"A CROSS SECTIONAL STUDY TO ASSESS THE PATTERN OF NON-FATAL INJURIES IN ROAD TRAFFIC ACCIDENTS REPORTING TO A TERTIARY CARE HOSPITAL"

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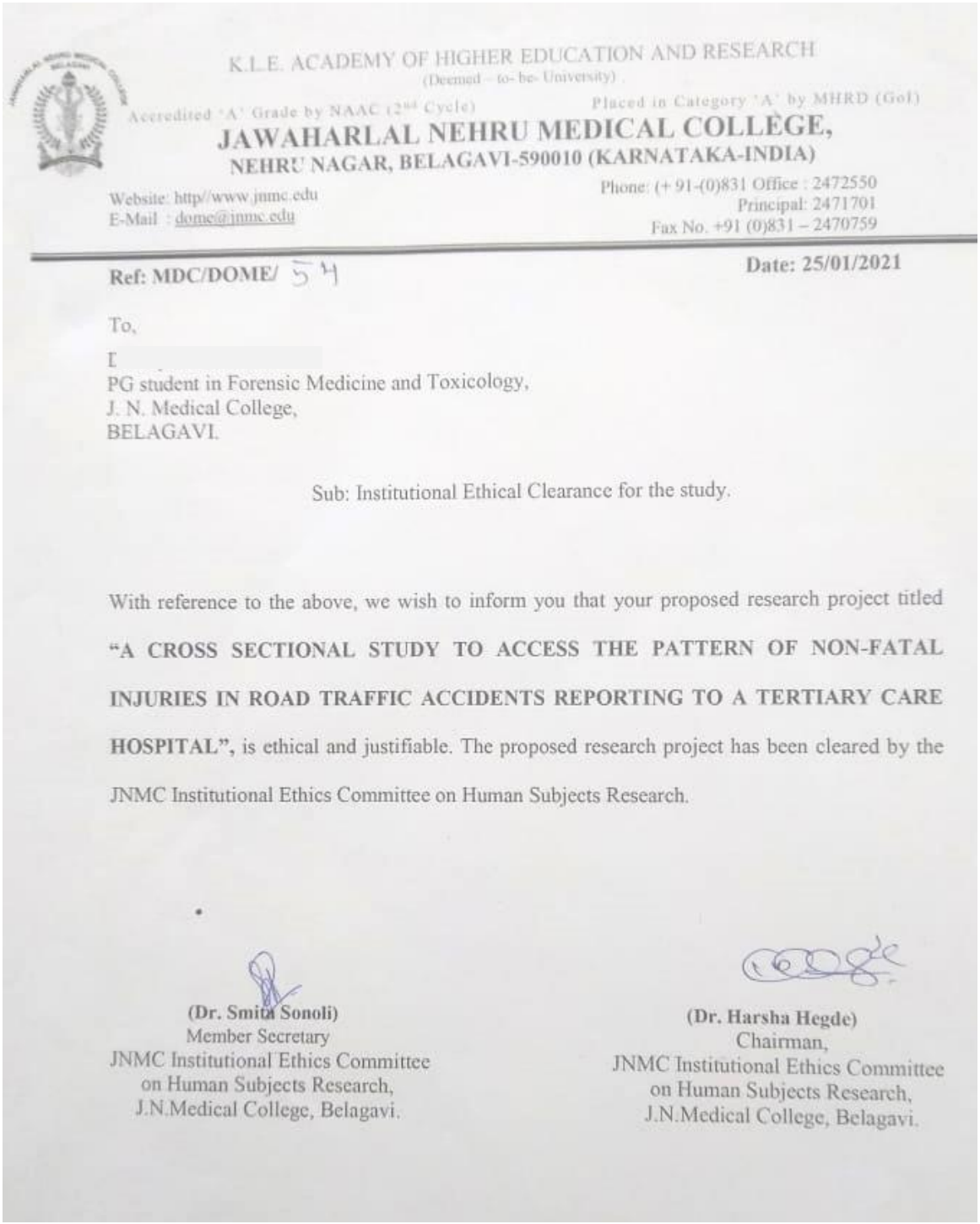

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Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"A CROSS SECTIONAL STUDY TO ACCESS THE PATTERN OF NON-FATAL INJURIES IN ROAD TRAFFIC ACCIDENTS REPORTING TO A TERTIARY CARE HOSPITAL",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

(Dr. Smita Sonoli)
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(Dr. Harsha Hegde)
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LIST OF ABBREVIATIONS USED

RTA	-	ROAD TRAFFIC ACCIDENTS
RTI	-	ROAD TRAFFIC INJURY
DALYS	-	DISABILITY ADJUSTED LIFE YEARS
ISS	-	INJURY SEVERITY SCORE
ED	-	EMERGENCY DEPARTMENTS
RTC	-	ROAD TRAFFIC COLLISION
ICU	-	INTENSIVE CARE UNIT
KM/H	-	KILOMETRES PER HOUR
U.LIMB	-	UPPER LIMB
L.LIMB	–	LOWER LIMB
CI	-	CONFIDENCE INTERVAL
LMV	-	LIGHT MOTOR VEHICLE
MRD	-	MEDICAL RECORDS DEPARTMENT
MLC	-	MEDICO LEGAL CERTIFICATE
KLE	-	KARNATAKA LINGAYAT EDUCATION
SPSS	-	STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES
ANOVA	-	ANALYSIS OF VARIANCE
SD	-	STANDARD DEVIATION

ABSTRACT

Title

A CROSS SECTIONAL STUDY TO ASSESS THE PATTERN OF NON-FATAL INJURIES IN ROAD TRAFFIC ACCIDENTS REPORTING TO A TERTIARY CARE HOSPITAL

BACKGROUND:

"A road traffic injury is a fatal or non-fatal injury incurred as a result of a collision or incident involving at least one road vehicle in motion on a public road or private road to which the public has right of assess resulting in at least one injured or a killed person". Socially these accidents are considered as inevitable and a part of life which occur randomly. But in reality, these are results of a complex set of interaction among the public with their vehicles and the prevalent environmental conditions along with the existing legal provisions. Many a times road traffic accidents are preventable.

PRIMARY OBJECTIVE:

- To study the pattern of injuries among non-fatal cases of road traffic accidents cases reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi.

SECONDARY OBJECTIVE:

- To find out the various epidemiological factors responsible for the RTA.

METHOLOGY:

A descriptive cross sectional study was conducted to study the pattern of injuries among non-fatal cases of road traffic accidents cases reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi and to find out the various epidemiological factors responsible for the RTA in the tertiary care hospital. Convenient sampling method was used to recruit the samples in the study. The clinical examination of all the subjects was done by a single examiner with the help of a trained recorder till the required sample size was obtained. After getting the consent from the patient information regarding all the non-fatal cases of road traffic accidents reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C were be collected. The information about the patients admitted as cases of road traffic accidents will be obtained from the records of Out Patient Department of the hospital daily and then these patients will be contacted in the wards. The victims will be interviewed for the injury details and the circumstances leading to crash and the same will be recorded on a pre-designed questionnaire along with basic demographic information. The site of injury will be recorded as reported in the case sheets of the patients by the specialists. Bed side study also included for follow up of the cases. Relatives/Attendants will be interviewed in case the condition of the victims demanded so. The medico-legal records, case sheets and police records will be referred to for collecting additional information wherever necessary for cross checking. The collected data was entered into Microsoft excel software by the examiner. The entered data was exported to SPSS Version 24 software for statistical analysis. The exploratory data analyses will check the distribution of values and present the results as frequency and percentages.

RESULTS:

The present study was done to assess the pattern of injuries among non-fatal cases of road traffic accidents. It was observed that the maximum number of cases were in the age group of 21-30 (32%), The least number of cases were amongst >70 years of age (1.6%). The crash rates were found 6.3 times higher in males (86.4%) than in females (13.6%). The time distribution of the road traffic crashes revealed that more than 40% of the crashes occurred during the night time (6.00pm- 12.00am). The majority of the people involved with the accidents were two wheelers. It was also found that 76.7% of the victims were drivers themselves and the 23.3% were the pillion. Out of 507 patient majority (more than 50%) of the patients had multiple site injuries i.e., upper and lower limbs. Out of 507 patients whereas 117 (23.1%) had minor injuries in the form of abrasions (85.6%).

CONCLUSION:

In majority of accidents, non-fatalities are strikingly common, and the majority of casualties are men and young people. Increased public knowledge and education about following traffic laws, using road safety equipment, and taking precautions when driving will reduce accidents.

KEY WORDS:

Accident, Non-fatal injuries, road traffic injury, upper and lower limbs, abrasions.

