Evaluation of the Use and Reasons for Not Using a Helmet by Motorcyclists Admitted to the Emergency Ward of Shahid Bahonar Hospital in Kerman

Javad Faryabi 1; Mahboobeh Rajabi 2,*, Shahin Alirezaee 3

1Department of Oral and Maxillofacial Surgery, Oral and Dental Diseases Research Center, Kerman University of Medical Sciences, Kerman, IR Iran
2Research Center for Health Services Management, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, IR Iran
3Shahid Bahonar Hospital, Kerman, IR Iran

*Corresponding author: Mahboobeh Rajabi, Research Center for Health Services Management, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, IR Iran. Tel: +98-3432111511, Fax: +98-3432111613, E-mail: ma_rajabi_k@yahoo.com

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Background: Motorcycle crashes are the cause of severe morbidity and mortality especially because of head injuries. It seems that wearing a helmet has an effective role in protection against head injuries. Nevertheless, motorcyclists usually have no tendency to wear a helmet when driving in cities and have several reasons for this behavior.

Objectives: This study aimed to evaluate the use and reasons for not using a helmet by motorcyclists admitted to an emergency ward of a trauma hospital due to accident in Kerman, Iran.

Patients and Methods: This study was carried out by recording the opinions of motorcyclists who had been transferred to the emergency ward of Shahid Bahonar Hospital (Kerman/Iran). Since no data was available on the frequency of the use of helmets, a pilot study was carried out and a sample size of 377 was determined for the main study. Then a researcher-made questionnaire was used to investigate the motorcyclists’ reasons for not using a helmet.

Results: Only 21.5% of the motorcyclists had been wearing helmets at the time of the accident. The most frequent reasons for not using a helmet were the heavy weight of the helmet (77%), feeling of heat (71.4%), pain in the neck (69.4%), feeling of suffocation (67.7%), limitation of head and neck movements (59.6%) and all together, physical discomfort was the main cause of not wearing a helmet during motorcycle rides.

Conclusions: In general, it appears that it is possible to increase the use of helmets by eliminating its physical problems, and increasing the knowledge of community members in relation to the advantages of helmet use, which will result in a significant decrease in traumas resulting from motorcycle accidents.

Keywords: Motorcyclists; Helmet; Use; Reasons

1. Background

Road traffic injuries are a major public health and development crisis and in developing countries the process of modernization, has aggravated this crisis. Thus, about 85% of mortalities, 90% of disability adjusted life years (DALY), and 96% of all children deaths that are caused by road traffic accidents (RTAs) worldwide, occur in these countries. Road traffic trauma is the sixth most common cause of death and will be the third leading cause of mortality and morbidity by 2030 in developing countries according to the world health organization (WHO) (1). Iran has the highest rate of road traffic accidents worldwide and RTAs are considered as the third leading cause of mortality (2). Road traffic injuries cause different issues at different levels. At the national level, they cause considerable financial expenses, especially for developing economies. These injuries are estimated to cost 1–2% of the gross national product of low-middle income countries, which is estimated at over 100 billion USD per year (3). Also, in many developing countries, conditions of referral centers, availability of modern equipments and skilled personnel in medical care centers are great issues. In addition, at the individual level, costs of prolonged and intensive medical care, individual and social problems of victims’ disability and loss of income due to death or disability of the head of the household can worsen the families’ life conditions (1, 4). Motorcycle has been accepted as a suitable vehicle to transfer the individuals in various communities and the public have welcomed its use. Nevertheless, it is a part of many accidents and it is a source of a large number of traumas and deaths (5). Thus, in many developing countries, the majority of people injured or died in road traffic crashes are motorcyclists. However, the number of road fatalities related to motorcyclists in developed countries, where private cars are more popular, is also disproportionately high (6).

In traffic accidents, motorcyclists are at high risk of head, neck, face and traumatic brain injuries (TBI); TBI being one of the most important causes of neuromotor disabilities and mortality in the world and reports from Europe, Asia, South Pacific, Africa and North Amer-
2. Objectives

This study, for the first time, aimed to evaluate the frequency of wearing a helmet by motorcyclists in Kerman, Iran. As the reasons for not wearing a helmet by motorcyclists are important, we obtained the motorcyclists’ opinions about not wearing helmets. Thus, the results may be used to warn all individuals in the community, especially riders about not wearing helmets. Thus, the results may be

3. Patients and Methods

Since no precise data was available on the use of helmets by motorcyclists in Kerman, we conducted two studies: a pilot study and the main study.

A) Pilot study: this study was carried out for a period of one month in order to determine the sample size. During this one-month, 93 motorcyclists were referred to the emergency ward of Shahid Bahonar Hospital, a Trauma Hospital of Kerman, due to motorcycle crashes. Forty of these motorcyclists had been wearing helmets and 53 had not. Therefore, the sample size was estimated as 377 motorcyclists. Thus, 377 motorcyclists who had referred to the emergency ward of this hospital because of crashes during the time of the study were included and the motorcyclists who had not worn helmets were asked to answer the questionnaire.

B) Main study: Subsequently, a researcher-made questionnaire was used to investigate the motorcyclists’ reasons for not using helmets. The first part of this questionnaire consisted of demographic characteristics and history of motorcycle accidents and the second part consisted of 15 questions (Table 1). Injured motorcyclists, under supervision of authors, responded to the questionnaire during all working shifts of the hospital. For assessing the content validity of the questionnaire, we distributed the questionnaire between ten members of Injuries and Disasters Prevention Committee of Kerman University of Medical Sciences to gain their opinion about the questions and with respect to their opinion, some questions were changed and the final questionnaire was prepared for our study. The revised questionnaire was checked by the members of that committee again and regarding their opinions the validity of the final questionnaire, as a whole, was estimated as 0.86. The reliability of the questionnaire based on Cronbach’s alpha, was 0.75. Statistical significance was defined at P < 0.05.

