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Assessing Motorcycle Helmet Usage Rates and Road Safety Laws Awareness Among Motorcyclists in Bangladesh

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Abstract

This study examines helmet use and motorcyclists' awareness about road safety laws regarding helmet usage in Darial union of Bakerganj Upazila in Bangladesh. For this study I have used Quantitative research methodology and used JASP statistical software for descriptive analysis and Chi-square tests. I have collected data from 100 participants that representing various age groups and professions. Then after data analysis it was revealed that, youngest age group of (15-20); here 33.33% people do not believe that wearing helmet is important and 66.67% are not aware about road safety laws regarding helmet usage. And older age groups (41-50 and 51 or above) here 100% aware of road safety laws regarding helmet usage. By profession here 60.61% "motorcycle driver" do not agree with motorcycle helmet wearing is important. In Darial Union, here it is the only category "student" who are used helmet during accident time is 0%. Middle age and older aged groups people helmet using rate is high comparing to other, (31-35) age group is 69.57%, 80% for the 41-50, 100% for those aged 51 and above. But few extra-ordinary groups like teachers, doctors, retired persons, and government job holders, had a helmet usage rate of about 100% during accident time. And here younger people, especially students, shows very low interest in wearing helmet and road safety training, while 100% of those aged 41+ and all government employees, teachers, doctors, and retirees have received it.

Keywords: motorcycle helmet, helmet use, road safety, awareness among motorcyclists

1 Introduction

Bangladesh, like many other low- and middle-income nations, has seen a sharp rise in the number of motorcycle riders. On the other hand, practically little is known about motorcycle riders' use of helmets. Only 53% of those who regularly used safety helmets were among the 45.3% of people who reported wearing one. And, according

to the report, young, single motorcyclists in Bangladesh's rural areas do not wear helmets [1]. In Bangladesh, there are more than 1.1 million registered motorcycles, or approximately 57% of all registered motor vehicles [2]. Especially in areas where public transportation is not easily accessible, motorbikes are a common form of transportation in developing countries. Driving without a helmet increases one's risk of being involved in an accident by three times (OR: 3.423, p value < 0.05). Research shows that, Helmet use is proven to be a critical component in preventing traffic crashes in Noakhali, Bangladesh [3]. It was also found that people who wear helmets and survive motorbike accidents in the United States have lower hospitalization costs than people who don't wear helmets [4]. Cochrane did a systematic study in 2009 and found that motorcycle helmets lower the risk of death and injury for riders who crash [5].

Motorcycle accidents are a significant cause of injury and fatalities in Bangladesh. Especially in rural areas, wearing a helmet and knowing traffic safety laws are often neglected. Wearing a helmet has been shown to have numerous benefits. But many motorcycle riders in these areas still disregard this crucial safety measure. In the event of an accident, this behavior increases their risk of suffering severe injuries or passing away. A significant segment of the populace either needs more awareness of or disregards road safety regulations mandating the usage of helmets. A world study by Abbas et al. found that not wearing a helmet was the most important thing that affected the death rate of motorcyclists in an RTI and that helmets lower the risk of death in a crash [6].

In Hai Duong province in 2006, Hung et al. did an observational study and found that 29.9% of riders wore helmets. Men and adults were more likely to be wearing helmets than women and children. Throughout 37 road locations, 16,560 motorcycle riders were monitored (which includes 5 road classifications). Motorcycle riders used helmets on average 29.94% of the time. Men were more likely than women to wear helmets (odds ratio (OR) 1.64, 95% confidence interval (CI) 1.53 to 1.76) [7]. In a survey conducted in the USA with 445 participants, 68.4% said they always wore a helmet. The motorcyclists who did not always wear a helmet had higher odds of being male, having less education, and having a history of motorcycle accidents and injuries

compared to those who did. In this state where riding instruction is required, less than half of riders obtained their riding skills from rider education courses, and 44% of those who do not wear helmets stated they would only do so if required by law [8]. After adjusting for a number of potential confounders, a recent analysis conducted in California revealed that motorcycle helmets were associated with a significantly lower risk of head injuries (RR 0.40, 95% CI 0.31–0.52), fatal injuries (RR 0.44, 95% CI 0.26–0.74), and slightly lower but statistically significant chance of injuries to the neck (RR 0.63, 95% CI 0.40–0.99) [9]. As far as lessening the severity of head injuries sustained, motorcycle safety helmets are an effective way to increase safety. People working in manufacturing or on the land, those without a college degree, and those with a history of significant traffic infractions may find training programs especially beneficial [10]. However, a significant percentage of Malaysian riders (44%), claimed that they began riding without a valid license [11]. On highways and major metropolitan routes, as well as in the mornings and on weekdays, helmet usage is higher. The usage of safety helmets is higher among longer-distance travelers, regular riders, and motorcyclists with powerful engines [12].

