

Education and enforcement in traffic management

V.Sree Devi¹, B.V. Sree Kumar² and Dr.M.Sulaipher³

¹Department of Management Studies, Udaya School of Engineering, Vellamodi - 629204

²Motor Vehicle Inspector, TC'S Squad, Transtower, Vazhuthakadu, TVM.

³Faculty of Management Studies, Noorul Islam University - 629180

*Corresponding Author: E-Mail: sulaipherjerry@gmail.com

ABSTRACT

Road traffic accidents are serious health concern at present as far as public health and prevention is concerned. Increase in number of vehicles on road, urbanisation, shift in rural areas to urban centres, Unplanned urban growth, poor driving conditions due to improper road maintenance, unplanned intersections and insufficient provision for pedestrian have led to traffic congestion on roads and subsequently to accidents on roads. Road traffic injuries are one of the leading causes of death across the world with severe socio-economic costs. They result not only in death but also permanent disability. India, being a developing country has changed the health scenario of the country in a significant way due to demographic, epidemiological and economic transition. This serious health problem needs the immediate attention of the planners and policy makers to formulate suitable policies and strategies to prevent road accidents (Gururaj, 2015). Education and Enforcement are closely related. It is very difficult to enforce traffic rules and regulations if people are not aware and understand the traffic rules. It has been experienced that enforcement without self discipline many a times becomes mere figure. They do not get the desired result of education in traffic accidents and better traffic management. This paper examines the awareness and attitude of road users about road safety rules and regulation and its enforcement in the state of Kerala.

KEYWORDS: Road users, Road traffic accidents, motor vehicle population, road transport, traffic management

1. INTRODUCTION

Transport is an important segment and role in the economic development of any region. Transport infrastructure is tied to every sector of the economy. Roads provide a very important means of transport and communication throughout the world and have a great role to play in the development of nations and people through improving access to information and resources, leading to better health outcomes among populations. Provisions of adequate infrastructure are pre-requisite for sustained growth and to ensure cost-effective movement of people and goods.

Road development is a basic economic activity that stimulates growth. It also creates permanent assets. They contribute to around 5 percentage of the National Income and promote trade and social integration. The road network in the country has improved considerably in terms of road length and associated infrastructure. However the vehicular traffic has outpaced road development. The vehicle population is found doubling every 5 to 6 years, resulting in higher number of road accidents in the country (Sunder Lal, 2008). The National Highway network system which account for one percent of total road network carries around 40 percent of the total traffic. There are several continuous accident black spots on the highways and other arterial road network in the country.

At present increase in vehicle population and its simultaneous increase in traffic on roads have been witnessing higher risk of road accidents. Experience in developed especially developing countries proves that road traffic accidents are increasing and are the fifth important cause of deaths globally, leading to a significant proportion of injuries, deaths and disabilities in the population. Population and the number of vehicles in the country have been continuously increasing. Population has increased from 651 million in 1981 to 1210 million approximately in the year 2011. Road length has been increased from 15.34 lakhs km in 1981 to 46.90 lakhs in the year 2011 (Hassen, 2011). Along with the increase in human and vehicle, population the number of accidents has also gone up.

Road traffic accidents are tragedy to human beings and leads to misery. It leads to incur huge socio economic costs in terms of untimely death. Disability and injuries reflected in loss of potential income. The implications of road accidents are serious and its affect not only the individuals but also on the economy. Road crashes takeaway the right of life of three thousand people every day. This is a Global humanitarian disaster and manmade.

Accidents dry the national economy and may cause disablement, death, damage to health and property, social suffering and general degradation of the environment. Road traffic accidents are the social health problem for which planners and policy makers still accept death and disability among people at large (Mohan, 2003). Estimate by the World Health Organisation have indicated that globally, road traffic accidents have led to as high as 1.27 million deaths in 2004, which has been found to be equivalent to all the deaths caused by communicable diseases. The most affected are the young population and it has been found that road accidents are one of the top three reasons for deaths among the population from the age group of 5 to 44 years globally.