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INTRODUCTION:

"A road traffic injury is a fatal or non-fatal injury incurred as a result of a collision or incident involving at least one road vehicle in motion on a public road or private road to which the public has right of access resulting in at least one injured or a killed person". Socially these accidents are considered as inevitable and a part of life which occur randomly. But, in reality, these as a results of complex set of interaction among the public with their vehicles and the prevalent environmental conditions along with the existing legal provisions. Many a times road traffic accidents are preventable.[1]

Road traffic accidents (RTAs) are a major cause of disability and death globally, with a disproportionately higher number occurring in developing countries.[2]

Road traffic injuries (RTI) are responsible for "1.2 million global deaths" and rank 9th as cause of death in both the high and low income countries. The impact of road traffic injuries is greater in the 5– 29 years age group. In this age group, these injuries are the leading cause of mortality in high-income countries and second leading cause in low-income countries. Road traffic injuries were responsible for more than 38 million Disability Adjusted Life Years (DALYs) lost worldwide and accounted for 5.6% of the total DALYs lost in the year 2021. The greatest tragedy associated with injuries from road traffic crashes is the fact that most of these deaths are preventable. The number of vehicles in India is rapidly increasing, with about 6 million new motor vehicles sold every year. According to the WHO, India has the second highest reported mortality rate from road traffic injuries in the world of 29.2 per 100,000 people. Injuries are the seventh leading cause of death (11% of all deaths) in India, with RTIs making up to 78% of them. Unintentional injuries (including RTI) were responsible for 13% of DALYs lost in India. [3]

Global urbanization and industrialization has led to rapid expansion of roads and motorization accompanied by a rise in road accidents. Today RTAs are one of the leading causes of deaths, disabilities, and hospitalizations with severe impacts on the economy, public health and the general welfare of the people.[2]

Reasons for road traffic accidents in India:

Road traffic accident results from a combination of factors related to the components of the system comprising roads, the environment, vehicles and road users, and the way they interact. These can be grouped under the following heads: Factors influencing exposure to risk: The mode, mean, duration of travel as well as the layout and design of the road along with insufficient traffic knowledge like speed limits, road sign can have an influence on exposure to risk of road traffic accidents.[4]

Human Factors in RTA:

Drunken Driving, over speeding, decline to follow traffic rules, reckless driving are some of the factors that contribute to road traffic accidents. In India, drunken driving is customary in commercial vehicle drivers. Private car owners and youngsters are also major players in the game. Driver Fatigue, sleepiness , younger age (15–29 years), male sex, inadequate use of helmets and safety belts, medical conditions (sudden illness, myocardial infarction, impaired vision), psychological factors (risk taking, impulsiveness), defective judgment, delayed decisions, aggressiveness, poor perceptions, family dysfunction, and distraction while driving (using mobile phones) also are responsible human factors in RTA.[5]

Man made risk factors:

These are related to the roads like defective and narrow roads, defective layout of crossroads, poor lighting, and lack of familiarity, poor construction, bad design etc. Another factor in India is the outsourcing of road construction to contractors. Some of the contractors are very much profit oriented resulting in low quality roads. Ditches and pot holes also contribute to RTA.[6]

Vehicles factors:

Conditions of the vehicles plying on the roads plays a major role in road traffic accidents. Excessive speed, poorly maintained vehicles, large number of vehicles, low driving standards and overloaded buses are some of the factors associated with vehicles. Thus, road traffic accidents in India results from an interaction of these different factors.[7]

Hence, RTA is an issue of national as well as local concern. It has high impacts on the economy, public health, and the general welfare of the people. However, as these injuries depend on number of factors like type of accident, involved vehicle, site of impact, etc., their study is important for setting priorities for the prevention of such injuries.[8] Very few studies have attempted to study the pattern of injuries in non-fatal accident victims in India. Thus, this study was carried out to understand the pattern of injuries in non-fatal road traffic accident cases and to prescribe preventive measures.

AIMS AND OBJECTIVES:

PRIMARY OBJECTIVE:

- To study the pattern of injuries among non-fatal cases of road traffic accidents cases reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi.

SECONDARY OBJECTIVE:

- To find out the various epidemiological factors responsible for the RTA.

REVIEW OF LITERATURE:

1. **Subarna Roy et al (2020)** conducted a study a cross-sectional among RTA victims, who attended two large tertiary care hospitals located inside the Dhaka metropolitan area, through structured interview between 28 January and 22 March 2020. The study aimed to determine the patterns of injuries due to road traffic accidents (RTAs), the severity of injuries, and factors associated with injury severity the study showed that Among 375 RTI patients, a total of 1390 injuries were recorded among interviewed patients, yielding a mean of 3.7 injuries per patient. The most frequently injured systems were external (n ¼ 351), lower limb (n ¼ 235), head and neck (n ¼ 151), and face (n ¼ 150). The mean ISS were 20.96 12.027 with a maximum of 65 and a minimum of 4. Among patients, 87 (23.20%) had a severe injury, and 37 (9.87%) patients were critically injured. A statistically significant variation in ISS was observed in ANOVA among various categories of age, education, occupation, and purpose of going outside, vehicle type and fitness, accident type, road type, times required in hospitalization, and death history ($p < 0.05$). The study revealed several important findings which will help stakeholders and policymakers devise better policies to reduce RTA and RTA related injuries in Bangladesh.[9]

2. **Mohammed Liyaqat Shareef et al (2020)** conducted a study to study pattern of injuries in victims of road traffic accidents. A study was undertaken at Osmania General Hospital to find out the types of injury patterns occurred due to the road traffic accidents. All Case histories and records, reports pertaining to road traffic accident victims were collected and analyzed to see different types of injury patterns sustained in the accident and data was compiled based on the findings with SPSS 20 software the Results revealed that out of 470 patients, Majority of them were males (84.25%) and belonged to the age group of 21 to 30 years with 25.31%. Majority of the patients had injury to Head neck and face constituting 53.61% and least had injury to the abdominal region constituting 9.14%. Abrasion was seen in most of the cases around 64.89% and Lacerations was the least found in 14.46%. Majority of the patients around 42.81% had skull and maxillofacial fracture and the least type of fracture observed was Ribs fracture observed in 4.79% of the cases.

Conclusion: All efforts need to undertake to prevent a Road Traffic injury which is an important cause of mortality, morbidity and disability.[10]

3. **Karmakonda Anil Kumar et al (2020)** conducted a study a hospital based study done on all road traffic accident cases admitted in Owaisi Hospital between April 2013 to July 2014 using a pretested, pre-designed questionnaire and collecting Medico legal case records. Association between factors and severity of injuries was calculated using Chi-square test. The Results showed that Majority of the victims had suffered grievous injury (95.29%). Majority (62.48%) had injuries involving upper limb, 52% had injuries involving multiple body regions. Majority of the times it was a sideways collision 275 (48.00%), followed by head on collision 198 (34.55%). Factors such as use of the seat belt, alcohol consumption, lighting on the road are found to be statistically significant with the severity of the injuries. The Conclusion of the study revealed that Majority of the victims had suffered from multiple injuries (52%). The road traffic accidents can be prevented mainly putting emphasis on the use of seat belt, avoidance of consumption of alcohol by the drivers, adequate lighting on roads which can reduce the burden of occurrence of the road traffic accidents.[11]

4. **Govind Kumar Gupta (2020)** conducted a study to assess the incidence and pattern of RTIs in the tribal population of Jharkhand. This prospective observational study was conducted for a period of 1 year (June 2018 to May 2019) at the Rajendra Institute of Medical Sciences, Ranchi, Jharkhand. A pretested semi-structured questionnaire was administered. A total of 1713 road traffic accident (RTA) victims belonging to tribal population were interviewed during the study period. Data were entered in a Microsoft Excel sheet and analyzed using Statistical Package for Social Sciences (SPSS) version 16. The results showed that There were 1258 (73.4%) males and 455 (26.6%) females. The majority (31.4%) of patients belonged to the age group of 21–30 years, followed by 19.2% in the age group of 31–40 years. The majority (52.13%) of RTAs involved a two-wheeler vehicle. Head injury was the most common type of injury (40.86%), followed by lower limb injury (26.68%). Common upper limb injuries were in the humerus and radius and ulna region. The majority of lower limb injuries involved tibia and femur. Common thoracic-abdomen injuries were soft tissue injury and lung contusion. Drunk driving

(alcohol influence) was seen in 34.68% of cases of RTI and the study was concluded that RTA is a major public health problem which needs to accelerate the efforts of road safety preventive measures. Road safety education should be promoted.[12]

5. **Manjunatha Babu et al (2022)** conducted a study to assess the magnitude of (RTIs) among rural and urban school children while commuting to schools and to determine factors affecting RTIs among school children. This cross-sectional study was conducted in urban and rural districts of a state in South India, a pretested, semi structured, self-administered questionnaire was used to collect data and analyzed using SPSS version 20. The Results showed that Magnitude of RTIs reported was similar in urban and rural districts. Children going to Government (public schools) reported more compared to the ones going to private schools. Male children and those accompanying other schoolchildren during commute to schools reported more injuries. The concluded that nearly one fourth of the schoolchildren from Bangalore urban and rural districts reported RTIs during the past 12 months.[13]

6. **Sumita Sharma et al (2021)** conducted a study to assess the epidemiological factors responsible for RTA and to know the pattern of accidents. : A hospital-based, cross-sectional study was conducted among RTA victims admitted at a tertiary care hospital of Odisha from August to November 2019. The data were collected by using predesigned and pretested interview schedule and analyzed with the help of SPSS 20. The results showed that Out of 147 accident victims, 81% were male; mean age was 36.6 ± 13.67 years. Maximum accidents (43.5%) had taken place between 11 a.m. and 5 p.m. Bike-riders (81.6%) were the major victim involved in accidents followed by pedestrian (9.5%) and cyclist (8.9%). Among bike riders, 44.16% did not wear helmet during accident and 3.33% did not have a valid driving license. About 25.2% were due to alcohol intake. Unusual behavior of animals and defective road contributed around 10.2% and 16.90%, respectively. Among injuries, the most common was laceration (38.1%) followed by abrasion (22.4%). Fracture was found in 7.5% cases. Most common sites involved were head, face, upper limb, and lower limb and the study concluded that Public awareness should be initiated regarding various factors associated with RTA and measures to prevent accidents.[14]

7. **Rujuta S. Hadaye (2020)** conducted a study to estimate the proportion of fatal and nonfatal accidents and to determine the epidemiological factors related to nonfatal accidents. It was a cross-sectional study carried out in a tertiary care hospital over a period of 6 months. A simple random sampling technique was used for the selection of sample size of 476. Nonfatal accident victims were interviewed. The proportion of nonfatal to fatal accidents was found to be 1.8:1. Around 72.9% of drivers did not use any safety measure while driving. Two-wheelers (39%) and light motor vehicles (28.3%) were mostly involved, 45% of drivers had speed more than 60 km/h. Obstacles in the road (41%), defective roads (36.5%), and poor street lighting (11.4%) were reported as contributing factors of the accident. Lower extremities and head neck and face were involved in 47.2% and 27.1% of cases, respectively. Around 40.4% of cases had a single-site fracture and the study was concluded that Traffic injuries result from the interaction between agent, host, and environmental factors. Preventing these interactions is very well possible with little extra care given towards road safety and traffic behavior of individuals.[15]

