



Knowledge regarding prevention of road traffic accidents: a descriptive cross-sectional study in Kashmir

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Abstract

Background: Road traffic accidents (RTAs) are a major global health concern, and young adults are one group that is especially at risk. Approximately 1.3 million people die in road accidents each year, and another 20 to 50 million get non-fatal injuries that result in lifelong disability. Among those aged 5 to 29, these accidents are the leading cause of death. The purpose of this study is to evaluate university-bound students' awareness of how to prevent traffic accidents.

Methods: A cross-sectional analytical research design using a quantitative approach was used to gauge students' understanding of how to prevent road traffic accidents (RTAs). Data collection took place at the Islamic University of Science and Technology, specifically focusing on students from various departments. A multi-stage cluster-level sampling technique was employed, resulting in a sample size of 613 participants.

Results: Findings indicated that university students exhibited a moderate level of knowledge regarding road safety (77%), with scope for enhancement. The average knowledge score stood at 16.18 out of 30. On average, participants correctly answered around 54% of the questions. Educational attainment significantly influenced knowledge levels, while factors such as age, gender, family status, economic standing, and locality demonstrated no significant correlations with road safety awareness.

Conclusion: In conclusion, the study finds that most of the participants had a moderate understanding of how to prevent road traffic accidents. Additionally, educational background emerged as a significant determinant of participants' awareness levels.

Keywords: road traffic accidents, prevention knowledge, university students, Kashmir, cross-sectional study, traffic safety awareness, educational impact

Introduction

Road traffic accidents constitute a prominent and pervasive global concern within the realm of public health, engendering substantial morbidity and mortality outcomes [1]. They incur a considerable loss of human lives, incite economic detriment, and impose a burden upon healthcare infrastructures [2]. Approximately 1.3 million people die in road accidents each year, and another 20 to 50 million get non-fatal injuries that result in lifelong disability. The United Nations (UN) aims to halve these incidents



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Evidence in Context

- Assesses awareness among university students in the Indian state of Jammu and Kashmir.
- Finds moderate road safety knowledge with an average score of 16.18 out of 30.
- Education level significantly impacts knowledge; age, gender, and economic status do not.
- Suggests that improved educational programs could enhance road safety awareness.
- Recommends further research to develop targeted educational interventions.

To view Article



By 2030. Such accidents are the top-ranking cause of death among 5-29-year-olds. Over 50% of deaths affect vulnerable road users like pedestrians, cyclists, and motorcyclists. Low- and middle-income nations, with 60% of global vehicles, suffer 93% of these fatalities, costing 3% of Gross Domestic Product (GDP) [3].

Road traffic safety trends vary across different countries: In China, road traffic accidents have been a major concern, with a significant increase in the number of motor vehicles leading to frequent accidents and a high risk of road traffic safety [4]. In Uganda, motorcycle taxis have become a growing contributor to road traffic injuries, with an increase in fatal accidents involving motorcycles [5]. Ukraine emphasizes the importance of road safety, with traffic lights playing a crucial role in regulating traffic and preventing accidents [6]. The development of autonomous vehicles and intelligent transportation systems is seen as the next stage in improving road safety worldwide [7]. State legislative actions in the United States have focused on various aspects of highway safety, including occupant protection, distracted driving, impaired driving, and pedestrian and bicycle safety [8].

Recent analyses of road traffic safety trends in India reveal notable insights. Primarily, a substantial gender discrepancy is evident in accident data, with males exhibiting a higher fatality proportion relative to females[9]. Furthermore, the city of Bhubaneswar in Odisha manifests an escalation in road accidents, notably concentrated at pivotal intersections and high-risk zones [10]. Additionally, a state-level investigation in India highlights that walking, cycling, and intermediate public transportation modes correlate with diminished road fatality risks, whereas motorized two-wheelers, cars, and buses are associated with heightened risks [11]. Significantly, proactive and economically viable measures encompassing road safety audits emerge as avenues to enhance safety within the Indian road network [12]. Lastly, the reinforcement of collision surveillance coupled with the establishment of a comprehensive national repository for law enforcement reports emerges as a strategic mechanism for informed policymaking to bolster road safety management in the Indian context [13].

