

**“A CROSS-SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE,
AND PRACTICE OF ROAD TRAFFIC RULES AMONG
COLLEGE STUDENTS WHO ARE REGULARLY USING
TWO WHEELERS IN KANYAKUMARI DISTRICT”**



Dissertation

Reg No:201725151

Submitted to

THE TAMILNADU Dr. M.G.R MEDICAL UNIVERSITY

**In partial fulfilment of the requirements for
the award of the degree of**

M.D COMMUNITY MEDICINE


Branch XV


May 2020

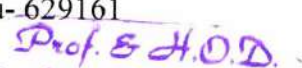
CERTIFICATE -I

This is to certify that this dissertation entitled “**A Cross-Sectional Study on Knowledge, Attitude, and Practice of Road Traffic Rules Among College Students Who are Regularly Using Two Wheelers in Kanyakumari District**” is a bonafide work done by **Dr.M.Narayanan** under my guidance and supervision in the Department of Community Medicine during the period of his postgraduate study for M.D Community Medicine [Branch-XV] of The Tamilnadu Dr. MGR Medical University from 2017-2020.


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DECLARATION

I Dr. M.Narayanan, hereby declare that this dissertation entitled **“A Cross-Sectional Study on Knowledge, Attitude, and Practice of Road Traffic Rules Among College Students Who are Regularly Using Two Wheelers in Kanyakumari District”** is a bonafide and genuine research work carried out by me under the guidance and supervision of Dr.M.C.Vasantha Mallika and Dr. Vishnu G Ashok in Sree Mookambika Institute of Medical Sciences, Kulasekharam during the period 2017-2020 in partial fulfilment of requirements for the award of the degree of M.D. Degree in Community Medicine [Branch-XV] by The Tamilnadu Dr.MGR Medical University.

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ACKNOWLEDGMENT

I am privileged to express my extreme gratefulness to our chairman, **Dr. C. K. Velayudhan Nair M.S**, Sree Mookambika Institute of Medical Sciences and our Director, **Dr. Rema. V. Nair M.D, D.G.O**, Sree Mookambika Institute of Medical Sciences for their constant encouragement and sustained support all through my career in this esteemed institution.

I would like to express my sincere thanks to our respected Principal **Dr. Padmakumar, M.S, M.Ch**, Vice Principal **Dr. Mookambika. R.V, M.D, D.M** and the Deputy Medical Superintendent **Dr. Vinu Gopinath, M.S, M.ch** for their constant encouragement and sustained support all through my career in this esteemed institution.

I am grateful to **Mr. J. S. Prasad**, Administrative officer, for his help in the study.

I consider it a great privilege and honour to express my profound gratitude to my respected professor, mentor and guide **Dr. M.C Vasantha Mallika, MD, DPH** professor and Head of the Department of Community Medicine for her constant monitoring, support and valuable guidance at every stage of this study.

I sincerely express my gratitude to my co guide **Dr. Vishnu G Ashok** Assistant professor, Department of Community Medicine for his guidance and encouragement throughout the study.

I express my sincere thanks to **Dr. Leela Itty Amma**, Professor, Department of Community Medicine, for her support and guidance.

I thank my respected teachers **Dr. Sudhir Ben Nelson, Dr. Priya R Panicker, Dr. Austoria A.J, Dr.Aazmi.M**, Assistant professors, department of Community Medicine for their guidance and encouragement throughout the study.

I also thank **Miss Jossy John**, Lecturer in Statistics, Department of Community Medicine for her support, help and encouragement during this study.

I am thankful to all my **postgraduate colleagues and my friends** for their help and valuable suggestions during the course of the study.

I am very grateful to my wife, and family members for their support and encouragement.

Mrs. Ambika Kumari deserves special mention for her help and cooperation.

Above all, I thank God Almighty for his blessings, to undergo my postgraduate course.

M. Narayanan

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Analysed Document: A CROSS-SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE, AND PRACTICE OF ROAD TRAFFIC RULES AMONG COLLEGE STUDENTS WHO ARE REGULARLY USING TWO WHEELERS IN KANYAKUMARI DISTRICT.docx (D56441446)

Submitted: 03/10/2019 19:05:00

Submitted By: dmarayanan81@gmail.com

Significance: 5 %

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CERTIFICATE-III

This is to certify that this dissertation work titled “**A Cross-Sectional Study on Knowledge, Attitude, and Practice of Road Traffic Rules Among College Students Who are Regularly Using Two Wheelers in Kanyakumari District**” of the candidate Dr. M. Narayanan., with registration number **201725151** for the award of **Doctor of Medicine** in the branch of **Community Medicine**. I personally verified the urkund.com website for the purpose of plagiarism check. I found that the uploaded thesis file contains from introduction to limitations pages and result shows 5 (five) percentage of plagiarism in the dissertation.

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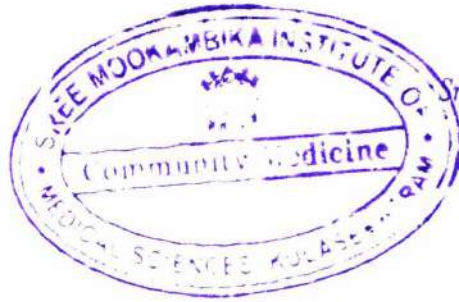
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1. INTRODUCTION

A road traffic injury is a fatal or non-fatal injury incurred as a result of collision on a public road involving at least one moving vehicle ¹. Road traffic safety refers to methods and measures for reducing the risk of a person using the road network being killed or seriously injured ².

A road traffic accident (RTA) is any injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road. As per Global status report on road safety, It is the eighth leading cause of death for all age groups ³. Road traffic injuries are one of the leading cause of global deaths and expected to go on to the third position. Road traffic injuries cause considerable economic losses to victims, their families, and to the nation ⁴.

Road traffic injuries form alarming public health problem in India. Every day thousands of people are injured and killed on the roads, usually affecting the productive age groups of road users. Majority of the people killed in traffic injuries are young adults between the age group of 15 and 44 years ⁵.

Low and middle-income countries having 82% of the global population and 56% of global vehicles but account for 90% of accidents. Mortality in low and middle-income countries is 2.5 times higher than that in high-income countries ⁶.

1.1 GLOBAL SCENARIO

Globally, road traffic injuries (RTIs) are responsible for a significant proportion of overall injury, morbidity and mortality. Globally 1.35 Million deaths occur on roads all over the world each year due to road traffic injuries. In children and young adults, road traffic injuries are the leading cause of death. More than 50% of

road traffic deaths occur among Pedestrians, Cyclists and Motorcyclists. Road traffic injuries are the eighth leading cause of death in all age groups. Now Road traffic injuries are the leading cause of death among children and young adults of age 5-29 years. Death rates due to road traffic injuries are three times higher in low income countries. The majority of deaths from South East Asia are among two wheeler riders³. Globally more than 3,400 people die daily on road. Every year 10 million peoples are injured or disabled due to road traffic injuries ⁷. Traffic injuries are the second leading cause of death among children of 5- 14 years of age ⁸.

Road traffic injuries (RTIs) account for 9% of global deaths, which is 1.7 times higher than the combined number of deaths from HIV/AIDS, Tuberculosis and Malaria. Road Traffic Injuries are expected to be 7th leading cause of deaths in 2030. RTIs are expected to rise to the 7th position in the list of causes of death by the year 2030 ⁶.

1.2 SCENARIO IN INDIA

WHO published a Global Status Report on Road Safety 2018, based on the road traffic accidents data 2016. India is one of the leading countries for higher number of road traffic accidents. Road traffic injuries vary from state to state ^{3,9}.

1.3 SCENARIO IN TAMILNADU

According to the Ministry of Road Transport and Highways, the state leading in accidents in India is Tamilnadu during 2017. The maximum accidents in Tamilnadu were caused by two-wheelers (43.94%) in January 2019. Maximum deaths were due to two-wheelers (37.38%) out of which 47.28% of deaths were due to not wearing a helmet. The Government has taken actions to reduce accidents through

departments of transport, police, and education and through proper highway instructions. After this the number of deaths were reduced in 2018 compared to previous years. Death rate in 2018 is 24% lower than 2017. 25% of total accidents and 78.5 % deaths has been increased in January 2019 compared to that in January 2018 in Kanyakumari district ⁷.

Road traffic injuries (RTIs) and deaths have an impact on individuals, communities, and countries. The individuals suffer from a massive cost of the health care. The individuals occupy hospital beds and consume resources resulting in losses of significant productivity with social and economic repercussions. Globally road traffic injuries are three times more common among men. The risk factors for road traffic injuries and deaths are drinking and driving, speeding and failing to use helmets. 30 % of deaths due to speed in high-income countries, while more than 50% of the deaths in low and middle-income countries. 40% of deaths and 70% risk of severe injury may be reduced by wearing a standard motorcycle helmet. If the Government fails to take action to reduce the road traffic deaths, it is to be predicted to increase to 1.9 million deaths by 2030 and it becomes the seventh leading cause of death ⁹.

The world's second-largest road network is in India. It has different shapes, sizes, construction methods, safety criteria, and quality. Common risk factors observed in India are faulty designing of road, poor maintenance of roads, absence of segregation of vehicles with their speed, slippery roads, narrow roads, poor visibility of road surface and roads that promote speeding beyond limits ⁶.

1.4 PROGRAMME RELATED TO ROAD TRAFFIC ACCIDENTS

In September 2015, the United Nations launched ‘the 2030 agenda for Sustainable development goals’ (SDG). Out of the seventeen Sustainable development goals, two goals concentrate on road safety. The Goal 3.6 is targeted to achieve halve the number of global deaths and injuries from road traffic accidents by the year 2020. Goal 11.2 targets on provision of access to safe, affordable, accessible and sustainable transport system for all by the year 2030, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons ^{10, 11}.

1.5 SCIENTIFIC JUSTIFICATION OF THE STUDY

Road Traffic Accidents (RTA) and deaths due to road traffic injuries are preventable. In the modern world rapid growth of vehicle production and necessity for the use of two-wheelers are increasing day by day. The most vulnerable age group for the involvement of RTA is 15-29 years. The minimum age for getting a driving license in our country is 18 years. So college students were chosen as study participants in this study. Individuals of this younger age group will be the future parents. If they have better knowledge about road traffic rules it will be helpful to motivate their family members towards correct road traffic rules. Implementation of effective road traffic rules in this age group will be helpful to bring changes in their behavior towards healthy road traffic practices. Road traffic accidents and injuries are a major but often neglected public health problem in India. So this study was planned to be carried out among college students. Literature shows only very few studies on this topic among students from Tamilnadu.

2. AIMS AND OBJECTIVES

1. To assess knowledge, attitude, and practice of road traffic rules among college students who are using two-wheelers regularly in Kanyakumari district.
2. To study the prevalence of road traffic accidents and associated risk factors among college students in Kanyakumari district.

3. REVIEW OF LITERATURE

3.1 INJURY

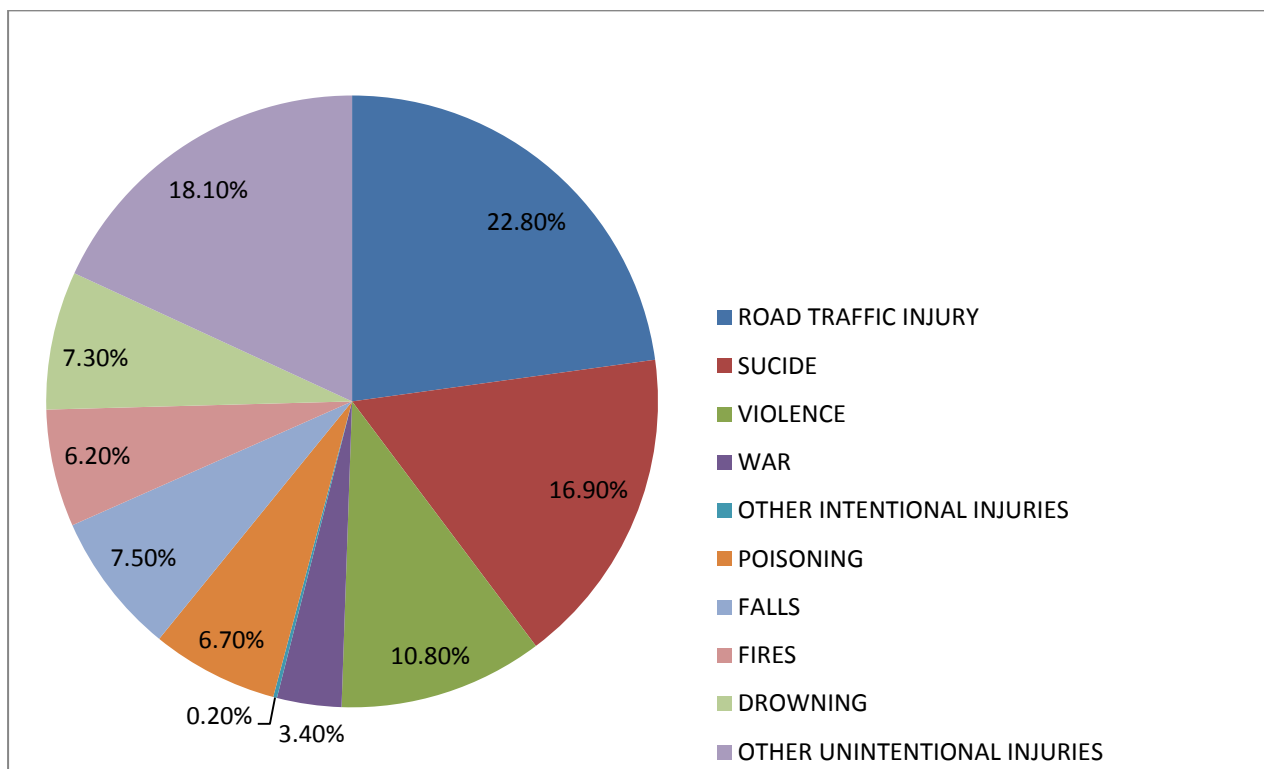
Injuries may result from traffic collisions, poisoning, drowning, burns, falls, assault, self-inflicted violence, and an act of war. Globally injuries cause 9% of mortality. For every death due to injuries, there are hundreds of emergencies and hospitalizations. Many Peoples survive with temporary or permanent disabilities after injury ¹².

Poor countries were severely affected by fatal injuries, and non fatal injuries. Globally there is one death every six second due to injuries that is around 14000 deaths per day ¹³.

In India, rapid industrialization and urbanization have to lead to an alarming increase in accidental injuries, crime, and violence ¹⁴.

India accounts for about 10% of road crash fatalities worldwide. In terms of absolute numbers, more people die in road crashes in India than anywhere else in the world, including the most populous country China ¹⁵.

Figure no 1: Distribution of global injury mortality by the cause ¹⁶.



3.2 ROAD TRAFFIC INJURIES (RTIs)

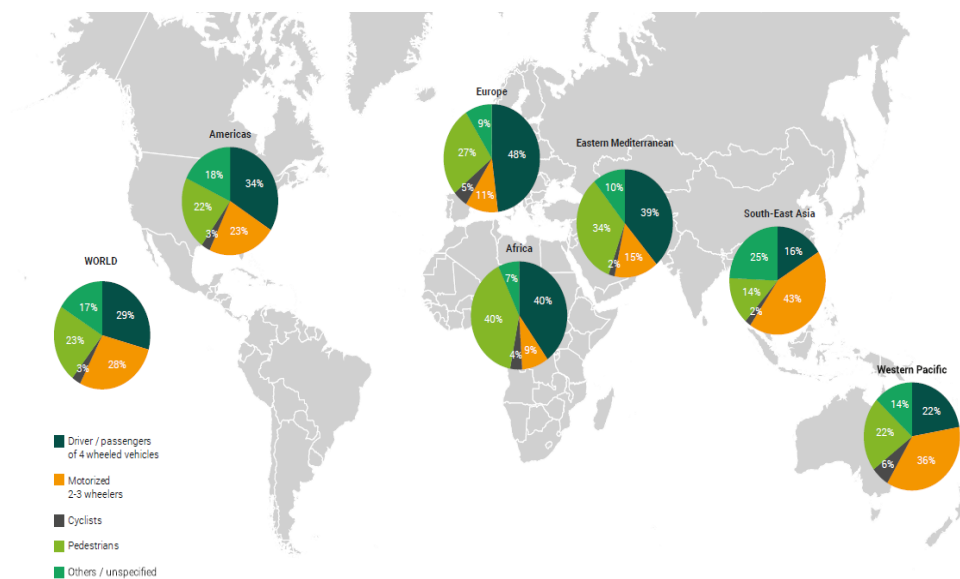
Road traffic crashes occur all over the world. Road traffic accidents (RTA) are one of the major causes of injury, death, and disability all over the world including developed and developing countries. There is a significant association between income and risk of deaths due to the road traffic injuries. The average death rate due to RTA in low income countries are three times higher (27.5 deaths / 100,000 population) than high-income countries (8.3 deaths/ 100,000 population). Road traffic injuries are a major but neglected problem and the tragedy behind these attracts less mass media attention than other less frequent types of tragedies. Considerable economic losses occur to the affected individuals, their families and nation due to road traffic injuries. Also losses arise from the treatment cost and lost productivity for those killed or disabled by injuries. Family members need to take time for taking care

of an injured person. The cost of road traffic injuries in most countries is about 3% of their gross domestic product ¹⁷.