According to the study of a researcher, M.F. Hasan in Bangladesh, 33.91% of respondents said in the response that they use helmets every day. About 52.87% of respondents said here they wore helmets most of the time, with 9.77% saying they did so occasionally. And, here Merely 1.72% of respondents acknowledged that they never use a helmet, and the same proportion said they wear one very infrequently when riding a motorcycle. Several rates of helmet use have been seen during field observations on various cities, highways, and regional roads. According to his observational survey, Dhaka has the highest average rate of helmet wearers—98.6% (drivers: 99.8% and passengers: 91.8%). Helmet use on regional roads such as the Barisal-Patuakhali Highway and the Bakerganj-Barguna regional road is extremely low, with just 45.7% and 17.5%, respectively. As per the statement, here most people don't wear helmets when they go on short rides, especially in hot weather when they don't expect to encounter law enforcement when riding on a local route. When riding for a brief distance, nearly 63% of respondents said to him, they typically avoid wearing helmets or don't wear them at all [13]. Only 54.6% of the 350 motorcycle riders knew about

road signs and safety requirements, while 16.9% needed more information. Furthermore, just 50.6% of respondents adhered to good road safety procedures, whereas 23.4% did not. Although most motorcycle riders were aware of specific signs and laws, their general road safety knowledge and practice needed to improve [14]. Helmets are extremely successful in preventing this kind of trauma, and the use of them is higher and the risk of head injuries among motorcycle riders is lower in areas where wearing one is mandatory [15].

Wearing a helmet dramatically lowers the risk of head and neck injuries by 53% and lowers the risk of death by 72% [16]. The best way to prevent or decrease the severity of injuries sustained in an accident is to wear a motorcycle helmet. According to the current meta-analysis, helmet use among motorcycle riders and passengers can rise significantly as a result of safety initiatives [17]. An analysis of accident data showed that from 2000 to 2014, there were 460 motorbike accidents in the Dhaka Metropolitan Area, resulting in 581 fatalities. Riding made up about 56.45% of the victims, followed by passengers (24.61%) and pedestrians (24.61%). Over 50% of deaths occurred among people under the age of thirty, while roughly 32% and 14%, respectively, occurred in people between the ages of 31 and 40. In the research area, the percentage of rear-end crashes was high (53.5%). The study also showed that 94% of incidents did not include the use of helmets [18].

Previous research study show that motorcycle accident is a very serious issue and, in those cases, using helmet is one of the best options that can help to reduce serious injury. And, there is no previous research work based on this selected area, darial Union of Bakerganj Upazila in Bangladesh. Like many rural places, the Darial Union of Bakerganj Upazila faces challenges related to road safety, particularly for motorcycle riders. This growing issue results from several factors, including a need for more knowledge about road safety laws, a lax attitude toward helmet use, and inadequate enforcement of existing regulations.

Here the exact problem is People are ignoring to wearing helmet, and then badly injured in motorcycle accident & facing even death, they have lack of awareness and knowledge about road safety laws regarding helmet usage. So, this research goal is to assessing the helmet using rates & understanding the percentage of motorcycle users

is concern about road safety law regarding helmet use in Darial Union of Bakerganj Upazila. And, after getting the data insights it will be easier for decision makers to take any decisions or steps.