8. **Sachin Chourasia et al (2019)** conducted a study at casualty department of a tertiary care hospital in South Western India among victims of road traffic accident. This cross sectional study was conducted to elucidate the role of various factors involved in road traffic accidents and to study demographic profile and injury pattern among RTA victims. All the reported RTA cases from 1st January 2016 to 31st December 2018 were included in the study. The Results showed that A total of 875 cases of RTA were studied. There were 83.77% (n=733) male and 16.23%(n=142) female accident victims. Most of the patients were aged between 21 and 30 years. Monsoons witnessed 46.63%(n=408) cases. Most cases occurred between 6 and 12pm (54.4%, n=476). Commonest injury was a simple injury (72.91%, n=638), dangerous injuries (27.09% percent, n=237) and dead was (7.43%, n=65). The highest number of accidents took place in the month of June (19.09%, n=167) and on Sundays (22.17%). Among the motorized vehicles, twowheeler drivers were more (76.91%, n=673) involved in accidents. In this study 17.60% (n=154) were under influence of alcohol while driving. This study shows there are multiple factors associated with road traffic accidents.[16]

9. **Eshrak Alfalah et al (2018)** conducted a study to aim to present time-limited trial surveillance in two referral hospitals to describe the pattern of RTIs in Sana'a, Yemen and determine road traffic crashes (RTCs) associated factors. All RTIs presented to Emergency Departments (ED) of the two Sanaa city hospitals between August and October, 2015 were studied and described. Data were collected everyday by trained data collectors. A pretested questionnaire modified from WHO injury surveillance form was used for data collection. The Results showed that : A total of 156 casualties from 128 RTCs had attended the two study hospitals during the study period. About 73% of victims were less than 30 years old. Poor driving skills were involved in 133 (85%) casualties. Factors related to the vehicles contributed to 12% of RTCs. Of the 156 casualties, 17% had severe injuries and needed ICU admission. After 48 hours of the accident, 38% of patients ended with disability due to fractured limbs, 29% were not improving and their conditions were deteriorating, 18% had recovered and 5% died. The study concluded that Several personal, behavioral, environmental and vehicles related factors had contributed to RTIs in Yemen. The burden of RTIs in Yemen in terms of disability and mortality is high.[17]

10. **Baljeet Singh et al (2018)** conducted a study at Indira Gandhi Medical College & Hospital, Shimla. A structured, pretested, self-designed questionnaire schedule was used for interviewing RTA victims (an attendant in case victims was not able to provide information). This questionnaire included information regarding socio-demographic characteristics of victims along with pattern of injuries. A total of 410 Road Traffic accidents Victims were studied who sustained non-fatal injuries. 48.29% (n-198) of the road traffic accidents victims were in the age group of 16 - 30 years. 75% (n-307) of the victims were Male. Most common time of accidents was between 4:00 P.M. to 12:00 P.M. (45.61%). Most of accidents occurred on weekend i.e. Sunday 29.51% and Saturday 20%. Majority of accidents occurred in the third quarter 127 (30.98%) of the year. Light Motor Vehicle (Car) (54.88%) and motorized two wheelers (25.85%) were the most common vehicles involved in road traffic accidents. Most common major injury in current study was lower limb fracture (16.6%) followed by head injury (16.3%).[18]

11. **Dadasaheb Dhage et al (2018)** conducted a study to study the distribution of non-fatal road traffic accident cases admitted in tertiary care hospital according to time, place and person. A cross sectional study was carried out for 1 year and Distribution of study subjects according to time, place and person was recorded in the proforma. Statistical analysis was carried out with the help of software Epi Info version 7.2. Results were presented in percentages. Chi-square test was used as test of significance. The study showed that In temporal distribution, it was seen that 44% road traffic accident cases occurred in the evening and maximum road traffic accident cases occurred on weekends, i.e. on Saturdays (16.72%) and on Sundays (17.39%). 40.67% of road traffic accident cases occurred in rainy season (June to September). In zone wise distribution of accidents which occurred inside city, 36.51% were seen in north zone. It was observed that in majority of accident cases, mode of transport was motorcycle (49.33%). Males were significantly higher than females among the motorcycle occupants as compared to other modes of transport. The present study clearly demonstrated that several factors such as rainy season, evening hours, weekends i.e. Saturday and Sunday, north zone of city was found to be more common in road traffic accidents. In majority of accident cases, mode of transport was motorcycle.[19]

12. **Shubham Mohan Sharma et al (2017)** conducted a study to study the prevalence and various environmental risk factors related to Road Traffic Accidental injuries in rural population of district Dehradun. A cross sectional descriptive study was conducted in rural areas of district Dehradun. Multistage stratified random sampling method was used to reach the desired sample size. Overall 2000 individuals were interviewed using a structured pretested questionnaire. The data was entered in computer and analyzed by using SPSS software version 20. Maximum numbers of Road Traffic Accident (RTA) victims were in the age group of 20 – 29 years (31.0%). Males (74.3%) were involved significantly more as compared to females (25.7%). Most of the RTAs (54.7%) occurred during good light conditions and during clean and clear weather (94.7%).on crowded municipality roads (43.9%). Rural area had significantly more accidents (69.6%) as compared to urban area (30.8%). Maximum RTAs (76.5%) happened to occur on good roads.[20]

13. **Chichom-Mefire et al (2017)** conducted a study to aims at describing the crash characteristics and pattern of injuries in an urban area of a middle-income country with particular emphasis on the differential analysis of various road user categories. It was prospective cohort analysis conducted over a period of 5 months in the casualty department of the largest hospital in the city of Douala in Cameroon, all patients admitted after sustaining a traffic related injury were analyzed for crash characteristics, pattern and severity of injury and final outcome after a maximum follow-up period of 1 week. The analysis compared various user categories for different variables. The Results showed that a total of 811 cases could be analyzed. These included 586 (72.2%) males for a sex-ratio of 2.6/1. Motorized two-wheelers and pedestrians represented overall over 80% of all victims and the most frequent collision involved a motorcycle and a tourist car. Over 95% of victims did not use a protective device. Most patients sustained external soft tissue lesions frequently involving the limbs and face. A total of 280 patients (34.52%) sustained a limb fracture. The most frequently fractured bones were the tibia, fibula and femur. Most injury cases were minor or moderate and collision between a motorcycle and a truck resulted in a significantly more severe injury. Motorized two-wheelers and pedestrian were significantly more exposed to external injuries while car occupants were more exposed to chest and spine injuries. The study concluded that crash characteristics in Douala are greatly influenced by the popularization of motorized two-wheelers who are exposed to collision with tourist cars. Victims mostly tend to develop external lesions resulting in minor injuries.[21]

14. **Mohitgoyal et al (2016)** conducted a prospective study at Government Doon Medical College, Dehradun. Total of 230 accident victims was included in this study. Among them, 195 (85%) were males and 35 (15%) were females. Out of 230 respondents, 180 (78.26%) were involved in the accidents on normal working days, 30 (13.04%) of the accidents occurred during weekends and 4 (8.70%) on public holidays, speeding 50 (21.74%) was one of the most significant personal factors associated with RTAs. Alcohol intoxication 35 cases (15.22%), reckless driving 45 cases (19.57%) and tiredness of the driver is 30 cases (13.04%) are the important personal factors associated with RTAs.[22]

15. **Abdulhameed Ali Al-Thaifani et al (2016)** conducted a study to analyze road traffic accidents in Sana'a city, Yemen, during 2013–2015. Methods. The required information and data of accidents were collected, respectively, from police reported road accident statistics, Sana'a city. 11684 cases of road traffic accidents during period 2013–2015 were studied. The Results revealed that 840 people were killed and 9760 people were injured in RTAs during 2013–2015 in Sana'a city. The accident rates per 100000 of the population were 234.8 in 2013, 180.3 in 2014, and 92.2 in 2015. Mortality rates per 100000 of the population were 15.17 in 2013, 12.2 in 2014, and 8.9 in 2015. High speed was the single most important factor responsible for accidents, deaths, and injuries accounting for 38.1% of RTAs followed by drivers' fault accounting for 18.9% of the total RTAs. The most common age group involved was ≥18 years. Males accounted for 83.1% of killed and injured persons. Most frequent victims of road traffic accidents were vehicles motor (48.9%) followed by pedestrians (38.1%). More than half of RTAs occurred on the straight road. The study concluded that RTAs are a major source of public health concern in Sana'a city, Yemen. Preventive measures to reduce the burden of mortality and morbidity due to road accidents should be introduced.[23]

16. **Babu Rao B et al (2015)** conducted a study assess the prevalence of road traffic cases coming to hospital and to know the various epidemiological factors related to road traffic accident cases. Materials and Methods:- This study was conducted at Osmania General Hospital, Hyderabad, Telangana South India from 1st January to 31st December 2013. The study group-consisted of all the RTA victims reporting to casualty in the above one year period. The Results showed that A total of 1158 RTA cases reported at Osmania General Hospital during study period. Out of 1158 RTA cases 1026 (88.6%) of the victims were males & rest 132 (11.4%) were female. The highest number of victims 601(51.8%) were from 16 – 30 years of age group. Followed by 291 (25.1%) in the age group 31 – 45 years. Motorized two-wheeler occupants were highest in number i.e. 898 (77.5%) followed by occupants of four wheelers 147 (12.6%). Pedestrians involved were 82 (7%). Being knocked down was the common mode of RTA, involving 502 victims (43.3%), followed by falling off vehicles which claimed 241(20.8%) victims. Other modes were collision between two vehicles (18.8%), run over (5.9%) and due to overturning (7.0%).