3.3 GLOBAL PREVALENCE OF ROAD TRAFFIC ACCIDENTS

Road traffic injury was first recorded by cyclist on 30th May in 1896 in United States (Newyork) ¹⁸. The road traffic deaths rise steadily from year to year. In 2016 road traffic deaths reached 1.35 Million in number. These death rates were relative to the size of the world's population. Due to the increasing population and rapid motorization the global burden of road traffic accidents will keep on increasing ³. A number of factors contribute to the risk of collision including; vehicle design, speed of operation, road design, and driver impairment. Worldwide motor vehicle collisions lead to significant death and disability as well as significant financial costs to both society and the individual. Deaths due to RTA is predicted to be 1.9 million by the year 2020, reported by WHO ¹⁸.

Figure no 2: Distribution of global deaths among road users.



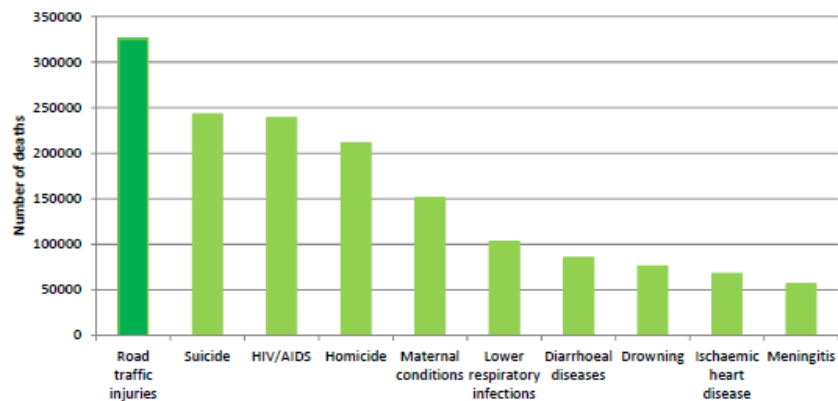
3.3.1 A LEADING KILLER OF CHILDREN AND ADOLESCENTS

The countries' future is on young people's hand. One child dies every minute on road globally. These death rates are found to be higher than 500 deaths per day. RTA forms the fourth cause of death among children of age group of 5-9 years, third cause of death in the age group of 10-14 years, and first leading cause death in the age group of 15-17 years. Studies show that majority (95%) of road traffic deaths among children occur in low and middle income countries. The occurrence of road traffic injuries are twice in boys compared to girls ¹⁹.

Figure no 3: According to WHO, RTA forms the topmost cause of death of age between 15-29 years



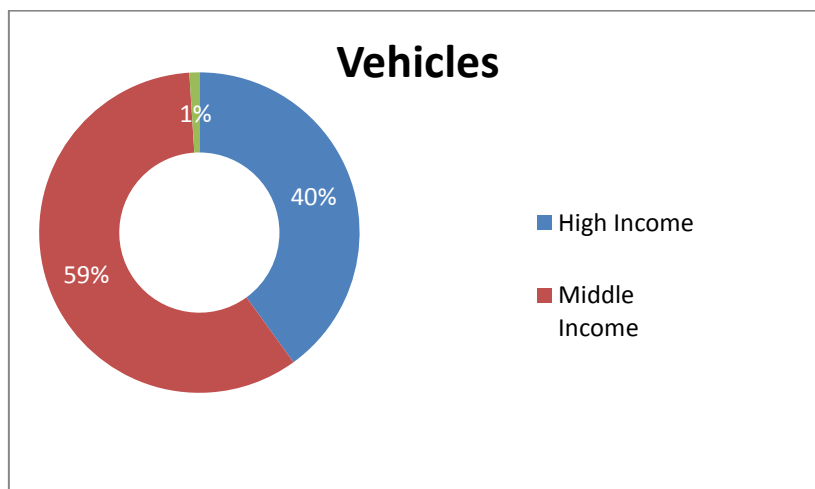
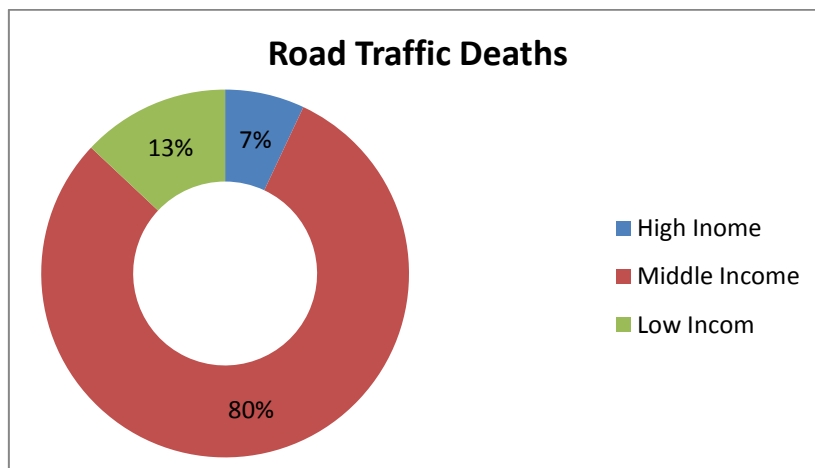
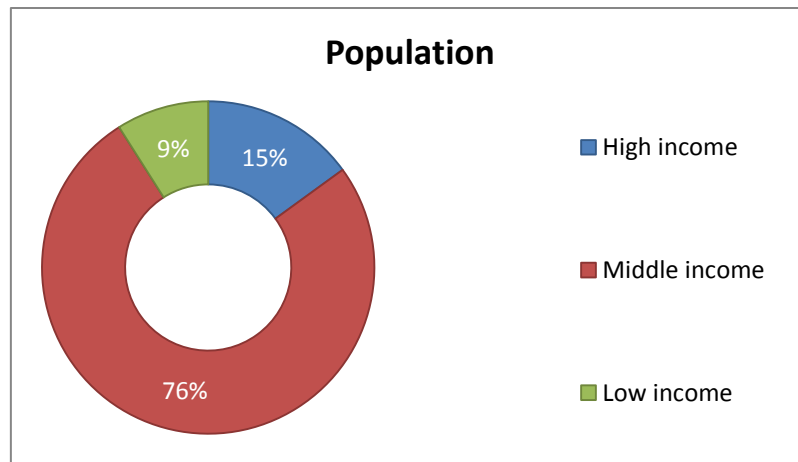
The #1 cause of death: ages 15-29



Compared to the deaths due to infectious diseases, the relative contribution from non-communicable diseases including injuries has increased. In general for all age groups, the eighth leading cause of deaths is due to road traffic injuries. In the current situation, it is the leading cause of death for children and young adults of the

age group of 5-29 years. The number of deaths from road traffic injuries are higher than deaths due to communicable diseases like HIV/AIDS, Tuberculosis and diarrhoeal diseases ³. The global burden of road traffic deaths is disproportionately high in low and middle income countries with about the size of the population and the total number of motor vehicles. ²⁰. In many developing countries the children are at high risk for RTAs because they use road for playing. RTAs form one of the leading causes for disabilities in younger age group ²¹.

Figure no 4: Distribution based on Proportion of population, road traffic deaths, and registered motor vehicles by country income category, 2016- (104 countries)



Income levels are based on 2017 World Bank classifications.

Road traffic death rate in global was 18.2 per 1 lakh population.

In Africa - 26.6 per 1 lakh population.

In South East-Asia - 20.7 deaths per 1 lakh population.

In Eastern Mediterranean – 18 deaths per 1 lakh population.

In Western Pacific regions - 16.9 deaths per 1 lakh population.

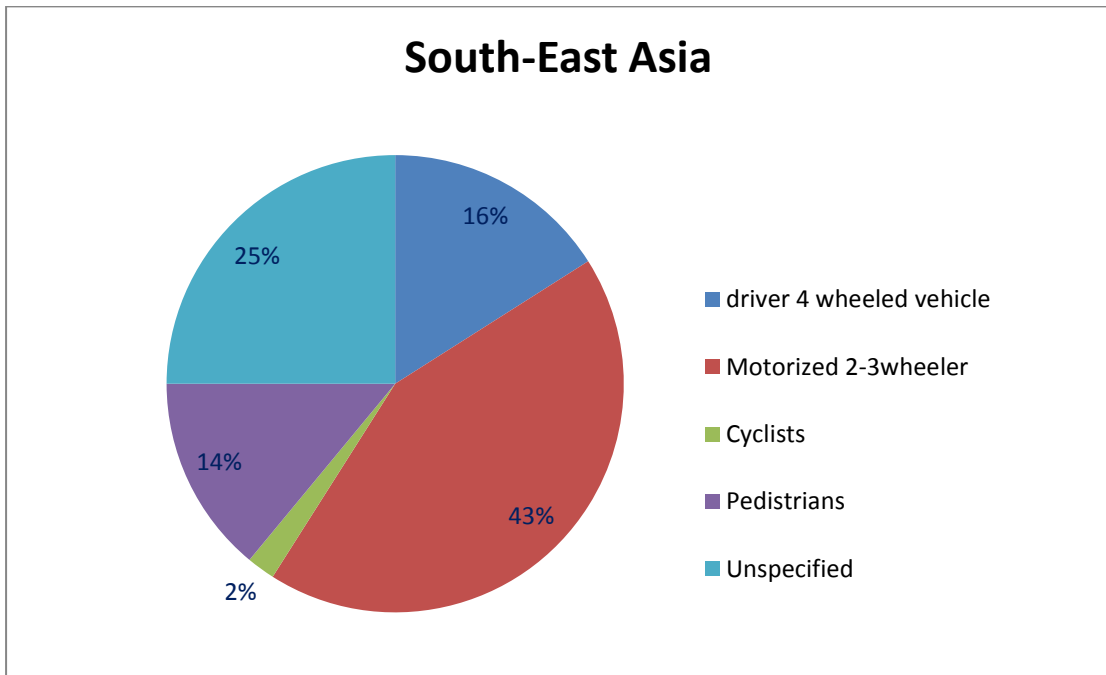
In America -15.6 deaths per 1 lakh population.

In Europe- 9.3 deaths per 1 lakh population.

3.3.2 VULNERABLE ROAD USER

Death rates from RTAs vary between regions and countries. The vulnerable road users are cyclists, motorcyclists, and pedestrians. Those using motorized two-wheeler and three-wheelers contribute to 28 % of deaths. In Africa, 44% of deaths occurred from cyclists and pedestrians. Data shows that in South-East Asia, 43% of deaths occur among motorized two and three-wheelers ³. Pedestrians contribute 22% of all road traffic deaths globally. Millions of pedestrians are non fatally injured and some of them with permanent disabilities ²². Children are prone to limited physical development, social development and cognitive development, as they are more susceptible to involve in RTAs ¹⁹.

Figure no 5: Distribution of deaths by road user type, by WHO Region



3.3.3 LEGISLATION AND ROAD USE BEHAVIOR

A regulation or rule is a policy statement or guidelines released by the government. The factors influencing the legislation on road safety includes driving force, political will, public pressure, tragedy among law-makers family, and changes in social values. Global road safety was recommended by the International policy-making and technical institution such as United Nations. Legislation is one of the road safety strategies to reduce fatal and non-fatal injuries. Legislation is a useful measure to achieve most of the road safety goals. International regulations give guidelines and legal framework for regions and countries from evidence based practice ²³.

Enacting and enforcing legislation is important in reducing the risk factors of RTA. Risk factors are over speeding of vehicle, drunken-driving, riding without standard helmets, driving without seat belts, and child restraints. These are the important components of an integrated strategy to prevent deaths from road traffic

injuries. Currently, 123 countries have laws that meet at least one of the five key behavioral risk factors, nearly representing 6 billion people ³.

3.3.4 MANAGING SPEED

Riding Speed is one of the important factors directly proportional to the severity of injury and likelihood of death. A national speed limit setting is an important step to reduce accidents. The maximum speed limit in urban should be less than or equal to 50 km/Hour. Local authorities should have the legislative power to further reduce speed limits in such places like schools. Only 46 countries meet those speed practice criteria. In India, the speed limit in the urban area is more than 50 km/Hour ³.

3.3.5 REDUCING DRUNKEN-DRIVING

Among total road deaths 5- 35% have been reported as Alcohol-related deaths. Drunken driving significantly increases the risk of road traffic injuries and severity. There is a limitation on alcohol consumption for drivers. The blood alcohol concentration (BAC) limit for drunk-driving is 0.05g/dl for the general population and 0.02 g/dl for young or novice drivers ³.

Drunken driving laws vary between country to country as well as Blood Alcohol Concentration (BAC) level. BAC limit is 0.02% to 0.05% for central Asian countries. In china, if BAC is 0.02%, there is a fine of 200-500 CNY and suspension of license for 1-3 months ²⁴.

3.3.6 INCREASING HELMET- USE IN MOTORCYCLE USERS

The leading cause of death among two-wheeled and three-wheeled motor users was head Injury. 42% of fatal injuries and 69% of head injuries can be reduced by using helmet. So proper helmet use is one of the important measures for preventing road traffic deaths. According to motorcycle helmet law on all roads, the drivers and passengers should wear a helmet. The helmet should be of a reference to standard quality 63 countries restrict child passengers on a motorcycle ³.

3.4 INDIAN SCENARIO

Road traffic crashes are one of the world's largest public health and injury prevention problems. The problem is all the more acute because the victims are overwhelmingly healthy prior to their crashes. The population in India crosses more than one billion. In the world, India is one of the fastest-growing countries in economies. Economic growth leads to rapidly increasing vehicle production and usage. In the world, India reports one of the highest mortality rates due to road traffic injuries ²⁵.

India alone contributes 73% of RTA burden from South East Asian region ²⁶. In India, 1,47,913 peoples died due to road traffic accidents during 2017 ⁷. Top three leading causes of deaths in 1990 were pneumonia, diarrhoea, and perinatal conditions. These disease burdens will shift to heart diseases, depression and road traffic injuries in 2020. India has 1% of the global motor vehicle population, but bears 6% of the global road traffic accidents ¹⁴. The motorcyclist have 35 times more risk of death than car occupants ¹⁸.

In India, one death occur every minute due to RTA. Every minute there is one serious road traffic accident that happened in our country. The state with maximum

deaths was recorded in Uttar Pradesh. Two deaths occur in Uttar Pradesh every hour. The state with maximum road crash injuries happened in Tamil Nadu ²⁷.

Human factors are responsible for increasing road traffic accidents in India rather than mechanical factors. Human factors include drunken driving, not following traffic rules, over speeding of vehicle and irresponsible driving. Irresponsible driving like not using helmets and using cell phones while riding contribute to more number of accidents. Other reasons for high road traffic injuries in India are rapid urbanization, rapid motor vehicle growth, poor road engineering, lack of awareness about road safety, poor enforcement of road traffic rules and laws as well as lack of injury prevention programmes ⁴.

The speed limit in India is 80 km/hour on highways, and city speed limit is 60 km/hour for two-wheelers. Motor vehicle act, 1988, under section 183 states that no action may be taken when the person crosses a speed limit of 5% of the maximum speed ²⁸.

Pranab Jyoti Bhuyan et al conducted a descriptive study in Assam from September 1998 to August 1999. RTAs affected the people of productive age group especially men. 73% of victims affected belonged to the age group of 15-44 years. 19% of accidents were caused by motorcycles. And pedestrians were involved in 24% of accidents. About 15% of drivers did not have a driving license. 19% of drivers consumed alcohol during driving for the last 24 hours ²⁹.

In the year 2006, a study was conducted by Rakhi Dandona et al in Hyderabad among 4183 Motorized two-wheeled vehicles (MTV) riders. 21.4% of riders had their driving license without a mandatory driving test. 11% of the riders did not obtain a driving license. 69.8% of riders were not using or occasionally using a helmet while

riding two-wheelers. 59.9% of the riders violated traffic rules at least one time in the last three months³⁰.