According to the estimate of WHO (2009), road traffic accidents will be the fifth leading cause of deaths world wide by 2030, approximately 2.4 million families per year loss their lives and their potential income, if proper steps are not taken to prevent deaths and injuries on the road. More than 90 percentages of the world's fatalities on

the roads happen in low-income and middle income countries, which contributed 48 percentages of the world's registered vehicles, (World Health Organisation 2004). Steady increase in vehicle and human population travelling through the adverse road situations and made road traffic injuries a serious conditions (Nilambar, 2004). The phenomenal increase in mobility, morbidity, disability and socio-economic impact from injuries in particular, during the past decade has been a matter of increasing concern among professionals and policy makers (Gururaj, 2008)

Accidents rates are increasing every year in India. Technological implications in agriculture and industry, induction of semi-skilled and unskilled workers in various operations and rapid increase in vehicles have resulted in an increase in morbidity and mortality due to accidents. Overcrowding, lack of awareness and poor implementation of essential safety precautions result in an increasing number of accidents

Accident profile of Kerala: The development in the Road Transportation Sector has been a key element in the economic development of any nation. In India, more than 70,000 people die and nearly 4 lakhs persons are injured every year. When income rise, car loans proliferate and the auto industry churns out low-cost cars to nudge them out of their motor cycles, Indians are rushing behind the wheel. India has more truly congested cities than any other nation which is not surprising, since it is also the world's second most populous country, after China. India is estimated to have the second highest number of road accidents in a year (Park, 2012).

Kerala leads in certain social and health indicators like high literacy rate, 100 percent road connectivity to villages, better health care system and high density of population distribution. The topography of Kerala has different regions like hilly, semi hilly, plain the coastal terrains. The economic activities differ based on the predominance of industrial or agricultural activities of the area. But Kerala is also leading the country in terms of risk factors like high rate of road accidents and high injury rate injury due to traffic crashes. Road accidents are the third major causes of death in the State. Heart ailments and cancer are the other diseases that take the heavy toll of human lives in Kerala State. The State of Kerala has nearly 3 percentage of the country's population but it has recorded about 10 percentage of the country's road traffic accidents. According to the causality figures recorded in major medical college hospitals in the state, nearly 70 % of the head injuries are reportedly caused due to traffic crashes.

A constant rise the vehicle population, rampant encroachment of roads, unscientific construction of subways and under passes at highways, very high speed levels of driving at the highways, ignorance for wearing helmets among two-wheeler riders, nasty tendency of violating traffic rules, anarchic traffic systems and population explosion have significant contribution to increase in road traffic accidents in the state. Therefore it is relevant to analyse the strategy to reduce road traffic accidents in Kerala-Education and Enforcement

For the purpose of the study, a Road Traffic Accident (RTA) is defined as accident, which happened on the road between two or more objects and one must be any kind of a moving vehicle. Any injury on the road without involvement of a vehicle (eg. a person slipping and falling on the road sustaining injury) or injury involving a stationary vehicle (eg. persons getting injured while washing or loading a vehicle) or deaths due to RTA were excluded from the study. The respondents include road users like pedestrians, (motor cyclists, car owners, heavy vehicle) drivers etc. Necessary modifications were made in the questionnaire to make it more users friendly.

Objectives:

- i. To examine the level of awareness about road safety rules /traffic regulations among road users.
- ii. To analyse the influence of demographic factors of the respondents on their safety awareness.
- iii. To study the attitude of the respondents towards enforcement of road safety rules / traffic regulations.

2. RESEARCH METHODOLOGY

The present study is both descriptive and analytical in nature. Formulation of methodology of the study helps the researcher to draw a systematic approach for the research process. The methodology of the present study has been designed with regard to period and area of study, sources of data, pilot study and sampling designs, sampling method and statistical tools and technique used for the data analyses.

Sample Size: The determination of sample size

$$\text{Sample size } n = (ZS/E)^2$$

Where

Z = Standardised value corresponding to a confidence level of 95% = 1.96

S = Sample SD from pilot study of 120 sample = 0.574

E = Acceptable Error = 5% = 0.05

Sampling Method: The stratified Sampling technique was used to collect filled - questionnaire from 506 road users. The road users are geographically located in different parts of fourteen districts of the state.

Universe for the Study: All 14 districts of Kerala State had been selected as the universe for the study.

Sources of Data: Data and information were gathered from primary sources.

Primary Data: Primary data related to traffic management to reduce road accidents were obtained with the help of structured questionnaire, prepared in English and Malayalam languages.

