacts of road traffic accidents (RTAs) admitted to Sanjay Gandhi Memorial Hospital in Rewa, Madhya Pradesh, India. This is a hospital-based, cross-sectional study covering 720 accidents. **Results:** Among individuals involved in accidents attributed to overspeeding, 21 sustained fatal injuries, 436 sustained grievous injuries, 273 sustained minor injuries, and 94 escaped without injury. Among crashes involving alcohol consumption by the driver, 8 resulted in fatal injuries, 271 in grievous injuries, 121 in minor injuries, and 48 reported no injury. Wrong-side driving and mobile phone usage contributing to accidents have been relatively low in the sampled data. Head-on collisions accounted for a substantial proportion of severe injuries. Among these crashes, 7 victims sustained fatal injuries, 284 sustained grievous injuries, 138 sustained minor injuries, and 44 escaped without injury. Highest number of road traffic accident victims occurred during the afternoon-evening period (12:00 PM-6:00 PM). **Conclusion:** The study concludes that road traffic injury severity in this population is shaped by an interplay of driver behaviour (particularly speeding and drunken driving), collision mechanism, road infrastructure, and temporal/environmental factors.

Keywords: *Road traffic accidents, Drunken driving, Overspeeding, Timing of accidents, Head-on collision*

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1. Introduction

Human, vehicle, and environmental factors significantly impact outcomes before, during, and after traffic collisions. When examining causes for road traffic incidents, researchers often analyze three key components: the agent (the cause or contributing factor), the host (individual vulnerability), and the environment (circumstances surrounding the event). These elements

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also help classify collisions epidemiologically by their timing, location, and the affected individuals (Jha et al., 2004).

Globally, road crashes claim nearly 1.2 million lives annually, while injuries affect up to 50 million people—roughly equivalent to the combined populations of five major cities worldwide. Over the past two decades (2000–2020), traffic fatalities and injuries have surged by approximately 65%. In low-income and middle-income countries, this increase has been even more pronounced, with death tolls rising by up to 80%.

In India, transportation via roads remains one of the most efficient ways to move goods and people, particularly in densely populated areas. However, rapid motorization and urban expansion—driven by economic growth—have intensified exposure to dangerous traffic conditions. As a result, accident rates remain dangerously high. One of the most vulnerable groups on roads are pedestrians, cyclists, and motorcyclists, who face significantly higher fatality risks compared to occupants of passenger vehicles.

Given these alarming trends, immediate interventions are need of the hour. Road safety efforts must be prioritized alongside other major health initiatives if we are to reduce the growing number of mortality. There is a clear knowledge gap in published literature regarding the factors contributing to road traffic collisions in Madhya Pradesh. This study is intended to address this critical paucity of evidence.

2. Aims and objectives

The present study investigates the burden, epidemiological patterns, and clinical impacts of road traffic collisions admitted to Sanjay Gandhi Memorial Hospital in Rewa, Madhya Pradesh, providing critical insights into the local RTA landscape.

Secondary objectives include identifying key epidemiological factors associated with RTA cases, as well as evaluating differences in injury severity and outcomes between road users who employ safety devices (e.g., helmets, seatbelts) and those who do not.

By examining these dimensions, this research aims to contribute to evidence-based interventions aimed at reducing RTA incidence, improving patient care, and informing public health policies tailored to the region's specific demographic and infrastructural challenges.

3. Methodology

This study employed a hospital-based, cross-sectional design conducted within the orthopedic and surgery wards of Sanjay Gandhi Memorial Hospital, associated with SSMC in Rewa, Madhya Pradesh. The sample size of 720 collisions was established based on 2021 data from the Ministry of Road Transport and Highways (Government of India) (MoRTH, 2025), which indicated that Madhya Pradesh accounts for 11.8% of the nation's road traffic accidents, utilizing a 15% allowable margin of error. All together, the study covered 1603 individuals from 720 collisions. Participants were eligible for inclusion if they were road traffic accident (RTA) victims—or their attendants in the case of non-oriented victims—who provided written informed consent and were involved in incidents where a moving vehicle collided with one or more objects. Conversely, the study excluded non-vehicular road injuries (such as falls on the roadway), injuries resulting from stationary vehicles (e.g., during loading or washing), and fatalities brought to the hospital. Data were systematically collected using a pilot-tested, semi-structured proforma specifically designed for this research.