C K Priyanka Raj et al in the year 2011, conducted a study among 485(277 girls and 208 boys) government and private high school students in the Villupuram district of Tamilnadu, India. 34.6% of students knew the legal age for driving. Boys had better knowledge compared to girls. The majority of them (55%) were not able to identify even one mandatory road sign out of the five signs given. 98.1% of students were aware of drunken driving and its risk. 20.88% of students were wearing a helmet while riding a two-wheeler. Nearly half of the students(48.45%) were able to explain three traffic lights. 11.34% of students met with road-related accidents for the past one year³¹.

In the year 2013, Humera Banu et al conducted a study among 457 (361 males and 96 females) college students in Delhi. Undergraduate and postgraduate students from Government and Private Colleges, professional and non-professional courses were included. About 60% of students reported that they were riding at least a few days every week. The average speed of riders was 48 km per hour while the speed limit was 70 km per hour. About 50% of riders were always using a helmet (90-95 % of times) while riding a two-wheeler. About 25% of the riders were using helmet most of (75% of the events) the time. Men had aggressive riding behavior compare to women³².

In the same year 2013, Nikumb VB et al conducted a cross-sectional study among 200 (112 male students and 88 female students) college-going students in Pune, India. The majority of the students knew road safety measures such as using helmets and not using mobile phones while riding. Though the majority of them were aware of road safety rules, only a few of them followed road traffic rules. A small

number of students (18.35% of males and 14.09% of females) were always wearing a helmet while riding a two-wheeler ³³.

3.5 SCENARIO IN TAMIL NADU

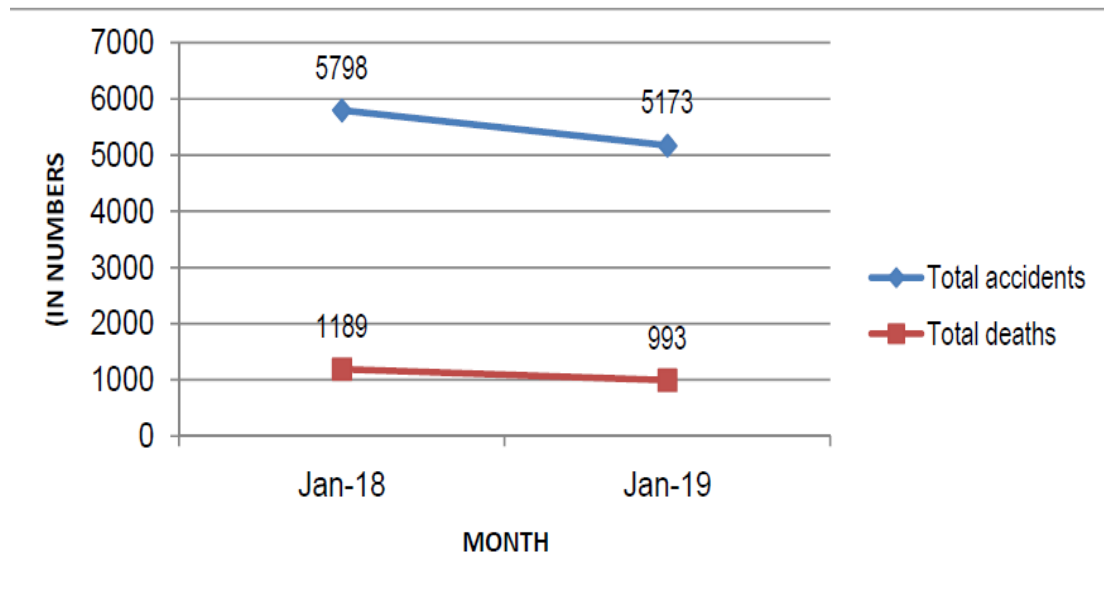
According to the Ministry of Road Transport and Highways (MoRTH), among all the Indian states the leading state of road traffic injuries is Tamil Nadu ^{7,27}. The data were taken from State Crime Record Bureau (SCRB) compared with Road Accident Data Base Management System (RADMS) as well as Vahan, and Saradhy. Data were also collected from 108 Ambulance and Accident and emergency care initiative from Tamilnadu ⁷.

Mortality rate from RTA has come down across Tamilnadu in 2017 compared to death rates of the year 2016. (34) Due to vehicle growth, traffic on roads is increasing 7 to 10 % annually. In Tamilnadu cause of accidents are due to fault of the drivers (97%). The major faults are over speed, drunken driving, cell phone usage while driving and aggressive driving. Cell phone usage while driving contributes to 36% of violation of law and it ranks one in Tamilnadu ³⁵.

District wise total accidents for the month of January 2019, Chennai city was ranking the topmost and Kanyakumari district was on 14th rank. Least accidents were recorded in Nilgiris. District wise total number of deaths was recorded in January 2019. Chennai city was holding the first rank and Kanyakumari was on 17th rank. No deaths were reported in Nilgiris. Grievious injuries were recorded in January 2019. Chennai city was on the top with 203 grievious injuries and Kanyakumari was on 7th place with 18 grievious injuries. Total accidents were compared between month of January 2018 and January 2019. 12.77% of total accidents were increased in Chennai city, but 25% of accidents were increased in Kanyakumari district. Similarly 10.68% of total deaths were increased in Chennai city but 78.57% of deaths were increased in

Kanyakumari district. Overall in Tamilnadu, 10.78% of accidents and 16.49% of deaths decreased in 2019 when compared to 2018 ⁷.

Figure no 6: Distribution based on comparison of total accidents and deaths between January 2018 and January 2019



3.5.1 GROWTH OF VEHICLE IN TAMILNADU

In India, Tamilnadu takes second place in total vehicular population next to Maharashtra. Motor vehicles were classified into transport and non-transport vehicles. Transport vehicle used for transportation of public or goods, like goods carrier, omni buses, tourist cabs, Educational institute vehicle. Non-transport vehicles are mainly used for personal purposes. Non-transport vehicles are two-wheelers, three-wheelers, scooters, light motor vehicles. Transport vehicle constitute of 4.79%, and non-transport vehicles constitute of 95.21 in Tamilnadu. Two-wheelers alone contribute 84.12% in contrast to total vehicular population ³⁶.

3.6 STUDIES RELATED TO KNOWLEDGE ABOUT ROAD TRAFFIC RULES

Kulkarni v et al conducted a cross-sectional Study among 260 medical students (2012) in coastal South India. Awareness on the road safety measure was

higher among females. All the participants had low level of awareness regarding the drunken drive and use of mobile phones. Regarding traffic signs, all the participants had better knowledge. More than 50% of the participants had identified all the traffic signs³⁷.

Taranga Reang et al conducted a cross-sectional study in 2013 from Agartala Government Medical College among 310 medical students. A majority (98.7%) of the students knew that driving after alcohol consumption was dangerous and 88.4% were not familiar with traffic signs which were commonly used. 43% of students were using their two-wheelers³⁸.

A cross-sectional study conducted by Phanindra Det al in the year 2015 among 450 college students in Guntur city, Andhra Pradesh. 86% of students knew that wearing Helmet was important, 85.33 % students were aware about mobile phone usage during riding, 77.33% of students knew that they should follow speed limits. 64.22% of students checked their vehicle condition regularly, 24% students knew that overtaking should be taken on the right side³⁹.

Lalitha D et al conducted a cross-sectional study in the year 2015 among 150 college students in Visakhapatnam. More than 80% of students knew about the use of wearing a helmet. 52.6% of male students and 35.4% of female students knew not to drive after the consumption of alcohol. Only 5% male and 4% of female students overtook on the right side, 30% of males and 67% of females were following the speed limit. 30% of males and 33% of females did not use a mobile phone while driving⁴⁰.

In the year 2015 Shetty et al conducted a cross-sectional study in south Mangaluru among 180 motorists. Most of the participants (97.2%) knew that documents to be carried while driving. The majority of them knew that the minimum

age for obtaining a driving licence was 18 years. The majority of participants (67.2%) had insufficient awareness about road traffic rules and 86.1% of them did not obey traffic rules ⁴¹.

A cross-sectional study conducted by Lakshmi R. Kalbandkeri in 2016 among 310 undergraduate medical students from M.R medical college, Kalaburagi. The study showed that 91.1% of male students and 99.6% of female students had high knowledge. The reasons for accidents were high speed (45.1%) and influence of alcohol (22.9%) ⁴².

Manjula R et al conducted a cross-sectional study in 2016 among 90 undergraduate medical students at Karnataka. The majority (91.1) of the students knew the legal age for driving licence. 62.2 % of the participants knew the speed limit. 81.1% of students knew that mobile phone usage while driving was punishable. 52.2% of participants did not know about the legal limit of alcohol consumption. 82.2% of the participants had good knowledge on road safety rules ⁴³.

Ramya M. S. et al conducted a cross-sectional study in 2017 among 540 undergraduate medical students at Bengaluru. Majority of students (99.2%) had awareness about Traffic signal Rules. 98.8% of participants had awareness about wearing a helmet while riding and 93.33 % gave way to an ambulance. 87.7% of the students had known that alcohol consumption was dangerous while riding two-wheelers. 86.2 % of riders had used hand signals while riding. 64.8 % of the students knew that the hands-free use of mobiles was safe while riding ⁴⁴.

Mukhopadhyay conducted a cross-sectional study in 2017 among 200 undergraduate students in North India. Among the study participants, 71% had their driving licence. The majority of the students (74%) were aware of the importance of helmet use. More than 90% of girls were aware of the right way of overtaking and not

to use a mobile phone while riding vehicles compared to boys (72-80%). More than 90% of girls were aware of not to drive a vehicle while sick and after consumption of alcohol, aware of common traffic signs, use spectacle while driving compared to boys (72-74%)⁴⁵.

Din Prakash Ranjan et al conducted a cross-sectional study in the year 2017 among 372 pre-university college students in Raichur city, Karnataka. Among the participants, 47.2% had inadequate knowledge about road traffic rules and regulations. 55.4% of participants knew about the city speed limit. 33.8% of participants had correct knowledge about traffic lights⁴⁶.

3.7 STUDIES RELATED TO ATTITUDE TOWARDS ROAD TRAFFIC RULES

Tanveer Kalantharakath and Ramya Iyer performed a cross-sectional study in 2013 from 22 Medical and 70 Dental college students of a University in Gujarat. Among the participants, 75% of the riders opined that helmet use was important only for long distance ride. 33.7% of the students strongly believed that persons were likely to suffer from brain damage if happened to meet with an accident⁴⁷.

Evangeline Mary et al conducted a cross sectional study in 2014 among 360 private and Government higher secondary school students in Chennai. Among the study participants more than 50% of the students had positive attitude towards Road safety and regulations²⁶.

A cross-sectional study conducted in Trichy in the year 2015 by Karthikeyan Kulothungan among 511 medical and engineering college students. 87.5% of the students felt that the consumption of a minimal amount of alcohol was also not safe while driving. 5% of participants told that there is no harm in consuming alcohol

before driving. While pedestrian crossing the road majority of the participants (89.5%) either slow down their vehicle or horn or doing both ⁵.

A cross-sectional study conducted by Phanindra D et al in the year 2015 among 450 college students in Guntur city, Andhra Pradesh. 82 % of students did not use mobile phones while riding. 55.11% of students thought that regular maintenance of a vehicle was essential. 7.33% of students thought that there is no harm in listening to music while riding ³⁹.

Manjula R et al conducted a cross-sectional study in 2016 among undergraduate medical students at Karnataka. 88.9% of students had a good attitude towards road traffic rules ⁴³.

Din Prakash Ranjan et al performed a cross-sectional study in the year 2017 among 372 pre-university college students in Raichur city, Karnataka. Among the study participants more than 50% had a positive attitude towards road traffic rules and regulations. 85.8% of participants thought that prime importance regarding road safety must be given to the pedestrians. 62.1% of participants thought that following traffic rules will reduce road traffic accidents ⁴⁶.

Suresh K. Sharma et al conducted a cross-sectional study in 2017 among 150 college students from medical and nursing sciences at All India Institute of Medical Sciences, Uttarakhand. Among the study participants, 75.4% were good attitude scores towards road safety practice ⁴⁸.

Bindhu Sharma et al conducted a descriptive study in 2018 among 250 vehicle users in Chandigarh. The study participants were having a positive attitude towards road traffic rules and regulations ⁴⁹.

Jacob and Rajeev conducted a descriptive study in a year 2018 among 100 college going students from selected college of Faridabad. Majority of the participants(70%) had moderately favorable attitude toward road traffic rules ⁵⁰.

Amala shaji et al conducted descriptive study in 2019 among 100 teenagers in Karnataka. Majority of the study participants (91%) had favorable attitude towards road traffic rules ⁵¹.

3.8 STUDIES ABOUT PRACTICE OF ROAD TRAFFIC RULES

Manoj Kumar et al conducted a cross-sectional study in the year 2011 among students from the campus of Panjab university U.T. Chandigarh. Majority of male students (45%) were using mobile phones while driving and habituated to violation of traffic rules. Violation of traffic rules includes using mobile phones while riding two-wheelers, not wearing a helmet while riding and crossing the roads at signal points at the wrong time. The reason for accidents was over speeding and overtaking. Most of the accidents happened in the evening hours between 5 PM to 7.30 PM ⁵².

Kulkarni v et al conducted a cross-sectional study among 260 medical students (2012) in coastal south India. In the previous year, 25% of participants were driving after drinking. Only 20% of the participants were using mobile phones with hands-free devices. 68% of the participants crossed speed limits on multiple occasions ³⁷.

Tanveer Kalantharakath and Ramya Iyer conducted a cross-sectional study in 2013 from 22 Medical and 70 Dental college students of a University in Gujarat. More than half (57.6%) of the students were using their helmet daily. 21.7% of the students used their bike commuting to college. 35.9 of students never wore a helmet, 30.4% of students always wore a helmet, 21.7% of students wearing a helmet only when they ride on highways. 75% of students thought that helmets were important only while riding long distances ⁴⁷.

Taranga Reang et al conducted a cross-sectional study in 2013 from Agartala Government Medical College among 310 medical students. 3.3 % of students rode after drinking, 8.2% of students used a mobile phone, 27.5 % of students exceeded the speed limit, 83% of students were regularly maintaining their vehicle. 90.1% of students used a helmet while riding, 18.7 % of students frequently overtook vehicle, 15.9% of students were frequently overtaking from left, 31.3% of students met with an accident while riding ³⁸.

Lalitha D et al conducted a cross-sectional study in the year 2015 among 150 college students in Visakhapatnam. 66% of the students did not talk on mobile phones while riding and 50% of them maintained a speed limit of 40-60 km/hour. (40)

Karthikeyan Kulothungan conducted a cross-sectional study in the year 2015 in Trichy among 511 medical and engineering college students. Among the study participants, 37% had driving licence. The majority of the participants (65.6%) were riding two-wheelers. 66.5% of the students drove their own vehicle. Vehicles were insured by only 3.8% of students. One-third of the students (32.1%) said that they had received information about first aid during their learning period. 48.3% of students used to slow down their vehicles while seeing a yellow signal. 65.9 % of the students were always using indicator before turning. Students were driving their vehicle with maximum speed range of 61-80 km/hour. 67.1% of students never used a cell phone while riding. (5)

A cross-sectional study was conducted by Phanindra Det al in the year 2015 among 450 college students in Guntur city, Andhra Pradesh. 79.11% of students had their driving licence, 46% of students were wearing a helmet while riding. 52.44% of students attended phone calls while riding, 51.33% of the students exceeded speed

limits. 20.44% of students were riding two-wheelers under the influence of alcohol. 49.77% of students drove the bike with more than two persons. (39)

In a cross-sectional study conducted by Manjula R et al in 2016 among undergraduate medical students at Karnataka, 58.9% of students had good practice towards road traffic rules and regulations ⁴³.

A cross-sectional study was conducted by Lakshmi R. Kalbandkeri in 2016 among 310 undergraduate medical students from M.R medical college, Kalaburagi. Majority of the students (67.78%) said that the city speed limit range was 30-40 km/hour. Most of the students were overtaking on the right side while driving and crossing the speed limit ⁴².

J Mukhopadhyay conducted a cross-sectional study in 2017 among 200 undergraduate students in North India. About 32% of students did not use the helmet as well as used to overtake incorrectly. About 64% of participants did not follow the speed limit and lane discipline. 25% did not wear a helmet among those students involved in accidents. The non-compliance of traffic rules was higher among boys ⁴⁵.