The knowledge level on the prevention of road traffic accidents varies among different populations. In a study conducted among secondary school children, it was found that a self-educational module significantly increased their knowledge of traffic accident prevention [14]. Another study focused on motorbike riders found that while they had average knowledge of traffic signs and signals, their practice in following these signs and signals was poor [15]. It has also been that adolescent students' understanding of how to prevent traffic accidents on the road was enhanced by an organized teaching program [16]. A study on elementary school students showed that their knowledge and performance in preventing road traffic injuries were undesirable, highlighting the need for more appropriate prevention programs [17]. Road traffic safety knowledge and practice differed among male adolescents living in urban slums, with a considerable proportion of them operating vehicles without a license [18].

Since the majority of road traffic accident fatalities are associated with younger populations, the purpose of this study is to investigate university students' awareness levels regarding the prevention of these incidents [3]. This study marks a significant breakthrough in adolescent research by not only expanding the sample size but also by examining the adolescent population in Kashmir, an area previously untouched by research in this field. Also, with the rapid advancements in technology and changes in transportation trends, there is a need for updated research to reflect these evolving road safety challenges.

Methods

Research Methodology

A cross-sectional research approach was used in this study.

Research setting

The study was conducted at the Islamic University of Science and Technology which is situated in Awantipora, Jammu, and Kashmir. It is located 25 km away from the summer capital of the state, Srinagar.

Target population

The study population consisted of students with or without a driving license, studying in different departments of the Islamic University of Science and Technology

Sample size and sampling technique

Multi-stage cluster-level sampling technique was employed to divide the population into three sampling units. In the Primary Sampling Unit (PSU), the population was divided into six clusters (Six schools in the university) and in the Secondary Sampling Unit (SSU) population was further divided into different clusters (Departments under six schools) Lastly in Ultimate Sampling Unit (USU) six departments (clusters) were chosen from Secondary Sampling Unit (SSU) to select the representative sample. The study was limited to 1 department from each of the six schools of the university. Subsequently, the sample size was reduced using basic random sampling. This sampling process was repeated until the requisite minimum sample size was obtained.

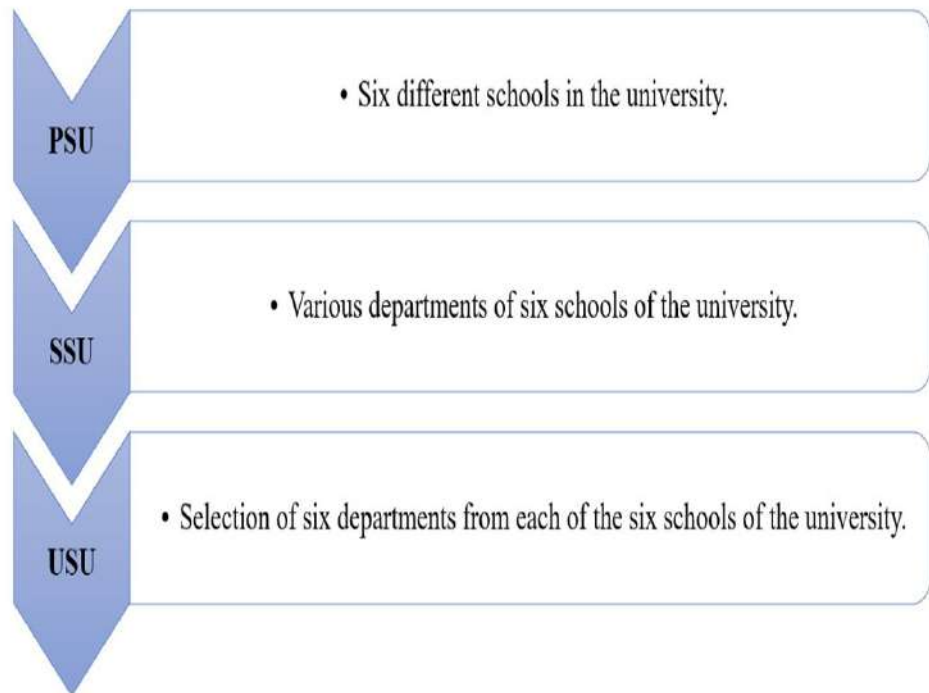


Figure 1: Sampling strategy of the study

Raosoft software determined the minimum required sample size to be 362, with a 95% confidence level, a 5% margin of error, assuming an adequate awareness regarding the prevention of road traffic accidents as 50%, and an estimated population size of 6000. A total of 613 samples were obtained after data collection.