Interestingly 130(11.2%) victims were injured due to the vehicle hitting a stationary object (parked vehicle). In the present study it was observed that time factor (To reach hospital) is very crucial for increase the chance of survival among RTA victims, death rate significantly low 7% among those who reached within 30minutes in comparison to those who took more time to reach the hospital. Majority (89%) did not use any safety measures. Only 3% used car seat belt and 8% wear helmet. The effect of alcohol was evident with 62 % were consumed alcohol. It was found that greater portion of the RTA occurred due to collusion between two vehicles followed by defective road. A significant number of accidents took place during bad weather. More than half of the accidents occurred due to wrong side driving.[24]

17. **Bhuvan PJ et al (2013)** conducted a study o find out the prevalence, probable epidemiological factors and mortality pattern due to RTAs in Dibrugarh district. Descriptive study was carried out in Dibrugarh district from September 1998 to August 1999 under the department of Community Medicine. The information was collected from Assam Medical College and Hospital and cross checked with the police report. A medical investigation including interview, clinical and radiological investigation was carried out. An on the spot investigation was carried out in accessible RTAs to collect the probable epidemiological factors the result showed that RTAs affected mainly the people of productive age group which were predominantly male. Majority of the RTAs were single vehicle accidents and half of the victims were passengers. Accident rate was maximum in twilight and winter season demanding high mortality. Head and neck, U.limb and L.limb were commonly involved. The study has shown that head and neck (66%) is commonly involved in an accident, followed by upper and lower limb (44% and 41% respectively). The least affected sites are chest (14%), abdomen (3%) and perineum (1.5%).[25]

18. **Khare Neeraj et al (2012)** conducted a study to find out different epidemiological determinants of RTA in Bhopal MP and examine the factors associated with RTA. It was retrospective observational. Study was performed in a tertiary healthcare delivery institute in Bhopal MP. All RTA cases coming to Emergency of Peoples

hospital were recruited in Demographic; human, vehicular, environmental and time factors were assessed. The Results showed that most of them were males 1047 (82.5%) and 16-31 years of age 647 (51%). Most common time duration of occurrence of RTA was 6PM to 12 PM 783(62%), most common injury after RTA was head injury 808 (64%), and most common cause of RTA according to type of vehicle was motor cycle (Two wheelers) 929(73%).The RTA cases according to place of occurrence more common on Ayodhya bypass Road 463 (37%) and least common on Raisen Road 91(7%). RTA cases according to time taken to reach hospital were less than 30 minutes in more of the cases 774(61%). Overall mortality among RTA cases was 40 (3.15%). Most of the factors responsible for RTA and its fatal consequences are preventable. A comprehensive multi programme approach can mitigate most of them.[26]

19. **Rakhi Dandona et al (2011)** assessed the road use pattern and incidence and risk factors of non-fatal road traffic injuries (RTI) among children aged 5–14 years in Hyderabad, India. A cross-sectional population-based survey, data were collected on 2809 participants aged 5– 14 years (98.4% participation) selected using multi-stage cluster sampling. Participants recalled non-fatal RTI during the previous 3 and 12 months. The Results showed that Boys (11.5) had a higher mean number of road trips per day than girls (9.6), and the latter were more likely to walk and less likely to use a cycle ($p < 0.001$). With increasing household income quartile, the proportion of trips using cycles or motorized two-wheeled vehicles increased while trips as pedestrians decreased ($p < 0.001$). Based on the 3-month recall period, the age-sex-adjusted annual rate of RTI requiring recovery period of >7 days was 5.8% (95% CI 4.9–6.6). Boys and girls had similar RTI rates as pedestrians but boys had a three times higher rate as cyclists. Considering the most recent RTI in the last 12 months, children of the highest household income quartile were significantly less likely to sustain pedestrian RTI (0.26, 95% CI 0.08–0.86). The odds of overall RTI were significantly higher for those who rode a cycle (2.45, 95% CI 1.75–3.42) and who currently drove a motorized two-wheeled vehicle (2.83, 95% CI 1.60–5.00). These findings can assist in planning appropriate road safety initiatives to reduce cycle and pedestrian RTI among children to reduce RTI burden in India.[27]

20. **Abhishek Singh et al (2011)** conducted a cross-sectional study at Maharishi Markandeshwar Institute of Medical Sciences and Research (MMIMSR), Mullana (Ambala) Various parameters like age and sex distribution, time of occurrence, protective gears worn, injuries sustained, receipt of First -Aid, alcohol consumption, category of road user, vehicles involved in RTA, types of RTA, road conditions, environmental conditions etc were studied and valid conclusions were drawn. The outcome was a marked male preponderance (88.77 %) with maximum involvement of younger age groups. Most of the accidents had taken place in the evening hours (6 pm -12 midnight). The vulnerable road users like motorized two-wheeler, LMV and pedestrians constituted 41.52%, 19.39% and 13.41% respectively. Only 158 of 545 two-wheeler users wore a helmet at the time of injury. 16.24% of drivers did not have a valid driving license. Not using indicator lights and not following speed limits were two most common factors responsible for these RTA.[28]

21. **Deepak Sharma et al (2011)** conducted a study to analyses the (i) age and sex distribution of injured in road traffic accidents (RTA), (ii) distribution of injured in road traffic accidents by mode of transport and victim role, (iii) the distribution of injured in road traffic accidents by counterpart to which they hit (iv) transportation time required to shift the patients, and (v) the fatality rate in road traffic accidents. The present study was a retrospective record based study and data was collected using questionnaire method (for collecting relevant information) A total of 423 RTA cases were studied from the case records of the medical records section of Shree Krishna Hospital, Pramukhswami Medical College All the road traffic accident cases coming in the particular specified time period were taken. The results revealed that (i) out of total 423 RTA cases, 327(77.3%) of the victims were males and the rest 96 (22.7%) were females. (ii) The highest number of victims 122 (28.8%) were from 21-30 years of age group. In males the maximum numbers of cases were seen in the age group 21-30 years (31.8%); whereas in case of females the highest numbers of cases were seen in the age group 31-40(21.9%). 55.79 % of the RTA victims were drivers and riders followed by the occupants and passengers (30.26%). (iii) 41.9% of two wheeler users were hit by 4 wheelers (iv) 48.1% victims managed to reach hospital in less than an hour, 2.8% cases reached the hospital after 6 hours of delay.[29]

22. **Gichuhi K (2007)** conducted a study to study and analyse the pattern of injuries among non-fatal road traffic crash victims. The Results showed that One thousand four hundred and twenty four victims of road traffic crashes were treated over a six-month period. The male: female ratio was 3:1 and the pedestrians were the majority (69.7%). The commonest injuries were fractures (69.0%) and the tibia/fibula being the most fractured bones (30.3%). Age group 15-44 years was the most affected (81.9%). There was one incidence of a ruptured eye in a passenger. The study Concluded that Road traffic injuries are a major cause of death and disability globally with disproportionate number occurring in the developing countries. The most affected age group 15-44 years lead to double tragedy to these countries with loss of productive man-hours and expenditure incurred to treat them.[30]

23. **Mahajan et al (2005)**, conducted a one-year descriptive study at Indira Gandhi Medical College hospital, Shimla by The study population comprised of 401 consecutive cases of non- fatal injuries involved in road traffic crashes. Outcome of this study was that 73% of the injured victims were young between 20-49yrs, male to female ratio being 5.3:1. Employees (34.7%) and occupants of transport vehicles (45.9%) constituted the maximum number of the victims. Major injuries (fractures and abdominal injuries) were reported in 53.4% of the victims and fractures of lower limb were the commonest of the injuries (26.3%). Use of seat-belt was found to be alarmingly low (14.3%) amongst the four- wheeler users and its non-use was found to be significantly associated with the major injuries. Helmet was used by 36 cases (66.7%) out of total of 54 users of motorized two-wheelers at the time of crash. Human error was the most reported cause of crash (82%) and the most common mode of crash was skidding and/rolling down (55%).23.1% of the drivers were reported to have consumed alcohol at the time of crash.[31]

24. **Gunjan B. Ganveer et al (2005)** conducted a Cross-sectional study to study the pattern of injuries among non-fatal cases of road traffic accidents in Nagpur. The results showed that Out of total 423 subjects, 363 (85.8%) were male while only 60 (14.2%) were female subjects. Majority of the victims (75%) were in the age group 18- 37 years. Sideways collision was the most common type of accident seen in 269 (63.59%) cases. Two wheelers and LMV were the common vehicle being involved

in accidents (69.97%) and these accidents were almost equally distributed in both half of the day. Fracture of the bones was the common injury afflicted to the victims followed by multiple injuries like blunt injury, abrasions and lacerations. Lower extremity was involved in 192 (45.39%) cases while multiple sites were affected in 114 (26.95%) cases. The study concluded that the present study, the fractures were the commonest injury among the victims of non-fatal road traffic accidents.[32]

25. **Supriyasatishpatil et al (2004)** conducted a prospective study at Krishna Hospital and Medical Research Centre (KH and MRC), Maharashtra. A total of 350 cases of road traffic injures were included in the study period. The outcomes were 288 (82.3%) male and 62 (17.7%) female casualties. The average age of victims was 32.5 years. The highest number 103 (29.4%) victims were between 20 and 29 years of age. There were 37 (10.5%) children below 14 years of age and 21 (6%) victims were aged 60 and above. In the present study, considering all age groups, males were more commonly involved than females with the ratio of 4.6:1.Of 174 (49.7%) occupants, motorized two-wheeler occupants were highest in number, i.e. 61 (35%) followed by occupants of four wheelers - 45 (25.9%), other occupants were from truck - 27 (15.5%), three wheelers - 19 (10.9%), tractors - 10 (5.7%), tempos - 4 (2.3%), bullock carts - 4 (2.3%), bicycles - 3 (1.7%) and bus - 1 (0.6%).Pedestrians were 47 (13.4%). Fifteen (31.9%) were injured by motorized two wheelers; four wheelers caused injury to 14 (29.8%) pedestrians. Tractor and trucks were involved in six (12.8%) and five (10.6%) pedestrians. A total of 129 drivers were involved. Among the drivers of different types of vehicles, there were 79 (61.2%) motorized two-wheeler drivers and 26 (20.1%) bicyclists. Truck drivers were three (7%), whereas bullock cart, three-wheeler and tempo drivers were two (1.6%) each. Tractor drivers were three (2.3%), four-wheeler drivers were five (3.9%) and bus drivers were one (0.8%). Of 129 drivers involved, 28 (21.7%) were bicyclists and bullock cart drivers who did not require a license. From the remaining 101 (78.3%) drivers of different motor vehicles, one had learner's driving license and 38 (29.5%) had no valid license. Those who had no license, 35 (92.1%) were driving motorized two wheelers. In the present study, out of 129 vehicle drivers, 38 (29.5%) were under influence of alcohol. History of alcohol consumption was obtained from relatives or patients themselves (by the smell of alcohol). Out of 64 four wheelers,