3.9 RISK FACTORS FOR RTA

In India, RTA results from various risk factors including the condition of the road, the environmental factors, condition of the vehicle, the experience of the rider, etc.

Age: Road traffic injuries are the leading cause of deaths among productive age group which include children and young adults of 5- 29 years ¹⁷. Mortalities due to RTA are low among people above 60 years of age because of lesser mobility of the people ¹⁸.

Sex: Road traffic injuries are common among males. Literature shows that Road traffic deaths had occurred among young males (under 25 years) about three quarters (73%)¹⁶. Three out of four deaths due to RTA were among males¹⁰.

Socio-economic status: The majority of road traffic deaths had occurred in low and middle-income countries. Even with high-income countries, road traffic injuries are more likely among those from lower socioeconomic backgrounds¹⁷.

Climate: The extremes of weather influence the occurrence of RTAs. RTAs are higher during May-June (temperature is extremely high) and December- January (poor visibility on the road). Accidents are high during 9AM- 9PM and comparatively low during midnight and early hours of the day⁵³.

Human factors: Factors such as drunken driving, not using of helmets, not following traffic rules, over speeding, reckless driving, low driving standards, psychological factors (risk-taking), distraction while riding (mobile phones), defective judgment and poor perception are contributing factors for road traffic accidents⁵⁴.

Rider/ Pillion Rider: Most of the two wheeler riders are of younger age group. Usually in the pillion occupants are children, females, and elderly persons. RTAs occur due to lack of attention, slow reaction time, sudden heart attack, seizure disorder, visual impairments of riders¹⁸.

Environmental factors: Factors such as defective roads, the defective layout of crossroads, poor lighting, poor construction, low-quality roads, ditches, and potholes are also contributing to road traffic accidents⁵⁴.

Vehicle factors: the condition of the vehicle, excessive speed, a large number of vehicles, and poorly maintained vehicles are contributing factors to road traffic accidents⁵⁴.

3.10 IMPACTS OF ROAD TRAFFIC ACCIDENTS

In the world, WHO estimated that about 1.3 million people die each year on the roads. About 20 to 50 million people are injured and disabled due to RTA. Due to rapid motorization, RTA burden in term of mortality and morbidity is very rapidly increasing in developing countries. In India, with a population of more than one billion is becoming the fastest economic growth in the world. This economic growth leads to a rapid increase in vehicle production and sold every year. India has reported one of the highest mortality rates in the world. For every death due to RTA, three persons survived with permanent disability. Mild to severe injuries have a significant social and economic impact on an individual level, family level, and community level²⁵.

In India, studies have shown that from 2003- 2013 (ten years) fatalities from RTA had increased by 5 % per year while the population in our country has increased only at 1.4% per year⁵³.

India is growing economically. Road traffic accidents were also increasing year by year. RTA creates hurdles in the nation's Economic growth. Every year approximately 1.5 Million preventable deaths and disabilities happened in our country. RTA affects all the peoples in the society irrespective of the socioeconomic status, educational status and occupational status. The majority of them are involved in the productive age group of 20-40 years and they are the earners of their family. RTA is depleting the basic needs like health, nutrition, and education. RTA is not only causing physical disability as well as causing economic disability also. Peoples become poor after RTA. About Fifty percent of the families are selling their property or borrowing money from others for the treatment of involved persons. In spite of active treatment, one fourth to half of the RTA victims remain disabled either

temporarily or permanently. Due to RTA, India loses 3% of the GDP annually. In India for the last ten years, road traffic accidents have doubled whereas in china RTA have decreased one third ⁵⁵.

If the children involved in accidents, due to their softer heads leading to produce severe head injuries compare to adults ¹⁹. RTA can produce mental illness such as post traumatic stress disorder. Non fatal injuries like fracture head injuries also common among children ²¹.

3.11 INDIA ROAD SAFETY PROJECT

The goal of Bloomberg Philanthropies Global Road Safety Programme in India is to implement good road safety practices in India supported by the Government of India along with national road safety strategy. The main focus of the project is to promote helmet use and reduce drunken-drive. WHO conducted a review of existing laws and regulations in the Government of India's Motor Vehicle Act, to focus on drink-drive and wearing helmet. Two legislative amendments were proposed in parliament. The amendment to the motor vehicle act which proposes for a road traffic violation to increase fines, also address post-crash care and to set up an agency for road safety ⁵⁶.

3.11.1 SOCIAL MARKETING

WHO produces mass media campaign after researching with the target audience. The printed advertisements, radio spot has been developed and aired as of this campaign ⁵⁶.

3.11.2 WORKING WITH MEDIA

Media is one of the important media for raising awareness among the public and policymakers for policy changes ⁵⁶.

3.12 MOTOR VEHICLES ACT, 1988

The Motor Vehicles Act, 1988 is an act passed from parliament of India. This act came into force from 1st July 1989. The Act regulates all the views of the vehicles in road transport. The Motor Vehicles Act is the national law having authority of the road safety. It covers issues like driving licence and behavior of users. It implements regulations coming under the central motor vehicles rules of 1989. The act permits state government s authority to follow own rules to set into practice. The Indian Penal Code (IPC) criminalizes rash driving and dangerous driving according to the road safety laws. So rash driving that endangers the life or safety of others or causes injury can be prosecuted as homicide, murder, negligence if end in death. Under the road safety law, individuals punishable for over speed, and drunken driving with blood alcohol concentration above the permissible limits. The persons not following the rules can be imprisoned for six months for first time making offence and three years for second time making offence and fine. Under section 129 states that while riding two-wheeler in public must wear helmet. The Motor vehicle act under Section 112 states that a person should drive vehicle with in the permitted speed limit. The person should not drive less than minimum speed and should not exceed maximum speed ²³.

3.13 DECADE OF ACTION ON ROAD SAFETY 2011-2020

The decade of action for road safety 2011-2020, was developed in March 2010 by the United Nations general assembly. The main pillars of activities are to build up road safety management capacity, to enhance the road infrastructure safety and wider

transport network, vehicles safety, improving road safety behaviours, and improving care of the victims. Decade of action provides a framework for Policy, Practice and advocacy, guided by global plan to achieve the sustainable development goals ⁵⁷.

3.14 STATE ROAD SAFETY COUNCIL

State road safety council is a policy making body constituted under 215(2) of the motor vehicles act,1988. This is functioning under the chairmanship of honourable transport minister and twenty members. Important function of this council is to review all the programmes and policies related to road safety and also recommended to the Government for implementation ³⁶.

3.15 ROAD SAFETY WEEK

In India the central government as well as state governments have been implementing strategies to make safer roads. Road safety alone will not be sufficient to reduce road traffic accidents. The society contribution in a larger extent can be helpful to reduce RTA, So join hands together to make road safety a social movement. Road safety week has been observed in India every year on date January ⁴.

Road safety is defined as type of safety or any type of security from the accidents by which people should safely drive their vehicles on the road. Road safety is important to protect people who drive and walk on the road from road accidents. Road safety gives protection from unwanted accidents for everyone ⁵⁸.

The Ministry of Road transport and Highway(MORTH), Government of India, observe road safety week every year. In 2019, 30th road safety week was observed from 4th to 10th February 2019. Theme for the year2018 as well as 2019 is ‘Sadak Suraksha- Jeevan Raksha’ ⁵⁹.

Road safety programmes are organized in various cities to make awareness among people on road safety. This is observed for one week. During this one week various campaigns are conducted; various banners regarding education, safety posters, pamphlets, leaflets are distributed to the road travelers ⁶⁰.

3.16 VISION ZERO (VZ):

Vision zero is a multinational road traffic safety project. . The main aim of this program is zero fatalities or serious injuries due to RTA. This policy was created in Sweden and in 1997 which was adopted by the Swedish parliament. VZ redefines road safety through Strategic principles.

The traffic system has to adapt to take better account of the needs, mistakes and vulnerabilities of road users.

The level of violence that the human body can tolerate without being killed or seriously injured forms the basic parameter in the design of the road transport system.

Vehicle speed is the most important regulating factor for safe road traffic. It should be determined by the technical standard of both roads and vehicle so as not to exceed the level of violence that the human body can tolerate ⁶¹.

VZ redefines road safety by taking a public health approach to collisions, i.e., that they are a preventable health threat. As such, VZ explicitly states that responsibility for road traffic collisions is shared between road users and system designers.

4. MATERIALS AND METHODS

4.1 STUDY DESIGN

A Cross sectional study conducted among college students in Kanyakumari district

4.2 STUDY SUBJECTS

Students were selected from various colleges in Kanyaumari district. The age group of the study participants was between 18- 25 years. These students were included from 1st year to final year of various courses. Both boys and girls were enrolled in this study.

4.3 STUDY SETTING

All the colleges were selected from Kanyakumari district of Tamilnadu..

4.4 STUDY PERIOD

The study was done during the period of one and half year January 2018 to June 2019.

4.5 INCLUSION CRITERIA

1. College going students of age group 18-25 years
2. College going students using two wheelers regularly (at least once a week)
3. Both boys and girls

4.6 EXCLUSION CRITERIA

1. Those college going students not willing to participate in this study
2. Those who are absent on the day of data collection

DEFINITIONS

Knowledge-Conceptual definition

“Knowledge is defined as expertise and skill acquired by a person through experience or education; the theoretical or practical understanding of a subject.”

Operational definition of knowledge

Knowledge: “The term Knowledge in the study means the understanding of the concept of road safety rules and regulations”, such as age of getting driver’s license, wearing helmets, identification of traffic signals, etc

Attitude-Conceptual definition

“Attitude is a way of thinking, a posture of the body ”.

Operational definition

Attitude is someone’s opinion or feelings about road traffic rules and regulations.

Example: attitude towards using motorcycle helmet, listening music while riding, etc

Practice-Conceptual definition

“Practice is the action rather than theory of doing something”.

Operational definition

“The term practice in this study means the learning and acquiring experience to bring about positive change in college students towards road safety rules and regulations”, like putting a seatbelt, wearing a helmet etc.

4.7 SAMPLE SIZE

Sample size was calculated by using the formula $n = \frac{z_{\alpha}^2 pq}{d^2}$. where z_{α} is taken as 1.96, p is taken as 30 % based on a study on Knowledge Attitude and Practice of road safety measures among college students in Visakhapatnam city by Lalitha.D et al

40 .

$$n = \frac{z_{\alpha}^2 pq}{d^2}$$

$$p=30\%$$

$$q=100-p=100-30=70$$

$$d=20\% \text{ of } p =6$$

$$=233.33$$

Adding 5% to account for drop out if any and rounding off, hence the final sample size is 250

4.8 SAMPLING TECHNIQUE

Multistage random sampling technique is used in this study

STAGE 1

List of all the colleges in the Kanyakumari district obtained from Kanyakumari district statistical hand book 2016. (62) The list of the colleges from Kanyakumari district, 5 colleges had been chosen using simple random sampling. The selected colleges were Nesamony Memorial Christian College, Narayanaguru Memorial Engineering College, Maria College of Engineering and Technology, Lekshmpuram college of Arts and Science, Neyyoor, White Memorial Homeopathy College.

STAGE 2

Permission had been obtained from the principal of each college chosen. Using Attendance register as a baseline, list of the students regularly using two wheelers had been obtained with the help of the college faculty. Using this list as the sampling frame, 50 students had been chosen using simple random sampling from each of the college, thus making a sample size of 250.

4.9 VARIABLES MEASURED

Socio-demographic characters

Knowledge of road traffic rules

Attitude of road traffic rules

Practice of road traffic rules

Prevalence of road traffic accident and associated factors

4.10 PROCEDURE IN DETAIL

250 college students were chosen from Kanyakumari district. From the selected colleges, students regularly using two-wheelers were selected from attendance register. From this list 50 students were selected for the study and obtained the sample size of 250. Permission was obtained from the principal of the colleges. After explaining the purpose of the study, informed written consent was obtained from the study participants. Institutional Human Ethical Committee clearance was obtained before starting the study. Semi structured question was administered to the students after explaining about the study in detail.

The First part of the questionnaire consists of socio-demographic details of the participants.

Socio-economic status was assessed by modified BG Prasad scale 2019.

Table no 1: Modified BG Prasad's socio-economic status scale

Per Capita Income (INR)	Socio Economic Class
>7008	Upper class
3504-7007	Upper middle class
2102-3503	Middle class
1051-2101	Lower middle class
<1050	Lower class

4.10.1 SCORING OF KNOWLEDGE

Second part of the questionnaire consists of 11 questions to assess the knowledge regarding road traffic rules and regulations. Scoring system was used to score the participants' knowledge. Each correct response under the knowledge was given one point whereas wrong response or not responding was given no mark. The

score of the individual participants was calculated. After that scoring, participants were grouped into three categories. Those getting score 0-50% were classified into those with inadequate knowledge, 51-70% classified into those with moderately adequate knowledge, 71-100% classified into those with adequate knowledge.

4.10.2 SCORING OF ATTITUDE

Attitude was assessed by six questions related to helmet use, and hearing music while riding. Scoring system was used to score the participants' attitude. Each positive attitude towards road traffic rules was given one point whereas negative attitude towards road traffic rules was given no mark. The individual participants' score was calculated. After that scoring, participants were classified into three categories. Those getting score 0-50% classified into unfavorable Attitude, 51-70% classified into moderately favorable Attitude, 71-100% classified into favorable Attitude.

4.10.3 SCORING OF PRACTICE

Questions were asked to assess the practices with regards to using rear mirror, practicing triples, response when seeing school sign, using helmet practice, racing vehicle, response when blind person crossing the road, and time of indicator switch on. Assessment of practice was done by scoring method. Each correct response under practice was given one point whereas wrong response was given no mark. On the basis of total score, participants were classified into three categories. Those getting score 0-50% classified into poor practice, those getting 51-70% classified into good practice, and those getting 71-100% were classified into best practice.

4.11 STATISTICAL METHODS OF ANALYSIS

i. Statistical tests used for data analysis:

Quantitative variables (mean, standard deviation, confidence interval): Age, Sex, Socio-economic status, Occupation of father, Education of father, Knowledge score.

Qualitative variables expressed in percentage

Chi square test used to find the association between dependent and independent variables

Correlation used to find out association between variables

Software used for data entry: Study parameters were entered in Microsoft Office Excel 2013

ii. Software used for statistical analysis: IBM Statistical Package for Social Science Version 20.0

5. RESULTS

5.1 GENERAL INFORMATION

A cross sectional study was conducted among 250 college students in the age group of 18- 25 years from Kanyakumari district, Tamilnadu.

The results relevant to the objectives of the study are present under following headings

1. Socio-demographic characteristics
2. Knowledge of road traffic rules
3. Attitude towards road traffic rules
4. Practice of road traffic rules
5. Prevalence of road traffic accidents
6. Factors associated with road traffic accidents

5.2 SOCIO-DEMOGRAPHIC CHARACTERISTICS

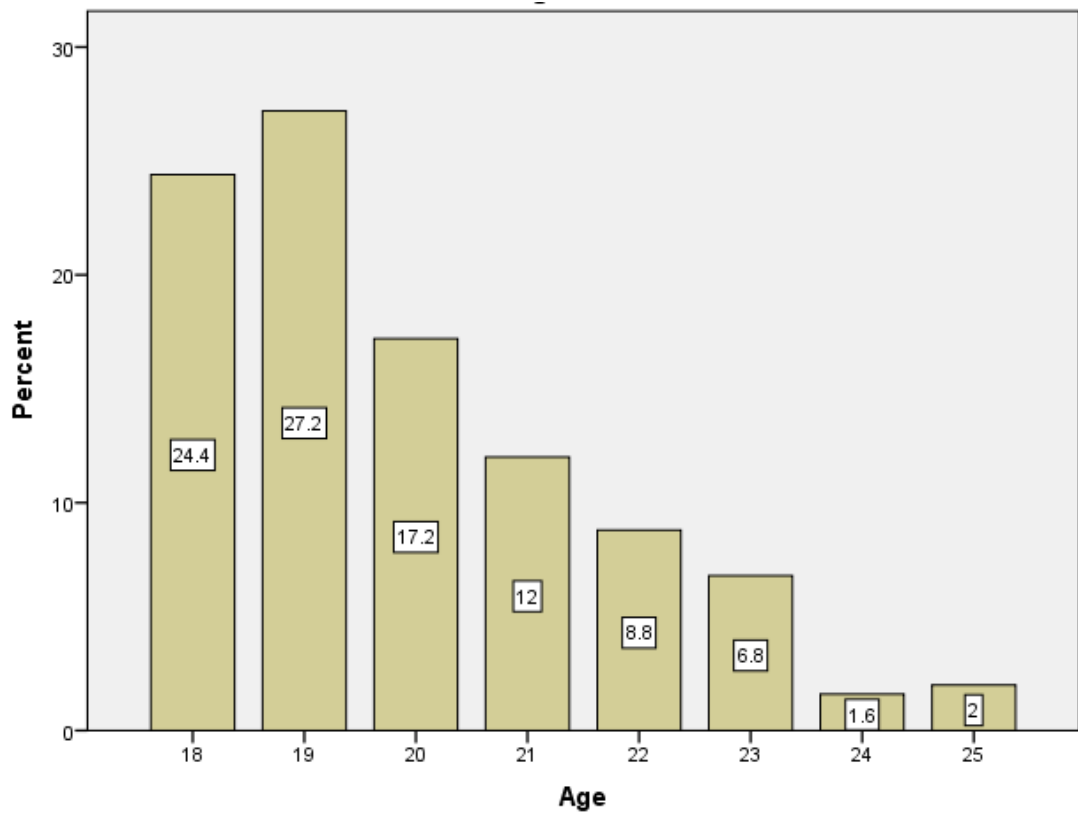
5.2.1 AGE DISTRIBUTION

Table no 2: Distribution of characteristics of Age

Age characteristics	Value (years)
Mean age	19.9
Standard deviation	1.75
Minimum age	18
Maximum age	25

The age of the study group ranged from 18 to 25 years with mean age of 19.9 years with standard deviation of 1.75 years. Majority of the study participants belonged to the age of 19years (27.2%) followed by 18 years (24.4%).