Pilot Study: Pilot Study was undertaken with 120 respondents; the respondents include road users like pedestrians, (motor cyclists, car owners, heavy vehicle) drivers etc. Necessary modifications were made in the questionnaire to make it more users friendly.

Data Analysis and Tools Used: The tools used for the analysis were descriptive analysis for demographic factors and Chi-square test.

3. RESULTS AND DISCUSSION

Mean and SD of Awareness of Road Users about Traffic Regulations: Road traffic safety refers to methods and measures for reducing the risk of person using the road network being killed or severely injured. The users of road include pedestrians, cyclists, motorists, their passengers and passengers of on-road public transport. There are so many issues related to the traffic rule violations such as wrong sense of driving which involves drunken driving, over speeding, jumping the red lights, lane violations, not wearing seat belts etc. In this background it is paramount importance to know the level of awareness of road users about traffic regulations and its mean and SD is listed in Table 1.

Table.1.Mean and SD of Awareness of Road Users about Traffic Regulations

Statement of awareness	Mean	SD
Maintaining minimum distance between two vehicles while driving	4.47	0.71
Seat belt usage	4.43	0.71
Wearing of Helmet while travelling in a two-wheeler	4.41	0.85
Vehicle registration documents and type of vehicle to be used	4.38	0.76
Crossing the road using Zebra crossing	4.33	0.84
Road sign on Overtaking	4.29	0.78
Speed limit	4.28	0.86
Road sign on major road ahead	4.28	0.83
Parking place	4.27	0.80
Right way of vehicle while driving on hills	4.27	0.73
Controlling speed while descending	4.26	0.81
The side in which the people must walk on the road	4.26	0.83
Road sign about No crossing	4.25	0.83
Road sign on 'U' turn prohibited	4.23	0.87
Road sign about vehicle prohibited on both direction	4.23	0.81
Road sign about steep descent	4.21	0.83
Right way of Emergency stopping	4.21	0.82
Drunken driving	4.20	1.22
Road sign on pedestrian prohibited	4.19	0.86
Road sign about give away	4.17	0.80
Safety awareness for pedestrians during rainy seasons	4.15	0.75
Left line on roads	4.11	0.80
White continuous/broken line	4.10	0.78
Right way of using horn	4.09	0.83
Use of Hazard lights	4.09	0.90
Use of mobile phone while driving	4.01	1.32
Starting the vehicle on road during high traffic volume	3.75	1.07

Table1 illustrates that the road users are highly aware about maintaining minimum distance between two vehicles while driving with a mean of 4.47 and SD of 0.71. The respondents are also aware about seat belt usage (Mean 4.43 and SD 0.71), Wearing of Helmet while travelling in a two-wheeler (Mean 4.41 and SD 0.85), updated Vehicle registration documents and type of vehicle to be used (Mean 4.38 and SD 0.76), Crossing the road using Zebra crossing (Mean 4.33 and SD 0.84), Road sign on Overtaking (Mean 4.29 and SD 0.78), Road sign on major road ahead (Mean 4.28 and SD 0.83) and having least awareness on starting the vehicle during high traffic volume.

An investigation on causes of road accident shows that Driver's fault, road condition, Fault of driver of other vehicle are the main causes, and lack of awareness in many traffic regulations and engineering factors insisted traffic education for overall traffic management to reduce road accidents.

Mean and SD of Enforcement Factors: Regulatory interventions through legislations- enforcement which influence people-vehicles and roads have been recognized as a key strategy for reducing road deaths and injuries. For enforcement become effective, legislation is essential. Enforcement should lead to a smooth flow of road traffic without compromising on safety, saving of time, protection of environment and fuel conservation. Effective enforcement is one where the behaviour of the road user is within the defined legal, engineering and ethical

framework – where the right of way is truly respected. The enforcement effectiveness is measured on the basis of mean and SD which is shown in the following Table 2.