4. Results

4.1. Demographic characteristics

Demographic characteristics of the study population (N = 1,603) are summarized in Table 1. The sample was predominantly male (n = 1,344; 83.87%) and primarily recruited from rural settings (74.32%). The age distribution was concentrated in the 16–30 (46.37%) and 31–45 (31.83%) brackets, with fewer participants under 15 or over 60 years of age. Educational levels were diverse; while 12.38% of the sample were illiterate, the highest concentrations were found among those with middle school (19.03%) and high school (23.77%) education. Socio-economic analysis revealed that nearly half of the participants belonged to the lower-middle class (47.17%), while the upper class represented the smallest segment of the sample (5.40%).

Table 1: Demographic characteristics of the study population (N = 1,603)		
Parameter	**Number of subjects**	**Percentage (%)**
Gender		
Male	1344	83.87
Female	259	16.13
Total	1603	100.00
Age group in years		
<15	98	6.10
16–30	743	46.37
31–45	510	31.83
46–60	191	11.95
>60	60	3.76
Total	1603	100.00
Place of residence		
Rural	1191	74.32
Urban	412	25.68
Total	1603	100.00
Education		
Illiterate	198	12.38
Primary School	236	14.72
Middle School	305	19.03
High School	381	23.77
Intermediate	271	16.93
Undergraduate	169	10.53
Postgraduate	42	2.65
Total	1603	100.00
SES		
Upper	87	5.40
Upper middle	225	14.01
Middle class	140	8.75
Lower middle	756	47.17
Lower class	396	24.68
Total	1603	100.00

4.2. Association between traffic rule violations and severity of road traffic injuries

Table 2 presents the distribution of injury severity according to selected traffic rule violations among road traffic accident victims. Among individuals involved in collisions attributed to overspeeding, 21 sustained fatal injuries, 436 sustained grievous injuries, 273 sustained minor injuries, and 94 escaped without injury. Overall, grievous injuries constituted the largest proportion of injuries, although fatal injuries were relatively more frequent in crashes involving overspeeding.

Table 2: Type of injury suffered in different traffic violations				
Cause of injury	**Fatal injuries**	**Grievous injuries**	**Minor injuries**	**No injury**
Overspeeding	21	436	273	94
Drunken driving	8	271	121	48
Wrong-side driving	1	47	23	4
Mobile phone usage	2	25	16	9
Jumping red light	0	29	9	4

A similar pattern was observed for drunken driving. Among crashes involving alcohol consumption by the driver, 8 resulted in fatal injuries, 271 in grievous injuries, 121 in minor injuries, and 48 reported no injury. Wrong-side driving was relatively infrequent but demonstrated a predominance of grievous injuries. Among cases involving wrong-side driving, there was one fatal injury, 47 grievous injuries, 23 minor injuries, and four individuals without injury.

Mobile phone use while driving was reported in comparatively few cases. Among these, two resulted in fatal injuries, 25 in grievous injuries, 16 in minor injuries, and nine individuals

sustained no injury. Similarly, jumping a red traffic signal was uncommon. None of the reported crashes involving red-light jumping resulted in fatal injury, while 29 resulted in grievous injuries, nine in minor injuries, and four individuals sustained no injury.

Across all traffic violations examined, grievous injuries consistently represented the most common outcome, followed by minor injuries. Fatal injuries constituted the smallest category in absolute numbers but were observed across nearly all categories of traffic violations. The findings suggest that violations such as overspeeding, drunken driving, wrong-side driving, mobile phone use while driving, and jumping traffic signals are predominantly associated with serious non-fatal injuries, while also contributing to fatal outcomes. It must be noted that many collisions had multiple traffic violations, the overlapping nature of which makes it difficult to analyse associations of injuries with violations and single out biggest contributory cause.

