



The Prevalence of Helmet Use and Predictive Factors Among Motorcyclists in Shahrekord, Iran in 2018

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Abstract

Background and aims: Motorcycle accidents are a major concern for countries. One of the most important risk factors for motorcyclists is the lack of helmet use. This study aimed to measure the rate of the helmet use and predictive factors in Shahrekord, Iran.

Methods: Using simple random sampling method, this cross-sectional study was conducted in 2018 with a sample size of 350 motorcyclists. A researcher-made questionnaire was used to collect data, and the SPSS software version 24 was used to analyze the data.

Results: The mean age of participants was 28.8 ± 10.1 years. Out of 350 participants, 15.1% and 1.4% of motorcyclists and their passengers used helmets. The most important predictors of helmet use were age more than 35 years, high education, and having a driving license. The most important reason for using the helmet was protection against injuries in accidents.

Conclusion: According to our results, the rate of helmet use was low. Thus, more efforts should be made to intervene and train for the helmet use among community members with an emphasis on younger people, individuals with governmental jobs, and people with lower education level.

Keywords: Motorcycle, Helmet, Trauma

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Introduction

An accident is defined as an unexpected event that results in injury.¹ Among the accidents, road traffic injuries (RTIs) are a huge public health problem and a leading cause of death around the world.² About 85% of mortalities and 90% of disability adjusted life years (DALYs) are caused by road traffic accidents (RTAs) worldwide, taking place in developing countries.³ Based on the report by the World Health Organization (WHO) in 2004, RTIs will be the third leading cause of mortality and morbidity by 2030 in developing countries.⁴ The economic cost of RTIs is estimated to be about 1% of the gross national product in low-income countries and 1.5% in middle-income countries.⁵ The RTAs are the leading cause of death in young people (aged 15–29 years) worldwide; in addition, they cause 763 101 deaths and 15.1 million DALYs annually in Asian countries.⁶ Motor riders are 30 times more likely to lose their lives in RTAs than individuals who are riding in a car, for each mile traveled⁷. Motorcycles provide less protection because of their open design⁸; however, despite the inefficiency in providing safety, it is a good vehicle of transport in busy cities where the public transport system is not efficient.⁹ Motorcycles account for 5% to 10% of road traffic deaths in the United States and Australia, and 40% to 70% of road fatalities in

the countries such as Indonesia, Malaysia, and Thailand¹⁰; these rates are 27% in India and 25% in Iran.⁹ Motorcycle riders are a vulnerable group in Iran, accounting for 42% of RTAs in 2004.¹¹ Using a helmet reduces the risk of head injuries at the time of an accident.^{12,13} Moreover, it reduces the fatality rate of accidents by 20%–45%.^{4,14,15} Therefore, considering that no previous study has been conducted to assess the use helmet in motorcyclists in Shahrekord, the necessity for doing the study is clear. Accordingly, by determining the status of the helmet use, the existing gap, which is our ignorance of the status of helmet use, could be answered.

Materials and Methods

Study Population

This study was carried out in the summer of 2018 with the sample size of 350 motorcyclists. Due to the small number of petrol stations in Shahrekord (n=5), these petrol stations were considered as the sampling environment.

Data Collection

Questionnaires were completed in seven consecutive days by five questioners with necessary trainings. Before completing the questionnaires, the purpose of the study was explained to all participants and they were ensured about

the confidentiality of their information. Furthermore, a verbal consent was obtained from all participants. There were two main inclusion criteria: having a motorcycle and willingness to participate in the study. Data were collected using the simple random sampling method.

Instrument and Measurement

Data were collected using a researcher-made questionnaire, and its reliability was confirmed by Cronbach's alpha ($\alpha=0.78$). The questionnaire had two parts, including demographic information and 21 questions in Likert scale ranging from strongly agree to strongly disagree.

Statistical Analysis

In the present study, the data were analyzed by SPSS software version 24 (IBM Corp, Armonk, NY, USA). Statistical tests including chi-square and logistic regression were performed. The chi-square test was used to test the relationship between qualitative variables, and the logistic regression test was used to predict the reasons for helmet use while the lower or higher amount of variables were considered as a reference group. Odds ratios (ORs with 95% confidence intervals [CIs]) were used to assess the strength of association.

Results

Characteristics of Participants

In this study, 350 motorcyclists (ages range: 13-68 years) were studied. The average age of all participants was 28.8 ± 10.1 years. The mean age of participants wearing the helmet and those not wearing the helmet was 40.2 ± 13 and 26.7 ± 7.9 , respectively. In this study all participants were male, because it is illegal for females to ride a bicycle in public in Iran .

Helmet Use

Among motorcyclists and their passengers, only 15.1% ($n=53$) and 1.4% ($n=5$), respectively, were wearing helmets at the time of study. The number of passengers per motorcycle ranged from one to two (26.9% of motorcyclists had no passengers, 43.1% had one passenger, and 30% had two passengers). The participants were divided to four age groups as follows: lower than 24 years, 25-34 years, 35-44 years, and higher than 45 years. Most of the helmet users were in age group of higher than 45 years (Table 1).