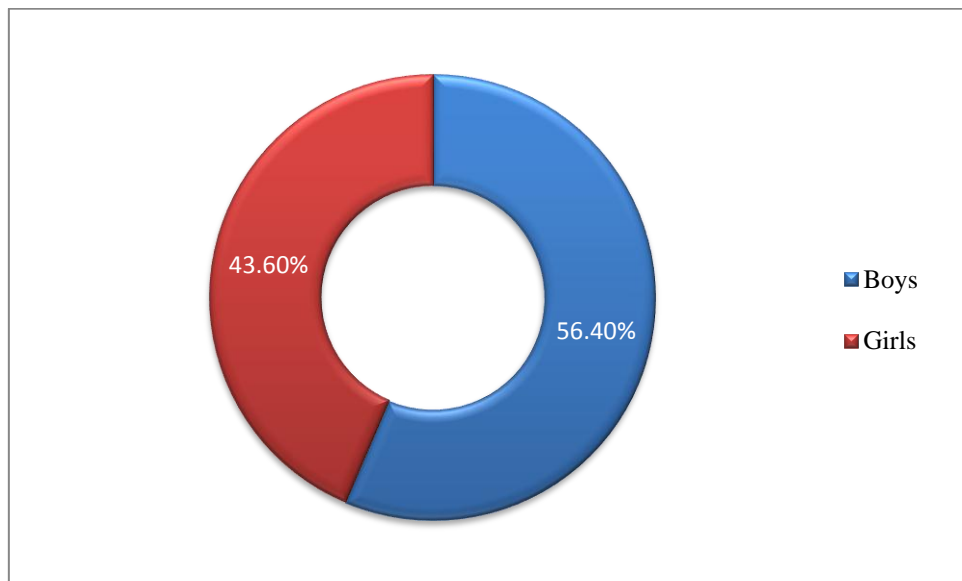
Figure no 7: Distribution of age



5.2.2 GENDER WISE DISTRIBUTION OF STUDY PARTICIPANTS

Among the 250 study participants 56.4 % (141) were boys and 43.6 % (109) were girls.

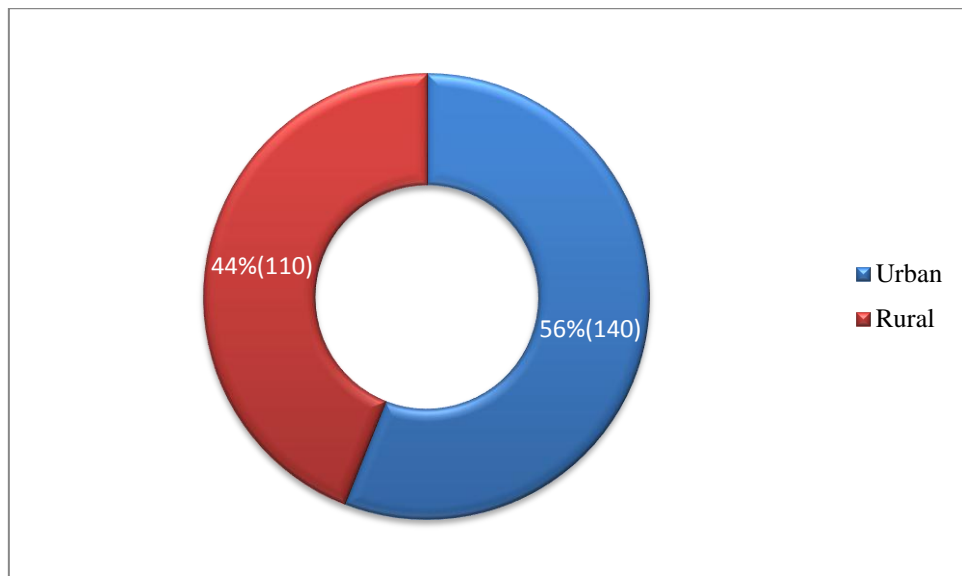
Figure no 8: Shows sex distribution



5.2.3 AREA OF RESIDENCE

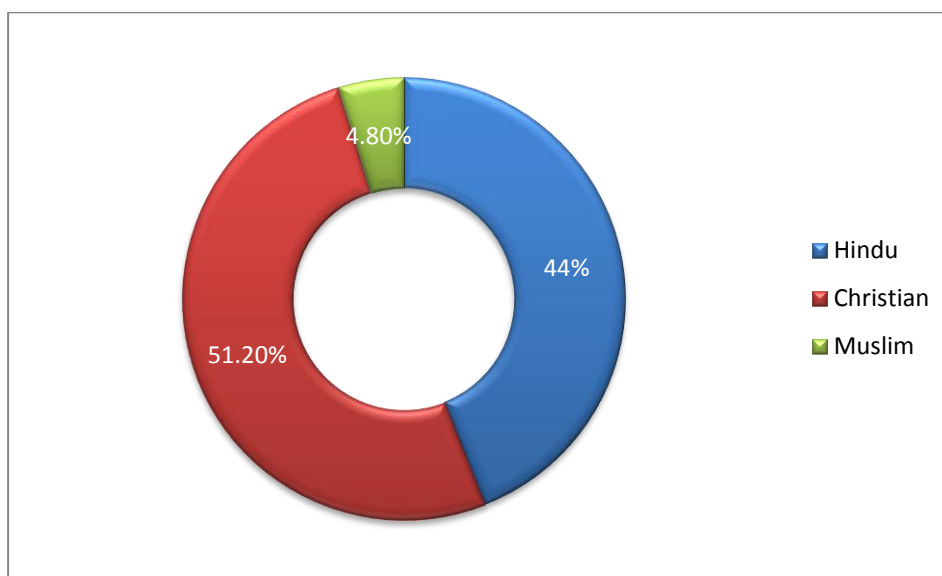
Among the 250 study participants 56% (140) of the students belonged to urban area, 44% (110) of the students had come from rural area.

Figure no 9: Distribution of Study participants based on area of residence



5.2.4 RELIGION

Figure no 10: Distribution of the study participants based on religion



Majority of the study participants were Christians 51.2% (128), followed by Hindus 44% (110), and Muslims 4.8% (12).

5.2.5 EDUCATION OF HEAD OF THE HOUSEHOLD

Table no 3: Distribution based on educational status of head of the household

Educational status	Frequency	Percentage
Profession	43	17.2
Graduate	69	27.6
Diploma	30	12
High school	57	22.8
Middle school	42	16.8
Primary school	5	2
Illiterate	4	1.6
Total	250	100

Regarding educational status of the head of the household, 56.8% (142) were above the high school education. 41.6% (104) were from high school, middle school and primary school and 1.6% (4) were Illiterates.

5.2.6 OCCUPATION OF THE HEAD OF THE HOUSEHOLD

Table no 4: Distribution based on occupational status of the head of the household.

Occupation	Frequency	Percentage
Legislator/ senior officials	12	4.8
Professionals	67	26.8
Technician /Associate professionals	57	22.8
Clerks	5	2
Skilled workers/ shop, market sale worker	28	11.2
Skilled agricultural / fishery worker	28	11.2
Graft related trade work	7	2.8
Plant /machine operator	15	6
Elementary occupation	17	6.8
Unemployment	14	5.6
Total	250	100

Regarding occupation of the head of the household, 26.8% (67) were professionals followed by 22.8% (57) were technician/associate professionals. Elementary occupations were 6.8% (17) and 5.6% (14) were unemployed.

5.2.7 SOCIO-ECONOMIC STATUS

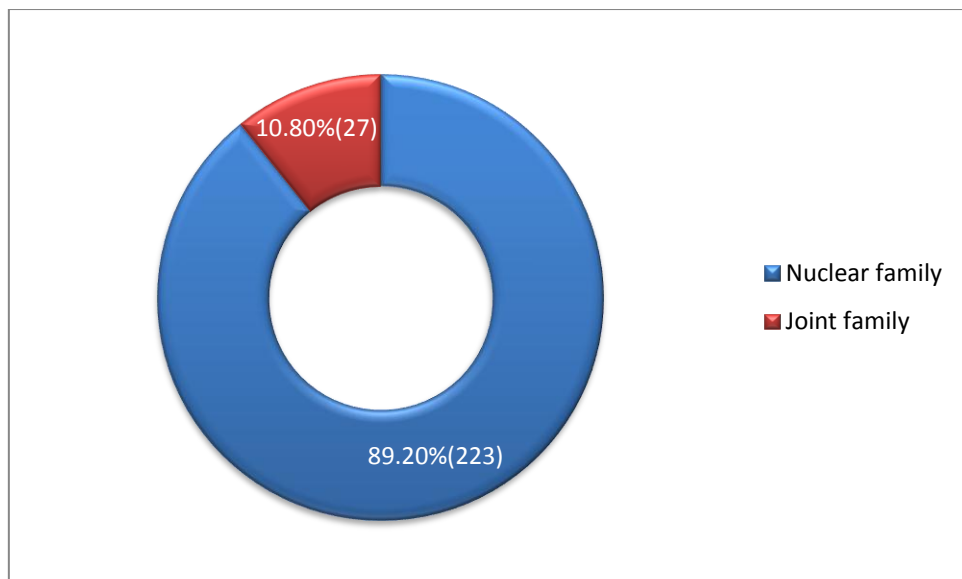
Table no 5: Distribution of socio-economic status

Socio Economic Status	Frequency	Percentage
Upper class	118	47.2
Upper middle class	68	27.2
Middle class	31	12.4
Lower middle class	27	10.8
Lower class	6	2.4
Total	250	100

According to the BG Prasad's Socio-Economic status scale, 47.2% (118) of the participants came from upper class, 27.2% belonged to the upper middle class, 12.4% to middle class, 10.8% (27) to lower middle class and 2.4% (6) of the participants belonged to the lower socio-economic status.

5.2.8 TYPE OF FAMILY

Figure no 11: Shows type of family



Regarding type of the family 89.2% (223) belonged to nuclear family and 10.8% (27) belonged to joint family.

5.2.9 TOTAL FAMILY MEMBERS

Table no 6: Distribution according to total number of family members

Total family members	Frequency	Percent
4	4	1.6
34	34	13.6
147	147	58.8
48	48	19.2
12	12	4.8
3	3	1.2
2	2	0.8
250	250	100

Regarding the total family members, that was the range of minimum 2 members to maximum 8 members. 58.8% (147) of the family had four members and 0.8% (2) had 8 members in the family.

5.3 KNOWLEDGE ON ROAD TRAFFIC RULES

5.3.1 KNOWLEDGE ABOUT ONE WAY

Table 7: Distribution of knowledge regarding one way

Knowledge about one way	Frequency	Percentage
Parking is prohibited	82	32.8
Overtaking is prohibited	50	20
Should not drive in reverse gear	118	47.2
Total	250	100

Out of 250 college students 47.2% (118) knew that in a one way should not drive in reverse gear.

5.3.2 KNOWLEDGE REGARDING FOOTPATH

Table no 8: Distribution of knowledge regarding pedestrian footpath

Knowledge regarding footpath	Frequency	Percentage
Should walk on the left side of the road	145	58
Should walk on the right side of the road	69	27.6
May walk on either side of the road	36	14.4
Total	250	100

Among 250 students only 27.6% (69) knew that in a road without footpath the pedestrian should walk on right side of the road

5.3.3 KNOWLEDGE ABOUT FREE PASSAGE

Table 9: Distribution based on knowledge regarding free passage to the vehicles

Free passage should be given to	Frequency	Percentage
Police vehicle	9	3.6
Ambulance and fire service vehicles	233	93.2
Super express buses	8	3.2
Total	250	100

Among 250 study participants 93.2% (233) students correctly knew that free passage should be given to ambulance and fire service vehicles.

5.3.4 KNOWLEDGE ABOUT RESPONSE WHEN AMBULANCE APPROACHES

Table 10: Distribution based on knowledge regarding response when ambulance is approaching.

When ambulance is approaching	Frequency	Percentage
Allow passage if there are no vehicle from front side	49	19.6
No preference need to be given	14	5.6
Allow free passage by drawing vehicle to the side of the road	187	74.8
Total	250	100

Among the 250 study participants 74.8% (187) of the students knew that free passage should be allowed by drawing the vehicle to the side of the road when an ambulance approaches.

5.3.5 KNOWLEDGE REGARDING OVERTAKING A VEHICLE

Table no 11: Distribution based on knowledge about overtaking a vehicle

When overtaking is prohibited	Frequency	Percentage
When it likely to cause inconvenience or danger to other traffic	149	59.6
When the vehicle in front reducing speed	53	21.2
During night	48	19.2
Total	250	100

Among the study participants 59.6% (149) knew overtaking was prohibited when likely to cause inconvenience or danger to other traffic.

5.3.6 KNOWLEDGE REGARDING ACTION BEFORE OVERTAKING A VEHICLE

Table no 12: Distribution based on knowledge regarding action before overtaking a vehicle.

Before overtaking a vehicle to ensure that	Frequency	Percentage
No vehicle is approaching from behind	49	19.6
See that the road is clearly visible and it is safe to overtake	171	68.4
The vehicle in front turning left	30	12
Total	250	100

Among the participants 68.4% (171) knew that before overtaking a vehicle should see that the road is clearly visible and it is safe to overtake.

5.3.7 KNOWLEDGE REGARDING TRIPLES IN A TWO-WHEELER

Table no 13: Distribution based on knowledge regarding triples in a two-wheeler

Triples in two wheelers	Frequency	Percentage
Allowed in unavoidable circumstances	45	18
Violation of law	163	65.2
Allowed when the traffic is less	42	16.8
Total	250	100

Among the study participants 65.2% (163) correctly knew that triples in a two-wheelers was violation of law.

5.3.8 KNOWLEDGE REGARDING ACCIDENT REPORTING

Table no 14: Distribution based on knowledge regarding when a motor vehicle involved in an accident

Time to report when vehicle involved accident	Frequency	Percentage
Report to the nearest police station within 24 hours	85	34
Within 12 hours	151	60.4
Within 48 hours	14	5.6
Total	250	100

Among the study participants 34% reported to the police station within 24 hours following accident. 60.4% reported to the police station within 12 hours and 5.6% reported within 48hours following accident.

5.3.9 KNOWLEDGE REGARDING HAND SIGNAL

Among the 250 study participants 43.2% of the students knew hand signal should be given only on right hand.

Table no 15: Distribution based on knowledge about hand signal

While riding two-wheeler hand signal given by	Frequency	Percentage
Only left hand	49	19.6
Only right hand	108	43.2
Both hands	93	37.2
Total	250	100

5.3.10 KNOWLEDGE REGARDING PILLION RIDER AND ACCESSORIES IN TWO WHEELER

Among the college students 88.4% knew to carry a pillion rider in a two-wheeler, the two-wheeler must have foot rest, hand grip and sari guard.