4.3. Nature of accident and injury severity

Table 3 describes the distribution of injury severity according to the nature of road traffic collisions. Head-on collisions accounted for a substantial proportion of severe injuries. Among these crashes, 7 victims sustained fatal injuries, 284 sustained grievous injuries, 138 sustained minor injuries, and 44 escaped without injury. Grievous injuries constituted the majority of outcomes following head-on collisions, indicating the high-energy impact associated with this mechanism of injury.

Table 3: Distribution of injuries by nature of accident

Nature of accident	Fatal injury (n = 38)	Grievous injury (n = 859)	Minor injury (n = 504)	No injury (n = 202)
Head-on collision	7 (18.42%)	284 (33.06%)	138 (27.38%)	44 (21.78%)
Hit from back/side	10 (26.32%)	238 (27.71%)	133 (26.39%)	53 (26.24%)
Hit with fixed object/parked vehicle/animal	9 (23.68%)	140 (16.30%)	110 (21.83%)	75 (37.13%)
Hit and Run	7 (18.42%)	121 (14.09%)	55 (10.91%)	9 (4.46%)
Vehicle ran off the road/overturned	5 (13.16%)	76 (8.85%)	68 (13.49%)	21 (10.40%)

Collisions involving vehicles being hit from the back or side represented the most common collision type in the study. Among these incidents, 10 victims suffered fatal injuries, 238 sustained grievous injuries, 133 sustained minor injuries, and 53 sustained no injury. This category recorded the highest absolute number of grievous injuries as well as the greatest number of fatal injuries among all accident types studied, suggesting that side-impact and rear-end collisions contribute considerably to the burden of severe road traffic injuries.

Crashes involving collision with fixed objects, parked vehicles, or animals resulted in 9 fatal injuries, 140 grievous injuries, 110 minor injuries, and 75 cases without injury. Compared with other accident mechanisms, this category recorded the highest number of non-injury outcomes, although grievous injuries remained the predominant consequence.

Hit-and-run collisions accounted for 7 fatal injuries, 121 grievous injuries, 55 minor injuries, and 9 non-injury cases. The predominance of grievous injuries among hit-and-run crashes highlights the serious nature of these incidents, which are often associated with delayed medical assistance because the offending vehicle leaves the scene immediately after the collision.

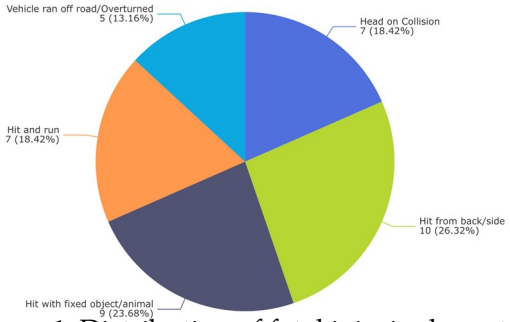


Figure 1: Distribution of fatal injuries by nature of accident (n = 38)

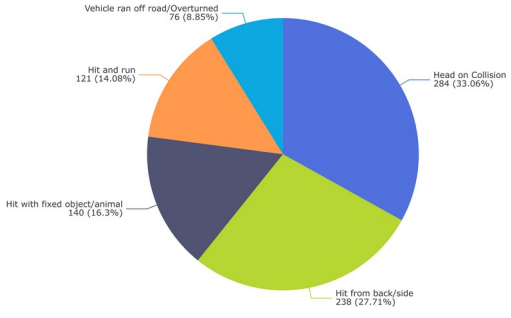


Figure 2: Distribution of grievous injuries by nature of accident (n = 859)

Vehicle run-off-road or overturning incidents resulted in 5 fatal injuries, 76 grievous injuries, 68 minor injuries, and 21 cases without injury. Although fewer in number compared with other

accident types, overturning crashes were associated with a considerable proportion of grievous injuries, reflecting the high kinetic forces and multiple impact events experienced during such crashes.