48 (75%) were overcrowded (occupancy more than permitted capacity). There was a significant association between type of vehicle and overcrowding ($\chi 2 = 110.888$; df = 8; $P < 0.001$). Overcrowding was there in 38 (92.7%) trucks, 13 (68.4%) tractors, 6 (85.7%) tempos, 18 (78.3%) three wheelers, 41 (26.5%) motorized two wheelers, 6 (20.7%) bicycles and 5 (71.4%) bullock carts. Out of 48 overcrowded four wheelers, 22 (45.8%) were Wadap jeeps and out of 18 three wheelers, 11 (61.1%) were Wadap rickshaws. A total of 190 fractures were noted among the victims. The commonest site of fracture was lower limb 88 (46.3%) followed by upper limb 47 (24.7%) and skull 25 (13.2%). Other sites were spine 12 (6.3%), ribs 11 (5.8%) and pelvis 7(3.7%). Fatality rate in our study was 3 (0.8%). The severity of injury according to category of road users showed that two (1.6%) drivers, five (2.9%) vehicle occupants and one (2.1%) pedestrian have severe injuries. There was no significant association between severity of injuries and category of road users ($\chi 2 = 7.937$; df = 4; $P > 0.05$).[33]

MATERIALS AND METHODS

STUDY DESIGN:

- A descriptive cross sectional study was conducted to study the pattern of injuries among non-fatal cases of road traffic accidents cases reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi and to find out the various epidemiological factors responsible for the RTA.

STUDY DURATION:

- The present study was conducted from 1-January-2021 to 31-December 2021 to study the pattern of injuries among non-fatal cases of road traffic accidents cases reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi and to find out the various epidemiological factors responsible for the RTA.

ETHICAL CLEARANCE:

- Ethical clearance was obtained from JNMC institutional ethics committee before starting study.

STUDY POPULATION:

- Study population comprised patients of road traffic accidents reporting to KLES, Dr.Prabhakar Kore Hospital & M.R.C, Belagavi.

SAMPLING SIZE AND METHOD:

- Convenient sampling (data from MRD files) on an average 800 cases /year was recorded from data of last three years from KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi.

YEAR	Non Fatal Cases
2019	771
2018	652
2017	973

INCLUSION CRITERIA:

- RTA non fatal cases reporting to KLES, Dr.Prabhakar Kore Hospital & M.R.C, Belagavi for treatment.

EXCLUSION CRITERIA:

- RTA cases with fatal outcomes.

PROCEDURE

- The clinical examination of all the subjects was done by a single examiner with the help of a trained recorder till the required sample size was obtained.
- A written informed consent was obtained from all the participants. (**Annexure II**)
- After getting the consent from the patient information regarding all the non-fatal cases of road traffic accidents reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C will be collected.
- The information about the patients admitted as cases of road traffic accidents was obtained from the records of Out Patient Department of the hospital daily and then these patients were contacted in the wards.
- The victims were interviewed for the injury details and the circumstances leading to crash and the same was recorded on a pre-designed questionnaire along with basic demographic information.
- The site of injury was recorded as reported in the case sheets of the patients by the specialists. Bed side study also included for follow up of the cases.
- Relatives/Attendants were interviewed in case the condition of the victims demanded so.
- The medico-legal records, case sheets and police records were referred to for collecting additional information wherever necessary for cross checking.

STATISTICAL ANALYSIS

The collected data was entered into Microsoft excel software by the examiner. The entered data was exported to SPSS Version 22 software for statistical analysis. The exploratory data analyses checked the distribution of values and present the results as the mean and standard deviation (SD) for numerical data, and a proportion (%) for nominal data. Pattern of injuries was tested using the chi-square test for categorical variables, and independent t test for continuous variables.

RESULTS:

- Every year throughout the globe, 50 million people die as a result of traffic-related injuries. Up to 90% of the disability adjusted life years (DALYs) lost worldwide are attributable to low- and middle-income nations.
- The present study was done to assess the pattern of injuries among non-fatal cases of road traffic accidents. It was observed that the maximum number of cases were in the age group of 21-30 (32%), followed by the age group of 31-40 yrs (23.3%) followed by the age group of 41-50 years which is 13.8% followed by the age group of 11-20 years, 51-60 years, 61-70 years, 0-10 years which were (11.8%, 8.9%,5.5%,3.2% respectively). Those over 70 years old had the fewest cases (1.6%). [Table 1].
- Males (86.4%) had crash rates that were 6.3 times greater than those of females (13.6%). [Table 2] According to the breakdown of road traffic accidents by time (6 p.m. to 12 a.m.), well over 40% of the accidents took place at night followed by afternoons (12.00pm-6.00pm) which was 35.5%, followed by day time (6.00am to 12.00pm) were 14.4% and least were during the might night (12.00 am to 6.00 am) which was 9.7%. [Table 3].
- The majority of the people involved with the accidents were two wheelers, three/four wheelers and Pedestrians which was 76.7%, 11.8%, 8.3% heavy vehicle were involved only 3.1%. [Table 4]. It was also found that 76.6% of the victims were drivers themselves and the 23.4% were the pillion. [Table 5].
- Out of 507 patient majority (more than 50%) of the patients had multiple site injuries i.e., upper and lower limbs and abdominal injury were reported in 88(17.3%), upper limb and head injury were reported in 91(17.9%). Out of 507 patients 75.7% patients had injuries in limbs, 67.9% had head injuries, 28.2% had abdominal injuries and 6.3% had chest injuries. [Table 6].
- Abrasion (85.6%), contusions (1O.6%), lacerations (51.3%), fractures or dislocations (20.7%), and abrasions (51.3%), among other minor injuries, were present in 117 (23.1%) of the 507 patients. [Table 8] lists some of the significant injuries. The most frequent kind of fractures were upper limb fractures (217, or 42.8%), followed by lower limb fractures (105, or 20.7%) occurrences. [Table 7].

TABLE 1: Distribution of study participants based on age

AGE	NUMBER OF PARTICIPANTS
0-10	16 (3.2%)
11-20	60 (11.8%)
21-30	162 (31.9%)
31-40	118 (23.3%)
41-50	70 (13.8%)
51-60	45 (8.9%)
61-70	28 (5.5%)
71-80	8 (1.6%)
TOTAL	507

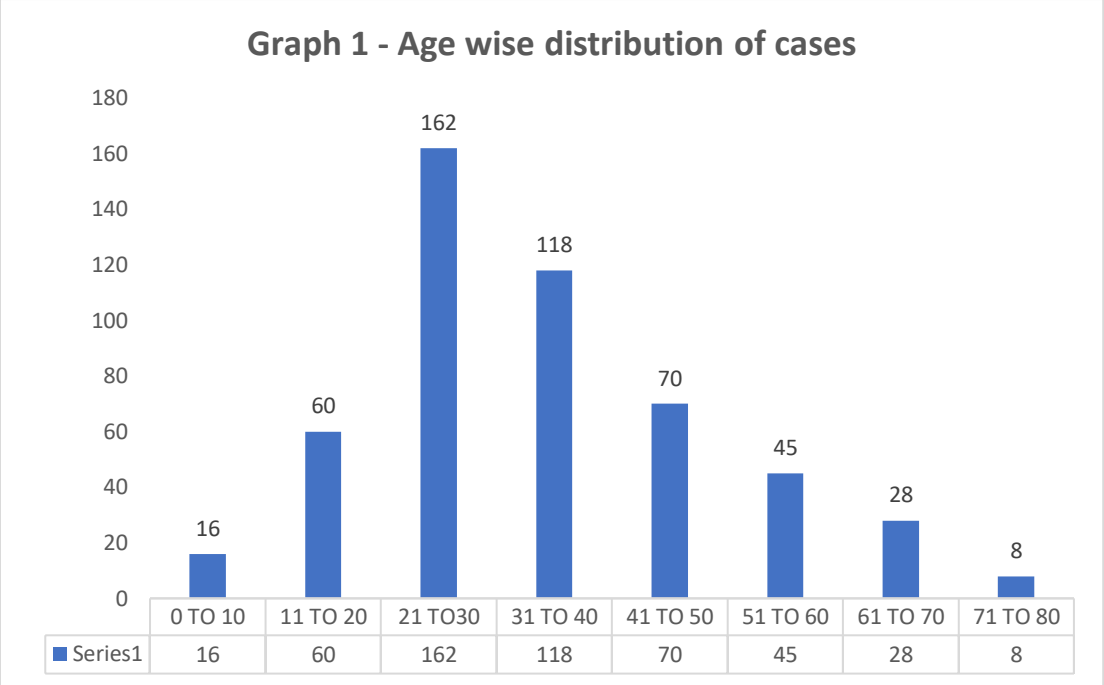

Graph 1 - Age wise distribution of cases
180
160
140
120
100
80
60
40
20
0
16
60
162
118
70
45
28
8
0 TO 10
11 TO 20
21 TO30
31 TO 40
41 TO 50
51 TO 60
61 TO 70
71 TO 80
Series1
16
60
162
118
70
45
28
8