Table no 16: Distribution based on knowledge regarding to carry a pillion rider, motor cycle must provided

To carry pillion rider motor cycle provided with	Frequency	Percentage
Foot rest alone	18	7.2
Hand grip alone	11	4.4
Foot rest, hand grip, sari guard	221	88.4
Total	250	100

5.3.11 KNOWLEDGE REGARDING MINIMUM DISTANCE BETWEEN VEHICLES

Among the study participants only 36% correctly answered that the minimum distance to be kept from vehicle going in front was to keep safe distance according to speed. Majority (52.8%) of them answered 10 meters.

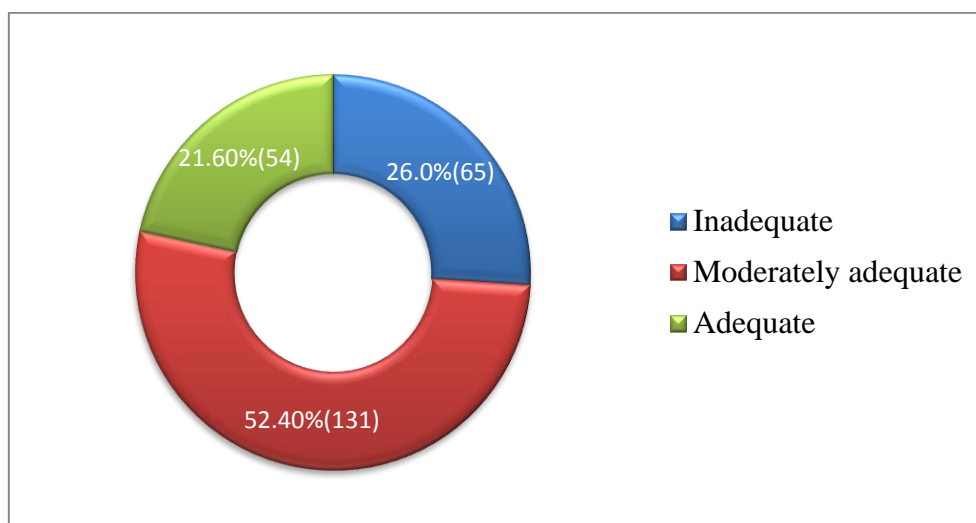
Table no 17: Distribution based on knowledge regarding the minimum distance to be kept from vehicle going in front

Minimum distance to be kept from the vehicle in front	Frequency	Percentage
10 meters	132	52.8
20 meters	21	8.4
30 meters	7	2.8
Safe distance according to speed	90	36
Total	250	100

5.3.12 KNOWLEDGE SCORE

On the basis of score, knowledge of the participants were divided into inadequate knowledge, moderately adequate knowledge, and adequate knowledge. Those scoring 0-50% labeled as inadequate knowledge, those scoring 51-70% labeled as moderately adequate knowledge, and those scoring 71-100% were labeled as adequate knowledge regarding road traffic rules.

Figure no 12: Knowledge Score



Among the study participants 52.4% (131) had moderately adequate knowledge regarding road traffic rules. 21.6% (54) of participants had adequate knowledge and 26% (65) of students had inadequate knowledge regarding road traffic rules.

5.4 ATTITUDE TOWARDS ROAD TRAFFIC RULES

5.4.1 ATTITUDE TOWARDS WRONG DRIVE IN ONE WAY

Table no 18: Distribution of attitude towards wrong drive in one way

Whether driving in wrong way in one way is right	Frequency	Percentage
Yes	53	21.2
No	197	78.8
Total	250	100

Among the 250 study participants, 78.8%(197) of students did not drive in wrong way in one way signal even when there is no traffic in one way. Only 21.2% (53) of the students told that it is safe to drive in wrong way in one way signal.

5.4.2 ATTITUDE TOWARDS DRIVING SPEED WHEN ROAD IS CLEAR

Table no 19: Distribution based on attitude towards driving speed

Whether it is right to drive very fast if the road is clear	Frequency	Percentage
Yes	87	34.8
No	163	65.2
Total	250	100

Among the 250 study participants 65.2% (163) did not drive very fast even when the road is clear. They were obeying speed limits. 34.2% (87) were driving very fast if the road is clear.

5.4.3 ATTITUDE TOWARDS DRUNKEN-DRIVING

Table no 20: Distribution based on attitude towards drunken- diving

Is it right to drive after drinking if hands and vision are steady	Frequency	Percentage
Yes	46	18.4
No	204	81.6
Total	250	100

Among 250 college students, 81.6% (204) of the participants were not driving after drinking even when their hand and vision steady. 18.4% (46) of the participants told that they were driving after drinking if their hands and vision were steady.

5.4.4 ATTITUDE TOWARDS HELMET USE

Table no 21: Distribution based on attitude towards helmet use

Whether to use of helmet by two wheeler users for short distance	Frequency	Percentage
Yes	104	41.6
No	146	58.4
Total	250	100

Among the study participants, 58.4% (146) of the students felt that they must use helmet even driving just to nearby the road/street. 41.6% (104) of the students felt that they need not wear helmet if they were driving just to the nearby road/street.

5.4.5 ATTITUDE TOWARDS ORANGE TRAFFIC LIGHT

Table no 22: Distribution based on attitude towards orange traffic light

Do you think that slowing down at orange traffic light is important	Frequency	Percentage
Yes	205	82
No	45	18
Total	250	100

Among the study participants, 82% (205) students thought that slowing down at orange traffic light was important. 18% (45) of the students thought that slowing down at orange traffic light was not important.

5.4.6 ATTITUDE TOWARDS LISTENING TO MUSIC WITH EAR PHONE WHEN RIDING TWO-WHEELER

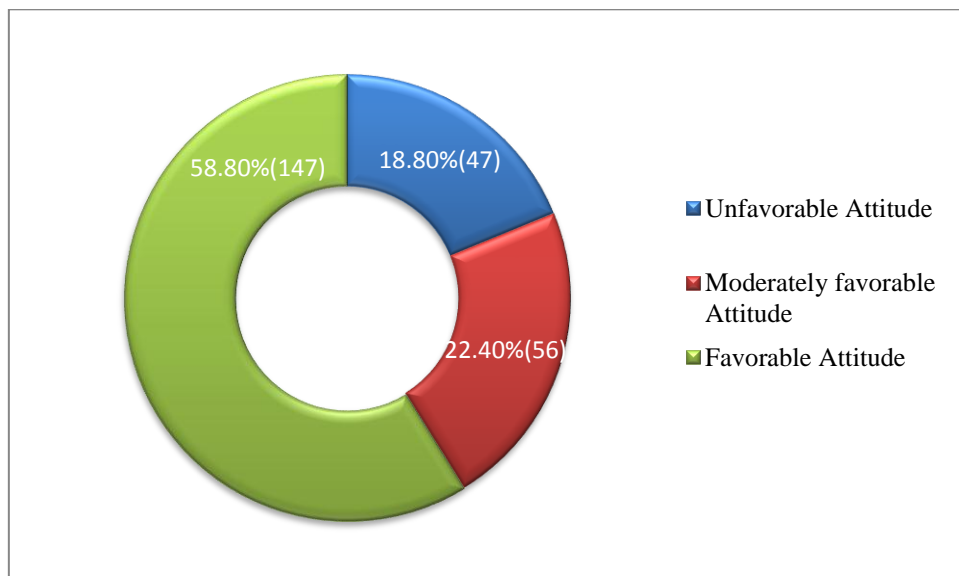
Table no 23: Distribution based on attitude towards listening music with ear phone while riding.

There is no harm in listening to music with ear phone when riding two-wheeler	Frequency	Percentage
Yes	37	14.8
No	213	85.2
Total	250	100

Among the study participants, 85.2% (213) of the participants thought that it was not safe to listen music using ear phone while riding two-wheeler. 14.8% (37) of the participants thought that listening music with ear phone was safe while riding two-wheeler.

5.4.7 ATTITUDE SCORE

Figure no 13: Attitude score



Among the study participants, 18.8% (47) of the students had unfavorable attitude towards road traffic rules. 22.4% (56) of the students had moderately favorable attitude towards road traffic rules. 58.8% (147) students had favorable attitude towards road traffic rules.

5.5 PRACTICES TOWARDS ROAD TRAFFIC RULES

5.5.1 PRACTICE REGARDING TRIPLES

Table no 24: Distribution based on practice regarding triples in two-wheeler

Practice of triples in two-wheeler	Frequency	Percentage
Yes	65	26
No	185	74
Total	250	100

Among the study participants, 74% (185) of the participants did not practice triples in two-wheeler. 26% (65) of the participants practiced triples in two-wheeler.

5.5.2 PRACTICE REGARDING USE OF REAR MIRROR

Table no 25: Distribution of practice regarding use of rear mirror

Usage of rear mirror	Frequency	Percentage
Always	125	50
Occasionally	65	26
Rarely	34	13.6
Never	26	10.4
Total	250	100

Among the study participants, 50% (125) of the participant's always used rear mirror while riding two- wheeler. 26% (65) of the participants were occasionally using rear mirror, 13.6% (34) of the participants rarely were using rear mirror, and 10.4% (26) were never using rear mirror while riding two-wheeler.

5.5.3 PRACTICE REGARDING THE RESPONSE WHEN TO SEE THE SCHOOL TRAFFIC SIGN.

Table no 26: Distribution based on response when to see the school traffic sign

Practice on when to look for a school sign	Frequency	Percentage
Stop the vehicle, sound horn and proceed	57	22.8
Slow down and proceed with caution	165	66
Sound horn continuously and proceed	28	11.2
Total	250	100

Among the study participants, 66% (165) of the participants slowed down when they saw a school sign and proceeded with caution. 22.8% (57) of the participants practiced to stop the vehicle sound horn and proceeding. 11.2% (28) of the participants practiced to sound horn continuously and proceeding.

5.5.4 PRACTICE REGARDING HELMET- WEARING

Table no 27: Distribution based on practice regarding helmet wearing

Practice on helmet wearing	Frequency	Percent
Always	125	50
Occasionally	61	24.4
Rarely	45	18
Never	19	7.6
Total	250	100

Among the study participants, 50% (125) always wore helmet while riding two-wheeler. 24.4% (61) of the participants' occasionally wore helmet, 18% (45) of the participants rarely wore helmet, and 7.6% (19) of the participants' never wore helmet while riding two-wheeler.

5.5.5 PRACTICE REGARDING WHEN BLIND PERSON CROSSES THE ROAD HOLDING WHITE CANE

Table no 28: Distribution based on practice when blind person crosses the road

Practice on when a blind person crosses the road	Frequency	Percent
Stop vehicle and let them cross	158	63.2
Blow the horn and proceed as usual	26	10.4
Slow down and proceed with caution	66	26.4
Total	250	100

When a blind person crosses the road holding white cane in his hand, 63.2% (158) of the participants stopped the vehicle and allowed them to cross the road. 10.4% (26) of the participants blew the horn and proceeded as usual. 26.4% (66) of the participants slowed down and proceeded with caution.

5.5.6 PRACTICE ON SEEING AN ORANGE SIGNAL

Table no 29: Distribution based on practice regarding seeing an orange signal

Practice on when to see a orange light	Frequency	Percentage
Cross as fast as possible	52	20.8
Cross normally if no vehicle is there	119	47.6
Cross normally	43	17.2
Stop	36	14.4
Total	250	100

Among the study participants when they see an orange signal, 20.8% (52) practiced to cross as fast as possible. 47.6% (119) of the participants crossed normally when there were no vehicle in signal. 17.2% (43) of the participants crossed the signal normally. Only 14.4% (36) of the participants stopped their vehicle and correctly obeyed traffic rules.

5.5.7 PRACTICE REGARDING VEHICLE RACING

Table no 30: Distribution based on practice regarding racing

Practice of racing vehicle	Frequency	Percentage
Yes	67	26.8
No	183	73.2
Total	250	100

Among the study participants, 26.8% (67) raced their vehicle while riding. 73.2% (183) of the study participants never raced their vehicle while riding two-wheeler.

5.5.8 PRACTICE REGARDING OVERTAKING A VEHICLE ENSURING OPPOSITE LANE IS CLEAR

Table no 31: Distribution based on practice while overtaking a vehicle

While overtaking to see the opposite lane is clear or not	Frequency	Percentage
Always	146	58.4
Occasionally	44	17.6
Rarely	44	17.6
Never	16	6.4
Total	250	100

Among the study participants, 58.4% (146) of the students always ensured that opposite lane was free while overtaking a vehicle. 17.6% (44) of the participants ensured occasionally that opposite lane was free while overtaking. 6.4% (16) of the students never ensured that opposite lane was free while overtaking vehicle.

5.5.9 PRACTICE REGARDING WHEN TO SWITCH ON THE INDICATOR

Table no 32: Distribution based on practice regarding when to switch on the indicator

Practice of switch on the indicator	Frequency	Percentage
Always just before turning	98	39.2
Always at-least 30 meters before	125	50
Occasionally if I remembered	26	10.4
Never	1	0.4
Total	250	100

Among the study participants, 39.2% (98) of the students always switched on the indicator just before turning. 50% (125) of the students switched on the indicator always at-least 30 meters before turning. 10.4% (26) of the students were occasionally switch on the indicator if they remember. 0.4% (1) students never switch on the indicator before turning.

5.5.10 PRACTICE REGARDING OVERTAKING FROM LEFT SIDE

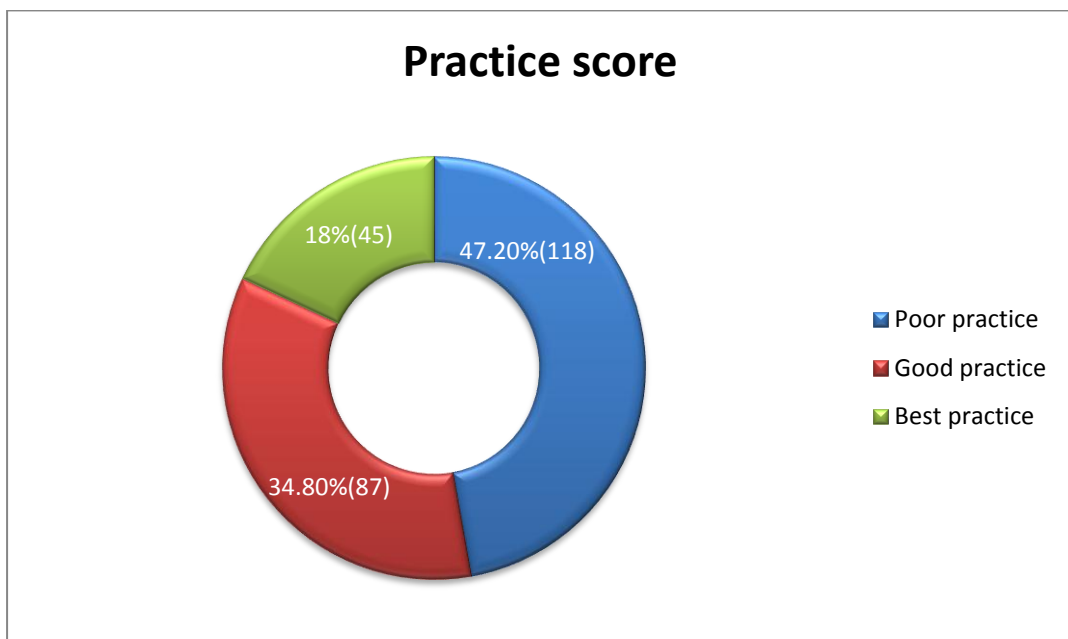
Table no 33: Distribution based on practice on overtaking the vehicle from left side.

Practice on overtaking from left side of the vehicle	Frequency	Percent
Mostly	45	18
Occasionally	61	24.4
Rarely	56	22.4
Never	88	35.2
Total	250	100

Among the study participants, 18% (45) of the participants were mostly overtaking vehicle from left side. 24.4% (61) of the participants were occasionally overtaking the vehicle from left side. 22.4% (56) of the participants were rarely overtaking the vehicle from left side. 35.2% (88) of the participants were never overtaking the vehicle from left side.

5.5.11 PRACTICE SCORE

Figure no 14: Distribution based on practice score



Among the study participants, 47.20% (118) of the participants had poor practice towards road traffic rules, 34.80% (87) participants had good practice towards road traffic rules, 18% (45) of the participants had best practice towards road traffic rules.

5.6 OWNER OF TWO-WHEELER AND USAGE

Table no 34: Distribution based on two-wheeler usage and the ownership of the vehicle

Usage and ownership of the vehicle	Frequency	Percentage
Own	98	39.2
Family members	130	52
Friends/relatives	22	8.8
Total	250	100

Among the study participants, 39.2% (98) students used their own two-wheeler for riding regularly. 52% (130) of the students were regularly using two-wheelers of family members for riding. 8.8% (22) of the students were using two-wheelers of friends/ relatives for riding regularly.

