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Knowledge, Attitude and Practice Regarding Road Safety Measures Among Adolescents in Selected Schools of Nalbari District, Assam, and Development of an Information Booklet

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Abstract: ***Background: Road safety is a major public health concern globally, particularly in India. Road traffic injuries are a leading cause of mortality, disability, and hospitalisation, imposing a substantial socioeconomic burden. According to the Road Accidents in India (2020) report, 3,66,138 road accidents were recorded, resulting in 1,31,714 deaths and 3,48,279 injuries. Adolescents are especially vulnerable, and road traffic injuries remain one of the leading causes of death among individuals aged 5-29 years. Aim: To assess the knowledge, attitude, and practice regarding road safety measures among adolescents in selected schools of Nalbari district, Assam. Methods: A quantitative survey approach with a descriptive correlational design was adopted. A total of 190 adolescents were selected using a systematic random sampling from three Government Higher Secondary Schools of Nalbari district, Assam. Data were collected using a structured self-administered questionnaire. Results: The mean knowledge score was 13.17 (SD ± 2.33), the mean attitude score was 38.27 (SD ± 7.66), and the mean practice score was 34.57 (SD ± 5.18). A weak positive correlation was observed between knowledge and attitude ($r = 0.165$, $p = 0.023$). A strong positive correlation was found between knowledge and practice ($r = 0.484$, $p < 0.001$), while a moderate positive correlation was observed between attitude and practice ($r = 0.351$, $p < 0.001$). Conclusion: The study reveals gaps between knowledge, attitude, and practice regarding road safety among adolescents. The findings highlight the need for targeted educational interventions and structured awareness programmes to promote safe practices and improve road safety behaviours.***

Keywords: Knowledge, Attitude, Practice, Road Safety Measures, Adolescents

1. Introduction

Road traffic accidents (RTAs) are a major global public health problem, contributing significantly to mortality, morbidity, and disability[1]. Adolescents (10-19 years) represent a vulnerable group, as this developmental stage is characterized by increased independence, risk-taking behaviour and exposure to road environments[2]. Globally, road traffic injuries are among the leading causes of death among individuals aged 5-29 years, imposing a substantial social and emotional burden[1].

In India, road safety remains a critical concern. According to the Road Accidents in India (2020) report, 3,66,138 road accidents were recorded, resulting in 1,31,714 deaths and 3,48,279 injuries. India accounts for a significant proportion of global road traffic deaths, with adolescents and young adults being particularly at risk. Despite various initiatives such as the '4Es' strategy- Education, Engineering, Enforcement, and Emergency care, the burden of road traffic accidents remains high[1], particularly among adolescents.

In Assam, road transport is the primary mode of mobility, and the increasing number of vehicles has contributed to a rising trend of road traffic accidents[3]. Adolescents, as active road users (pedestrians, cyclists, and passengers), are particularly at risk due to inadequate awareness, unsafe practices, and risk- taking behaviour[4].

Limited research is available on knowledge, attitude, and practice (KAP) regarding road safety among adolescents in this region, indicating a significant research gap. Understanding these aspects is essential for developing effective interventions and promoting safe behaviours. Therefore, the present study was undertaken to assess the knowledge, attitude, and practice regarding road safety measures among adolescents in selected schools of Nalbari district, Assam, and to examine the relationship between these variables.

Objectives

The objectives of the study were to:

1) Assess the knowledge, attitude, and practice regarding road safety measures among adolescents.
2) Determine the relationship between knowledge, attitude, and practice regarding road safety measures among adolescents.
3) Ascertain the association between knowledge, attitude, and practice with selected socio-demographic variables among adolescents.
4) Develop an information booklet regarding road safety measures.

Hypotheses

The following hypotheses were tested at 0.05 level of significance:

H_1: There is a significant relationship between knowledge, attitude, and practice regarding road safety measures among adolescents.

H_2: There is a significant association between knowledge, attitude, and practice with selected socio-demographic variables among adolescents.