Overall, grievous injuries were the most common outcome across all categories of collisions. Collisions involving rear-end or side impacts recorded the highest number of fatal and grievous injuries, whereas collisions with fixed objects, parked vehicles, or animals resulted in the greatest number of non-injury cases. The highly significant Chi-square test indicates that injury severity is not uniformly distributed across different mechanisms of road traffic collisions. Instead, the type of collision appears to influence the pattern and severity of injuries sustained. High-energy mechanisms such as head-on collisions and rear- or side-impact crashes were associated with a greater burden of fatal and grievous injuries, whereas collisions with fixed objects or animals showed a relatively higher proportion of non-injury outcomes.

4.4. Type of road, time of accident and weather

Table 4 shows the distribution of injury severity according to the time of accident and prevailing weather conditions. Both factors demonstrated a statistically significant association with injury severity (χ^2 test, $p < 0.001$).

Table 4: Type of road, timing and weather during accident by type of injury

Parameter	Fatal injury (n = 38)	Grievous injury (n = 859)	Minor injury (n = 504)	No injury (n = 202)
Type of road				
Expressway	4 (10.53%)	36 (4.19%)	10 (1.98%)	2 (0.99%)
Local Road	9 (23.68%)	260 (30.27%)	153 (30.36%)	66 (32.67%)
National Highway	14 (36.84%)	318 (37.02%)	230 (45.63%)	86 (42.57%)
State Highway	11 (28.95%)	245 (28.52%)	111 (22.02%)	48 (23.76%)
Time of accident				
12 PM – 6 PM	15 (39.47%)	350 (40.75%)	234 (46.43%)	80 (39.60%)
6 PM – 12 AM	13 (34.21%)	278 (32.36%)	141 (27.98%)	52 (25.74%)
12 AM – 6 AM	4 (10.53%)	63 (7.33%)	52 (10.32%)	13 (6.44%)
6 AM – 12 PM	6 (15.79%)	168 (19.56%)	77 (15.28%)	57 (28.22%)
Weather during accident				
Foggy and misty	5 (13.16%)	88 (10.24%)	46 (9.13%)	15 (7.43%)
Night/Dark	11 (28.95%)	271 (31.55%)	153 (30.36%)	56 (27.72%)
Rainy	4 (10.53%)	71 (8.27%)	36 (7.14%)	5 (2.48%)
Sunny	18 (47.37%)	429 (49.94%)	269 (53.37%)	126 (62.38%)

For the time of accident, the highest number of road traffic accident victims occurred during the afternoon-evening period (12:00 PM-6:00 PM), accounting for 679 cases. This period also recorded the highest numbers of grievous injuries (350), minor injuries (234), and fatal injuries (15). The evening-midnight period (6:00 PM-12:00 AM) was the second most affected time interval, with 484 cases, including 13 fatalities and 278 grievous injuries. Comparatively fewer collisions occurred during the midnight-morning period (12:00 AM-6:00 AM), which recorded only 133 cases and the lowest numbers of fatalities (5), grievous injuries (63), minor injuries (52), and non-injury cases (13). The morning-afternoon period (6:00 AM-12:00 PM) accounted for 328 cases, with 7 fatalities, 178 grievous injuries, 85 minor injuries, and 58 non-injury cases. Overall, grievous injuries constituted the largest proportion of injuries across all time intervals, while fatal injuries remained relatively infrequent.

Analysis according to weather conditions revealed that the majority of collisions occurred during sunny weather (842 cases), which also accounted for the highest numbers of fatalities (18), grievous injuries (429), minor injuries (269), and non-injury cases (126). Night or dark conditions were associated with the second-highest burden of collisions (491 cases), including 11 fatalities and 271 grievous injuries. Foggy and misty weather contributed to 154 cases, with 5 fatalities and 88 grievous injuries, whereas rainy weather accounted for the fewest cases (117), including 5 fatalities, 71 grievous injuries, 36 minor injuries, and 5 non-injury cases. Across all weather conditions, grievous injuries consistently represented the predominant injury category, followed by minor injuries, while fatal injuries comprised only a small proportion of total cases.