Tools utilized

To facilitate data gathering, a structured questionnaire was adopted from a study conducted by *Derfika RJ* [19]. The tool was disseminated to students via Google Forms and data collection was completed in a month from May-June 2023.

The questionnaire consisted of multiple-choice questions which are divided into two sections with a total of 30 items. Section A comprised of socio-demographic profile, while section B had the items in the following domains: Foundational information, Road hazard & mitigation, Mishap & emergencies, and Traffic symbols & signs

Sociodemographic Characteristics: This section gathered information on participants' age, gender, educational level, family status, economic status and locality.

Knowledge on RTA: The second section assessed the participants' awareness of the prevention of road traffic accidents. The questions covered a wide range of topics, including fundamental knowledge, pedestrian crossings, road risk and prevention, emergencies and accidents, and traffic signs and symbols.

Scoring key:

There were thirty questions on RTA knowledge in the tool.

01. A score of one was awarded for the right response.

02. The correct response received a zero score.

Thus, the total score was 30

To understand the participant's knowledge scoring was done as per the following pattern enumerated in Table 1.

Table 1: Categorization of knowledge levels of the study participants

SNo.	Knowledge Score	Total	Knowledge Level
1.	0-10	<33%	Inadequate knowledge
2.	11-20	34-66%	Moderately adequate knowledge
3.	21-30	67-100%	Adequate knowledge

Analysis

The data were inputted into the Epi Data® software version 3.1 and analysed employing SPSS® version 26. Data was depicted through frequency distributions and percentages, measures of central tendency and dispersion. To examine associations between variables, we conducted chi-square tests. A result was considered statistically significant if the p-value was less than or equal to 0.05.

Results

Description of demographic profile of subjects

Most of the participants were aged between 21 and 25 years (83%), females (58%) and hailed from rural backgrounds (70%)(Table 2).

Table 2: The participants' socio-demographic profile

Variables	Options	Percentage (%)
Age	15-20 years	11
	21- 25 years	83
	26-30 years	7
	Above 30 years	0
Gender	Male	42
	Female	58
	Transgender	0
	Others	0
Educational level	10+2	3
	Diploma	1
	Undergraduate	73
	Postgraduate	23
Family status	Extended family	15

	Nuclear family	80
	Other	4
Economic status	High Income	13
	Middle income	85
	Low income	2
Locality	Rural	70
	Urban	30

Description of Level of Knowledge

In the present study, 77% of the participants showed a moderate level of knowledge regarding road traffic accident prevention, while 14.4% had adequate knowledge (Table 3). The mean knowledge score was 16.18 ± 4.16 .

Table 3: Frequency & percentage distribution level of knowledge

Criteria for knowledge score	
Level of Scores N= 613	Percentage
Inadequate knowledge (0-10)	8.6
Moderate knowledge (11-20)	77
Adequate knowledge (0-10)	14.4
Maximum =30, Minimum=0	

Association of scores and demographic variables

The education level of participants was significantly associated with knowledge levels regarding road traffic accident prevention. There is no discernible relationship between the level of scores and the other demographic variables (gender, age, family status, location, and economic position)(Table 4).

Table 4: Association of knowledge scores with demographic variables

Demographic profile		Levels of knowledge (N=613)			Association of knowledge scores with demographic variables				
Study Variables	Options	Adequate knowledge	Moderate knowledge	Inadequate knowledge	Chi Test	P Value	Df	Table Value	Result
Age	15-20 years	12	43	11	9.181	0.057	4	9.488	Not Significant
	21- 25 years	72	397	37					
	26-30 years	4	32	5					
	Above 30 years	0	0	0					
Gender	Male	29	208	18	5.163	0.076	2	5.991	Not Significant
	Female	59	264	35					
	Transgender	0	0	0					
	Others	0	0	0					

	10+2	5	8	6					
	Diploma	0	5	0					
Educational level	Undergraduate	68	351	31	22.351	0.001	6	12.592	Significant
	Postgraduate	15	108	16					
	Extended family	14	70	11					
Family status	Nuclear family	73	380	40	3.595	0.464	4	9.488	Not Significant
	Other	1	22	2					
	High Income	8	65	6					
Economic status	Middle income	75	398	46	5.803	0.214	4	9.488	Not Significant
	Low income	5	9	1					
	Rural	64	335	33					
Locality	Urban	24	137	20	1.988	0.370	2	5.991	Not Significant

