

ROAD SAFETY AWARENESS INDEX & ROAD USER BEHAVIOR- A CASE STUDY AT KAZHAKKOOTAM

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ABSTRACT

This article reports the results of a case study of road user characteristics with regard to road safety. The two main characteristics considered were road user awareness and road user behavior. Influence of Road user awareness on road safety was studied. Questionnaire survey method was done to find the influence of age and educational qualification on awareness of road users and developed Road Safety Awareness Index (RSAI). It is found that age and educational qualification are not completely deciding factors of road user awareness. To determine the reasons for traffic violation, road user behavior observation surveys were done. It is also tried to cross examine whether any other authentic factors which enhance traffic violations, previous accident history and enforcement measures were taken as factors. And the authors could find out a strong relation among them.

NOMENCLATURE

RSAI – Road Safety Awareness Index

AI - Awareness Index

1.INTRODUCTION

Road traffic safety refers to methods and measures for reducing the risk of a person using the road network being killed or seriously injured. The users of a 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 involve drunken driving, over speeding, jumping the red lights, lane violation, not wearing seat belts, etc. In this background it is of paramount importance to continue the road safety awareness targeting the road users and is fundamental for developing a bottom-

up approach for inculcating and developing a sense of responsibility about various aspects of road safety.

The main factors of road safety are the vehicle, road, traffic, road user and the environment. In this paper the road user influence in road safety has been studied. It includes two factors such as road user behavior and road user awareness.

Road user error is believed to be a factor in 95 percent of all road accidents, improving road user behavior should always be priority. Ensuring road safety means ensuring safe roads, safe people, safe vehicle and safe speed.

Our state has recorded the third highest number of road accidents in the whole of the country after Maharashtra and Tamil Nadu. On an average, 100 road accidents take place in a day, resulting in death of at least 11 persons and injuries and /or hospitalization of 130 persons every day in the State.

The Details of traffic accidents detected during last three years in the Kazhakkootam junction in Kerala is listed below. The major reasons are driving without helmet, without seat belt, over speeding, rash and negligent driving, drunken driving and driving without license. The data corresponding to the years 2010, 2011, 2012 are listed below.

TABLE 1. DETAILS OF ROAD ACCIDENTS IN KAZHAKKOOTTAM.

Year	Over speed	Rash & negligent driving	Drunken driving	Without Helmet	Without seat belt	Without license	Others
2010	112	162	398	632	46	26	1514
2011	120	181	499	745	53	42	2110
2012	142	235	327	1181	147	63	2746

Source: NATPAC

From the table it is clear that the major reason for accidents is road user faults. For providing proper remedial measures, it has to be found out whether lack of awareness or wrong behavior is the cause.

Scope of the work

Road accident is considered to be the third major cause of deaths in the State After heart ailments and cancer. Nearly 70% of head injury cases admitted to Medical College hospitals in the State is reportedly caused due to traffic crashes. The State has recorded the third highest number of road accidents in the whole of the country after Maharashtra and Tamil Nadu. The accident rate of Kerala in 2012 is 36,174 (source : Accident data, Kerala Police Department). However with concerted efforts taken by all the concerned agencies the rate of accident in absolute and relative terms decreased in Kerala during the last three years. On an average, 100 road accidents take place in a day, resulting in death of at least 11 persons and injuries and /or hospitalization of 130 persons every day in the State. This is a very serious health problem of the State. As road user error is believed to be a factor in 95 percent of all road accidents, improving road user characteristics should always be priority. Hence the paper deals with the influence of age and educational qualification of the road users on their road safety awareness and the reasons for the wrong road user behavior other than their socio economic conditions.

Objectives

The main objectives of this paper are:

- To find out the influence of age and educational qualification of the road users on their road safety awareness.
- To find out the awareness index of road users.
- To find out the reasons for the wrong road user behavior other than their socio economic conditions. To Change attitudes and beliefs to
- more positive road safety approach.

2.METHODOLOGY

To find out the influence of age and educational qualification of various road users on the road safety awareness and their awareness index, the authors selected questionnaire survey method. To determine the reasons for traffic violations, road user behaviour observation surveys were chosen. For these studies road users had been classified as pedestrians, two wheelers, drivers and passengers. And different questionnaires were prepared for each type of road user. Further categorization of each group was done based on age group and educational qualification for questionnaire survey.

Then the location of the study has been selected with regards to some criteria such as previous accident data, local investigation, etc. Off peak time is selected for the study because, the main reason for the violation at peak hours is the traffic congestion hence it cannot be related with behavior. For questionnaire survey, sample size of each category of the group was selected as 100. From the survey results, the more important questions with variation answer variation of more than 10% were selected for finding out road safety awareness index of each category of the groups. For finding the road user behavioral influence on road safety, total of 250 samples were taken.

