

HELMET USAGE: ATTITUDES AND PRACTICES IN UNIVERSITY STUDENTS OF KARACHI

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ABSTRACT

BACKGROUND: Road traffic accidents continue to be a significant public health concern worldwide, with a pronounced gender disparity in accident involvement, as reported by the World Health Organization in 2021. Males are more likely to be involved in road traffic crashes than females. Motorcycle-related injuries, particularly head injuries, contribute substantially to the disease burden in low and middle-income countries (LMICs). Wearing helmets has been conclusively established as an effective measure to reduce the risk of head injuries. Despite this, between 20 to 50 million individuals suffer from non-fatal injuries resulting in permanent disabilities globally.

OBJECTIVE: This study aimed to assess the attitudes and practices regarding helmet usage among non-medical university students.

METHODOLOGY: A cross-sectional study was conducted using an online self-administered questionnaire over a six-month period. The sample size was determined to be 384 individuals using Open Epi, and 399 responses were received. Data were analyzed using SPSS v. 25, applying the Chi-Square test to assess associations between variables, and conducting descriptive analysis.

RESULTS: Among the 399 respondents, 236 (59.1%) reported using helmets, while 163 (40.8%) did not. Age was significantly associated with helmet usage ($P=0.008<0.05$), with 49.9% of urban participants using helmets compared to only 9.27% of rural participants ($P=0.027$). Notably, both helmet users and non-helmet users exhibited low adherence to other safety precautions. A substantial 54% of non-helmet users believed that strict penalties should be imposed for non-compliance, whereas only 26.2% of them supported such measures. Additionally, 71.1% of helmet users possessed a valid license, compared to only 39.3% of non-helmet users.

CONCLUSION: It was concluded that most non-medical university students don't use helmets despite understanding their importance due to discomfort and suffocation concerns. Urban riders use helmets more, but passenger helmet usage remains low. To address this, targeted awareness campaigns and stricter penalties for university students are recommended to enhance road safety.

KEYWORDS: Helmet use, two-wheelers, helmet attitude, safety.

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INTRODUCTION:

Road Traffic Injuries are the most common cause of death worldwide. Various factors contributing to Road Traffic Accidents are distracted driving, speeding, not using safety precautions, and drunk driving.¹ There are nearly 1.3 million deaths due to road traffic accidents. According to research in Tanzania, motorcycle riders have a 34 times higher risk of death than drivers of other vehicles and are eight times more likely to be injured.² Road Traffic Accidents are currently the 8th leading cause of death globally and are predicted to become the 5th leading cause of death by 2030.³

Usually, the people involved are the sole earners in the family, as presented by WHO in 2012. Recently, according to WHO in 2021, it was established that males are more likely to be involved in road traffic crashes than females.

Motorcycle-related injuries, mainly head injuries and related

deaths and disabilities, significantly contribute to disease burden in low- and middle-income countries (LMICs). Helmets have been proven to be an effective way to reduce the risk of head injury.⁴ Ranging from 20 to 50 million people suffer from non-fatal injuries, which may result in incurable permanent disabilities worldwide. The damage usually is at the maxillofacial region.⁵ Other body parts, including legs, feet, arms, and chest, may show grievous injuries. Vascular lesions and amputations were common too. However, riding without a helmet is common in Asia and many parts of the world. In Asian countries like India, the commonest mode of transport amongst university students is a 2-wheeler. In another study, Chennai's death toll due to road accidents accounted for 97.75% of persons without helmets.⁶ Helmet usage was also poor amongst the literate. In India, among the medical and dental students surveyed in a study, 36% reported never having worn a helmet while riding a motorcycle.⁵ The non-usage of helmets has been seen mostly in young adults

below 16 years of age; they also indulge in over speeding.⁵ In a study in Cambodia, it was discovered that day-time helmet usage was higher than night-time and significantly higher among drivers than passengers. Amongst the decisions influencing helmet purchase, helmet quality, price, style, and color were important factors.⁷ The embarrassment of wearing a helmet has been the most typical (70%) reason for not wearing a helmet, according to a study held in Iran.⁷ Similarly, another survey targeting high-school students revealed that most of the participants had a good knowledge and positive attitude regarding the utilization of helmets but practically were not consistent towards its usage.³

A significant method of avoiding Road Traffic Accidents is to ensure wearing a helmet, safety seat belts, etc. In a counter study, the Health Belief Model has significantly increased the widespread use of Seatbelts, helmets, and safety equipment.⁹ Wearing a seat belt reduces the risk of death among drivers and front-seat occupants by 45 - 50% and the risk of death and severe injuries among rear-seat occupants by 25%. In addition, the use of child restraints can lead to a 60% reduction in deaths.