2 Material and Methods

This study used a quantitative research method to investigate helmet usage rates among motorcyclists and their awareness of road safety laws. A structured questionnaire was implemented here to collect data from motorcycle users of different professions and ages in the Darial Union of Bakerganj Upazila, Bangladesh. Few years back there was no pitch road in this union, but recently developed the union with pitch road and increased motorcycle percentage. The reason of selecting this study area is, here I have physically seen and noticed, occurred several horrible motorcycle accidents and died all of them every time and observed none of them used helmet during that accident time, because I think they have lack of knowledge and awareness about it. The survey gathered information on their helmet usage habits and frequency, motorcycle ownership, involvement in motorcycle accidents, whether they wore a helmet during the accident, their awareness of road safety laws related to helmet usage, and whether they had received any training or lessons on the importance of wearing a helmet.

2.1 Instruments

At first, a structured survey was designed as the primary instrument for gathering data for this research. The survey included only closed-ended questions to allow quantitative analysis that focused on motorcycle helmet usage rates and road safety laws awareness among motorcyclists in darial union. The survey was carefully prepared to ensure clarity and avoid opacity, with questions formatted as yes/no options, Likert scales, and multiple-choice answers. Also, a pilot test was conducted with a small group of people to validate the instrument's effectiveness and make any necessary adjustments before full deployment.

2.2 Data Collection

To manage the scope of the research effectively, data collection was focused on the Darial Union, one of the 14 unions within Bakerganj Upazila, comprising 172 villages. The Darial Union, consisting of 15 villages, was selected as the study area. Data was gathered through a Google Form that was created and distributed online to residents of Darial Union. In addition to the online distribution, I visited the area to raise awareness about the study and to share the Google Form directly with individuals. For participants who did not have access to social media and email addresses, I conducted face-to-face interviews. I manually completed the Google Form on their behalf. This approach ensured inclusivity and a more comprehensive data collection process. Data was collected from 105 respondents with full consent, representing a diverse range of ages and professions.

2.3 Data Analysis

Firstly, the data collected through the structured questionnaire were cleaned by the process of manually checking including missing information in forms to ensure accuracy, and 100 samples were used from a total of 105 data samples for missing information of participants profession. Then entered the data into Microsoft Excel using coded values for efficiency. The dataset was then saved in .CSV format and imported into JASP (version 0.18.3) software, JASP is used for statistical analysis, where the coded values were converted back into string values for clarity during analysis. Here, at first descriptive statistics test was completed using JASP software to get mean, median, percent, frequency to summarize helmet usage patterns, motorcycle ownership, accident involvement percentage, justifying awareness level percentage, and the rate of trained persons. The study revealed varying levels of helmet usage, with notable differences based on ownership, profession, age, training, and awareness level. Then used chi-square tests to examine associations between categorical variables. This tests also explored the relationships between wearing helmets at accident time with the comparing age, profession, and motorcycle ownership factors.

3 Results & Discussions

After analyzing data from 100 participants, including 7 age groups and 10 professional categories, it was found that the youngest age group, those between 15 to 20 years old, had 33% who did not believe that wearing a helmet was important. The study also showed that within this age group, 66.67% were not aware of road safety laws regarding helmet usage. In Fig. 1; From the seven age groups, two groups (15-20 and 36-40) did not 100% believe that wearing a helmet was important. The other age groups generally recognized 100%, the importance of helmet use for motorcyclists. The study showed that only two age groups (41-50 & 51 or above), comprising the other participants, were 100% aware of road safety laws regarding helmet usage. In the youngest age group (15-20 years old), only 33.33% were aware of these laws. The second lowest awareness level was found in the 36-40 age group, where only 45% of participants were aware of road safety laws.