5.7 MAXIMUM SPEED DRIVEN

Table no 35: Distribution based on maximum speed rode by the participants

Speed (KM/ HOUR)	Frequency	Percentage
<40	40	16.0
41-60	120	48.0
61-80	47	18.8
81-100	24	9.6
>100	19	7.6
Total	250	100

Among the study participants, 16% (40) of the participants rode maximum speed of less than 40 Kms/Hour. 48% (120) of the participants rode maximum speed of 41-60 Kms/Hour. 18.8% (47) of the participants rode maximum speed of 61-80 Kms/Hour. 96% (24) of the participants rode maximum speed of 81-100 Kms/Hour. 7.6% (19) of the participants rode the vehicle with the speed more than 100 Kms/Hour.

5.8. PREVALENCE OF ROAD TRAFFIC ACCIDENT

5.8.1 PREVALENCE OF ACCIDENT

Table no 36: Distribution based on accident involved in the past two years

Accidents involved in the past 2 years	Frequency	Percentage
Yes	50	20
No	200	80
Total	250	100

Among 250 students, 20% (50) of the students were involved in accidents in the past two years. 80% (200) of the students were never involved in any accident in the past two years.

5.8.2 DRIVING DURING ACCIDENT

Table no 37: Distribution based on whether driving while involved in accident

Whether driving while involving accident	Frequency	Percentage
Yes	39	78
No	11	22
Total	50	100

Among the episodes of accident for the past two years, 78% (39) of the students were driving during accidents.

5.8.3 SEVERITY OF THE ACCIDENT

Table no 38: Distribution based on severity of the accident

Severity of accident	Frequency	Percentage
Damage to vehicle only	12	24
Scratches to rider	23	46
Severe injury but no fracture	4	8
Fracture	8	16
Death of some one	3	6
Total	50	100

Among the students involved in the accidents, 24% (12) of the students got damage to the vehicles only. 46 % (23) of the students were affected by scratches, and 8% (4) of the students had been involved in severe injury. 16% (8) of the students had been fractured and 6% (3) of the students reported death of someone due to accident.

5.8.4 FREQUENCY OF AMBULANCE CALLED FOR THE ACCIDENTS.

Table no 39: Distribution based on ambulance called following accident for first-aid and transportation

Ambulance called following accident	Frequency	Percentage
Yes	14	28
No	36	72
Total	50	100

Following accidents, 28% (14) of the participants called ambulance for first aid and transportation.

5.8.5 FOLLOWING ACCIDENT TIME TAKEN FOR THE AMBULANCE TO REACH THE SPOT

Table no 40: Time taken for the ambulance to reach the spot

Time taken to reach the spot	Frequency	Percentage
0	36	72
10	7	14
15	2	4
30	2	4
40	1	2
50	1	2
60	1	2
Total	50	100

Following accident 72% (36) did not call for the ambulance service. 28% (14) called for the ambulance. The ambulance had reached the accident spot between 10 minutes to 60 minutes.

5.8.6 FOLLOWING ACCIDENT TIME TAKEN THE AMBULANCE TO REACH THE HOSPITAL

Table no 41: Time taken for the ambulance to reach the hospital

Time taken to reach the hospital	Frequency	Percentage
0	36	72
10	7	14
15	2	4
30	2	4
40	1	2
50	1	2
60	1	2
Total	50	100

Following accident the time taken for the ambulance to reach the hospital from accident spot varied. The time taken varied from one minute to 60 minutes to reach the hospital depending upon the distance from the hospital.

5.8.7 HOSPITALIZED FOLLOWING ACCIDENT

Table no 42: Distribution based on need of hospitalization following accident

Following accident whether hospitalized	Frequency	Percentage
Yes	22	44
No	28	56
Total	50	100

Following accident, 44% (22) of the affected persons were hospitalized.

5.8.8 CONDITION OF THE ROAD AT THE SPOT

Table no 43: Distribution based on the condition of the road at the accident spot

Condition of the road	Frequency	Percentage
Good	21	42
Broken	27	54
No road	2	4
Total	50	100

Among the students involved in accident, the condition of the road at the accident spot was evaluated. 42% (21) of the students involved in accident told that the road was good at the time of accident. 54% (27) of the students reported that the road was broken, and 4% (2) of the students told that there was no road at all.

5.8.9 TIME OF ACCIDENT

Table no 44: Distribution based on of time of the accident

Time of accident	Frequency	Percentage
Day	16	32
Night	17	34
Evening	11	22
Early morning	6	12
Total	50	100

Among the students involved in accident, 32% (16) of the students told that accidents happened during day time. 34% (17) of the students told that accidents happened during night time. 22% (11) of the students told that accidents happened during evening and 12% (6) told that accidents were happened during early morning.

5.8.10 WEATHER CONDITION DURING ACCIDENT

Table no 45: Distribution based on weather condition during time of accident

Weather condition during accident	Frequency	Percentage
Raining	20	40
Wet	11	22
Dry	19	38
Total	50	100

Among the students involved in accidents, 40% (20) of the accidents happened during raining hours. 22% (11) of the accidents happened on wet condition and 38% (19) of the accidents were happened during dry condition.

5.8.11 TRAFFIC DURING ACCIDENT

Table no 46: Distribution based on traffic during accident

Traffic during accident	Frequency	Percentage
Heavy traffic	15	30
Slow traffic	23	46
No traffic	12	24
Total	50	100

Among the students involved in accident, 30% (15) of the students experienced heavy traffic during accident time. 46% (23) of the students experienced slow traffic during accident and 24% (12) experienced no traffic during accident.

5.8.12 FAULT IN VEHICLE

Table no 47: Distribution based on fault in vehicle

Fault in vehicle during accident	Frequency	Percentage
Yes	21	42
No	29	58
Total	50	100

Among the students involved in accidents, 42% (21) told that there was a fault in vehicle during accident.

5.8.13 SPEED DURING ACCIDENT

Table no 48: Distribution based on speed during accident

Speed during accident	Frequency	Percentage
Within normal limit	26	52
High speed	24	48
Total	50	100

Among the students involved in accident, 52% (26) of the students rode their vehicle within normal speed limits. Meanwhile 48% (24) of the students rode their vehicle in high speed.

5.8.14 LIGHTING OF THE ROAD DURING ACCIDENT

Table no 49: Distribution based on lighting of the road during accident

Lighting of the road	Frequency	Percentage
Good	34	68
Poor	16	32
Total	50	100

Among the students were involved in accident, 68% (34) of the students told that there was good lighting in the road during accident. 32% (16) of the students told poor lighting in the road during accident.

5.8.15 USING MOBILE PHONE DURING ACCIDENT

Table no 50: Distribution based on using mobile phone at the time of accident

Using mobile phone during accident	Frequency	Percentage
Yes	12	24
No	38	76
Total	50	100

Among the students involved in accident, 24% (12) of the students were using mobile phone at the time of accident. 76% (38) of the students did not use mobile phone at the time of accident.

5.8.16 ALCOHOL CONSUMPTION DURING ACCIDENT

Table no 51: Distribution based on alcohol consumption just before accident

Alcohol consumption during accident	Frequency	Percentage
Yes	7	14
No	43	86
Total	50	100

Among the students involved in accident, majority (86%) did not consume alcohol immediately before the accident. 14% (7) of the students consumed alcohol just before accident.

5.8.17 HELMET USAGE AT THE TIME OF ACCIDENT

Table no 52: Distribution based on helmet usage at the time of accident

Helmet usage at the time of accident	Frequency	Percentage
Yes	20	40
No	30	60
Total	50	100

Among the students involved in accident, 40% (20) of the students used helmet during accident. Majority (60%) of them did not wear helmet during accident.

5.8.18 ASSOCIATION BETWEEN KNOWLEDGE AND PREVALENCE OF ACCIDENT

Table no 53: Association of knowledge and prevalence of accidents

Knowledge	Accident		Total
	Yes	No	
Inadequate	22	43	65
Moderately adequate	21	110	131
Adequate	7	47	54
Total	50	200	250

$$\chi^2 = 10.75 \text{ df} = 2 \text{ p} = 0.05$$

In this study it was found that knowledge score had a statistically significant association with prevalence of accidents with χ^2 value of 10.75 and $p < 0.05$

5.8.19 ASSOCIATION BETWEEN ATTITUDE AND PREVALENCE OF ACCIDENTS

Table no 54: Association of attitude with prevalence of accidents

Attitude	Accident		Total
	Yes	No	
Unfavourable	16	31	47
Moderately favourable	10	46	56
Favourable	24	123	147
Total	50	200	250

$$\chi^2 = 7.19 \text{ df}=2 \text{ p}=0.027$$

In this study it was found that attitude had a statistically significant association with prevalence of accidents with χ^2 value of 7.19 and p value less than 0.05.

5.8.20 ASSOCIATION BETWEEN PRACTICE AND PREVALENCE OF ACCIDENTS

Table no 55: Association between practice and prevalence of accidents

Practice	Accident		Total
	Yes	No	
Poor practice	35	83	118
Good practice	9	78	87
Best practice	6	39	45
Total	50	200	250

$$\chi^2 = 13.202 \text{ df}=2 \text{ p}=0.001$$

In this study it was found that poor practice had a statistically significant association with occurrence of accidents with value of 13.202 and p value less than 0.001.

5.8.21 CORRELATION BETWEEN KNOWLEDGE, ATTITUDE AND PRACTICE

Table no 56: Correlation between knowledge, attitude and practice

Variable	Pearson correlation	p-value
Knowledge Vs Attitude	0.173	0.006*
Knowledge Vs Practice	0.381	0.001*
Attitude Vs Practice	0.375	0.001*

There was a positive correlation between knowledge attitude and practice ($p < 0.05$).

6. DISCUSSION

The present study was done to assess the knowledge, attitude, and practice of road traffic rules among college students who were regularly using two wheelers in Kanyakumari district of Tamil Nadu. The study was done among 250 college students of age 18 – 25 years. Manjula et al had done a study in Karnataka reported majority of the participants from age group of 18-22years⁴³. Reang and Tripura had done a study in Tripura reported that majority of the participants were of the age group of 18- 25 years³⁸.

In the present study majority of the participants were boys (56.4%), than girls (43.6%). Manjula et al had reported majority of the participants were male than females.(43) Majority of the participants were males (51.8%) in a study conducted in Trichy by Kulothungan et al⁵.

In the present study majority of the participants belonged to urban area (56%). Kulothungan et al reported majority of the participants were from rural area (69.47%)⁵. Reang and Tripura found that 53.2% of the males and 69% of females belonged to urban area.³⁸ Kalbandkeri et al had conducted a study in M R Medical College, reported that majority of the study participants were from urban area⁴².

In the present study majority of the participants belonged to upper class (class I) based on BG Prasad Socio economic status scale. A study conducted in Visakapatnam by Lalitha had reported that majority of the participants belonged to upper class (class I).

In the present study among all the participants, 52.4% had moderately adequate knowledge, 21.6% had adequate knowledge and 26% had inadequate knowledge regarding road traffic rules and regulations.

Kulkarni et al reported that more than 50% of the students had better knowledge regarding road traffic signs. This finding was similar to present study ³⁷. Nikumb et al found that more than 95% of the participants had adequate knowledge regarding road safety measures ³³. Phanindra et al found that majority of the participants had very poor knowledge in identifying traffic signs ³⁹. Emmily et al reported 99% of the participants had heard about road traffic rules and regulations. 51.3% of the participants had average knowledge regarding road traffic accidents ⁶³. These differences were due to lack of knowledge regarding road traffic rules and regulations.

Ranjan et al reported 52.8% of the participants had adequate knowledge on road safety rules and regulations. 99.4% of the participants knew that wearing helmet is important while riding two-wheelers ⁴⁶. Kalbandkeri et al reported majority of the participants (>90%) had high knowledge regarding road safety rules. Majority of the students told that the reason for accidents was high speed ⁴².

In the current study 74.8% of the participants reported that it is important to give way to ambulance the ambulance was approaching. 88.1% of the participants gave way to ambulance in the study conducted by Reang and Tripura. 81.8% of the males and 71.7% females had better knowledge. This knowledge score was higher than present study ³⁸. Redhwan et al reported that 78% of the students had moderate knowledge regarding road traffic rules. This knowledge was also higher than present study ⁶⁴.

In the current study 58.8% of the participants had favorable attitude, 22.4% had moderately favorable attitude, and 18.8% had unfavourable attitude towards road traffic rules. In the present study 34.8% of the participants had good practice, 18% had best practice, and 47.2% had poor practice towards road traffic rules.

Manjula et al reported 88.9% of the participants had good attitude towards RTA and 58.9% of the participants had good practice towards road traffic rules ⁴³. Phanindra et al reported that majority of the study participants had appropriate attitude towards road safety ³⁹. In the present study 58.8% of the participants had favorable attitude towards road traffic rules. Ranjan et al reported that more than 50% of the participants had positive attitude towards road traffic rules ⁴⁶. This result was similar to the current study. Kalantharakath et al reported that 75% of the participants agreed helmets were important for only those riding bike in a long distance. The participants had positive attitude towards helmet use ⁴⁷.

In the current study 48% of the participants rode the vehicle with the maximum speed between 41-60 kms /hour. Kulothungan et al reported that 15.7% of the participants rode the vehicle between 41-60 kms/hour. The reason for this difference was due to the fact that majority of them were obeying speed limit.

In the current study 14.4 % of the participants slow down/stop the vehicle when yellow signal is on. Kulothungan et al reported that 48.3% of the participants slow down the vehicle when yellow signal is on ⁵. The reason for this was due to either lack of knowledge or not obeying traffic signals.

In the current study 50 % of the participants always switched on the indicator at least 30 meters before turning. Kulothungan et al reported that 65.9% of the participants always switched on the indicator before turning ⁵. The reason for this difference was not obeying traffic signs in the present study.

In the current study 50% of the participants were always wearing helmet while riding two-wheelers. Kulothungan et al reported that only 24.3% of the participants always used helmet while riding ⁵. Sreedharan et al reported only 26.9 %

of the participants were using helmet while riding two-wheelers ⁶⁵. Ranjan et al reported that 22.4% of the participants wore helmet while riding two-wheelers. Phanindra et al reported 46% of the participants were wearing helmet while riding ³⁹.

In the current study prevalence of accident were 20%. Emmily et al found that 55% of the participants involved in road traffic accidents of which 60% of the accidents were due to two-wheelers ⁶³. This prevalence of accidents was higher than that of the present study. The reason was lack of awareness regarding road traffic rules.

The causes of road traffic accidents were lack of awareness regarding road traffic rules, drunken-driving, high speed and use of mobile phone while riding vehicle. Mukhopadhyay reported the cause of road traffic accidents was wrong overtaking, use of mobile phone while riding and high speed skids ⁴⁵. Manjula et al reported the prevalence of accident was 13.3% ⁴³.

Ramya et al reported that jumping traffic signal and trying hands free riding as the reasons for RTA. Majority ((90.92%) of the participants gave way to the ambulance. This finding was higher than that of the present study. The reason for the difference was the better knowledge of the participants regarding ambulance services⁴⁴.

Pranab Jyoti Bhuyan reported that the reason for road traffic accidents was drunken driving. The frequency of accidents was a little higher during December to January ²⁹.

Seethalakshmi et al reported majority of the accidents happened during 6 PM to 10 PM. ¹⁸. This findings were similar to that of the present study.

7. SUMMARY

A cross sectional study was carried out among college students who were regularly using two-wheelers in Kanyakumari district, Tamilnadu, India. The study participants were of age group ranging from 18 years to 25 years. Majority of them came from urban area (56%). Almost 50% of the students were from Christian religion (51.2%) and (47.2%) of them belonged to upper class.

In the current study, majority of the study participants (52.4%) had moderately adequate knowledge regarding road traffic rules and regulations. Majority of the study participants had favorable attitude towards road traffic rules. (47.2%) of the participants had poor practice towards road traffic rules.

In the present study, the prevalence of the accidents was 20%. The majority of the participants (78%) were driving vehicles during accidents. 44% of the participants were admitted in the hospital following accident. The factors associated with accidents were broken roads (54%), night time (34%), raining (40%), slow traffic (46%), fault in vehicle (42%), high speed (48%), poor street light (32%), using mobile phone (24%) and not wearing helmet (60%).