According to the CDC Injury Center, correct helmet use can lead to a 42% reduction in fatal injuries and a 69% reduced risk of head injuries. It decreases the risk and severity of injuries by about 72%. Furthermore, it decreases the likelihood of death by up to 39%. The Death Rate is 17.12 per 100,000 population, ranking Pakistan on 95 globally.

Prior studies have only targeted general populations, not university students specifically. A study conducted in 2017 targeted only females to find out their attitudes toward helmets but did not target the male population.¹⁰ Another 2019 Karachi study targeted the general population to determine an enforcement 'campaign's effectiveness but did not assess the practices and attitudes.¹¹ Prior Indian studies have been conducted on Medical and Dental students, which can be reciprocated on the Pakistani youth due to cultural similarities, but no previous study targeted non-medical university students. Especially for a city like Karachi, which according to WHO, accounted for 2741 deaths in 2019-2020 alone, and fatal injuries exceeding 572, there were no studies concerning the attitudes and practices towards helmet usage and other safety practices that may have contributed to the drastic increase in morbidity and mortality rates.¹² The article intends to create awareness about the significance of helmet usage amongst non-medical university students and speculate the attitudes associated with them to reduce motorcycle-related injuries and deaths.

METHODOLOGY:

This is a cross-sectional study done on non-medical University students (online) for a total duration of 6 months (January to June 2022).

The sample size was calculated by using Open Epi version 3.01, using the knowledge as mentioned above with a 95% confidence level. The sample size obtained was 384. Non-random

convenience sampling was used. Inclusion criteria were all two-wheeler users and students of non-medical universities. Students who can ride two-wheelers but currently do not use one were excluded from the study. A structured questionnaire was made in English. The students were asked to complete the survey circulated online due to Covid 19 restrictions, after providing informed consent and the purpose of the study. The instructions were explained thoroughly, and participants were instructed to answer questions chosen honestly from the options provided and fill all the steric-marked questions. The questionnaire contained two sections. The first section included essential socio-demographics (e.g., age, gender, education program, university year, marital status). The second portion of the questionnaire included questions regarding helmet usage practices and other safety equipment. This part included information on the use of a motorcycle, helmet use, speed of the bike, attitudes towards helmet use, reasons for not wearing a helmet, facilitators of helmet use, other safety precautions taken by riders, and thoughts and perceptions related to helmet ordinance, the number of traffic-related motorcycle accidents, etc. The variables were merged, and appropriate analysis was applied.

Each participant gave informed written consent at the beginning of the questionnaire comprehensively explaining the purpose of the study. There was an option in the online form to decline, which would then stop the survey. Moreover, ethical approval was acquired by the ERC of Bahria University Medical and Dental College. Ethical approval was acquired by the ERC of Bahria University Medical and Dental College with Reference number ERC-18/2022.

Data was analyzed by using SPSS version 25. The statistics in use will be descriptive statistics and the Chi-square test.

RESULTS

A total of 399 responses were collected with a response rate of 1.039. Among the 399 participants, male respondents were ten times more than female respondents (91.0%, and 9%, respectively). The majority of the participant's ages lied in the 21-23 years old range (63.9%). It was noted that most of the participants were inhabitants of urban areas (80.7%), rather than rural areas (19.3%); almost (58.1%) reported having a license, while (41.9%) did not have one.

A large number of the participants reported that they commuted on their motorcycles daily (60.7%), with only (23.8%) commuting 2-4 times a week. Only (10.3%) of the total reported that they commuted 2-4 times a month. The majority of the participants had 7 or more years of experience riding a motorcycle (52.1%), while only (15.5%) had 6 months to 2 years of experience. Of the 399 respondents, 173 (43.4%) reported being previously involved in a road accident.

