

Evaluation of Knowledge on Road Safety Awareness among Young Adult Motor Bikers In Dinajpur District, Bangladesh

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Abstract

Background: Over the past five years, road traffic crashes (RTCs) have emerged as a growing concern, with around 6,000 deaths and over 100,000 injuries annually reported by the Passenger Welfare Association of Bangladesh. However, these figures are likely underreported due to the lack of a robust traffic reporting system in the country. Previously, road crash data relied solely on First Information Reports (FIRs) from police, but recent efforts by the Bangladesh Road Transport Authority (BRTA) aim to improve transparency in injury reporting.

Methods: This was a cross-sectional type of descriptive study to assess the knowledge on road safety awareness among young adult motor bikers in Dinajpur district, was carried out in the Department of Community Medicine Rajshahi Medical College, Rajshahi. Data was collected from the respondents of major traffic point in Dinajpur district from July 2024 to June 2025. The study population consisted of young adult motor bikers aged between 18 and 35 years who ride motorcycles regularly in Dinajpur district. The calculated sample size was 384. A purposive sampling method was employed for the selection of study participants.

Results: Almost all respondents 382 (99.5%) knew that wearing a helmet is important for safe driving, 381 (99.2%) knew that using a mobile phone while driving is prohibited, 378 (98.4%) discerned that playing music while driving may distract the driver, another 378 (98.4%) knew that prohibition of alcohol consumption while driving and 368 (95.8%) know that frequent overtaking is dangerous. However, maximum speed limit of motorbike driving in Dinajpur was not known by 126 (32.8%), 130 (33.9%) had no knowledge on regular updating of all documents and 159 (41.4%) had no knowledge of motorbike insurance policies.

Conclusion: Tailored strategies should especially target younger riders, rural communities, and individuals with lower education levels to improve knowledge and reduce preventable injuries and fatalities on the road. An effort from all concerned bodies should increase in enhancing knowledge and addressing existing gaps to ensure better road safety outcomes.

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Introduction

Globally, road traffic injuries (RTIs) are a critical public health issue, especially as they are the leading cause of death among children, adolescents, and young adults. Each year, approximately 1.3 million people lose their lives, and 20–50 million individuals are injured in traffic-related incidents, resulting in an estimated global economic loss of US \$518 billion. Alarming, RTIs are projected to become the fifth leading cause of death and the third leading contributor to disability-adjusted life years lost by 2030. Over 90% of these fatalities occur in low- and middle-income countries, where the road traffic fatality rate is significantly higher at 20.2 deaths per 100,000 people compared to 12.6 deaths per 100,000 in high-income countries.¹ Bangladesh faces additional public health challenges, including outbreaks of diseases like COVID-19 and dengue, alongside persistent issues in nutrition and healthcare management. Over the past five years, road traffic crashes (RTCs) have emerged as a growing concern, with more than 6,000 deaths and over 100,000 injuries annually reported by the Passenger Welfare Association of Bangladesh. However, these figures are likely underreported due to the lack of a robust traffic reporting system in the country. Previously, road crash data relied solely on First Information Reports (FIRs) from police, but recent efforts by the Bangladesh Road Transport Authority (BRTA) aim to improve transparency in injury reporting. Motorcycle-related injuries have surged in Bangladesh due to the rapid increase in motorbike ownership, which now represents 70% of all registered vehicles. However, a substantial licensing gap persists, with only 2.2 million valid licenses issued for an estimated 3.5 million motorcycles.² As a result, Bangladesh holds the highest global motorcycle fatality rate, with 28 fatalities per 10,000 motorcycles. Dinajpur is an important city of Rangpur division in Bangladesh. The

internal communication system in this town is well organized. Vehicle entering into Dinajpur increases the possibility of accident occurrence. Dinajpur is an important city of Rangpur division in Bangladesh. The internal communication system in this town is well organized. Vehicle entering into Dinajpur increases the possibility of accident occurrence.

Objective

To evaluate the level of knowledge on road safety awareness among young adult motor bikers in Dinajpur District, Bangladesh and to identify key factors with their behaviors towards road safety and to identify the association between socio-demographic variables and knowledge.