Data collection

The road user safety and accessibility survey methodology involves the following tasks:

1. Identify the site for the survey based on road user crash history, community complaints and local investigation.
2. Obtain site characteristics such as crash data.
3. Review the crash data.
4. Entrance meeting with local traffic representative to obtain background (local) information about the site and reasons for the survey.
5. Initial inspection of the site.
6. Conduct road user questionnaire survey and road user behaviour observation survey.
7. Review the results from the road user questionnaire survey and road user behaviour observation surveys.
8. Find out the road safety awareness index for each category of group and road safety behavioural factors.

Specifications

- Conducted questionnaire surveys and user behaviour observation surveys at Kazhakkoottam.
- The target groups are two wheelers, drivers, passengers and pedestrians.
- The observation surveys were taken place during weekday from 10:00 am to 4:00pm on ten days. The timing is non peak hours since the road user behaviour can be reviewed more accurately, because at peak hours the main factors are the time and congestion.
- The questionnaire surveys were to cover a range of age groups and educational qualifications.
- Road users were classified based on age as less than 12 to 17 years, 18 to 22 years, 23 to 30, over 31 to 45, 45 to 60 and above 60.
- And they are also categorised based on qualification as below SSLC, SSLC, plus two, degree, P G and Professionals.

- User behavioural observation survey was to find out random factors of wrong road user behaviour.

3. ANALYSIS AND INFERENCES

Analysis of questionnaire survey

For the analysis there are two categories such as age and educational qualification. The awareness of two wheelers, drivers, pedestrians, public and passengers are found out with the help of questionnaire survey. The age is classified in to 6 groups as 12-17, 18-22, 23-30, 31-45, 46-60 and above 61. The graph has been plotted with the percentage of individuals those are not aware of the selected question in each category of age group.

a) Questions chosen for the analysis of two wheelers' awareness are:

1. Left side over taking is correct
2. one way riding during night is not necessary
3. U turn at any place is allowed.

b) Questions chosen for the analysis of passengers' awareness are:

1. Both the driver and the person in front seat need to wear seat belt.
2. Opening left side door of the vehicle.
3. Walk along the left side of the road.

c) Questions chosen for the analysis of driver awareness are:

1. Sight distance is more in curves than on straight road.
2. Controlling speed according to the sight distance is safe.
3. 60kmh is the speed limit in school premises.
4. At zebra lines vehicles have got more preference.

d) Questions chosen for the analysis of pedestrians' awareness are:

1. Both the driver and the person in front seat need to wear seat belt.
2. Opening left side door of the vehicle.
3. Walk along the left side of the road.

Calculation of RSAI of road users

The method of RSAI calculation is given in equation (1)

$$RSAI = I * C * N \quad (1)$$

I : Importance of Question

C: Crash intensity due to unawareness

A: Awareness

Weightage:

1. Importance of Question

Road safety awareness	1
Road safety measures	2
Road safety rule	3
2. Crash intensity due to unawareness

Minor 1	
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- Moderate 2
- Major 3
- 3. Awareness
 - Aware 1
 - Not aware 0

TABLE 2 . AGE WISE RSAI OF DIFFERENT ROADUSER GROUPS

Age Group	RSAI			
	2 wheeler	Driver	Passengers	Pedestrians
18 – 22	20.2	12.2	11.1	5.4
23 – 30	21.7	11.8	11	5.6
31 – 45	19.5	10.9	10.1	5.5
46 – 60	21.2	9.1	10	5.5
ABOVE 60	15	7.6	9.5	5.7

Based on age categorization for two wheelers the awareness index (AI) was almost equal. A small decrease in AI was observed in case of age group above 60, this may be due to lack of awareness of road rules and signs.

For pedestrians, there observed no regular pattern in AI still maximum awareness was observed in case of age group 12-17 followed by road users of age above 60. This may be due to the reason that pedestrian comprises more of school going children and old people so are more aware of the pedestrian road rules.

For drivers, the maximum AI was in case of 18-22 followed by 23-30 age group and further decrease in index as age increase. This may due to lack of driving experience so they are more careful in driving and that they are more familiar with the road signs and road rules. For passengers, AI for 12-17 was maximum and decreases with age. This is due to the fact that higher age group travels more by private vehicle. The decrease in AI in age group above 60 may be due to the physical weakness. Also this variation may be due to road safety classes provided at educational institutions.