Multiple Analysis

In the present study, unadjusted and adjusted logistic regression was used to investigate the relationship between the helmet use and a series of potential risk factors. After adjustment, the relationship between helmet use with education level, age groups, and having certificate were statistically significant. The participants holding diploma and middle school degrees were more likely to use the helmets (OR: 16.29, CI: 4.90-54.19; and OR: 16.24,

CI: 4.14-6.62 respectively). In this study, the correlation between the age groups of 35-44 years and higher than 45 years with the dependent variable was significant (OR: 0.13, CI: 0.04-0.46; OR: 0.01, CI: 0.005-0.07, respectively). Moreover, the relationship between helmet use and having a driving license was significant (OR: 3.26, CI: 1.43-7.41) (Table 2).

Attitudes Towards the Helmet Use

Among the motorcyclists who used the helmet, 98.1% believed that the helmet protects them against injuries in accidents (Table 3). Moreover, among motorcyclists who did not use the helmet, 66.9% believed that the helmet limits their visibility (Table 4).

Table 1. Distribution of Motorcycle Riders According to the Status of Using Helmet

Variable	Using the Helmet	Not Using the Helmet	Total
	No. (%)	No. (%)	No. (%)
Age groups			
<24	8 (15.1)	124 (41.8)	132 (37.7)
25-34	12 (22.6)	122 (41.1)	134 (38.8)
35-44	12 (22.6)	39 (13.1)	51 (14.5)
>45	21 (39.6)	11 (4)	32 (9.1)
Level of education			
Illiterate	2 (3.8)	7 (2.4)	9 (2.6)
Elementary school	8 (15.1)	14 (4.7)	22 (6.3)
Middle school	8 (15.1)	68 (22.9)	76 (21.8)
Diploma	8 (15.1)	134 (45.1)	142 (40.8)
Associate's degree	10 (18.9)	33 (11.1)	43 (12.3)
Bachelor's degree and higher	17 (32.1)	39 (13.1)	56 (16)
Motorcycle ownership			
Personal	48 (15.4)	264 (84.6)	312 (89.1)
Loan	5 (13.2)	33 (86.8)	38 (10.8)
Job			
Non-governmental	33 (62.3)	222 (74.7)	255 (72.8)
Governmental	15 (28.3)	13 (4.4)	28 (8)
Student	4 (7.5)	52 (17.5)	56 (16)
Unemployed	1 (1.9)	10 (3.4)	11 (3.1)
Driving license			
Yes	42 (79.2)	123 (41.4)	165 (47.1)
No	11 (2.8)	174 (58.6)	185 (52.9)
Duration of using helmet during a day (h)			
<1	15 (28.3)	89 (30)	104 (29.7)
1-2	11 (2.8)	59 (19.9)	70 (20)
>3	27 (50.9)	149 (50.2)	176 (50.3)
The age of first use of the motorcycle (y)			
<14	9 (17)	91 (31)	100 (28.6)
15-19	22 (41.5)	140 (47.1)	162 (46.4)
>20	22 (41.5)	65 (21.9)	87 (24.9)

Table 2. The Results of Unadjusted and Adjusted Logistic Regression

Variable	Unadjusted			Adjusted		
	OR	95 % CI	P Value	OR	95 % CI	P Value
Age groups						
<24	1	Reference group		1	Reference group	
25-34	0.65	0.25-1.66	1.09	1.09	0.39-3.02	<0.86
35-44	0.21	0.08-0.55	0.13	0.13	0.04-0.46	<0.001
>45	0.09	0.01-0.09	0.01	0.01	0.005-0.07	<0.001
Level of education						
Illiterate	1.48	0.28-7.90	0.64	6.12	0.43-85.91	0.17
Elementary School	0.74	0.26-2.09	0.57	4.54	0.94-21.83	0.59
Middle School	3.61	1.43-9.12	0.007	16.24	4.14-6.62	<0.001
Diploma	17.1	2.86-17.71	<0.001	16.29	4.90-54.19	<0.001
Diploma and higher	1.40	0.56-3.47	0.46	2.22	0.70-7.06	0.17
Bachelor's degree and higher	1	Reference group		1	Reference group	
Motorcycle ownership						
Personal	1	Reference group		1	Reference group	
Loan	1.2	0.44-3.22	0.71	1.47	0.44-4.87	0.52
Job						
Non-governmental	1	Reference group		1	Reference group	
Governmental	0.12	0.05-0.29	<0.001	1.28	0.12-1.87	0.06
Student	1.93	0.65-5.69	0.23	0.93	0.23-3.73	0.92
Unemployed	1.48	0.18-12	0.71	0.77	0.07-7.93	0.82
Driving license						
no	0.18	0.09-0.37	<0.001	3.26	1.43-7.41	0.005
yes	1	Reference group		1	Reference group	
The age of first use of the motorcycle (y)						
<14	3.42	1.48-7.19	0.004	0.56	0.17-1.78	0.32
15-19	2.15	1.11-4.16	0.02	0.79	0.29-2.15	0.65
>20	1	Reference group			Reference group	