2. Materials and Methods

A quantitative survey approach with a descriptive correlational design was adopted to assess the knowledge, attitude, and practice regarding road safety measures among adolescents.

The study was conducted in three selected Government Senior Secondary Schools of Nalbari district, Assam. The study population comprised adolescents studying in classes XI and XII. The accessible population was 800 students. A sample of 190 adolescents was selected using a systematic random sampling technique.

The sample size was calculated using Cochran's formula at a 95% confidence level (z = 1.96) which yielded a minimum sample size of 152. Considering possible non-response and feasibility, the final sample size was increased to 190.

Inclusion criteria included students who were willing to participate in the study, while those who were absent or ill during data collection were excluded.

Data were collected using a structured self-administered questionnaire developed based on the study's objectives, review of literature, and expert opinions. The tool consisted of sections on socio- demographic variables, knowledge questionnaire, 5-point Likert attitude scale, and 4-point Likert expressed practice scale.

The variables of the study included knowledge, attitude, and practice regarding road safety measures as research variables, and selected socio-demographic variables such as age, gender, educational standard, stream, religion, parental education, occupation, monthly family income, type of family, number of siblings, vehicle ownership, mode of transportation, previous knowledge of road safety, and history of road traffic accidents as demographic variables.

Content validity was established through expert review by specialists in Child Health Nursing, Community Health Nursing, Paediatric physician, and Orthopedic physician. Necessary modifications were made based on their suggestions. The tool was prepared in English and translated into Assamese, and linguistic validity was ensured.

Reliability of the tool was established using the Guttman split-half method for the knowledge section (r = 0.791), and Cronbach's alpha for attitude (r = 0.819), and practice (r = 0.802), indicating good internal consistency.

A pilot study was conducted among 30 students to assess the feasibility and reliability, and no major modifications were required.

Data collection was carried out from 5th June 2023 to 30th June 2023. The investigator personally administered the questionnaire after explaining the purpose of the study and obtaining informed consent. Each session lasted approximately 60-90 minutes.

Ethical approval was obtained from the Institutional Ethics Committee of Regional College of Nursing, Guwahati. Administrative permission was obtained from the Inspector of Schools, Nalbari district. Confidentiality and anonymity were maintained, and participants were informed of their right to withdraw at any time.

Data were analyzed using descriptive and inferential statistics. Descriptive statistics included frequency, percentage, mean, and standard deviation. Inferential statistics included Pearson's correlation coefficient, Chi-square test, and Fisher's exact test. A p-value of < 0.05 was considered statistically significant.

3. Results

Table 1: Socio-demographic Characteristics of Adolescents

Variable	Category	Frequency (f)	Percentage (%)
Age (years)	16-17	112	58.95
	18-19	78	41.05
Gender	Male	131	68.95
	Female	59	31.05
Class	11th	98	51.58
	12th	92	48.42
Stream	Science	72	37.89
	Commerce	24	12.63
	Arts	94	49.47
Religion	Hindu	87	45.79
	Islam	102	53.68
	Christian	1	0.53
Father's Education	Profession / Honours	2	1.05
	Graduate	24	12.63
	Intermediate / Diploma	6	3.16
	High School	111	58.42
	Middle School	19	10
	Primary School	26	13.68
	No formal education	2	1.05
Mother's Education	Graduate	5	2.63
	High School	96	50.53
	Middle School	36	18.95
	Primary School	43	22.63
	No formal education	10	5.26
Father's Occupation	Professional	12	6.32
	Technician	4	2.11
	Clerical	19	10
	Skilled worker / shopkeeper	43	22.63
	Skilled agriculture / fishery	48	25.26
	Craft / Trade worker	17	8.95
	Elementary occupation	45	23.68
	Unemployed	2	1.05
Mother's Occupation	Professional	3	1.58
	Clerical	3	1.58
	Skilled worker/ shopkeeper	3	1.58
	Agriculture / fishery	1	0.53
	Elementary occupation	7	3.68
	Homemaker	173	91.05
Monthly Family Income (Rs.)	46,095 - 68,961	6	3.16
	27,654 - 46,089	27	14.21
	9232 - 27,648	83	43.7