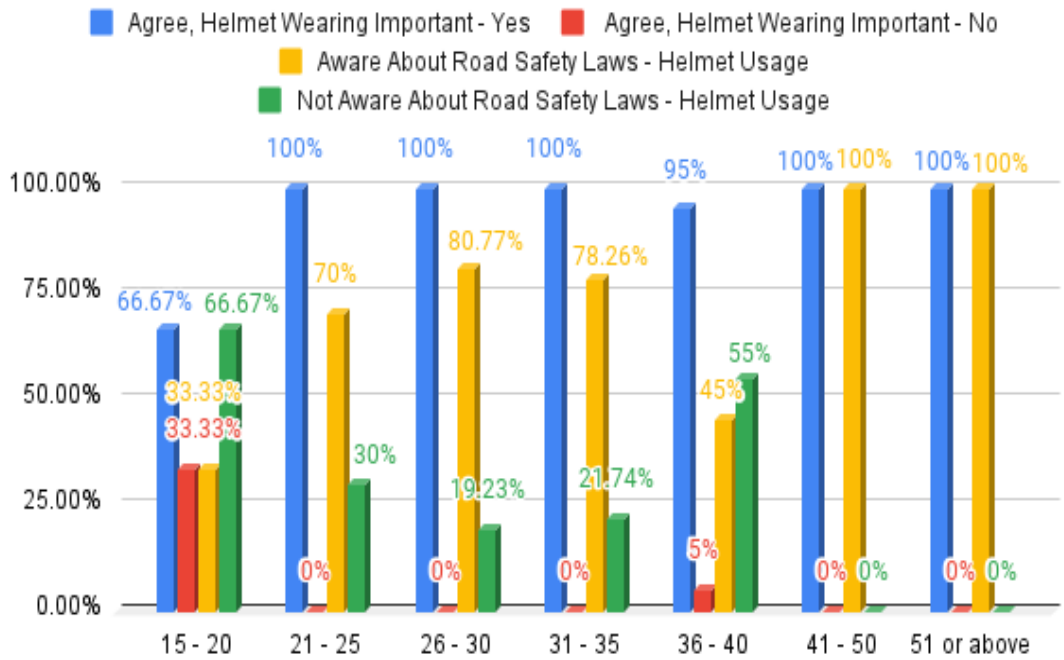

Figure 1. Helmet Wearing & Awareness rate about Road Safety by Age.

By profession, 60.61% of motorcycle drivers did not agree that wearing a helmet is important, which was the highest percentage among all groups. Among students, 50% were unaware of road safety laws regarding helmet usage, and 100% of unemployed individuals were not aware of these laws. Private job holders, unemployed individuals, and motorcycle drivers were the top categories not aware of road safety laws related to helmet usage, included in Fig. 2.

In Fig. 3; Middle-aged and older individuals had high helmet-wearing rates during accidents. Specifically, the rate was 69.57% for the 31-35 age group, 80% for the 41-50 age group, and 100% for those aged 51 and above. The only category with a 0% helmet usage rate during accidents was students. Highly educated individuals, such as teachers, doctors, retired persons, and government job holders, had a helmet usage rate of about 100% during accidents, data from Fig. 4. The lowest helmet usage rates during accidents were found among unemployed individuals and motorcycle drivers.

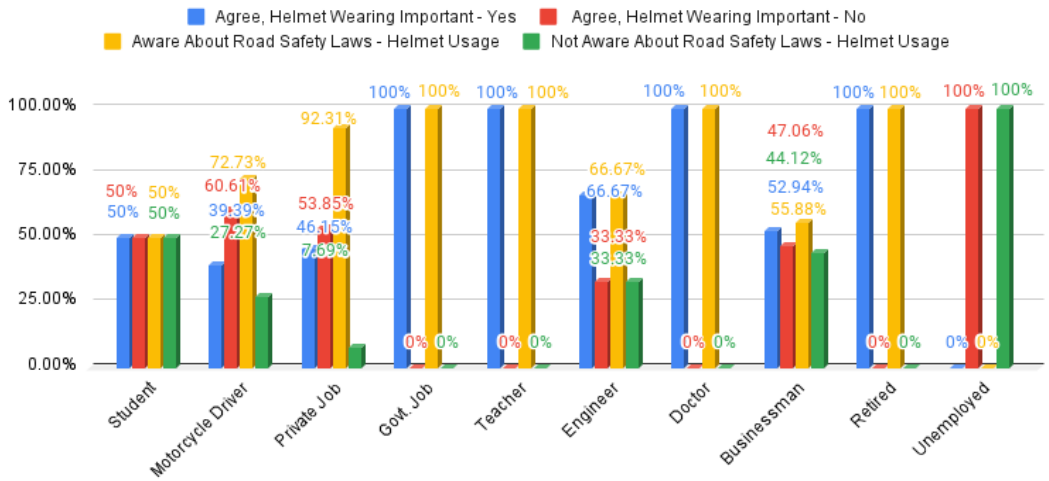

Figure 2. Helmet Wearing & Awareness rate about Road Safety by Age.