TABLE 3. QUALIFICATION WISE RSAI OF DIFFERENT ROAD USER GROUPS

Qualification	RSAI			
	2 wheeler	Driver	Passengers	Pedestrians
Below SSLC	19.3	10	9.5	5.4
SSLC	18.1	11.8	9.2	5.4
Plus two	21.6	12.9	9.9	5.5
Graduates	21.2	11.2	9.6	5.3
P g	23.25	8.4	10.6	5.6
Professionals	26	12.7	10.7	5.2

For two wheelers the AI was almost of same value. Comparatively a larger value was for AI was for professionals.

For drivers the AI was found least for graduates and below SSLC.

In the case of passengers AI was higher with professionals and least in case of those under below SSLC.

In case of pedestrians the AI was found maximum for graduates.

Analysis of road user behavior

Information about awareness, accident history and penalization of violated users are listed in the table 4. And reasons of traffic violations obtained from road users are listed in the table 5

TABLE 4. INFORMATION ABOUT AWARENESS, ACCIDENT HISTORY AND PENALISATION OF VIOLATED USERS

VIOLATION	AWARENESS		ACCIDENT HISTORY				PREVIOUS PENALTY/WARNING	
	YES	NO	NO	NO INJURY	MINOR INJURY	MAJOR INJURY	YES	NO
Not using helmet	100	0	62.4	23.6	7.2	6.8	26.4	73.6
Not using seat belts	100	0	56.8	22.4	17.6	3.2	11.6	88.4
Illegal parking	66.8	33.2	75.2	22	2.8	0	8	92
Left side over taking	73.2	26.8	63.6	19.2	9.2	8	13.6	86.4
Improper use of indicator	86	14	71.2	14.8	14	0	0	100
Waiting for bus on pavement	87.2	12.8	86.8	12	1.2	0	0	100
Opening right side door	69.2	30.8	58	2	38	2	0	100

TABLE 5. REASONS OF TRAFFIC VIOLATIONS OBTAINED FROM ROAD USERS

VIOLATION	REASON (IN %)		
Not using helmet	Local road user	Uncomfortable	Head ache
	64.8	22.8	12.4
Not using seat belts	Local	Lack of easiness	Not specified
	52.4	35.6	12
Illegal parking	Less supply	Temporary	Not specified
	79.6	17.2	3.2
Left side over taking	To gain time	Incorporated front vehicle	No specified
	49.6	33.6	16.8
Improper use of indicator	Unnecessary area	Forgotten	Not specified
	63.2	31.2	5.6
Waiting for bus on pavement	Curiosity	Hurry	Not specified
	33.6	44	22.4
Opening right side door	Hurry	Opened carefully	Not specified
	40	41.2	18.8

- About 83.2 percent of road safety violators were aware of that rule or regulation.
- About 67.7 percent of the road users didn't have any accident history with regard to the violated rule or regulation, so they are not aware of its gravity.
- The charts reveal that about 93.1 percent of violators didn't get any penalty yet. So poor enforcement measure is another reason for traffic violations.
- There are so many reasons of traffic violations were explained by road users. They are user related, and road and traffic related.

- User related can be minimized by providing proper awareness programmers and the later can be compensated by the authorities.

4. CONCLUSION

After the analysis the inferences made for age wise classification is that there is less awareness level for old people as a driver but as a pedestrian and passenger much higher level of awareness was observed. Younger age group showed a much higher level of awareness and this may be due to the road safety awareness classes conducted and hence the familiarity of road rules and signs. In case of qualification wise analysis professionals showed a good level of awareness though as a pedestrian they showed the least awareness level. But people with SSLC qualification showed on an average a good level of awareness level; hence in essence age and educational qualification have no influence on the road safety awareness which cannot be taken as a deciding factor of traffic violations. By analyzing road user behavior of people who violated the rules, about 83.2% were aware of the rules. So awareness has no major influence in traffic violation. It was tried to cross examine whether any other real factors which enhances wrong road user behaviors like previous history in accident and in penalty. And a strong relation was found among them. About 93.1% of violation case had not been penalized before. It discloses that lack of enforcement measure is responsible for violation. In 67.7% cases, road users were not involved in any type of accidents so they do not know the significance of the traffic laws and rules. There are other factors to be considered for finding a real correlation on the matter like driving experience, familiarity of road etc. So the study is not complete and has to be continued.

As a mitigation measure the authors suggest public awareness classes for all sections of people no matter age or social status or educational qualification and the importance of obeying the rules should be made understood, also strict enforcement measures shall be taken as an initial step.

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