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Original Research Article

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES OF ROAD SAFETY AMONG HIGHER SECONDARY SCHOOL STUDENTS IN RURAL FIELD PRACTICE AREA OF MAHADEVAPPA RAMPURE MEDICAL COLLEGE, KALABURAGI

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ABSTRACT

Background: Road traffic injuries pose a major global public health threat, disproportionately affecting adolescents in developing countries due to risk-taking behaviors and poor infrastructure. India contributes 11% of global fatalities (>150,000 deaths yearly), with aged 15-49 heavily impacted. Despite good safety knowledge, persistent KAP gaps undermine driving practices among rural students. **Objectives:** (i) To study the sociodemographic profiles of the study population, (ii) To study Knowledge, Attitude and Practices of road safety rules and regulations in higher secondary school students.

Materials and Methods: A cross-sectional study was conducted in August and September 2025 among 159 students from two higher secondary schools. Participants were selected using convenience sampling based on willingness to participate. Data were collected using a pretested semi-structured questionnaire. The data were entered into Microsoft Excel and analyzed with SPSS version 25.

Results: In a cross-sectional study of 159 school students, road safety KAP levels proved satisfactory, with 82.4% demonstrating adequate knowledge, 98.9% favorable attitudes, and 77.9% safe practices, though traffic sign recognition lagged at 62.1% overall. Among 76 student drivers, strong compliance emerged in honking before overtaking (97.4%) yet helmet use remained suboptimal at 69.7%, with 92.1% driving without parental knowledge and 26.3% reporting prior accidents.

Conclusion: This study of 159 rural higher secondary students showed satisfactory road safety knowledge, attitudes, and practices. Gaps persisted in traffic sign recognition, overtaking, and protective gear use among drivers. Underage driving and one-third accident exposure highlight a knowledge-practice gap, necessitating school-based education, parental oversight, and rural traffic enforcement.

Keywords: KAP study, Road safety measures, Secondary school students, Traffic sign recognition.

INTRODUCTION

Road traffic injuries constitute a major public health problem globally, leading to substantial morbidity and mortality, particularly among young people in developing countries.[1] Adolescents and young adults, such as those in higher secondary schools, are vulnerable road users due to their developing cognitive and motor skills, risk-taking tendencies, and increased exposure to traffic environments.[2]

Understanding their knowledge, attitudes, and practices (KAP) regarding road safety is crucial to mitigate the risk of road traffic accidents (RTAs) and promote safer behaviours.

Knowledge of road safety rules provides the foundation for safe road use, while positive attitudes towards traffic regulations influence compliance and safe practices.[3] However, numerous studies have reported discrepancies between knowledge and actual behaviours among adolescents, with risky practices such as non-use of helmets and mobile phone distraction while driving remaining prevalent.[2,4,5] These gaps highlight the need for comprehensive KAP assessments to inform targeted interventions focused on education and enforcement.

Given that India accounts for nearly 11% of the global road traffic fatalities, with over 150,000 deaths annually and a significant proportion involving road users aged 15 to 49 years,[6] evaluating the knowledge, attitude, and practice of road safety measures among higher secondary students is both timely and essential. This demographic represents a critical segment of emerging road users, and their behaviour greatly influences overall traffic safety outcomes. Such assessments provide valuable insights that can inform policy directives, craft effective educational campaigns, and foster a safety culture in schools. This study aims to elucidate current patterns in road safety awareness and behaviour to support evidence-based improvements in adolescent road safety initiatives.

Objectives

The objectives of the study were as follows

1. To study the sociodemographic profiles of the study population.
2. To study Knowledge, Attitude and Practices of road safety rules and regulations in higher secondary school students.

MATERIALS AND METHODS

A cross-sectional study was conducted in Hebbal, the rural field practice area of Mahadevappa Rampure Medical College, Kalaburagi, targeting higher secondary school students over a two month period from August to September 2025.

Sample Size

A total of 159 students from two higher secondary schools in the rural field practice area were included (n = 159).

Sampling Method

Convenience sampling was used, including individuals meeting inclusion criteria and providing consent, over a two month period following ethical clearance from the Institutional Ethics Committee.

Study tools

A predesigned, pretested semi-structured questionnaire evaluated KAP on road safety among higher secondary students. The knowledge section had 6 multiple-choice items on traffic rules (driving age, helmet/seat belt laws, pedestrian side, rural speed limits, overtaking) plus 10 traffic sign interpretations, scored as adequate (>75%), moderate (50-75%), or poor (<50%).