Discussion

The current study assessed participants' road safety knowledge and explored associations with demographic variables. Most of the participants in our study were between the ages of 21 and 25. (83%), reflecting the predominantly young population in our sample. Gender distribution skewed toward females, with 58% of respondents identifying as females and 42% as males. Regarding educational background, a substantial proportion of participants held undergraduate degrees (73%), followed by postgraduate qualifications (23%). A smaller percentage had completed 10+2 (3%) and even fewer had diploma qualifications (1%). Family status showed that most participants came from nuclear families (80%), with a minority belonging to extended families (15%) and other family statuses (4%). In terms of economic status, the majority fell into the middle-income category (85%), with 13% having high incomes and 2 % having low incomes. Lastly, locality revealed that 70% of respondents resided in rural areas, while 30% lived in urban areas. Our analysis of overall knowledge levels revealed several key findings. Participants, on average, possessed a moderate level of road safety knowledge (77%). The mean knowledge score percentage, at 53.95%, indicated that participants answered approximately 54% of questions correctly.

Our analysis of overall knowledge levels revealed several key findings. Participants, on average, possessed a moderate level of road safety knowledge (77%). In a similar study, Suresh K. Sharma and Parul Saini studied the knowledge, attitudes, and behaviors of Uttarakhand health science students regarding road traffic safety laws. 58% of participants had a moderate level of knowledge, according to the study [20]. Shaji et al. carried out a similar study to evaluate teenagers' attitudes and knowledge of traffic safety regulations. According to this study, the mean knowledge score percentage of the students was 64.17%, meaning that about 80% of them had average knowledge [21]. AH Al-Zahrani carried out a comparable study on the attitudes and knowledge of health sciences college students in the Taif region of Saudi Arabia regarding traffic laws. In this study, 120 people participated, with the lowest and highest ages being 18 and 23, respectively. According to this study, 75% of students had a moderate level of knowledge [22].

Association with demographic variables showed that participants with different educational backgrounds exhibit varying levels of knowledge. Postgraduate participants tend to have higher knowledge scores, while those with a 10+2 educational level have the lowest scores. Also, age, gender, family status, economic status locality don't appear to be significant factors influencing knowledge levels in this study. Similar research was done on secondary school student's knowledge and application of traffic safety laws and regulations by Sujeeta Baniya and Arati Timilsina. The results of this study showed that students' knowledge of road safety was on the moderate side. Furthermore, there was no correlation found between knowledge level and sociodemographic

Factors such as age, gender, and place of residence [23]. Since the study was undertaken in a single university, the generalizability of the findings to other settings and institutes is limited.

As the majority of participants held undergraduate degrees, nursing educators might need to develop road safety curricula that are adaptable to the educational level of the target audience, ensuring content is both accessible and challenging. Encouraging collaboration with professionals from other disciplines, such as traffic safety experts and educators, to develop comprehensive road safety programs. The study found the educational level to significantly influence road safety knowledge; nurses should consider the educational background of their patients when delivering road safety information. Nursing researchers can delve deeper into the influence of educational levels on road safety knowledge. Assessing the effectiveness of educational interventions on road safety knowledge can provide valuable insights. Further investigation and addressing the factors, more specifically the environmental factors, that may contribute to road safety practices to gain a deeper understanding and reduce road traffic accidents, needs to be undertaken.

Conclusion

Road safety knowledge is a crucial factor in preventing accidents, minimizing injuries, and saving lives. This study sheds light on the state of road safety knowledge among participants and offers valuable insights into the influence of demographic factors. The maximum number of study participants exhibited a moderate level of road safety knowledge, participants represented a diverse demographic landscape, with a predominantly young population. Educational level emerged as a significant predictor of road safety knowledge. It is recommended to develop targeted road safety education programs, particularly focusing on individuals with lower educational levels, as educational background was found to significantly influence road safety knowledge.

Supporting information

None

Ethical Considerations

The Islamic University of Science & Technology (IEC-IUST Protocol RP/024/2023) provided ethical approval for the study to guarantee that it complies with ethical standards and protects the participants' rights and welfare.

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Additional information

No additional information is available for this paper.

Declaration of competing interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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