	≤ 9226	74	38.95
Type of Family	Nuclear	151	79.47
	Joint	35	18.42
	Extended	4	2.11
Number of Siblings	Single child	25	13.16
	1	54	28.42
	> 1	111	58.42
Vehicles available at home	Car / Van	26	13.68
	Truck / Pickup	1	0.53
	Motorcycle / Scooter	100	52.63
	Bicycle	63	33.16
Vehicle Ownership	Parents	150	78.95
	Siblings	8	4.21
	Self	32	16.84
Mode of Transportation	Public transport	51	26.84
	Private transport	91	47.89
	Walking	48	25.26
Previous Knowledge	Yes	187	98.42
	No	3	1.58
Source of Information (n = 187)	Parents	86	45.99
	Teachers	88	47.06
	Friends	8	4.28
	Mass-media	5	2.67
History of RTA	Yes	69	36.32
	No	121	63.68
Type of Accident (n = 69)	2 wheeler (self riding)	38	55.07
	2 wheeler (other person riding)	14	20.29
	3 wheeler (other person)	10	14.49
	4 wheeler (self)	3	4.35
	4 wheeler (other person)	4	5.8

Table 2: Level of Knowledge, Attitude, and Practice regarding Road Safety Measures

Variables	Category	Score Range	Frequency	Percentage (%)
Knowledge	Inadequate	0 - 10	25	13.2
	Moderately Adequate	11-15	131	68.9
	Adequate	16 - 20	34	17.9
Attitude	Unfavourable	18 - 30	31	16.3
	Moderately Favourable	31 - 45	119	62.6
	Favourable	46 - 52	40	21.1
Practice	Poor	15 - 29	25	13.2
	Fair	30 - 39	136	71.6
	Good	40 - 42	29	15.3

Table 3: Correlation between Knowledge, Attitude, and Practice

Variables	Mean		SD		r Value	p Value
Knowledge and Attitude	13.17	38.27	2.33	7.66	0.165	0.023*
Knowledge and Practice	13.17	34.57	2.33	5.18	0.484	< 0.001**
Attitude and Practice	38.27	34.57	7.66	5.18	0.351	< 0.001**

Table 4: Association between Knowledge, Attitude, and Practice with selected Socio- demographic variables:

Variables	Knowledge (p Value)	Attitude (p Value)	Practice (p Value)
Age	0.599	0.204	0.14
Gender	0.074	< 0.001**	<0.001**
Educational Standard	0.296	0.101	0.14
Stream	0.36	0.693	0.1
Religion	0.019*	0.116	0.124
Education of Father	0.187	0.004*	0.985
Education of Mother	0.263	0.003*	0.062
Occupation of Father	0.004*	0.003*	0.703
Occupation of Mother	0.534	0.415	0.178
Monthly Family Income	0.089	0.614	0.29
Type of Family	0.493	0.591	0.919
Number of Siblings	0.189	0.089	0.238
Vehicles Available at Home	0.679	0.007*	0.793
Vehicle Ownership	0.025*	0.523	0.299
Mode of Transportation	0.318	0.325	0.464
Previous Knowledge	0.129	0.004*	1
Source of Information	0.216	0.093	0.020*
Previous History of RTA	0.046*	0.046*	0.045*
Type of Accident	0.079	0.627	0.303

*p < 0.05 level of significance
**p < 0.01 level of significance

Information Booklet
The information booklet on road safety measures was developed based on study findings, objectives, and literature review. It included key components such as introduction to road safety, importance of road safety, safe driving practices, road signs, driving license procedures, and registration rules.