The attitude section included 6 Yes/No items on safety norms (no mobile use while driving, helmet necessity, license requirement, seat belts, railway gates, no drink-driving). Practice section had (i) 7 Yes/No items for all (zebra crossing, sign obedience, helmet/seat belt use, driving status, accidents, road checking) and (ii) 7 items for drivers (parental knowledge, helmet while driving, honking, indicators, pedestrian stops, signs, accidents).

Methodology

The study received approval from the Institutional Ethics Committee, and permission was obtained from school authorities. Students were briefed about the study objectives and questionnaire, with informed consent secured prior to participation. Study variables encompassed general information, knowledge, traffic sign interpretation, attitude and practice questions on road safety. Participants were allotted 60 minutes to complete the self-administered questionnaire. This session also served as an opportunity to deliver a health education program on road safety measures to the students.

Inclusion Criteria

Students who were present on the day of data collection and willing to participate were included.

Exclusion Criteria

Students who were absent, unwilling to participate, or unavailable on the data collection day were excluded.

Statistical Analysis

Data was entered and compiled using Microsoft Excel, then analyzed with SPSS version 25.0. Descriptive statistics presented categorical variables as frequencies and percentages. Tabular and graphical representations (bar charts, pie charts) illustrated key findings such as KAP scores and sociodemographic distributions.

RESULTS

Among the 159 students, the largest age group was 15 years (30.2%), followed by 14 years (27.7%), 13 years (24.5%) and 16 years (17.6%). Females constituted a slight majority (54.7%) compared to males (45.3%). More than half of the participants were in 8th standard (52.2%), while 30.2% were in 9th and 17.6% in 10th. A majority of students belonged to nuclear families (71.1%), with 28.9% from joint families. According to the Modified B G Prasad classification, most students were from socioeconomic class IV (49.7%), followed by class III (42.1%) and class II (8.2%). [Table 1]

Table 1: Socio-Demographic profile of Students

Socio-Demographic profile	Frequency (n = 159)	Percentage
Age (in year)		
13	39	24.50
14	44	27.70
15	48	30.20
16	28	17.60
Gender		
Male	72	45.30
Female	87	54.70
Class		
8th	83	52.20
9th	48	30.20
10th	28	17.60
Family Type		
Nuclear	113	71.10
Joint	46	28.90
Socio-economic Status (Modified B G Prasad)		
II	13	8.20
III	67	42.10
IV	79	49.70

Of all students majority of students (55%) traveled to school as pedestrians, followed by private transport (27%) and public transport (22%), with only 6% using bicycles. [Figure 1]

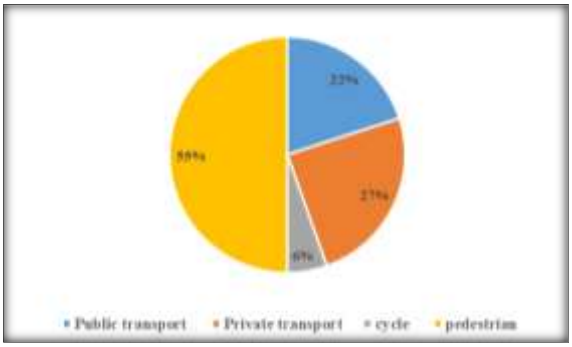

Figure 1: Mode of travelling to school by students

Overall KAP scores on road safety were high, with 82.4% of students showing adequate knowledge, 98.9% expressing positive attitudes and 77.9% reporting safe practices, while 62.1% correctly interpreted traffic signs, indicating relatively weaker performance in symbol recognition compared to other KAP domains. [Figure 2]