Methods

A descriptive Cross-sectional study was conducted to assess road safety knowledge among young adult motor bikers in Dinajpur district, Bangladesh. The study was carried out under the Department of Community Medicine Rajshahi Medical College, Rajshahi. Data was collected from the respondents of major traffic point in Dinajpur district from July 2024 to June 2025. The study population include of young adult motor bikers aged between 18 and 35 years who regularly ride motorcycles in Dinajpur district. Based on the sample size calculation, a total number of 384 participants were selected. A purposive sampling technique was used for the selection of study participants. Data were collected from major traffic points within Dinajpur city. Riders who met the inclusion criteria and agreed to participate were interviewed. Data were collected using a structured questionnaire through face-to-face interviews. The questionnaire consisted of three sections. The first section collected socio-demographic information, the second assessed participants knowledge regarding road safety measures

and the third section explored on their self-reported road safety practices. After data collection, all questionnaires were reviewed carefully to ensure completeness and consistency. Then data were cleaned by editing, coding, recoding and categorizing. Data were rechecked to detect errors and to maintain validity. Then all data were converted into SPSS file. The data collected from the respondents were analyzed. After completion of data collection, the data were checked and edited manually and verified before tabulation. Data were coded, entered and analyzed in a computer. The statistical analysis was conducted using SPSS (Statistical Package for Social Science) version 26 statistical software. The findings of the study were presented by frequency, percentage in tables and graphs. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample. Three levels of knowledge were identified using the percentile approach: poor (less than 25% percentile); average (25–49% percentile); and good (more than 50% percentile). Independent sample t-test and one-way analysis of variance test to show the mean knowledge and to identify the association between socio-demographic variables and knowledge. Here, $p < 0.05$ was considered significant and all p-values were

two sided. Prior to onset of the study, ethical clearance was taken from ethical committee of Rajshahi Medical College, Rajshahi. The respondents were briefed about the study and informed written consent was taken from them. Complete assurance was given that confidentiality of all information provided by the respondents would be maintained properly and they had freedom to withdraw themselves from the study at any moment. Their name or primary anonymity which could be identified them, would not be published. Their participation and contribution was acknowledged with due respect.

Results

Almost all respondents, 382 (99.5%) knew that wearing a helmet is important for safe driving. Similarly, 381 (99.2%) knew that using a mobile phone while driving is prohibited. Moreover, 378 (98.4%) respondents felt that playing music while driving can distract the driver, and the same number, 378 (98.4%) were aware that drinking alcohol and driving is not allowed. In addition, 368 (95.8%) thought that overtaking too frequently is risky. However, maximum speed limit of motorbike driving in Dinajpur was not known by 126 (32.8%) respondents. Also, 130 (33.9%) had no knowledge about regular updating of all documents, and 159 (41.4%) were unaware of motorbike insurance policies.

Table I: Distribution of the respondents by knowledge on road safety measures (n=384)

Knowledge variables	Yes n (%)	No n (%)
Wearing a helmet is important for safe driving	382 (99.5%)	2 (0.5%)
Using a mobile phone while driving is prohibited	381 (99.2%)	3 (0.8%)
Playing music while driving may be distract the driver	378 (98.4%)	6 (1.6%)
Prohibition of alcohol consumption while driving	378 (98.4%)	6 (1.6%)
Frequent overtaking is dangerous	368 (95.8%)	16 (4.2%)
Talking while driving may be distract the driver	306 (79.7%)	78 (20.3%)
Maximum speed limit of motorbike driving in Dinajpur	258 (67.2%)	126 (32.8%)
Regular updating of all documents	254 (66.1%)	130 (33.9%)
Knowledge of motorbike insurance policies	225 (58.6%)	159 (41.4%)

Table II: Distribution of the respondents by knowledge on road safety signs (n=384)

Road safety signs		Yes n (%)	No n (%)
The sign of no left turn		363 (94.5%)	21 (5.5%)
The sign of no overtaking		353 (91.9%)	31 (8.1%)
The sign of zebra crossing		345 (89.8%)	39 (10.2%)
The sign of no horn		329 (85.7%)	55 (14.3%)
The sign of no parking		308 (80.2%)	76 (19.8%)
The sign of no right turn		280 (72.9%)	104 (27.1%)
The sign of dangerous deep		254 (66.1%)	130 (33.9%)
The sign of U-turn		248 (64.6%)	136 (35.4%)
The sign of no stopping		230 (59.9%)	154 (40.1%)
The sign of speed breaker		226 (58.9%)	158 (41.1%)
The sign of stopping		186 (48.4%)	198 (51.6%)