Table.2.Mean and SD of Enforcement Violations

Factors/ Violations	Mean	SD
Helmet	4.47	0.85
Seat Belt	4.42	0.85
Traffic Signal	4.28	0.93
Parking Rules	4.14	0.99
Use of Mobile Phone While Driving	4.05	1.32
Drunken Driving	3.98	1.31
Dazzling Light	3.94	1.18
Teenage Driving	3.83	1.25
Black Dot/ Yellow Bond on Head Light	3.78	1.08
Driving without License	3.76	1.28
Lack of Reflectors on Back of the Vehicle	3.71	1.23
Dhoom Style (Rash) Driving	3.71	1.37
Risky Overtaking	3.69	1.33
Triple Rider on Two Wheeler	3.67	1.29
Over Loading of Passengers/Goods	3.65	1.30
Illegal Transportation of Passengers	3.63	1.27
Multi Toned Horns with Shrilling Sound	3.53	1.36

As shown in Table 2 the highest violation is Helmet with a Mean and SD of 4.47 and 0.85 followed by seat belt, Traffic signal, parking area, use of mobile phone while driving, drunken driving, dazzling light, teenage driving, Black dot/ yellow bond on head light, driving without license (mean 4.42 and SD of 0.85, mean 4.28 and SD of 0.93, mean 4.14 and SD of 0.99, mean 4.05 and SD of 1.32, mean 3.98 and SD of 1.31, mean 3.94 and SD of 1.18, mean 3.83 and SD 1.25, mean 3.75 and SD 1.08 and mean 3.76 and SD of 1.28) least violation is found in multi toned horns with shrilling sound with a mean of 3.53 and a SD of 1.36. Strict enforcement is needed for Helmet and for different traffic regulations. To reduce these violations traffic education is needed because a person can violate any of these regulations while driving at anytime and Police cannot be present everywhere to prevent people doing so. Traffic management will improve very much when traffic rules are enforced strictly.

Test for Association between Age and Awareness Level of Road Users:

Hypothesis 1: Null Hypothesis: There is no association between Age and Awareness level of road users.

Alternative Hypothesis: There is an association between Age and Awareness level of road users.

Table.3.Chi-Square Test for Association between Age and Awareness Level of Road Users

Age Group in Years	Level of Awareness			Total	Chi-Square	P Value
	Low	Moderate	High			
Below 25	36 (25.9%) [27.7%]	68 (48.9%) [27.5%]	35 (25.2%) [27.1%]	139	8.842	0.183
26-35	37 (23.3%) [28.5%]	74 (46.5%) [30.0%]	48 (30.2%) [37.2%]	159		
36-45	29 (22.0%) [22.3%]	72 (54.5%) [29.1%]	31 (23.5%) [24.0%]	132		
Above 45	28 (36.8%) [21.5%]	33 (43.4%) [13.4%]	15 (19.7%) [11.6%]	76		
Total	130	247	129	506		

Since P value is greater than 0.05, the null hypothesis is accepted at 5 percent level of significance and concluded that there is no association between age and awareness level of road users on traffic rules and regulation. Based on the row and column percentage, the road users aged in between 26-35 are highly aware about traffic rules and regulations when compared to other age groups

Test for Significant Difference between Mean Ranks towards Factors of Awareness in Es of Traffic Management:**Hypothesis 2**

Null Hypothesis: There is no significant difference between Mean Ranks towards factors of Awareness in Es of Traffic Management

Alternative Hypothesis: There is a significant difference between Mean Ranks towards factors of Awareness in Es of Traffic Management

Table.4.Friedman Test for Significant Difference between Mean Ranks towards Factors of Awareness in Es of Traffic Management

Factors of Awareness	Mean Rank	Chi-Square	P Value
Maintaining minimum distance between two vehicles while driving	16.28	515.121	<0.01* *
Seat belt usage	15.88		
Wearing of Helmet while traveling in a two-wheeler	15.84		
Drunken driving	15.71		
Updated vehicle registration documents and type of vehicle to be used	15.33		
Crossing the road using Zebra crossing	15.05		
Speed limit	14.58		
Road sign on Over taking	14.47		
Road sign on major road	14.33		
Parking place	14.30		
The side in which the people must walk on the road	14.25		
Controlling speed while descending	14.19		
Road sign about No crossing	14.18		
Use of mobile phone while driving	14.05		
Right way of vehicle while driving on hills	14.03		
Road sign on 'U' turn prohibited	13.96		
Road sign about vehicle prohibited on both direction	13.80		
Right way of Emergency stopping	13.72		
Road sign about steep descent	13.65		
Road sign on pedestrian prohibited	13.61		
Road sign about give away	13.10		
Use of Hazard lights	12.85		
Safety awareness for pedestrians during rainy seasons	12.83		
Right way of using horn	12.57		
Left line on roads	12.47		
White continuous/ broken line	12.27		
Starting the vehicle on road during high traffic volume	10.69		