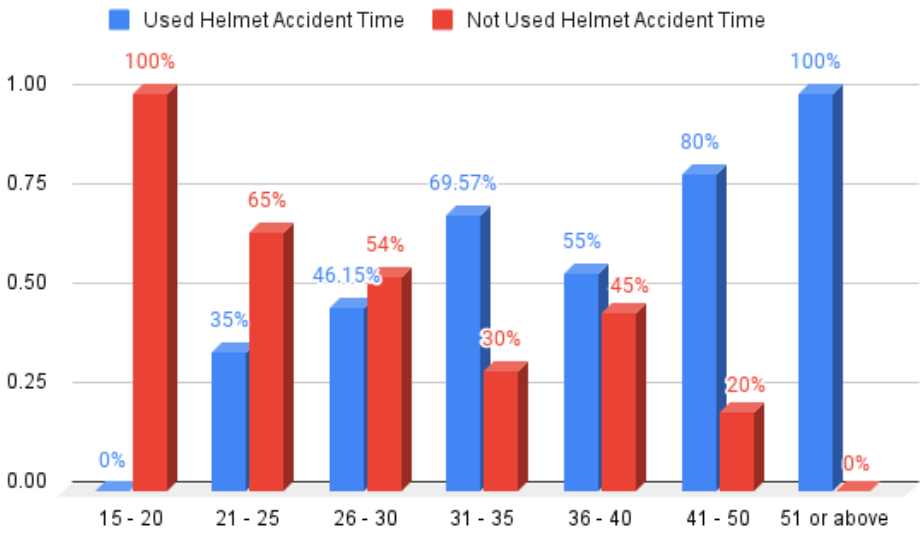

Figure 3. Helmet using rate at accident time by Age.

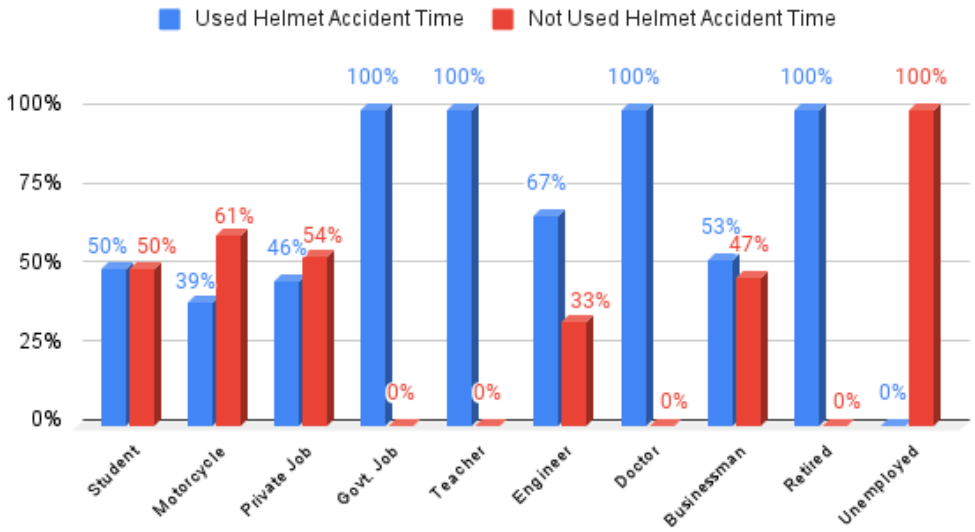

Figure 4. Helmet using rate at accident time by Profession.

This study shows that in Figs. 5 and 6; younger individuals, particularly students, are very less interested in taking lessons or training on motorcycle helmet use and road safety laws. And, 100% people of aged 41-50 and those aged 51 and above have taken such lessons or training. Everyone (100% participants) who works for the government, teaches, doctors, and retirees has taken part in lessons or training on these subjects.