In Table II, The most recognized road safety sign was the sign of no left turn (94.5%), followed by sign of no overtaking (91.9%), sign of zebra crossing(89.8%), sign of no horn(85.7%) and sign of no parking(80.2%). However, 130 (33.9%) did not recognize the sign of dangerous deep, 154 (40.1%) did not identify the sign of no stopping, 198 (51.6%) did not identify the sign of stopping.

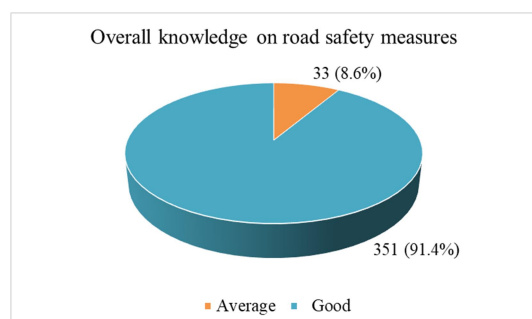


Figure 1. Distribution of the respondents by overall knowledge (n=384)

In Figure 1, Among the 384 respondents, 351 (91.4%) had good knowledge on road safety measures while 33 (8.6%) had average knowledge. None of them had poor knowledge. The mean knowledge score was 15.8 ± 3.5 (range: 7.0-20.0).

Table III: Association between socio-demographic variables and knowledge on road safety measures

Socio-demographic variables	Mean knowledge score	p value
Age group (in years)		
18- 23	13.2 ± 2.8	$F=24.716$ $p<0.001^a$
24-29	16.1 ± 3.5	
30-35	16.4 ± 3.4	
Marital status		
Ever married	16.2 ± 3.4	$t=2.268$, $p<0.001^b$
Never married	14.7 ± 3.5	
Educational status		
Up to primary	10.3 ± 1.6	$F=84.889$ $p<0.001^a$
Secondary	12.0 ± 2.8	
Higher secondary	14.4 ± 3.2	
Graduate and above	17.4 ± 2.6	
Occupational status		
Unemployed	13.4 ± 4.1	$F=16.357$ $p<0.001^a$
Employed	16.8 ± 3.1	
Businessman	14.4 ± 3.5	
Student	14.8 ± 3.4	
Monthly family income		
<20,000	14.1 ± 3.6	$F=16.920$ $p<0.001^a$
20,000-30,000	16.5 ± 3.4	
30,001-40,000	16.4 ± 2.9	
>40,000	16.9 ± 3.1	
Residence		
Urban	16.0 ± 3.3	$t=2.263$, $p=0.040^b$
Rural	15.1 ± 4.0	
Religion		
Islam	15.8 ± 3.5	$t=0.202$, $p=0.840^b$
Others	15.7 ± 3.7	
Smoking status		
Smoker	15.3 ± 3.5	$t=-1.729$, $p=0.085^b$
Non-smoker	15.9 ± 3.5	
Alcohol consumption		
Yes	12.0 ± 3.0	$t=2.866$, $p=0.004^b$
No	15.8 ± 3.5	

a=One way ANOVA, b=Independent sample t test

Table III shows, Higher knowledge was significantly more among respondents in 30-35 years age group ($p<0.001$), ever married respondents ($p<0.001$), graduate and above ($p<0.001$), employed person ($p<0.001$), monthly income $>40,000$ TK ($p<0.001$), urban residence ($p=0.040$) and non-alcohol consumer ($p=0.004$). Knowledge score was not associated with religion ($p=0.840$) and smoking status ($p=0.085$).