Note: ** Denotes Significant at 1% level

Since P value is less than 0.01, the null hypothesis is rejected at 1percentage level of significance. Hence it is concluded that there is significance difference between mean ranks towards factors of Awareness in Es of Traffic Management. Based on mean rank the road users are highly aware about the traffic rule of maintaining minimum distance between two vehicles while driving of motor vehicle (16.28), followed by Seat belt usage (15.88), Wearing of Helmet while traveling in a two-wheeler (15.84), Drunken driving (15.71), Updated vehicle registration documents and type of vehicle to be used (15.33), Crossing the road using Zebra crossing (15.05) and least aware about Starting the vehicle on road during high traffic volume (10.69).

Use of safety belts is picking-up but many drivers and occupants of vehicles do not use seat belts. Seat belt use reduces the impact of accident. Similarly, motorized two- wheelers do not use crash helmets and non use of bicycle helmets adds to the risk of fatal head injuries. The use of light during day time by two-wheeled vehicle reduces the chances of accidents.

A study by Pramod K V et al, had shown that nearly 80% of the victims did not receive the First aid, strictly showing the lack of emergency medical infrastructure and bus we lose the benefit of managing the person in the golden period. More than 42% of the victims were brought to the hospital after a period of 3 hours which is a significant delay with respect to management of trauma cases, the main reason being the inadequacy of infrastructure.

In another study by Agarwal et al, had shown that sixty eight percent of the victims were driving at the time of accident. Only 27% were wearing protective equipment (helmet and seat belt).

Test for Significant difference between Mean Ranks towards Factors of Enforcement in Es of Traffic Management:

Hypothesis 3

Null Hypothesis: There is no significant difference between Mean Ranks towards factors of Enforcement in Es of Traffic Management

Alternative Hypothesis: There is a significant difference between Mean Ranks towards factors of Enforcement in Es of Traffic Management

Table.5.Friedman Test for Significant Difference between Mean Ranks towards Factors of Enforcement in Es of Traffic Management

Enforcement/Violations	Mean Rank	Chi-Square	P Value
Helmet	11.46	876.905	<0.01**
Seat Belt	11.23		
Traffic Signal	10.63		
Use of Mobile while driving	10.32		
Drunken Driving	9.88		
Parking Rules	9.70		
Dazzling Light	9.30		
Teenage driving	8.79		
Driving without license	8.52		
Dhoom style (rash) driving	8.25		
Risky overtaking	8.12		
Triple rider on Two wheeler	7.98		
Lack of reflectors on back of the vehicle	7.95		
Black dot/ Yellow bond on head light	7.89		
Overloading of passengers/ goods	7.85		
Illegal transportation of Passengers	7.68		
Multi toned Horns with shrilling sound	7.45		

Note: ** Denotes Significant at 1% level

Since P value is less than 0.01, the null hypothesis is rejected at 1percentage level of significance. Hence it is concluded that there is significance difference between mean ranks towards factors of enforcement in Es of Traffic Management. Based on mean rank the highest enforcement needed is Helmet (11.46) followed by seat belt (11.23), Traffic signal (10.63), use of mobile phone while driving (10.32). Driving with hand held telephones has become a fashion, it is risky and misuse of telephones. It affects the reaction time and maintenance of lane, hence more risk of RTA. In many countries use of hand held mobile phones have been banned

A study by Bener A reported that 42.3% of the victims had a habit of using mobile phone while driving vehicle. A study by Hassen A observed that 42.3% had a habit of using mobile phone while driving vehicle. A study by Sood revealed a lower incidence and severity of head injuries in individuals who used helmets

Findings:

Awareness of Road Users about Traffic Regulations: The road users are highly aware about maintaining minimum distance between two vehicles while driving, seat belt usage, Wearing of Helmet while travelling in a two-wheeler, updated Vehicle registration documents and type of vehicle to be used, Crossing the road using Zebra crossing, Road sign on Over taking, Road sign on major road ahead and having least awareness on starting the vehicle during high traffic volume.