As shown in Table 2, out of the total population of 399, 236 (59.1%) were helmet users, and 163 (40.8%) were non-helmet users. The riding skills of both helmet users and non-users varied

from exceptional to bad, with most groups reporting their riding skills as good. The majority of the helmet users “always” follow traffic rules (53.0%), while the majority of the non-helmet users “mostly” follow traffic rules (56.4 %). 75.8% of helmet users and 72.4% of non-helmet users do not take other safety precautions. The majority of the participants from both groups, do not wear a helmet when riding on the backseat. However, helmet users are 3 times more likely than non-users to wear helmets while riding on the backseat. There is an association between using a helmet and owning a license. About 71.1% of the helmet users reported owning a license while only 39.3% of the non-helmet users reported holding a license.

As shown in table 3, majority of both helmet users and non-helmet users agreed that helmet usage is not limited to only those who drive fast (68.1% and 69.3%, respectively). A large majority

(76.1%) of the non-helmet users disagreed that helmets are not only necessary for beginners, compared with only 69.2% of the non-helmet users. 54% of non-helmet users agreed that strict penalties should be imposed for lack of helmet usage, while only 26.2% reported the affirmative. Most helmet users (67.7%) and non-users (72.4%) agreed that helmet use should not be limited to highways. A large majority of both groups (75.3% of helmet users and 74.2% of non-helmet users) were aware that most deaths in two-wheelers are due to not wearing a helmet.

Reasons for not wearing a helmet included feelings of discomfort (20.8%) followed by feeling of suffocation (14%) and feeling sweaty (13.1%). Most respondents wore a helmet on all journeys (43.9%) followed by wearing it only on highways only (32.3%) and (2.5%) wore it when visiting family.

Table 1: Socio-Demographics of the study population

Age	Frequency(N)	Percent (%)
18-20	107	26.8
21-23	255	63.9
24-25	37	9.3
Gender		
Male	363	91.0
Female	36	9.0
Area		
Urban Area	322	80.7
Rural Area	77	19.3
Educational Status		
Undergraduate	339	85.0
Post-Graduate	23	5.8
License		
Yes	232	58.1
No	167	41.9
Riding Experience		
6 Months to two years	62	15.5
4-6 years	129	32.3
7+ years	208	52.1
History of Accidents		
Yes	173	43.4
No	226	56.6
Frequency of Commute		
Daily	242	60.7
2-4 times/week	95	23.8
2-4 times/month	41	10.3

Table 2: Significance of other safety practices with helmet usage

Variable	Helmet users (n=236)	Non-Helmet users (n=163)	p-value
Riding skills			
Exceptional	51 (15.6%)	24 (14.7%)	.031
Good	145 (61.4%)	93 (57.1%)	
Average	26 (11.0%)	33 (20.2%)	
Bad	14 (5.93%)	13 (8.0%)	
Follow traffic rules			
Always	125 (53.0%)	33 (20.2%)	.000
Mostly	89 (33.8%)	92 (56.4%)	
Sometimes	20 (7.6%)	32 (19.6%)	
Never	2 (0.8%)	6 (3.7%)	
Average speed limit			
30-40 km/h	77 (32.6%)	63 (38.7%)	.169
50-60 km/h	142 (60.2%)	83 (50.9%)	
80-90 km/h	11 (4.7%)	14 (8.6%)	
>90 km/h	6 (2.5%)	3 (1.8%)	
Other safety precautions			
Yes	57 (24.2%)	45 (27.6%)	.437
No	179 (75.8%)	118 (72.4%)	
Helmet on backseat			
Yes	78 (33.1%)	19 (11.7%)	.000
No	158 (66.9)	144 (88.3%)	
License			
Yes	168 (71.1%)	64 (39.3%)	.000
No	68 (28.8%)	99 (60.7%)	