TABLE 2: Distribution of study participants based on sex

GENDER	NUMBER OF PARTICIPANTS
MALE	438 (86.4%)
FEMALE	69 (13.6%)
TOTAL	507

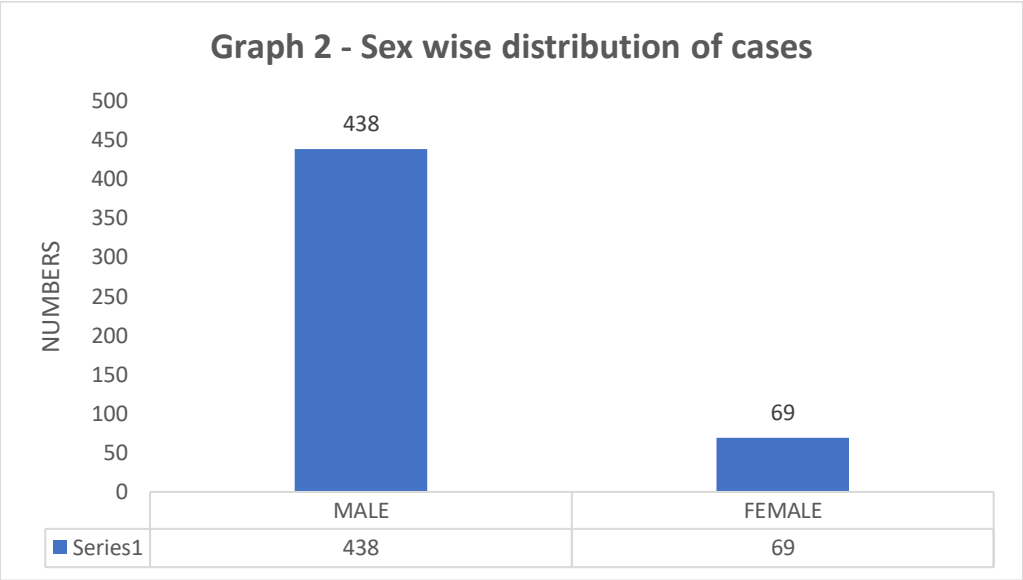


TABLE 3 Distribution of study participants based on time of accident

TIME OF ACCIDENT	NUMBER OF CASES
6am-12pm	73 (14.4%)
12pm-6pm	180 (35.5%)
6pm-12am	205 (40.4%)
12am -6am	49 (9.7%)
TOTAL	507

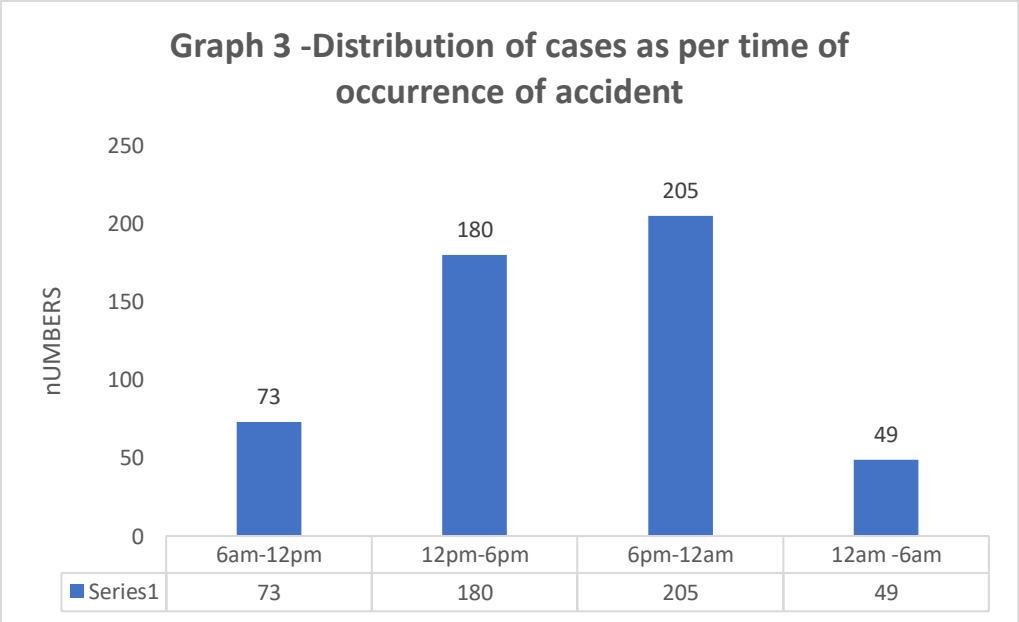


TABLE 4: Distribution of study participants based on medium of accident

MEDIUM OF ACCIDENT	NUMBER OF CASES
PEDESTRIAN	42 (8.3%)
TWO-WHEELER	389 (76.7%)
TREE/FOUR WHEELERS	60 (11.8%)
HEAVY VEHICLE	16 (3.1%)
TOTAL	507

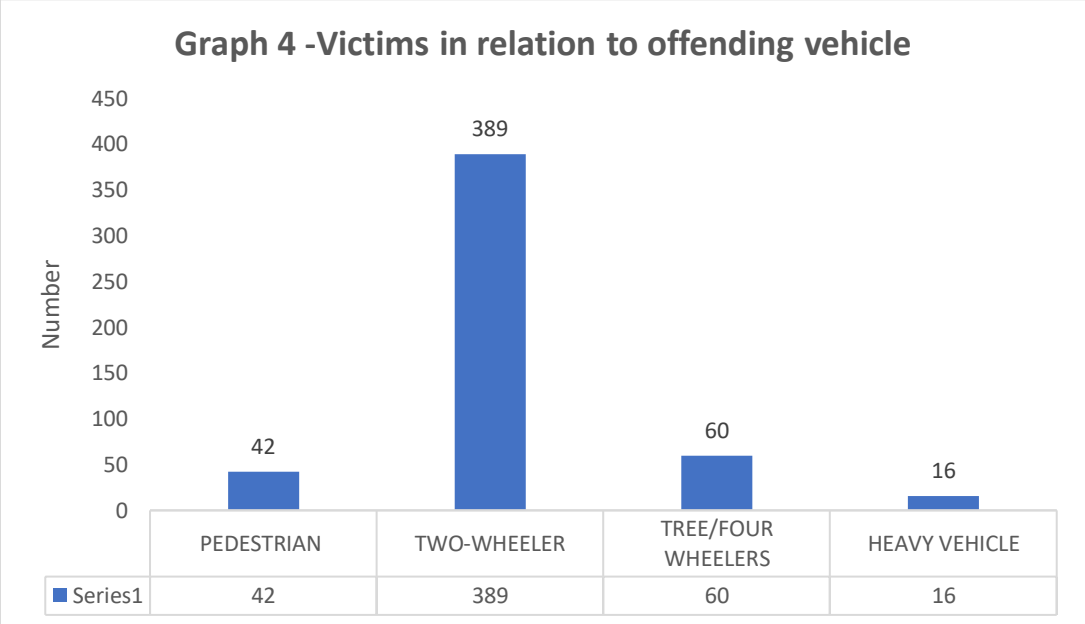


TABLE 5: Distribution of study participants based on two-wheeler rider

TWO-WHEELER RIDER	NUMBER OF CASES
RIDER	298 (76.6%)
PILLION	91 (23.4%)
TOTAL	389 (100%)

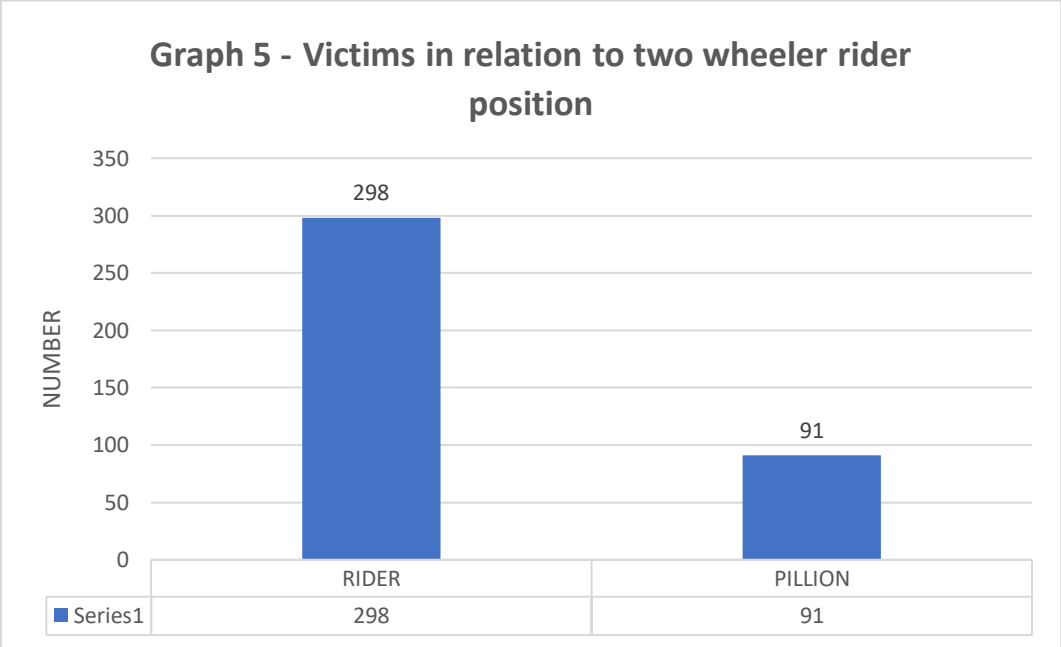


TABLE 6: Distribution of study participants based on Site of injury

SITE OF INJURY	NUMBER OF CASES
LIMBS	393 (77.5%)
CHEST	32 (6.3%)
ABDOMEN	143 (28.2%)
HEAD	344 (67.9%)