Enforcement Factors: The highest violation is Helmet with a Mean and SD of 4.47 and 0.85 followed by seat belt, Traffic signal, parking area, use of mobile phone while driving, drunken driving, dazzling light, teenage driving, Black dot/ yellow bond on head light, driving without license and least violation is found in multi toned horns with shrilling sound.

The Specific Objectives of the Study are analysed and concluded as follows

The **first objective** is to find out the level of awareness about road safety rules /traffic regulations among road users. It is found that the road users are highly aware about maintaining minimum distance between two vehicles while driving, seat belt usage, wearing of helmet while travelling in a two-wheeler.

The **Second Objective** to find out the influence of demographic factors of the road users on their safety awareness. It is concluded that there is no association between awareness level of road users and the demographic factors like age, gender, marital status, educational qualification and occupation.

The **Third Objective** is to study the attitude of road users toward enforcement of road safety rules /traffic regulations and the highest violation is found in Helmet with a Mean and SD of 4.47 and 0.85 followed by seat belt. It has been observed in the study that the agencies responsible for traffic management do not work in a strategic manner. They do not plan, execute, monitor, and evaluate their actions. The enforcement drive should be supported by education. The education should be backed by strong enforcement. But it has been observed that the police do not have plan for either of these. The actions are being done for the sake of taking actions. Behind their action, they do not have objectives to achieve. It has been observed that majority of the police officers didn't know what the strategy is. They were found to be unaware of such a concept. Of course there were some officers who individually have their vision but an organisation the vision was found to be missing.

It has been observed that the police enforcement is quite poor. The helmet, seatbelt, driving without licence, the teenage driving, triple riding on two-wheelers, the illegal transportation of the passengers without having necessary permits, the parking regulations, use of mobile phone while driving, drunken driving, traffic signals, speed regulations etc are some of the important regulations that are not effectively implemented by police. This is the regulations that can either improve traffic management or reduce road accidents. It has been observed that the police officers do not have clear directions or vision about what enforcement measures.

It has been observed that people generally do not cooperate with police in enforcement of traffic rules. They try to avoid police officers. They try to bringing in some influential person's influence to prevent police from taking legal actions. They do not adhere to traffic rules themselves. People generally do not observe rules like wearing helmet and seat belt parking regulations etc. they use mobile phone while driving though it is harmful and legally not permitted, more than 3 persons ride two wheeler, they overtake vehicle from wrong side. They avoid observance of almost all kind of traffic regulations. Regulations like risky overtaking, wrong side overtaking, using mobile phone while driving, dazzling light wearing seat belt, sticking reflectors on the back of the vehicle need a lot self regulations. These regulations cannot be enforced on the support of police presence and fear because police presence is not possible everywhere and the State generally do not have surveillance cameras for enforcement for all the areas

Suggestions: Kerala is a diverse State with a population of more than one million with variety of vehicles operating in a heterogeneous traffic environment. Road Traffic Accident (RTA) is a complex phenomenon of multiple causation, there is no single remedy that will prevent it and the urgent requirement is an organised team work by people in many disciplines like education, engineering, medical, law enforcement agencies for effective control of RTAs and their fatalities based on the study following suggestions were put forth:

Enforcement Strategy:

- Earmarked staff for every police station for traffic enforcement
- Study of enforcement act and its impact on the outcome in terms of improvement in traffic management, reduction in congestion, reduction n number of accidents etc.
- The enforcement may be made effective by taking action in a campaign mode. Enforcement drive may be organised and information may be given to the public through media.
- The enforcement drive may be backed by education drive so as to increase public cooperation and self regulation.
- Police may focus on enforcement of the following regulations; measure its impact and review:
 - Drunken driving;
 - Over speeding;
 - Driving without license.
 - Teenage driving
 - Transportation of passengers illegally without necessary permit.
 - Triple riding on two-wheelers
 - Use of mobile phone while driving.
 - Dazzling head lights.
 - Wrong side overtaking.
 - Overloading and foot-board travel in case of transport vehicles.

Enforcement for Better Traffic Management

- Parking regulations
- Traffic signals
- Transportation of passengers illegally, without necessary permit.
(Because these vehicles harm traffic management because of driver's behaviour. They park vehicle in a disorderly manner and do not follow traffic norms.)