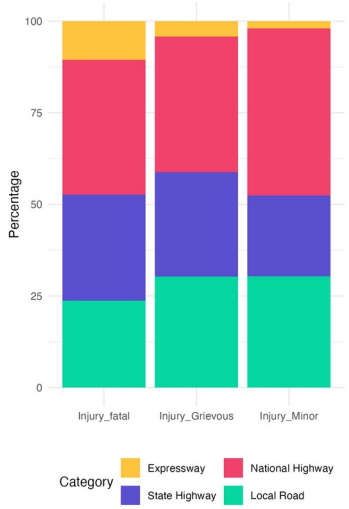


Figure 3: Nature of injury categorised by type of road

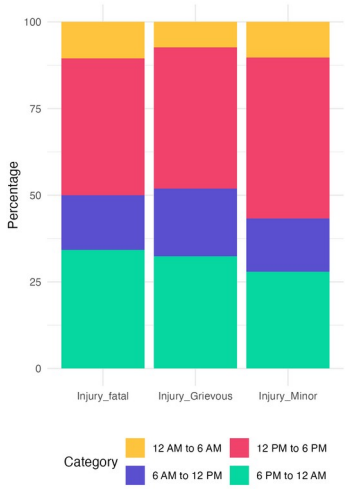


Figure 4: Nature of injury categorised by time of accident

4.5. Chi-square goodness-of-fit analysis

The chi-square goodness-of-fit analysis for fatal injuries (Table 5) demonstrated that the observed distribution of fatal injuries differed significantly from the expected distribution across time of accident ($\chi^2 = 11.067$, df = 3, p = 0.0114) and weather during the accident ($\chi^2 = 13.200$, df = 3, p = 0.00422). However, no significant deviation from the expected distribution was observed for nature of accident ($\chi^2 = 2.176$, df = 4, p = 0.703) or type of road ($\chi^2 = 6.200$, df = 3, p = 0.102). These findings indicate that fatal injuries were not uniformly distributed across categories of accident time and prevailing weather conditions, whereas their distribution by accident nature and road type did not differ significantly from expectation.

Table 5: Chi-square goodness-of-fit analysis of fatal and grievous injuries

Parameter	n	χ^2 statistic	p-value	df
Fatal Injury				
Nature of accident	5	2.176	0.703	4
Time of accident	4	11.067	0.0114	3
Weather during accident	4	13.200	0.00422	3
Type of road	4	6.200	0.102	3
Grievous Injury				
Nature of accident	5	113.546	1.28×10^{-23}	4
Time of accident	4	214.715	2.79×10^{-46}	3
Weather during accident	4	414.991	1.25×10^{-89}	3
Type of road	4	219.631	2.41×10^{-47}	3

For grievous injuries, the goodness-of-fit test revealed highly significant departures from the expected distribution for all examined parameters. Significant differences were observed for nature of accident ($\chi^2 = 113.546$, df = 4, $p = 1.28 \times 10^{-23}$), time of accident ($\chi^2 = 214.715$, df = 3, $p = 2.79 \times 10^{-46}$), weather during the accident ($\chi^2 = 414.991$, df = 3, $p = 1.25 \times 10^{-89}$), and type of road ($\chi^2 = 219.631$, df = 3, $p = 2.41 \times 10^{-47}$). Among these, weather conditions produced the largest chi-square statistic, indicating the greatest deviation from the expected distribution. Overall, the results suggest that grievous injuries were distributed non-randomly across all assessed accident characteristics.

5. Discussion

This study examined the demographic profile of road traffic accident (RTA) victims and the association between injury severity and several accident-related factors, including type of traffic violation, nature of collision, type of road, time of accident, and prevailing weather conditions.