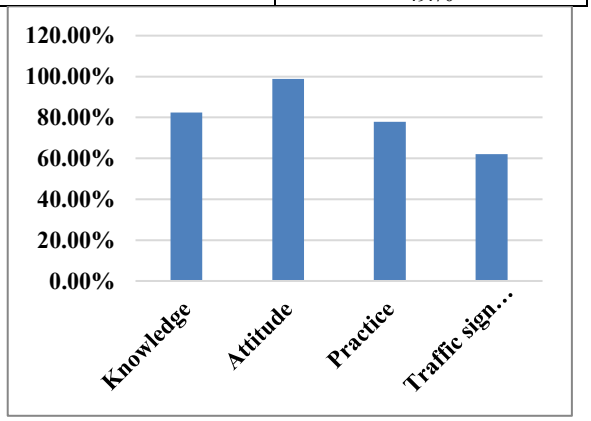

Figure 2: KAP & Traffic Sign Interpretation about road safety measures

All students demonstrated excellent factual knowledge of road safety rules, with 98.11% correctly identifying the minimum driving license age, 98.74% recognizing the preventive role of traffic police at signals, helmet/seat belt mandates, pedestrian side of the road, and rural speed limits in Kalaburagi; however, 84.28% knew the correct side for overtaking vehicles. [Table 2]

Table 2: Knowledge regarding road safety measures

Sl. No.	Questionnaire	Number of correct responses (n=159)	Percentage
1	Age to get driving license	156	98.11
2	Did presence of Traffic police at signals prevent Road Traffic Accident	157	98.74
3	Is wearing helmet and seat belt mandatory	157	98.74
4	Side of road used by pedestrians	157	98.74
5	Normal speed limit for driving in rural area of Kalaburagi	157	98.74
6	Side of the road one must overtake the vehicle is	134	84.28

Traffic sign interpretation varied widely, with high recognition for the Signal ahead sign (90%), Cycle prohibited (74%), pedestrian crossing (75%), no parking (86%), speed limit 50 (70%), no pedestrians (86%), and Playground Warning Sign (9%). Moderate recognition was noted for the hospital sign (28%) and Bus stop (33%), while 70% correctly identified the no honking sign. [Table 3]

Table 3: Knowledge regarding road safety measures

S. No	Traffic Sign	Traffic Sign	Number of correct responses (n=159)	Percentage
1		Signal ahead sign	143	90
2		Cycle prohibited	117	74
3		Hospital	45	28
4		Bus stop	52	33
5		No honking	111	70
6		Pedestrian crossing	120	75
7		No Pedestrian Sign	137	86
8		Speed limit 50	111	70
9		No parking	136	86
10		Playground Warning Sign	15	9

Among the 159 students, 58.49% of students exhibited adequate knowledge (>75% correct responses) on road safety measures, 33.96% had moderate knowledge (50–75%), and 7.55% showed poor knowledge (<50%). [Table 4]

Table 4: Knowledge level of students on road safety measures

Knowledge level	Number of students Frequency (n = 159)	Percentage
Adequate knowledge (>75% given correct answer)	93	58.49
Moderate knowledge (50-75% given correct answer)	54	33.96
Poor knowledge (<50% given correct answer)	12	7.55

All students recognized the need to avoid cell phones while driving and wear helmets on two-wheelers, with 100% also affirming seat belt compulsion. 99.37% viewed a valid driving license as essential, while 96.86% and 97.48% correctly opposed crossing closed railway gates and drink-driving, respectively. [Table 5]

Table 5: Attitude regarding road safety rules and regulations

Questionnaire	Number of correct responses (n=159)	Percentage
Should not use cell phones while driving a vehicle	159	100.00%
Wearing of helmets while driving two-wheeler is necessary	159	100.00%
Owing to driving license to drive a vehicle is necessary	158	99.37%
It is compulsory to put seat belt while you are in a moving car	159	100.00%
Should not cross closed railway gates	154	96.86%
Should we Drink and drive	155	97.48%

All students (100%) checked both sides before crossing roads. High compliance was observed for obeying road signs (96.2%) and using zebra crossings (86.2%). Helmet use during two-wheeler travel was reported by 75.5%, and seat belt use in four-wheelers by 73.6%. Nearly half (47.8%) drove vehicles, while 36.5% had prior road traffic accident exposure. [Table 6]

Table 6: Practice regarding road safety measures

Questionnaire	Number of correct responses (n=159)	Percentage
Do you use zebra crossing to cross roads	137	86.16%
Do you Obey the road signs and symbols	153	96.23%
Do you Wear helmet when traveling in two-wheeler	120	75.47%
Do you Wear seat belt when traveling in a four-wheeler	117	73.58%
Do you Drive vehicles	76	47.80%
Have you Exposed to a road traffic accident	58	36.48%
Do you look both side before crossing road	159	100.00%