Strategy to Get Co-Operation From People in Enforcement

To improve public cooperation and self regulation following measures are suggested:

- Effective traffic education backed by strict traffic enforcement.
- Enforcement drive may be followed by vigorous awareness drive.
- Strict traffic enforcement will create fear of law as well as educate people about law.
- Police may be protected from outside influence. An environment is created through generation of public opinion where police can enforce traffic rules strictly irrespective of the status of the violator. This will create certainty of police action and consequent deterrence.
- Improve police behaviour. It will improve police image and respect for police and law. These will improve self regulations and cooperation.
- Provision may be made in the law that insurance company will not pay if the person was not wearing helmet at the time of accidents and he dies due to head injury that could have been prevented by helmet.
- Similar provision for other violations is recommended.

Strategy for Traffic Education

- Traffic education may start from school. It may become part of the school syllabus.
- The school and college student may be involved in the traffic education programmes, the way they do NCC or NSS activities as part of their education.
- Use of existing forums like Garib Kalian Melas, Krishi Mahostav, Sadbhavna Mission programmes for educating people about the traffic rules.
- The prevalent fairs and festivals may be used to generate respect for law of the land in citizens.
- Creation of traffic education wing in police and providing them with enough staff, funds and other resources.
- Target oriented traffic education campaign looking to the education needs of different target group.
- Preparation of traffic education material for different categories of people.
- Training of police personnel to make them capable of educating people.
- Involving people on a very larger scale.
- Traffic education may become part of the agenda of the Gram Sabha.

Use electronics means for traffic education.

4. CONCLUSION

Accidents cannot be estimated or predicted, but it may be reduced, the guidelines and regulations laid down by the regulatory and other agencies may be followed. Better means of transport, well designed roads and utilisation of technological advancement for traffic control will be of more help than increasing the man power. It is the time for the State moves to a 'proactive phase' from a 'reactive phase' in road safety. The loss of more than lakhs of people and hospitalizations of millions across the state may make all concerned to develop and implement road safety on scientific and programmatic approaches. This requires political commitment, professionals involvement, or protective media and peoples participation. It is the time to act.

REFERENCES

- Agarwal A, Socio Demographic Profile of Road Traffic Accident Victims Admitted at Emergency Surgical OPD of a Tertiary Care Hospital. *Journal of Post Graduate Medicine, Education and Research* 2012 January-March; 46(1), 2012, 15-18
- Bener A, Burgut H, Sidahmed H, Albuza R, Sanya R, Khan WA, Road Traffic Injuries and Risk Factors. *California Journal of Health Promotion*, 7(2), 2009, 91-100.
- Gururaj G, Kolluri SVR, Traumatic Brain Injury, *National Institute of Mental Health and Neuro Sciences*, 18(1), 2015, 66-70.
- Hassen A, Godesso A, Adebel, Grima E, Risky Driving behaviors for Road Traffic Accidents among Drivers in Mekele City, Northern Ethiopia, *BMC Research Notes*, 4, 2011, 535.
- Mohan D, Road Traffic Injuries – Neglected Pandemic, *Bulletin world Health Organization*, 81(9), 2003, 884-5
- Nilambar Jh, Epidemiological Study of Road Traffic Accident Cases: a Study from South India. *Indian Journal of Community Medicine*, 29(1), 2004, 20-24.
- Park K, Epidemiology of Chronic Non Communicable Diseases and Conditions. Park's Textbook of Preventive and Social Medicine, 22nd Ed. Jabalpur, India: M/s Banarasidas Bhanot Publishers; 2012, 374-382
- Pramod KV, Epidemiology of Road Traffic Injuries in Delhi; Result of a Survey. *Regional Health Forum, Delhi. WHO-SEAR*, 1, 2008, 1, 4-14.
- Shrivastava KP, Sinha MK, Lala SK, Fatal road accidents. An Analysis of One Hundred Cases, *Journal of Indian Academy of Forensic Sciences*, 17(1), 1978, 51-6.

www.jchps.com

Journal of Chemical and Pharmaceutical Sciences

Sunder Lal, Adarsh, Pankaj, Textbook of Community Medicine. 3rd Edition. CBS Publishers & Distributors Pvt Ltd, New Delhi: 2008, 588

Suryakanth AH, Text Book of Community Medicine with Recent Advances, 2nd Edition: 590.

The Epidemiological Study of Road Traffic Accidents|| Geneva. WHO Regional Publications European Series, 2, 1976.