Discussion

The results of this study showed that the rate of helmet use was 15.1%. In the study conducted by Seyedabrishami et al in Mashhad, Iran, the rate of helmet use was 15.8%, which is close to the results of the present study.⁹ In two other studies by Amirjamshidi et al in Tehran and Zamani et al in Ahwaz, the rate of helmet use was 75% and 10%, respectively.^{16,17} In studies carried out in other parts of the world, different results were concluded. In a study by Xuequn et al in China, the rate of helmet use was 72.6%.¹⁸ In other study by Tosi et al in Argentina, it was 81.3%.¹⁹ In another study conducted by Bianco et al in Italy, it was 34.7%.²¹ The reasons for different percentages in various studies may be related to cultural behaviors, mandatory motorcycle helmet laws, and economic power of people.^{20,21}

The results of this study showed that the age groups of 35-44 years (OR=0.13) and over 45 years (OR=0.01) used the helmet more than other age groups, indicating that the use of helmet increases with age. Similar results were obtained in the study by Faryabi et al in Kerman, Iran. In this study, helmet use increased by 0.4% for each year of

increasing age.³ In another study by Khan et al in Pakistan, those who had an average age of 32.5 ± 9.7 years were more likely to wear the helmet (OR=1.6) than those who had an average age of 30.9 ± 10.3 years.¹⁰ However, in a study conducted by Chiou et al in Taiwan, from 2001 to 2009, the rate of the helmet use was declined with increasing age.²⁰ Furthermore, in a study by Papadakaki et al in Greece, no significant relationship was found between the helmet use and age.²² In the present study, motorcyclists with the level

Table 3. Reasons for Using Helmets among Motorcyclists

	No. (%)
History of an accident	34 (64.1)
Being useful	49 (92.5)
Protection against injuries at the moment of an accident	52 (98.1)
Fined by police	44 (79.2)
Family insistence	34 (65.4)
Protection against dust	44 (84.6)
Avoid insect clash	45 (84.9)
Protection of life	51 (96.3)

Table 4. Reasons for Not Using Helmets among Motorcyclists

	No. (%)
Being expensive	142 (47.8)
Feeling of suffocation	170 (57.2)
Limitation of vision	198 (66.9)
Limitation of head and neck movements	176 (59.3)
Feel the heat	184 (61.9)
Not protective	72 (24.3)
Having a permanent stop	135 (45.4)
Slow driving	119 (40.2)
The helmet causes neck pain	79 (26.6)
Being heavy	141 (47.5)
Being ridiculed	86 (28.9)
Short distance	121 (40.8)
Not hearing the car horns	115 (38.7)

of education of middle school and diploma were more likely to wear the helmet (OR= 16.24 and OR= 16.30, respectively). In the study of Faryabi et al, those with a diploma education and lower were more likely to wear the helmet than those with a college education (OR= 2.81 and OR= 2.88, respectively).³ But in a study by Wadhvaniya et al in India conducted from 2011 to 2013, those with a college degree and higher were more likely to use helmets (OR= 3.30).²³ In the present study, those with a driving license were more likely to use a helmet than those without it. This may be explained by a greater awareness and honor to the law by them. However, in a study by Skalkidou et al in Greece, the relationship between having a driving license and using the helmet was not significant.²⁴ In the present study, the most common reason for wearing the helmet was protection against injuries at the moment of an accident, which is consistent with the study by Khan et al.¹⁰ In another study by Constant et al in France, preventing face injury was the most important reason for using the helmet, which is close to the results of the present study.²⁵ In this study, one of the considerable reasons for not using helmet was heat sensation, that was consistent with the study by Papadakaki et al.²²

The results of this study have implications for public health, indicating that further efforts should be made to educate and intervene in using helmets. Although the law on helmet use has been enforced in Iran, only 15.1% of motorcyclists used helmet in our study; however, in various studies in Iran, the use of helmet varied from 8.6% to 75%.^{3,26} Accordingly, the helmet manufacturing companies may produce cooler helmets for warm seasons.

Limitations

One of the limitations of this study was its cross-sectional method. Moreover, the data were collected during the day and seasonal differences were not considered. In addition, increases or decreases in helmet use may occur in the rainy

season. Thus, the rate of helmet use is not the same during different seasons.

Conclusion

The results of the present study showed that the rate of helmet use was low in Shahrekord, indicating that the helmet law is not well-implemented in this city. Moreover, in this study, people with higher age groups, higher education, and non-governmental jobs were more likely to wear the helmet. Therefore, interventional and educational activities should be prepared for people in the age group under 35 years, with lower education, and governmental jobs. In addition, helmets should be designed according to the climate of each region. For example, it should be cool in the warm seasons, and it should be warm in the cold seasons.

Conflict of Interest Disclosures

None.

Ethical Approval

The study was approved by the Research Ethics Committee of Shahrekord University of Medical Sciences (code: IR.SKUMS.REC.1395.283). No personal information of motor riders was collected.

Authors' Contributions

All stages of this study were supervised by the Deputy of Research and Technology of Shahrekord University of Medical Sciences, Shahrekord, Iran. All authors participated in the analysis of the data and interpretation of the results and also critically reviewed the manuscript.

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