8. CONCLUSION

The findings of the study led to conclusion that less than 25% of the study participants had adequate knowledge about road traffic rules. Majority of the participants had moderately adequate knowledge. Majority of the participants belonged to upper class and literate family. Knowledge was associated with prevalence of accidents.

More than half of the participants had favorable attitude towards road traffic rules. Attitude of the participants showed significant association with prevalence of accidents.

Nearly 50% of the study participants had poor practice towards road traffic rules and regulations. Practice was significantly associated with prevalence of accidents. There was a positive correlation between knowledge, attitude, and practice.

9. RECOMMENDATION

The road safety rules and regulations are aimed at reducing the Road Traffic Accidents and deaths due to RTAs. The measures to decrease the road traffic accidents are through engineering methods, enforcement, education and emergency care. The most effective method was education regarding road safety rules and regulations.

Parents should be educated about importance of road traffic rules at the individual level. From the early childhood onwards the parents should teach their children regarding safety way of walking and make them understand the benefits of obeying the road traffic rules. Especially it becomes a responsibility of the parents to protect their children from road traffic accidents.

In the community level health education regarding road traffic rules and regulations should be started in the schools. The students should be educated regarding road traffic rules and safety at schools including it as a part of curriculum. School based education programs can improve pedestrian skills of children. The students should make the habit of following road traffic rules from school days itself.

Proper training should be given during the period of getting driving license to make them understand the consequences of road traffic injuries and the difficulties faced by their families. Road safety weeks should be celebrated throughout the country to create awareness regarding road safety. The college students should be educated about the use of helmet and other safety measures. Strict legislative measures should be followed throughout the country.

Government should enforce ban on drink and drive, and use of mobile phones while driving. Should implement speed limits by proper legislation. The utilization of public transport system may be encouraged to reduce road traffic accidents. Wearing

helmet should be made legally compulsory for those riding two-wheelers. Punishment should be given to those not following speed limits. Strict legislation regarding road traffic rules should be followed throughout the country. Those riding without a valid driving license should be punished with fine and imprisonment.

Those travelling regularly, should try to reduce the length of the travel distance. Special attention may be given to the high risk groups such as children and elderly peoples. Public transport facilities may be improved so that use of two-wheelers will be reduced.

Periodic health check up of the riders and periodic check up of vehicles should be made mandatory. Quality of the roads should be ensured periodically. Two-wheeler riding should be avoided during night time as well as raining time. Quality of the helmets should be standardized. The riders should purchase a standardised helmet of correct size.

The laws may be enforced effectively through the Departments of Police and Department of Transport to reduce Road Traffic Accidents.

10. LIMITATIONS

As my research is limited to college students in Kanyakumari district it might not reflect the entire population.

High literacy rate in the district can influence the knowledge, attitude, and practice, which may differ in different parts of the state.

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INSTITUTIONAL HUMAN ETHICS COMMITTEE

SREE MOOKAMBIKA INSTITUTE OF MEDICAL SCIENCES,
KULASEKHARAM, TAMILNADU

Communication of Decision of the Institutional Human Ethics Committee(IHEC)

SMIMS/IHEC No: 2 / Protocol no: 2 / 2017

Protocol title: A CROSS SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE AND PRACTICE OF ROAD TRAFFIC RULES AMONG COLLEGE STUDENTS WHO ARE REGULARLY USING TWO WHEELERS IN KANYAKUMARI DISTRICT			
Principal Investigator: Dr. M.Narayanan			
Name & Address of Institution: Department of Community Medicine Sree Mookambika Institute of Medical Sciences			
<input checked="" type="checkbox"/>	New review	<input type="checkbox"/>	Revised review
<input type="checkbox"/>		<input type="checkbox"/>	Expedited review
Date of review (D/M/Y): 04-12-2017			
Date of previous review , if revised application:			
Decision of the IHEC:			
<input checked="" type="checkbox"/>	Recommended	<input type="checkbox"/>	Recommended with suggestions
<input type="checkbox"/>	Revision	<input type="checkbox"/>	Rejected
Suggestions/ Reasons/ Remarks:			
Recommended for a period of : Eighteen months			

Please note*

- Inform IHEC immediately in case of any Adverse events and Serious adverse events.
- Inform IHEC in case of any change of study procedure, site and investigator
- This permission is only for period mentioned above. Annual report to be submitted to IHEC.
- Members of IHEC have right to monitor the trial with prior intimation.

Renegalyangachal

Signature of Member Secretary (IHEC)



ABBREVIATIONS

SL.NO	ACRONYM	EXPANSION
1.	BAC	Blood Alcohol Concentration
2.	CNY	Chinese Yuan
3.	GOI	Government of India
4.	INR	Indian Rupee
5.	IPC	Indian Penal Code
6.	MORTH	Ministry of Road Transport and Highway
7.	RTA	Road Traffic Accident
8.	RTI	Road Traffic Injury
9.	SCRB	State Crime Record Bureau
10.	SDG	Sustainable Development Goal
11.	UN	United Nation
12.	VZ	Vision Zero

ANNEXURE III

PARTICIPANTS CONSENT FORM

The details of the study have been explained to me in writing and the details have been fully explained to me. I am aware that the results of the study may not be directly beneficial to me but will help in the advancement of medical sciences. I confirm that I have understood the study and had the opportunity to ask questions. I understand that my participation in the study is voluntary and that I am free to withdraw at any time, without giving any reason, without the medical care that will normally be provided by the hospital being affected. I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s). I have been given an information sheet giving details of the study. I fully consent to participate in the study titled **‘A cross sectional study on knowledge, attitude and practices of road traffic rules among college students who are regularly using two wheelers in Kanyakumari district**

Serial no/Reference no:

Name of the Participant:

Address of the Participant:

Signature of the participant

Witnesses:

1.

2.

Date:

Place:

ஒப்புதல் படிவம்.

இந்த ஆராய்ச்சியில் தகவல்கள் அனைத்தும் என்னிடம் தெளிவாக எழுத்து மூலம் விளக்கப்பட்டள்ளது. இந்த ஆராய்ச்சியின் முடிவுகள் எனக்கு நேரடியாக பயன்பெறாவிட்டாலும் மருத்துவ துறையில் முன்னேற்றத்திற்கு பயன்படும் என்பதை அறிவேன். இவ் ஆராய்ச்சியை பற்றி நான் தெளிவாக புரிந்து கொண்டேன். மற்றும் இதை பற்றி என் சந்தேகங்களை தெளிவுபடுத்தியுள்ளேன். நான் நானாக முன்வந்து இதில் பங்கு பெறுவேன். இதிலிருந்து எந்நேரமும் எக்காரணமம் இன்றி என்னால் வெளிவர இயலும் என்பதை அறிவேன். அவ்வாறு நான் வெளிவந்தாலும் எனக்கு கிடைக்கும் மருத்துவ உதவிகள் எவ்விதத்திலும் பாதிக்கப்படாது என்பதை அறிவேன். இந்த ஆராய்ச்சியின் மூலம் வரும் முடிவுகள் மற்றும் தகவல்களை அறிவியல் துறையின் பயன்பாடுகளுக்கு உட்படத்திக் கொள்ள சம்மதிக்கிறேன். இவ் ஆராய்ச்சியை பற்றிய விரிவான தகவல் அடங்கிய படிவம் தரப்பட்டுள்ளது.

“கன்னியாகுமாரி மாவட்டத்தில் கல்லூரி மாணவர்களுக்கு இடையே சாலை போக்குவரத்து விதிகளின் அறிவு மற்றும் பயிற்சியின் மீது ஒரு குறுக்கு பிரிவு ஆய்வு”.

சீரியல் எண் :. குறிப்பு எண்

பங்கேற்பாளர் பெயர்.:

பங்கேற்பாளர் முகவரி:

பங்கேற்பாளர் தொடர்பு எண்:

பங்கேற்பாளர் கையொப்பம்:

சாட்சிகள்:

1.

2.

நாள்:

இடம்:

സമ്മതപത്രം

ഈ പഠനത്തെക്കുറിച്ചു ഉള്ള വിശദാംശങ്ങൾ എഴുത്തുമാറ്റലായി എന്നെ അറിയിച്ചിട്ടുണ്ട്. എനിക്ക് ഈ പഠനത്തെക്കുറിച്ചുള്ള വിശദാംശങ്ങൾ എന്നെയും എന്റെ രക്ഷകർത്താവിനെയും എഴുത്തുമാറ്റലായി അറിയിച്ചിട്ടുണ്ട്. ഈ പഠനം കൊണ്ട് നേരിട്ടുതുടങ്ങുന്ന ഉല്പന്നങ്ങളും ഇത് മെഡിക്കൽ സയൻസിന് വളരെയധികം ഉപയോഗപ്രദമായതാണ്. എനിക്ക് പഠനം മനസ്സിലായി എനിക്ക് ചോദ്യങ്ങൾ ചോദിക്കാനായി അവസരം ലഭിച്ചിട്ടുണ്ട്. ഞാൻ സ്വയം ഈ പഠനത്തിൽ പങ്കുചേരുകയാണ്. ഏതുസമയത്തും എനിക്ക് ഇതിൽ നിന്നും പിൻമാറ്റാനുള്ള അവകാശം ഉള്ളതായും എന്ന് എനിക്ക് ബോധ്യപ്പെട്ടിരിക്കുന്നു. അതെന്റെ ചികിത്സയിൽ ഏതുവകയിലും തടസ്സമാകാൻ കാരണമാവുകയുമില്ല. ഈ പഠനത്തിൽ നിന്നുള്ള ഷെഡ്യൂൾ വിജ്ഞാപനപരമായി മാത്രമായി ഉപയോഗിക്കു എന്നുള്ളതും എനിക്കു ബോധ്യമായി. ഈ പഠനത്തിനെക്കുറിച്ചുള്ള മുഴുവൻ രേഖകളും അടങ്ങിയ പത്രം എനിക്കു ലഭിച്ചു.

ഞാൻ “കന്യാകുമാരി ജില്ലയിലെ കോളേജ് വിദ്യാർത്ഥികളുടെ ഇടയിൽ ഉരുചക്ര വാഹന ഉപയോഗത്തിൽ റോഡിൽ പാലിക്കേണ്ട നിയമങ്ങളെക്കുറിച്ചു ഉള്ള അറിവുകൾ അപകടവും മരണവും ഉണ്ടാകാൻ അതിനാൽ കോളേജ് വിദ്യാർത്ഥികളുടെ അറിവും, നടപടികളും” എന്ന അന്വേഷണത്തിൽ ഞാൻ പങ്കുചേരുന്നതും സമ്മതിച്ചുകൊണ്ട് പങ്കെടുക്കുന്നു.

സീരിയൽ നമ്പർ : ഒ.പി.നമ്പർ:

പങ്കെടുക്കുന്ന ആളിന്റെ പേര് :

രക്ഷകർത്താവിന്റെ പേര് :

ബന്ധം :

മേൽവിലാസം :

ബന്ധപ്പെടേണ്ട നമ്പർ :

പങ്കെടുക്കുന്ന ആളിന്റെ കൈയൊപ്പ്/വിരലടയാളം രക്ഷകർത്താവിന്റെ കൈയൊപ്പ്/വിരലടയാളം

സാക്ഷി : 1.

2.
സ്ഥലം : കുലശ്ശേരി,
തീയതി :

QUESTIONNAIRE

1. Age :.....in completed years
2. Sex : Male / Female
3. Area of residence: urban / rural
4. Religion: Hindu/ Christian/ Muslim
5. Education of Head of the family: profession/graduate/diploma/ high school/ middle school/primary school/illiterate
6. Occupation of head of the family: legislator, senior official& manager/
professional/ technician and associate professional/ clerks/shop and market sale
worker/ agricultural & fishery work/Graft related work/plant & machine operator/
elementary occupation/unemployed
7. Total family income per month.....
8. Total monthly income of the family range: Rupees **1.** < 6323 **2.** 6327-18949
3. 18,953-31,589 **4.** 31,590-47,262 **5.** 47,266-63,178
6. 63,182-1,26,356 **7.** >1,26,360
9. Total number of members in the family :.....
10. Type of family: 1. Nuclear family 2. Joint family
11. On a road designated as one way
 1. parking is prohibited 2. overtaking is prohibited
 3. should not drive in reverse gear
12. In a road without footpath, the pedestrians
 1. should walk on the left side of the road
 2. should walk on the right side of the road
 3. may walk on either side of the road

13. Free passage should be given to the following type of vehicle
1. police vehicle
 2. ambulance and fire service vehicles
 3. super express buses
14. When an ambulance is approaching
1. allow passage if there are no vehicles from front side
 2. no preference need be given
 3. allow free passage by drawing to the side of the road
15. Overtaking is prohibited in following circumstances
1. When it likely to cause inconvenience or danger to other traffic
 2. When the vehicle in front is reducing speed
 3. During night
16. Before overtaking a vehicle, it should be ensured that
1. no vehicle is approaching from behind
 2. the road ahead is clearly visible and it is safe to overtake
 3. the vehicle in front is turning left
17. More than two persons on a two wheeler is
1. allowed in unavoidable circumstances
 2. violation of law
 3. allowed when the traffic is less
18. When a motor vehicle is involved in an accident
1. Report to the nearest police station within 24 hours
 2. Within 12 hours
 3. within 48 hours
19. While riding two wheeler hand signal should always be given by
1. only left hand
 2. only right hand
 3. both hand
20. To carry pillion rider, a motor cycle must be provided with
1. foot rest alone
 2. hand grip alone
 3. foot rest, hand grip, sari guard
21. Minimum distance to be kept from the vehicle going in front
1. 10 meters
 2. 20 meters
 3. 30 meters
 4. safe distance according to speed

22. Is it ok to drive in the wrong way in a one way street/road if there is no/very little traffic?

1. yes 2. no

23. Is it ok to drive very fast if the road is clear? 1. yes 2. no

24. Is it ok to drive after drinking if your hands & vision are steady? 1. yes 2. no

25. Is it ok not to wear helmet if you are driving just to the near by street / road ?

1. yes 2. no

26. Do you think that slowing down at orange traffic light is important?

1. yes 2. no

27. Is it ok to listen music with ear phone when driving two wheeler?

1. yes 2. no

28. Do you drive with more than 2 people (triples) usually ? 1. yes 2. no

29. Do you use rear mirror?

1. always 2. occasionally 3. Rarely 4. never

30. When you see the traffic sign of school, what do you usually do?

1. stop the vehicle, sound horn and proceed 2. slow down and proceed with caution

3. sound horn continuously and proceed

31. When do you wear helmet?

1. always 2. occasionally 3. rarely 4. never

32. When a blind person crosses the road holding white cane what do u usually do ?

1. stop vehicle let them cross 2. blow the horn and proceed as usual

3. slow down and proceed with caution

33. When you see a orange signal what do you usually do?

1. cross as fast as possible 2. cross normally if no vehicle is there

3. cross normally d. stop

34. Have you raced in your vehicle? 1. yes 2. no
35. What is the top speed you have driving the two wheeler ?
 _____KM/Hour_
36. While over taking do you ensure that the opposite lane is clear ?
 1. always 2. occasionally 3. rarely 4. never
37. when will you Switch On the indicator
 1. always just before turning 2. always at-least 30 meters before 3.
 occasionally if I remembered 4. never
38. Have you ever over taken from the left side of the vehicle
 1. mostly 2. occasionally 3. rarely 4. Never
39. Whose two wheeler do you use regularly? 1. Own 2. family members 3.
 friends / relatives
40. Have you ever been involved in accident in the past 2 years
 1. yes 2. no
- (IF NO: ignore the following questions)**
41. If YES: Were you driving : Yes / NO
42. How severe was the accident
 1. damage to vehicle only 2. scratches to the rider 3. severe injury
 but no fracture 4. fracture 5. death of some
 one
43. Was ambulance called for the accident? 1. yes 2. no
44. If yes how long did it taken to reach the spot
45. How long did it taken to reach the hospital.....
46. Follwing accident were you hospitalized 1. Yes 2. No

Factors involved in the accident

- 47. Condition of the road at the spot 1. good 2. broken 3. no road
- 48. Time of accident? 1. day 2. night 3. evening 4. early morning
- 49. Climatic condition: raining / wet / dry
- 50. Traffic : heavy / slow / no traffic
- 51. Fault in vehicle 1. yes 2. no
- 52. Speed : with in normal limits / high speed
- 53. Lighting of road / street: good / poor
- 54. Were you using mobile phone at the time of accident ? 1. yes 2. no
- 55. Had you consumed any alcohol/ medication immediately before accident?
1. yes 2. no
- 56. Were you wearing helmet at the time of accident? 1. yes 2. no

ANNEXURE – VII