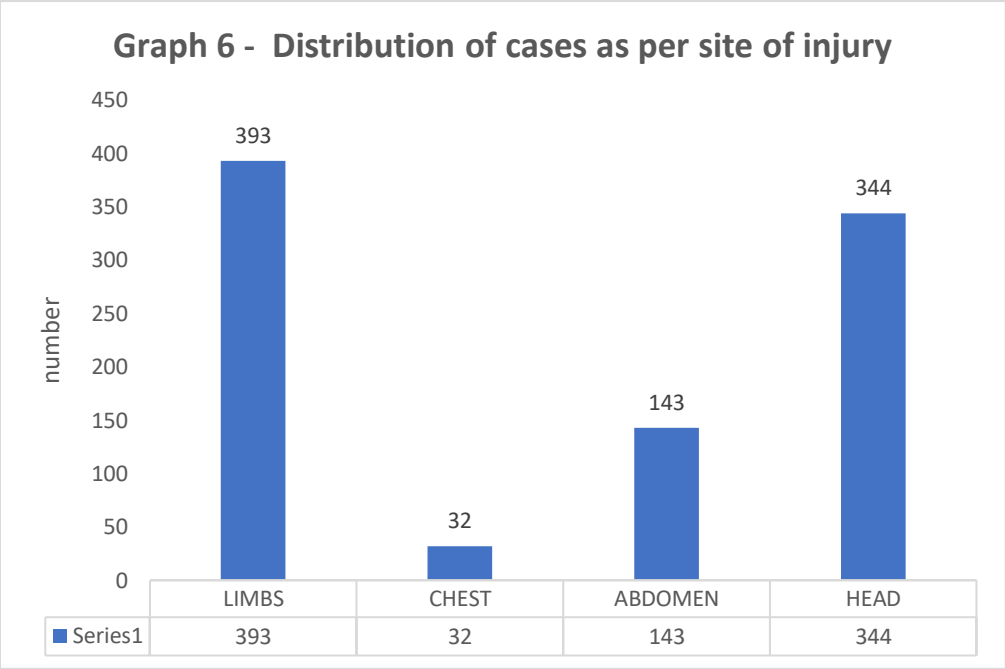
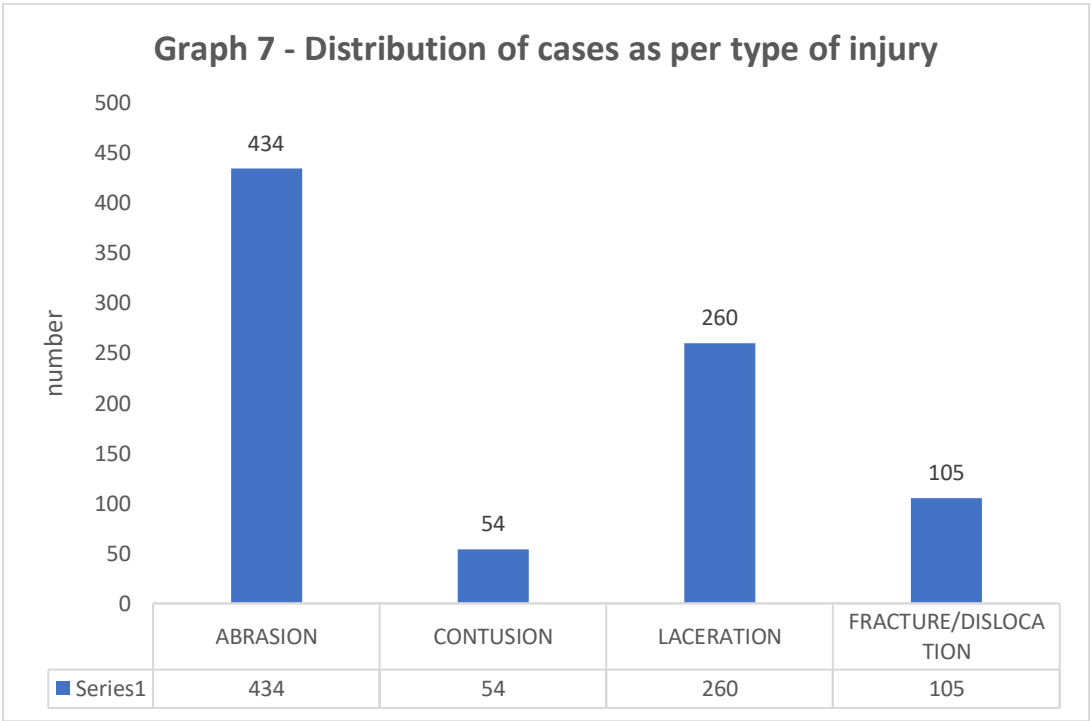


TABLE 7: Distribution of study participants based on Site of injury (LIMBS)

SITE OF INJURY (LIMBS)	NUMBER OF CASES
UPPER LIMB	217 (42.8%)
LOWER LIMB	176 (34.7%)

TABLE 8: Distribution of study participants based on Type of injury

TYPE OF INJURY	NUMBER OF CASES
ABRASION	434 (85.6%)
CONTUSION	54 (10.6%)
LACERATION	260 (51.3%)
FRACTURE/DISLOCATION	105 (20.7%)



DISCUSSION:

- A significant socio-demographic, epidemiological, technical, and media transformation is taking place in India. The health situation has changed as a result of social, political, and economic change. Historically, infectious illnesses were the leading cause of mortality in impoverished countries like India, but today non-communicable diseases & traumatic injuries are on the rise.. Around 5.8 million people worldwide pass away annually as a result of catastrophic injuries. "An occurrence that occurs on a way or street open to public traffic; resulting in one or more persons being hurt or killed where at least one moving vehicle is involved" is how a road traffic accident (RTA) is defined.[34] Road traffic accidents (RTA) cause approximately 3400 deaths per day worldwide and are expected to claim 1.9 million lives yearly by 2024. Road traffic accidents rank sixth in terms of their economic impact on the globe, making them one of the leading causes of disability and death among the younger population.[35] In the current investigation, a tertiary care hospital received reports of 507 different road traffic collision cases from January 1 through December 31, 2021.
- In the current investigation, men (86.4%) had accident rates that were determined to be 6.3 times greater than females (13.6%). Which was similar to the study carried out by Ajay Khade et al in 2012 for the reason that men are more exposed to traffic and tend to take risks while women are housebound. It was also similar to the study carried out by Nilamber j et al in JIPMER where 603 men (83%) and 123 women (17%) participated.[36]
- In a study by Narinder Mahajan et al.[11], the crash rates were found to be 5.3 times higher in men (84%) than in females (16%), whereas our study revealed that the crash rates were 6.3 times higher in males (86.4%) than in females (13.6%). This ratio is quite similar to India's, which is 4.5:1. However, the ratio reached 9:1 in a different research carried out in Delhi. Male dominance may result from more exposure and a propensity for risk-taking compared to females.
- In the current research The age range from 21 to 30 years had the highest percentage of cases (32%), followed by the ages range from 31 to 40 years (23.3%), the age range from 41 to 50 years (13.8%), the age range from 11 to 20 years (11.8%), the age range from 51 to 70 years (6.1%), and the age range from 0 to 10 years (3.2%). The research conducted by Ganveer GB et al[37] found that the age group above 70

had the fewest occurrences (1.6%). In a hospital-based research, the majority of victims were between the age range of 18 to 37 years. The biggest number of victims, 601 (51.8%), were in the 16 to 30 year age group. It was also comparable to the research conducted by Narinder Mahajan et al.[11], in which the age group of 20 to 29 years reported the greatest percentage of cases (36.2%). This age group's propensity for taking risks may be to blame for these outcomes.

- The current study's analysis of the timing of traffic accidents showed that more than 40% of them happened at night (6 p.m. to 12 a.m.), followed by the afternoon (12 p.m. to 6 p.m.) with 35.5%, the day (6 a.m. to 12 p.m.) with 14.4%, and the least of them (9 p.m. to 6 a.m.) with 9.7%. This was comparable to the research done by Babu Rao et al.18, according to which the highest number of accidents were seen between the hours of 8 am and 6 pm, when 330 (26% of all accidents), and between 6 pm and 12 pm, when 783 (62%) of them occurred. Another study produced similar findings, showing that the majority of accidents happened in the evening (42%), followed by the morning (28%), which is consistent with Kishore SK et al[38] finding that the most common time for trauma was the evening, specifically between 4 and 8 pm, followed by midday and the morning. In contrast, Singh YN et al[39] showed that the most frequent period of trauma was in the morning (33%) and the evening (29%).
- The majority of those involved in accidents in the current study—76.7%, 11.8%, and 8.3%—were two- and three-wheeler drivers, followed by pedestrians and heavy vehicle operators. This finding is similar to that of Kalpesh Zanzrukiya et al study[40], in which two- and three-wheeler drivers made up the bulk of the population. The study by Shamim M et al[41] found that 53.5% of victims were drivers and 36.9% were passengers. Menon A et al[42] also found that two-wheeler occupants were the most frequently involved, which is also reliable with Agnihotri A et al[43] and Kishore SK et al[38]. It was also discovered that 76.7% of the victims were the drivers themselves and that 23.3% were the pillion.
- In our research, out of 507 patients, the majority (more than 5O%) of the patients sustained multiple site injuries, including upper and lower limbs, the abdomen, and the head in 91 patients (17.9%) and 88 patients (17.3%). Out of 507 patients, 75.7% of patients had limb injuries, 67.9% seemed to have head injuries, 28.2% had abdominal injuries, and 6.3% had chest injuries; this is similar to the study by

Kishore S et al.44, in which limb injuries were the most common type of injury, followed by head, abdominal, and chest injuries. Contrarily, stomach injuries were found to be the most frequent kind of injury in a research from rural Haryana, while superficial injuries were shown to be the most common type of injury in a study from Delhi. [45]

- It was evident from the current research that fractures of the upper limbs were more prevalent than those of the lower limbs (217 (42.8%)). In contrast to studies by Supriya et al[9] and Kishore S et[43] al, which found that lower limbs were more often affected than upper limbs, this one included 105 (20.7%) cases.
- Abrasion (85.6%), contusions (10.6%), lacerations (51.3%), fractures or dislocations (20.7%), and abrasions (51.3%), among other minor injuries, were present in 117 (23.1%) of the 507 patients. Abrasion (89.62%) and lacerations (75.55%) were the most frequent forms of injuries among the major injuries, which was comparable to the research by Mukesh Prasad et al[46]. In contrast to the research by Kishore S[38] et al., in which fractures (39.87%) were the most common injury type, they were preceded by lacerations (25.87%), abrasion (19.58%), and contusion (14.68%), in that order.