Discussion

In the present study, almost all respondents (99.5%) knew that wearing a helmet is important for safe driving. Only 0.5% were not aware of its importance. A similar finding was reported in a study from Dhaka, where 97.2% of motorbikers recognized the importance of helmet use. In comparison, awareness was lower in a study conducted in Mymensingh, where only 76% of riders knew that wearing a helmet is important. A study from Nigeria also reported a lower level of awareness, with 65.7% of motor bikers considering helmet use essential for safety. The difference in these findings may be explained by variations in the study settings and the characteristics of the participants. In the present study, 99.2% of respondents knew that using a mobile phone while driving is prohibited. A comparable result was found in a study conducted in Dhaka, where 94.5% of motor bikers were aware that using a mobile phone while riding is unsafe. In contrast, a lower level of awareness was reported in rural Mymensingh, where only 69% of respondents knew that mobile phone use while driving is restricted. Similarly, a study from Nigeria found that only 61.2% of motor bikers recognized mobile phone use as a major distraction while driving. In the present study, 98.4% respondents knew that alcohol consumption while driving is prohibited, while only 1.6% did not. This is similar to findings in Dhaka. In Chattogram, 94.7% of participants also

reported correct knowledge regarding the prohibition of alcohol while operating a vehicle.³⁻⁶ In contrast, a study in rural Mymensingh reported lower awareness, with only 71.4% of riders recognizing that alcohol consumption is banned during driving. While in Nigeria, only 58.6% of respondents correctly identified alcohol consumption as a prohibited and hazardous driving behavior. Almost all the participants were aware that frequent overtaking is dangerous driving behavior, while only 4.2% lacked this knowledge. This finding is consistent with earlier studies that also reported as a high level of awareness regarding the risks associated with frequent overtaking. In contrast, a study was conducted in rural Mymensingh found that considerably lower awareness, with only 66.3% of respondents identifying frequent overtaking is a major road safety hazard. The variation between these findings may be related to differences in the study period, study setting, and characteristics of the participants. Regarding driving distractions, 79.7% of the motor bikers in the present study recognized that talking while riding can distract the driver, whereas 20.3% unaware of the risk.⁵ This result closely matches findings from a study conducted in Dhaka, where 76.8% of motor bikers acknowledged that talking while riding could impair concentration and increase the likelihood of accidents. Comparable levels of awareness were also reported among young riders in Chattogram.⁶ Knowledge of maximum permissible speed limit was comparatively lower. In the present study 67.2% of motor bikers correctly identified the maximum speed limit for motorbike driving in Dinajpur, while 32.8% did not know the correct correct speed limit. A similar level of knowledge was reported in a study conducted in Dhaka. In Chattogram, 61.3% of respondents also reported knowing the designated speed limits for two-wheeler vehicles. On the other hand, awareness was

lower in rural Mymensingh. Only 43.2% of motorbike users knew the speed limit regulation. A study from India reported an even lower level of awareness, with only 39.5% of young two-wheeler riders correctly identifying the legal speed limit in their area. In the present study, 66.1% knew that all driving-related documents should be kept valid and renewed regularly.⁷ This finding is consistent with several previous studies. In contrast, a study conducted in rural Mymensingh found that only 41.5% of motorbike riders understood the need for regular renewal of driving related documents. Likewise, a study from India reported an even lower level of awareness. With only 38.2% of riders recognizing the importance of keeping valid documents to comply with legal requirements. In the present study also found that, 58.6% of the respondents were aware of motorbike insurance policies. While 41.4% had no knowledge about them. This finding is comparable to the study conducted by Hasan in Dhaka. Stated that 56.2% of riders were aware of the legal requirement and benefits of vehicle insurance. Similar results were also reported by Islam et al. However, a study by Sundar and Sharma in demonstrated substantially lower awareness. Only 29.8% of two-wheeler users reporting knowledge of insurance requirements and available coverage options. Almost all participants in the present study correctly recognized the "No Left Turn" traffic sign. Only 5.5% failing to identify it.⁸ This finding is comparable to a study conducted in Dhaka. Where 91.3% of motor bikers correctly recognize the sign as an important road safety symbol. However, a considerably lower level of awareness was reported in rural Mymensingh. Where only 60.4% of riders were able to identify the "No Left Turn" sign correctly. Similarly, 91.9% of the participants In the present study correctly identified the "No Overtaking" sign. Whereas 8.1% were unable to recognize it. This result is consistent with findings from a study