Among the 76 student drivers, 97.37% consistently blew horns before overtaking and 94.74% obeyed road signs and symbols. Turn indicator use (86.84%) and stopping for pedestrians without signals or police (80.26%) showed strong compliance, though helmet use while driving two-wheelers was lower at 69.74%. Notably, 92.11% drove without parental knowledge, and 26.32% reported prior road traffic accident exposure. [Table 7]

Table 7: Practice regarding road safety measures who drive vehicles

Questionnaire	Number of correct responses (n=76)	Percentage
Drive without parents knowledge	70	92.11
Wear helmet when driving two-wheeler	53	69.74
Blow horn before overtaking	74	97.37
Use indicator before turning	66	86.84
Stop vehicle for pedestrians to cross even with no traffic signal or traffic police around	61	80.26
Obey the road signs and symbols	72	94.74
Exposed to road traffic accident	20	26.32

DISCUSSION

In the present study, the overall knowledge of road safety measures among students was high, with a larger proportion achieving adequate knowledge scores compared to earlier studies by Mary et al,[3] Swami et al,[7] Mahavar et al8 and Indumathy and Thenmozhi,[9] which reported adequate knowledge levels of 52%, 60%, 54% and 28% respectively. This suggests that recent efforts in school-based health education, mass-media campaigns and stricter enforcement may be enhancing cognitive awareness of key traffic rules such as licensing requirements, helmet and seat-belt use, and appropriate road behaviour.

When attitude was considered, students in our study expressed overwhelmingly positive beliefs towards safe road behaviour: most strongly endorsed the need for helmets, seat belts, valid driving licenses and avoidance of mobile phones and alcohol while driving, indicating an internalization of pro-safety norms that is more favourable than that reported in several earlier Indian studies. Such attitudes are critical because they reflect the motivational component of KAP, bridging the gap between mere awareness and genuine commitment to compliance.

However, the practice domain still showed important gaps, underscoring the classic discrepancy between what adolescents know, what they believe and what they actually do in real traffic environments. For example, although our findings showed better performance than Mary et al,[3] with only 47% of students under 18 years driving vehicles and 69.7% of them wearing helmets (vs 81% underage drivers and 52% helmet use in Chennai), underage driving remains unacceptably common and helmet usage are not yet universal.

In terms of specific practices, the proportion of students using indicators while turning was comparable to the 84% reported by Das et al,[10] suggesting that some safe driving behaviours, particularly those reinforced during two-wheeler training, have translated well from knowledge and attitude into routine action. Likewise, our students demonstrated better understanding and corresponding practice of correct overtaking side than those in studies by Basavaraju et al,[3] and Mahavar et al.[7] (2013), where 84% and 48% respectively knew the proper overtaking rule, indicating a more coherent KAP profile in this domain.

Knowledge and interpretation of traffic signs were also stronger in our study, more than three-quarters could correctly identify at least three standard traffic signs and 95% knew the correct colour sequence of traffic signals, figures that exceed those reported by Baniya and Timilsina,[10] and Salve et al.[11] This alignment of knowledge and practice in visual cue recognition suggests that repeated exposure to symbols in textbooks, traffic signs and media can effectively shape both cognitive understanding and real-world behaviour.

Overall, the KAP pattern observed, high knowledge, very favourable attitudes, but only partially translated into consistent safe practices highlights the need for sustained, behaviour-oriented interventions. Periodic, interactive school sessions that emphasize skills (helmet use, correct road crossing, demonstration of blind spots), peer-led campaigns that reinforce positive social norms, and parental counselling about the dangers and legal implications of underage driving could help convert the existing knowledge and attitudes into safer everyday practices among adolescents.

Recommendation

1. Enhance road safety education with interactive, practical sessions and peer-led activities to better connect knowledge with safe actions.
2. Encourage ongoing parent involvement and community support to strengthen safe behaviours and lower traffic injuries among youth.

CONCLUSION

This study of 159 rural higher secondary students revealed satisfactory levels of road safety knowledge, attitudes, and reported practices overall, including near-complete awareness of vital norms like minimum driving age and helmet/seat belt

requirements. Gaps remained evident in traffic sign comprehension, overtaking protocols, and regular protective equipment use, especially for student drivers. The high incidence of underage driving and over one-third accident exposure signals a key knowledge-practice mismatch, calling for ongoing school-focused safety programs, enhanced parental oversight, and robust rural traffic law implementation for young people.

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