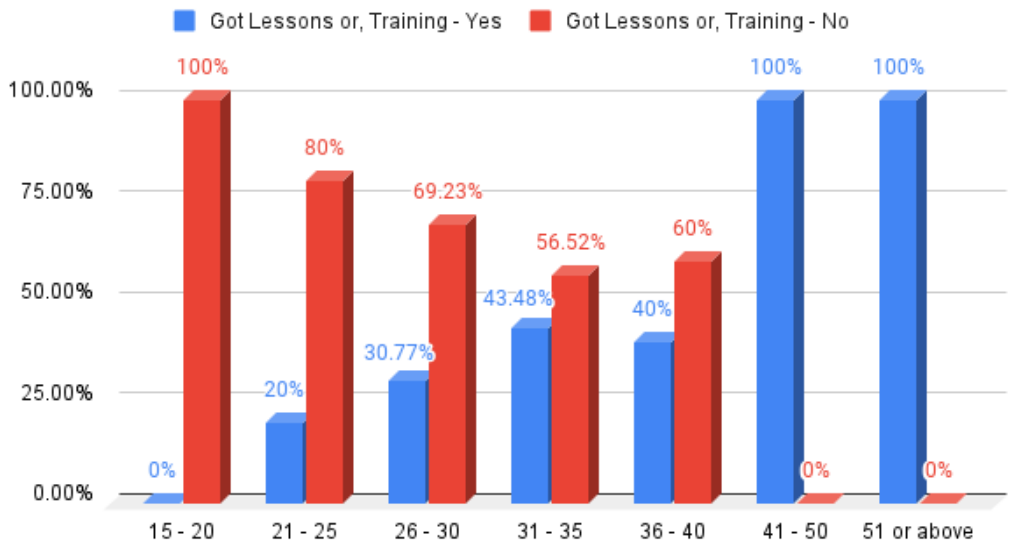

Figure 5. Got lessons or Training by Age.

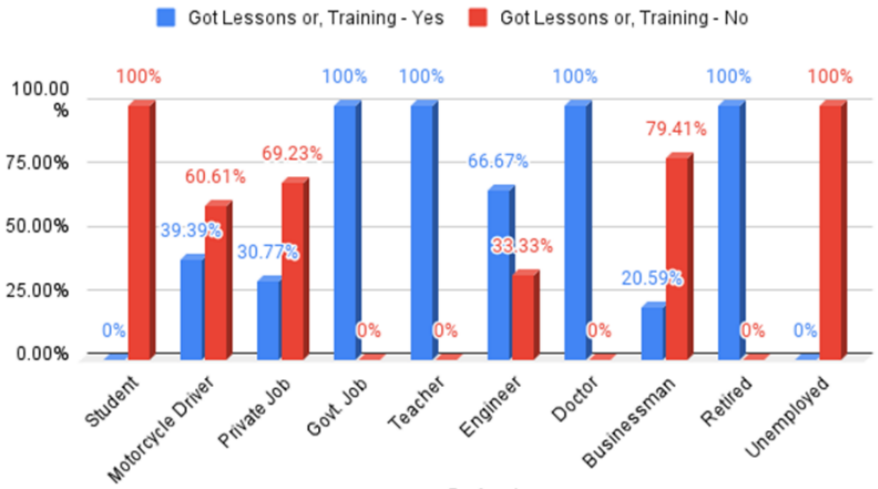

Figure 6. Got lessons or Training by Profession.

4 Conclusion

This research identifies significant gaps in helmet use and road safety awareness among motorcyclists in the Darial Union of Bakerganj Upazila. Here younger people, mainly those aged 15-20, exhibited low helmet usage and inadequate understanding of road safety laws, rendering them highly vulnerable to accidents. The 36-40 age group likewise needed more awareness to reach 100%. On the other hand, older age groups,

particularly those aged 41-50 and 51 and up, used helmets frequently and were well-versed in road safety laws. These groups were also more likely to take part in safety training. Motorcycle drivers, students, and the unemployed had the lowest helmet use and safety knowledge levels. It is especially alarming for motorcycle drivers, who face the most significant risk. On the other hand, government employees, teachers, doctors, and pensioners demonstrated the highest levels of safety compliance, with nearly all receiving relevant lessons or training. The findings highlight the importance of focused awareness campaigns and instructional initiatives, particularly among younger riders and high-risk professional groups. The study argues that resolving these gaps will considerably enhance traffic safety in rural areas, especially in the Darial Union of Bakerganj Upazila in Bangladesh. Due to the lack volunteers, for data collection process, this study conducted on only single union of Bakerganj. But the future study may focus on the location of rest of the union of Bakerganj Upazila and may try to apply both quantitative and qualitative methods and may include also several things in their survey questions about cultural attitudes, economic constraints for getting more better insights.

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