5.1. Demographic profile

The study population was overwhelmingly male (83.87%) and young to middle-aged, with nearly 78% of victims falling within the 16–45 year age bracket. This pattern is consistent with the well-documented global observation that young and middle-aged men, who typically

constitute the most mobile and economically active segment of the population (Naci et al., 2009), bear a disproportionate burden of road traffic injuries, likely reflecting greater exposure to road travel, occupational driving, and risk-taking behaviors such as speeding and driving under the influence of alcohol.

The predominance of rural residents (74.32%) among victims may reflect the study setting's catchment area, poorer road infrastructure and lighting in rural stretches, longer emergency response times, and lower awareness of traffic safety norms in these areas. The relatively high proportion of illiterate victims (12.38%) and those with only up to middle-school education (46.13% combined with primary/illiterate) suggests that lower educational attainment may correlate with reduced awareness of traffic rules and safe driving practices, although this relationship warrants direct investigation rather than inference. Sami et al. (2013) reported similar findings from Iran, where over 69% victims of RTA had low educational attainment. Similarly, nearly 72% of victims belonged to lower-middle or lower socio-economic strata, pointing to a possible link between socio-economic disadvantage and RTA risk, potentially mediated by reliance on two-wheelers, older or poorly maintained vehicles, and longer commutes. A systematic review by Getachew et al. (2024) also identified socio-economic status as key driver of RTA, alongside factors such as driver's experience.

5.2. Traffic violations and injury severity

Overspeeding emerged as the most frequently implicated violation across all injury categories, followed by drunken driving. This aligns with the broader literature identifying speed and alcohol impairment as the two most consistently implicated modifiable risk factors in RTA severity (Joshi et al., 2023), both of which compromise reaction time, vehicle control, and hazard perception, and increase the kinetic energy transferred during collision.

Although wrong-side driving, mobile phone use, and red-light jumping were reported less frequently, their persistent association with grievous and even fatal injuries indicates that even relatively "rare" violations carry substantial severity risk and should not be deprioritized in enforcement or public health messaging. The observation that many collisions involved multiple concurrent violations is an important methodological caveat: it limits the ability to isolate the independent contribution of any single violation to injury outcome and suggests that future analyses would benefit from multivariable modelling to disentangle overlapping risk factors.

5.3. Nature of accident and injury severity

Grievous injury was the modal outcome across every accident mechanism, road type, time period, and weather condition, indicating that most RTAs in this population result in serious but non-fatal trauma rather than immediate death - a pattern with direct implications for trauma-care capacity planning. Rear/side-impact collisions accounted for both the highest absolute number of fatal and grievous injuries, likely reflecting the vulnerability of unprotected or laterally exposed vehicle occupants (e.g., two-wheeler riders) to high-energy lateral impacts, which offer less structural protection than frontal impact zones in many vehicles.

Head-on collisions similarly contributed a large share of severe outcomes, consistent with the high combined closing speeds and energy transfer characteristic of this mechanism. In contrast, collisions with fixed objects, parked vehicles, or animals were associated with the highest proportion of "No Injury" outcomes, possibly reflecting lower-speed impacts or partial deceleration prior to collision. The elevated severity observed in hit-and-run cases is noteworthy and may be compounded by delayed access to emergency medical care rather than mechanism of injury alone, an important consideration for prehospital trauma response systems.

5.4. Road type, timing and weather

National and state highways accounted for the largest share of both fatal and grievous injuries, consistent with higher permissible speeds, greater traffic heterogeneity (mixing high-speed and slow-moving vehicles), and often limited access control on these roads. The statistically significant association between road type and injury severity ($p = 0.0011$) reinforces road design and speed-differentiated infrastructure as a modifiable determinant of crash severity, supporting continued investment in median barriers, service roads, and speed-calming measures on high-volume highway corridors.