Table 3: Attitudes toward helmet usage

Variable	Helmet users (n=263)	Helmet non-users (n=163)	p-value
Only those who drive fast need a helmet			
Agree			
Disagree	57 (21.8%) 179 (68.1)	53 (32.5%) 113 (69.3%)	.066
Helmets are only necessary for beginners			
Agree			
Disagree	54 (20.5%) 182 (69.2%)	39 (23.9%) 124 (76.1%)	.808
Strict penalties should be imposed for not wearing a helmet			
Agree			
Disagree	69 (26.2%) 167 (63.4%)	88 (54.0%) 75 (46.0%)	.001
You only need a helmet when driving on highways			
Agree			
Disagree	58 (22.1%) 178 (67.7%)	45 (27.6%) 118 (72.4%)	.496
Most deaths in two-wheeler accidents are due to not wearing a helmet			
Agree			
Disagree	198 (75.3%) 38 (14.4%)	121 (74.2%) 42 (25.8%)	.018

DISCUSSION

Even with general awareness about helmet usage and safety precautions, the majority of the participants lacked adequate safety practices. There was a remarkable association of age with acceptable helmet usage, which differed from another study where the participants' age had no significant association. This could be because our inclusion criteria only included university students who are primarily young adults. Sex was unrelated to helmet usage, unlike another study that showed a significant association.¹³ Although the majority of the participants wore a helmet, only a small minority followed other safety precautions.¹⁴ It was seen that students with valid driving licenses were more likely to wear helmets on the road.¹⁵ Students with inadequate practice of helmet usage were more prone to road accidents, which matched a previous Italian study.¹⁶ Upon scrutinizing the frequency of accidents, it was revealed that most students with more than one accident showed poor helmet practice. Frequent accidents were also linked to bad riding skills, which meant accidents did not entirely depend on helmet usage but also the rider's expertise and riding skills. There was a significant

association between the practice of helmet use and the level of study.¹⁷

In the survey to determine how to increase helmet usage amongst non-medical university students, the least advised option was the free distribution of helmets which matched prior research on teenagers, denying that teenagers with helmets do not necessarily result in a high helmet use rate.¹² Coinciding with a 2015 study done in Vadodara, India, our study also confirmed that the majority of helmet use was during "all journeys" followed by "on highways only".⁴ Finally, our results matched an Indian study done in 2013, which also stated that most individuals in the backseat did not wear a helmet.¹⁸

Our study showed the highest percentage of injuries being bruises, with lacerations and fractures, respectively, while in another study it was found that 10% of the injuries were neck sprains. In a similar study on helmets' effectiveness, no significant correlation was found between the use of a helmet and the incidence of midfacial fractures.^{6,17} According to another study young students were more prone to accidents. This is possible

because the questionnaire focused entirely on head injuries, while our question encompassed all types of injuries from a two-wheeler.²⁰ Age and the decreased use of helmets were risk factors for the combined outcome of severe or fatal injuries. People's perception towards increasing helmet usage included conviction and imposing fines to improve safety attitudes and helmet usage.^{21,22,25}

Since most of our questions were close-ended, it was easier to collect data and commute qualitative analysis by applying the Chi-square test, and descriptive analysis.

However, since the survey was in the form of an online questionnaire, and although anonymity was maintained regarding the responses, students had been hesitant to disclose their lack of helmet practices and selected more socially desirable options, which may limit the results of the data. The duration of the study was only 6 months. With over majority of the university students driving motorcycles, the sample size of 384 may not accurately be generalized to the entire population.

The study's major aims to investigate the attitudes and practices towards helmet usage and other safety precautions were met. The results articulated the main hindrances and attitudes towards decreased helmet and road safety practices. Since this research was based entirely on Karachi non-medical university students, there is room for investigating attitudes and practices in different Pakistan districts and highlighting the significant differences between various ethnic groups. Certain personality traits and behavioral trends may be responsible for inducing risk-taking behavior in young adults, which could be associated with improper helmet usage. Further research needs to look into details identifying these motivators for helmet usage.

CONCLUSION

The results concluded that most non-medical students did not practice helmet usage enough, even though most had positive attitudes towards its use. The main causes of low compliance towards helmets were discomfort, feelings of suffocation, and increased sweating. Most participants in urban areas had better helmet usage practices than in rural areas. Most helmet users had valid licenses, and both helmet users and non-users did not wear helmets in the backseat. Strict fines should be imposed for not wearing a helmet, and awareness campaigns should be implemented to increase helmet use.

Conflict of Interest

All the authors declare no conflict of interest

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