conducted in Dhaka, where 89.4% of motorbikes correctly identified this traffic sign. In contrast, awareness was much lower among riders in rural Mymensingh, where only 57.3% correctly interpreted the "No Overtaking" sign. An even lower level of knowledge was reported in an Indian study, in which only 51.9% of two-wheeler users accurately recognized this road sign. In the present study, 89.8% of the participants correctly recognized the "Zebra Crossing" sign, whereas 10.2% failed to identify it. This finding is comparable to a study conducted in Dhaka, where 86.5% of motorcyclists correctly recognized the zebra crossing sign. However, studies conducted in other settings have reported comparatively lower level of awareness. The present study also showed that, 85.7% of participants correctly identified the "No Horn" sign, while 14.3% were unable to recognize it. This result is consistent with findings from studies carried out in Dhaka and Chattogram. In contrast, awareness was substantially lower in rural Mymensingh, where only 48.6% of riders correctly identified the sign. Regarding the "No Parking" sign, 80.2% of participants in the present study identified it. Whereas 19.8% failed to recognize it. This aligns with findings from Dhaka and Chattogram, where most riders recognized the "No Parking" sign. Recognition of the "No Parking" sign was considerably lower in rural Mymensingh, where only 44.5% of riders identified it correctly. Similarly low level of awareness were reported in India (41.6%) and Nigeria (35.4%). Studies conducted in Ilorin and Southern Nigeria demonstrated moderate recognition of this traffic sign. In the present study, 72.9% of respondents correctly recognize the "No Right Turn" sign, whereas 27.1% were failed to identify it. Regarding the "Dangerous Deep" sign, 66.1% respondents accurately identified it correctly. While 33.9% failed to recognize it. This finding is comparable to a study conducted in

Dhaka, where 62.3% of riders recognized the "Dangerous Deep" sign, and in Chattogram, where awareness was 59.6%. In contrast, recognition was much lower in rural Mymensingh 35.2% only. Likewise, studies from India and Nigeria reported lower recognition rates of 33.4% and 28.9%, respectively. In the present study, 59.9% of participants correctly identified the "No Stopping" sign, while 40.1% failed to do so. This is similar to a study in Chattogram, where 57.2% of motor bikers identified the sign correctly.⁹ A similar level of awareness was also found in India. However, recognition of the No Stopping sign was considerably lower in rural Mymensingh. Only 34.7% of riders identified it correctly. Similarly, a Nigerian study reported that 30.9% of participants recognize the traffic sign. According to the findings of this study, 58.9% respondents correctly identified the "Speed Breaker" sign, while 41.1% did not. Results were alike reported in Dhaka and India, where over half of motor bikers recognized the "Speed Breaker" sign.¹⁰ In contrast, recognition was lower in rural Mymensingh 32.5% and Nigeria 29.4%. In this study, 48.4% of respondents correctly identified the "Stopping" sign. Similar results were found in Chattogram (47.9%) and India (46.2%). Recognition was lower in rural Mymensingh (29.7%) and even lower in Nigeria (24.1%). Overall, the present study demonstrated that 91.4% of young adult motor bikers in Dinajpur had good knowledge of road safety. A similar level of knowledge 89.6% of riders showed strong awareness of road safety ice behaviors. In contrast, a lower proportion of young riders in rural Mymensingh, only 68% possessed adequate road safety knowledge. Similarly, studies conducted in India (63.5%) and Nigeria (58.2%) reported lower level of awareness.¹¹

Conclusion

Road safety remains is a major public health challenge that impacts people of all ages, their families, and communities worldwide. Many road traffic crashes are preventable through responsible driving practices and regular awareness campaigns. This study was conducted to evaluate the level of knowledge regarding road safety among young adult motorbike users in Dinajpur district, Bangladesh, and to identify key socio-demographic factors influencing this knowledge. The findings showed most respondents had good knowledge regarding road safety measures, while a considerable proportion demonstrated an average level of knowledge. These findings suggest the need for integrated, multi-pronged approaches to further improve road safety awareness among young adult motorbike users. This includes strengthening education, enhancing public health interventions, and promoting awareness campaign. Special attention should be given to young riders, rural communities, and individuals with lower education levels to enhance knowledge and ultimately contribute to reducing preventable injuries and fatalities on the road.

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