Temporal analysis revealed that the afternoon–evening period (12:00 PM–6:00 PM) carried the highest crash burden, followed by the evening–midnight window, together accounting for the majority of fatal and grievous injuries. This likely reflects peak traffic density, fatigue accumulating toward the end of the working day, and reduced visibility during the evening-to-night transition. Notably, this finding diverges from reports by Shiva Kumar (2019), who

reported a significantly higher proportion of collisions occurring in 6 PM – 10 PM window. This difference could be attributed to the fact that the study area in this study is less urbanized, and therefore evening traffic is less compared to a tier-1 or tier-2 city. The comparatively low crash burden in the midnight–morning period may simply reflect lower traffic volumes overnight rather than lower per-trip risk, a distinction this analysis cannot resolve without exposure (vehicle-kilometer) data.

Somewhat counterintuitively, the largest absolute number of collisions and severe injuries occurred during sunny weather rather than during rain or fog. This finding should be interpreted in light of exposure: sunny conditions likely account for the greatest proportion of total driving time and traffic volume in the study region, so the raw injury counts mirror overall exposure rather than indicating that sunny weather is inherently more hazardous per trip. It could be also interpreted in the light that increase of temperature has a reported positive correlation with frequency of RTA (Dastoorpoor et al., 2016). Nonetheless, the substantial burden observed under night/dark conditions (491 cases, including 11 fatalities) underscores the compounding risk of reduced visibility, and highlights the importance of adequate street lighting and reflective signage, particularly on rural and highway stretches.

5.5. Fatal and grievous injury: Factors

The goodness-of-fit analyses clarified that fatal injuries were significantly non-uniformly distributed by time of accident and weather, but not by nature of accident or road type, whereas grievous injuries showed highly significant non-uniform distributions across all four factors. This divergence suggests that the mechanisms driving immediate mortality may differ somewhat from those driving serious non-fatal trauma; the small number of fatal events (n = 38) relative to grievous injuries (n = 859) likely also limits statistical power to detect associations for nature of accident and road type in the fatal-injury category, and this should be considered when interpreting the non-significant findings rather than concluding an absence of true association.

5.6. Recommendations

Taken together, these findings support a multi-pronged prevention strategy: (1) targeted enforcement and public awareness campaigns addressing speeding and drunken driving, the two most frequently implicated violations; (2) engineering interventions on national and state highways, where speed differentials and mixed traffic are most hazardous; (3) enhanced lighting and signage for evening and nighttime travel; and (4) strengthening of emergency response systems, particularly for hit-and-run and rural crashes where delays in care may worsen outcomes independent of injury mechanism.

6. Limitations

Several limitations merit consideration. First, the cross-tabulated nature of the violation and accident-mechanism data, with frequent overlap of multiple contributing violations per crash, precludes attribution of injury severity to a single cause and limits causal inference. Second, exposure data (e.g., traffic volume by road type, time, or weather condition) were not available, meaning that raw case counts may reflect underlying exposure differences rather than true differential risk per trip. Third, the demographic skew toward male, rural, and lower socio-economic status may reflect the specific catchment population of the study site and may limit generalizability to urban or more affluent populations. Finally, as a hospital- or registry-based sample, cases that resulted in on-scene death without transport, or minor injuries not seeking care, may be under-represented, potentially biasing severity distributions.

7. Conclusion

This study reaffirms that road traffic injury severity in this population is shaped by an interplay of driver behavior (particularly speeding and drunken driving), collision mechanism, road infrastructure, and temporal/environmental factors. Grievous injury, rather than death, represents the predominant burden of road trauma, with important implications for trauma system capacity. The significant associations identified across nearly all examined parameters emphasize that road traffic injury prevention requires coordinated action across enforcement, infrastructure design, and emergency care systems rather than any single intervention in isolation.

Declarations

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Conflicts of interest: The authors declare no conflict of interest.

Author contributions: All authors contributed to the conception and design of the study, data collection, analysis and interpretation, and preparation of the manuscript, and approved the final version.

Ethics statement: Written informed consent was obtained from all participants, or from their attendants in the case of disoriented victims, before data collection.

Data availability: The data supporting the findings of this study are available from the corresponding author on reasonable request.

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