4. Discussion

The present study assessed the knowledge, attitude, and practice regarding road safety measures among adolescents. The findings revealed that most participants belonged to the age group of 16-17 years and were males. A majority had previous knowledge regarding road safety measures, with teachers being the major source of information. Similar observations were reported by **Jothula KY, and Sreeharshika D (2021)**[5] and **Oinam J et al. (2019)**[6], where school adolescents had prior exposure to road safety information through educational settings.

The findings of the present study showed that most adolescents had moderately adequate knowledge, which is consistent with the studies conducted by **Bharathi AR(2021)**[7] and other similar research. This may be attributed to increased exposure to road safety information through schools and media. However, a proportion of adolescents still demonstrated inadequate knowledge, indicating gaps in awareness.

Regarding attitude, most participants exhibited moderately favourable attitude, which aligns with findings reported by **Jacob J and Rajeev (2018)**[8]. However, the presence of unfavourable attitudes among some participants suggests that knowledge alone may not be sufficient to bring behavioural change.

In terms of practice, the majority of adolescents demonstrated fair practices, while only a limited number

showed good practices. These findings are comparable with studies by **D'Costa et al. (2020)**[9], indicating that although awareness exists, its translation into safe practices remains inadequate. This gap between knowledge and practice may be due to lack of reinforcement, supervision, or behavioural interventions.

The study also found a statistically significant positive correlation between knowledge and attitude ($r = 0.165$, $p < 0.05$), indicating that improved knowledge is associated with better attitudes, although the relationship was weak. A stronger and highly significant correlation was observed between knowledge and practice ($r = 0.484$, $p < 0.01$), suggesting that increased knowledge contributes to safer practices. The findings were supported by a similar study done by **Indhumathy, and Thenmozhi (2016)**[10]. Additionally, significant correlation between attitude and practice ($r = 0.351$, $p < 0.01$) indicates that positive attitudes contribute to safer practices. These findings are consistent with previous study of **Dr. Monica G et al. (2020)**[11].

Significant associations were observed between knowledge and selected socio-demographic variables such as religion, father's occupation, vehicle ownership and history of RTA, which is supported by similar studies. Attitude showed significant association with variables such as gender, parental education, father's occupation, vehicles available at home, previous knowledge, and history of RTA. Practice was significantly associated with gender, source of information, and history of RTA. These findings indicate that behavioural aspects related to road safety are influenced by demographic and environmental factors and are consistent with previous research. Similar findings were reported by **Suprabha, and Madhuri (2020)**[12], and **Shrivastava SR, and Shrivastava PS (2019)**[13] .

While some findings were congruent with earlier studies, certain variations were observed, which may be attributed to differences in study setting, sample characteristics, cultural factors, and exposure to road safety education. Such variations highlight the contextual nature of adolescent behaviour regarding road safety.

The study has certain limitations. The use of a structured and closed-ended questionnaire may have limited the depth of responses, and the relatively small sample size restricts the generalisability of the findings to the wider adolescent population.

The findings of the study have important implications for nursing practice, education, and public health. As road traffic accidents remain a significant cause of morbidity and mortality among adolescents, improving knowledge, attitude, and practice can contribute to the reduction of accident- related injuries and promote safer communities.

In terms of potential application, the findings can be utilised to develop and implement school-based educational programmes, awareness campaigns, and behaviour change strategies targeting adolescents. Nurses, educators, and policy makers can use these findings to design structured interventions aimed at improving road safety awareness and promoting safe practices among adolescents.

5. Conclusion

The study concludes that although adolescents possess moderately adequate knowledge and favourable attitudes regarding road safety measures, their practices remain suboptimal. A significant positive relationship between knowledge, attitude, and practice indicates that improving awareness can contribute to safer behaviours. The presence of gaps between knowledge and practice highlights the need for targeted and sustained interventions. Strengthening school-based education, awareness programmes, and behaviour change strategies is essential to promote safe road practices among adolescents and reduce road traffic-related risks.

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