CONCLUSION:

In majority of accidents, non-fatalities are strikingly common, and the majority of casualties are men and young people. Increased public knowledge and education about following traffic laws, using road safety equipment, and taking precautions when driving will reduce accidents. Excellent emergency trauma care facilities and ambulance services will significantly lower fatalities and impairments in rural India during the initial stages of trauma. Although a number of circumstances combined to cause RTA, they can be somewhat avoided by properly enforcing traffic rules, such as those regarding drunk driving, crash helmets, mobile phone use, and speed limits. It is also recommended that strict licensure procedure should be followed and minimum level of education regarding road safety should be imparted. Policies are also needed to protect passengers in commercially operated passenger ferrying buses, minibuses and trucks because these vehicles carry a higher risk of being involved in fatal as well as non-fatal crashes. Stricter legislation should be adopted in dealing with rash, negligent driving and driving under the influence of alcohol. Compulsory implementation of helmet wearing for motorcyclist needs to be emphasized furthermore. Strict enforcement of road safety regulations and improving emergency medical services may prevent needless deaths and disabilities caused by road traffic collisions is the need of the hour.

SCOPE AND LIMITATIONS

SCOPE:

The current study aids in the analysis of nonfatal injury patterns and highlights the most significant human and natural factors related to traffic accidents that can be reduced or controlled by enforcing traffic laws strictly. The many epidemiological elements that led to RTA are also identified in this research.This would ultimately increase the health educator's knowledge and aid in giving better health education to inform the public about road traffic accident situations and measures to avoid them.

LIMITATIONS:

Our study had many shortcomings, one of which was that it was just an observational analysis. This study's inability to evaluate the accident's location, the drivers' BAC levels, whether they were wearing safety equipment, the posted speed limit, or if they were using any devices at the time of the crash were major limitations. Further, in-depth study might be done to look at the effects of applying safety measures in automobiles in instances of RTA, the effects of getting medical care quickly on the outcomes of severe cases of RTA, etc. Additionally, the need for hospitalisation was not assessed in this study, and fatal incidents were also not included.

SUMMARY:

- A descriptive cross sectional study was conducted to study the pattern of injuries among non-fatal cases of road traffic accidents cases reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C, Belagavi and to find out the various epidemiological factors responsible for the RTA in the tertiary care hospital.
- Convenient sampling method was used to recruit the samples in the study.
- The clinical examination of all the subjects was done by a single examiner with the help of a trained recorder till the required sample size was obtained.
- After getting the consent from the patient information regarding all the non-fatal cases of road traffic accidents reporting to KLES Dr.Prabhakar Kore Hospital & M.R.C were be collected.
- The information about the patients admitted as cases of road traffic accidents were obtained from the records of Out Patient Department of the hospital daily and then these patients were contacted in the wards.
- The victims were interviewed for the injury details and the circumstances leading to crash and the same were recorded on a pre-designed questionnaire along with basic demographic information.
- The site of injury were recorded as reported in the case sheets of the patients by the specialists. Bed side study also included for follow up of the cases.
- Relatives/Attendants were interviewed in case the condition of the victims demanded so.
- The medico-legal records, case sheets and police records were referred to for collecting additional information wherever necessary for cross checking.
- It was observed that the maximum number of cases were in the age group of 21-30 (32%), the least number of cases were amongst >70 years of age (1.6%)
- The crash rates were found 6.3 times higher in males (86.4%) than in females (13.6%).
- The time distribution of the road traffic crashes revealed that more than 40% of the crashes occurred during the night time (6.00pm- 12.00am) and least were during the might night (12.00 am to 6.00 am) which was 9.7%.
- The majority of the people involved with the accidents were two wheelers, 76.7%, and heavy vehicle were involved only 3.1%.

- It was also found that 76.6% of the victims were drivers themselves and the 23.4% were the pillion.
- Out of 507 patient majority (more than 50%) of the patients had multiple site injuries i.e., upper and lower limbs and abdominal injury were reported in 88(17.3%), and chest injuries were the least 6.3%.
- Out of 507 patients whereas 117 (23.1%) had minor injuries in the form of abrasions (85.6%),
- Fractures of upper limbs were the most common 217(42.8%) followed by Fractures lower limbs 105 (20.7%) cases.

RECOMMENDATIONS:

- Furthermore, research may be carried out in-depth like impact of use of safety measures in vehicles in RTA cases, impact of early hospitalized treatment in outcome of serious cases of RTA etc
- A further study involving the place of accident, drunk and drive, use of protective gears and speed limit and use of gadgets while driving should be assessed.
- Furthermore, the further study should assess the need for hospitalisation.
- Inclusion of fatal cases should be taken and the patterns of injury in fatal cases should also be taken into consideration.
- Weather condition and traffic following the traffic rules should also be considered to know the major cause of RTA

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ANNEXURE –I

PHOTOGRAPHS

REFERRING MLC REGISTER	EXAMINING & NOTING INJURY PATTERN

ASKING & NOTING PROFORMA DETAILS

Grazed Abrasion

Contusion

Lacerated wound	Open Fracture

Annexure –II

INFORMED CONSENT

Study title: A Cross sectional study to assess the pattern of non fatal injuries in road traffic accidents reporting to a tertiary care hospital

Primary Investigator: BF0120003

Guide: ASSOCIATE PROFESSOR

DEPT. OF FORENSIC MEDICINE

Introduction: Road Traffic Accident (RTAs) have emerged as a major global public health problems of the century and are now recognised as vertiable neglected pandamic with growing number of vehicles there have been spurt in road traffic injuries. Information on the injury patterns, nature and outcome are extremely limited present study is an endeavour to explore some of these basic issues.

Methodology: The present case series were carried out in KLES Dr. Prabhakar Kore Hospital & M.R.C, Belagavi in year 1-January-2021 to 31-December 2021. A structured self designed questionnaire schedule were used for interviewing RTA victims. This questionnaire includes pattern of non fatal injuries in RTA cases

Possible benefits: By this study we are providing time effective in diagnosing the pattern of non fatal injuries in road traffic accidents

Possible risks: There is no risk involved in our study.

Cost of participation: The cost of the study were entirely borne by the researcher. You will not have any cost for your participation in this study.

Legal rights: By signing this consent form, you are not waiving off any of your legal rights.

Privacy and Confidentiality: The results of the study may be published for scientific purposes. However, your identity will not be revealed and all information collected were coded so that, no one other than the investigator will know your identity.

Withdrawal from the study: You can withdraw from the study at any point of time if you wish to do.

Authorization to publish the results: The researcher may use the information gathered from this study for presentation or publication in scientific journals. However, your personal identity will not be revealed.

Questions:

If you have any queries/doubts regarding the study, you can contact **PG STUDENT,** Department of Forensic Medicine, KAHER, J.N. Medical College, Belagavi, Karnataka or **ASSOCIATE PROFESSOR**, Department of Forensic Medicine, KAHER, J.N. Medical College, Belagavi-590010

If you have any questions about the rights as a research participant you may contact Chairperson, Institutional Ethics Committee for Human Subjects' Research, KAHER, J.N. Medical College, Belagavi – 590010, or Principal, KAHER, J.N. Medical College, Belagavi-590010, Ph no: 0831-2471350.

CONSENT STATEMENT

"I have read / have been explained in my own understandable language about the contents in this form and my queries have been clarified by the investigator and I have been told that I /my relative (specify relation) …… have the right to withdraw from participating in this study at any point of time. I have been assured that confidentiality were maintained and were used only for this study and my identity shall never be revealed in future".

I hereby give my consent for (self/my relative) participation in the study voluntarily and not under the influence of the investigator or any other influence.

Name of the participant.

Signature.

Name of the interviewer Signature.

Signature of the guide.

Date: __/__/_____

Place: _____

ANNEXURE – III

PROFORMA

A cross sectional study to assess the pattern of non-fatal injuries in road traffic accidents reported to a tertiary care hospital

Primary Investigator: BF0120003

Guide:

Information to be Obtained while Investigating a Case of road traffic injury

1.Name of the patient :

2. Age :

3. Sex : MALE / FEMALE

4. Address :

5.. Occupation : Unemployed / Agriculturist / Laborer / Housewife/Businessman/ Student / Employee in service / Others.

6. Marital status : Married / Unmarried / Widower .

7. Education : Primary / Secondary / College / Graduate / Postgraduate.

8. Hospital OP/IP No :

9. Date and Time of accident :

10. Place of accident :

11. Date and Time of admission :

HISTORY

Patient is a pedestrian / driver / passenger.

A) If the patient is pedestrian

1. Crossing the road: Yes / No

2. Using mobile phone: Yes / No

B) If the patient is driver

1. Did the driver have adequate sleep during last 24 hrs- Yes / No

2. Whether he / she is using seat belt.

3. Using Mobile phone: Yes / No

C) If the patient is passenger

1. Whether he / she is using seat belt: Yes / No
2. Position; Front / back
3. Passenger density : Normal / crowded

CONDIITION OF PATIENT AT THE TIME OF ADMISSION

1. Conscious
2. Unconscious

Was there any smell of alcohol: Yes / No

ADDICTIONS (Habits, last six months) : Yes / No

ASSOCIATED CONDITIIONS: Yes / No

EXAMINATION OF INJURY:

1. Site :
2. Type : Avulsion / Laceration / Abrasion / Fracture / Burns / Others specify.
3. Brief description of injury :

Annexure – IV
Key to Master Chart

Age of the participants

0-10	1
11-20	2
21-30	3
31-40	4
41-50	5
51-60	6
61-70	7
71-80	8

Sex

M - Male

F - Female

OP NO – Out Patient Number

IP NO – In Patient Number

TOA - Time Of Accident

Morning 6 AM – 12 PM	1
Afternoon 12 PM – 6 PM	2
Evening 6 PM – 12 AM	3
Night 12AM – 6 AM	4

MOT - Patient's Mode Of Transport

Peds	-	Pedestrian
2 W	-	Two-wheeler
3 -4 W	-	Three/ Four Wheeler
Heav V	-	Heavy Vehicle

TRP - Two-wheeler Rider Position

Rid	-	Rider
Pil	-	Pillion

TOI - Type Of Injury

Ab	-	Abrasion
Con	-	Contusion
Lac	-	Laceration
Frac/ Dis	-	Fracture/Dislocation

SOI - Site Of Injury

UL	-	Upper Limbs
LL	-	Lower Limbs
CH	-	Chest
ABD	-	Abdomen
HE	-	Head