4. Results

The mean age of motorcyclists who had worn and those who had not worn helmets were 28.36 and 26.33 years, respectively. Most motorcyclists had lower than diploma level of education. Furthermore, 52.7% of the motorcyclists had no previous history of motorcycle accidents and 69.5% of them had not used a helmet; 33.9% of the motorcyclists had a history of one accident and 83.8% of them had not used a helmet. Also, 13.4% of the motorcyclists had a history of more than one accident, 87.2% of them had not used a helmet. Also, 13.4% of the motorcyclists had a history of more than one accident, 87.2% of them had not used a helmet (Table 2). There was no significant relationship between the motorcyclists’ age and educational status, and wearing helmet (P = 0.12, P = 0.42). However, there was a significant relationship between history of motorcycle accident and wearing a helmet (P = 0.008) (Table 2).

Age, educational status and a history of accident were considered in the multiple logistic regression models and the adjusted odds ratio (OR) (95% CI) were estimated. These results also showed no significant relationship between age, educational status and wearing a helmet but there was a significant relationship between a history of
motorcycle accident and wearing a helmet (Table 3). From 377 motorcyclists only 81 motorcyclists (21.5%) had worn a helmet at the time of the accident. The motorcyclists’ reasons for not wearing a helmet during the motorcycle ride were the heavy weight of the helmet in 77%; neck pain after wearing a helmet in 69.4%; limitation of movements of the head and neck in 59.6%; visual limitation during wearing a helmet in 57%; feeling of heat in 71.4%; feeling of suffocation in 67.7%; unfavorable appearance of the helmet in 55.4%; difficulty of preserving or holding the helmet before and after the ride in 59.2% and being ridiculed by others due to the use of a helmet in 53.9%. In addition, 64.8% of motorcyclists believed that summer was not a suitable season for wearing a helmet due to excessive heat and 66.3% believed that winter was a suitable season for wearing a helmet. Furthermore, 53.4% of the cases believed that if they obeyed the rules and rode at low speed, there would be no need to use a helmet. In addition, 41.6% of the subjects believed that they did not need a helmet because they were sure that they could keep their balance if an accident occurred and 49.8% believed that quiet streets were the best places to ride motorcycles without the need of wearing a helmet. Also 59.5% confessed that when they were in a hurry, they did not use their helmet.

Table 1. Questionnaire Investigating Motorcyclist’s Reasons of not Using a Helmet

| Number | Question details | Completely Agree | Agree | No Opinion | Disagree | Completely Disagree |
|--------|------------------|------------------|-------|------------|----------|---------------------|
| 1      | The helmet is heavy and I don’t use it for this reason |                 |       |            |          |                     |
| 2      | The helmet causes neck pain |                 |       |            |          |                     |
| 3      | I feel heat on my head when wearing the helmet |                 |       |            |          |                     |
| 4      | I have a feeling of suffocation when wearing the helmet |                 |       |            |          |                     |
| 5      | When I ride slowly there is no need to wear a helmet |                 |       |            |          |                     |
| 6      | I think if an accident occurs I can maintain my balance so there is no need to wear a helmet |                 |       |            |          |                     |
| 7      | It causes limitations in neck and head movement |                 |       |            |          |                     |
| 8      | In summary, I can not use a helmet due to excessive warmth |                 |       |            |          |                     |
| 9      | The winter season is suitable for wearing a helmet |                 |       |            |          |                     |
| 10     | When I am in a hurry, I do not use a helmet |                 |       |            |          |                     |
| 11     | In quiet streets and valleys there is no need to wear a helmet |                 |       |            |          |                     |
| 12     | Helmet leads to restriction of vision |                 |       |            |          |                     |
| 13     | Helmets do not have a suitable appearance |                 |       |            |          |                     |
| 14     | Carrying the helmet before and after use is difficult |                 |       |            |          |                     |
| 15     | Some people ridicule motorcyclists who wear helmet |                 |       |            |          |                     |

Table 2. Demographic Characteristics of Motorcyclist \(^{a}\)

|                      | Helmed Motorcyclists | Non-Helmeted Motorcyclists | P Value |
|----------------------|----------------------|-----------------------------|---------|
| Age, y               | 28.36 ± 10.33        | 26.33 ± 10.19               | 0.12    |
| Education Level      |                      |                             |         |
| Illiterate           | 3.7                  | 7.9                         | 0.42    |
| Under diploma        | 44.4                 | 47.9                        |         |
| Diploma              | 34.6                 | 31.2                        |         |
| Academic Education   | 17.3                 | 13                          |         |
| History of Accident  |                      |                             | 0.008   |
| Did not have any     | 30.5                 | 69.5                        |         |
| One time             | 16.2                 | 83.4                        |         |
| More than one time   | 12.8                 | 87.2                        |         |

\(^{a}\) Data are presented as % or Mean ± SD.
5. Discussion

Motorcycles crashes are considerable causes of injury-related fatality and disability (22). Head injuries as one of the most common injuries after motorcycle crashes are estimated to be the cause of most deaths and long-term disabilities. Also in some studies, head injuries and deaths had a significant relationship (16, 17). In our study, the mean age of motorcyclists was less than 30 years. This finding was consistent with the results of the Jammohamadidi et al. study in Mazandaran (28.1%) but lower than the results of other studies in Yazd (34.8%), Fars (31.4%), Tehran (32.3%) and United State of America (38%) (13, 14, 26, 28, 29). This pattern showed that most motorcyclists’ injuries and disabilities occur in the productive age group of the society, which causes enormous social and economic problems. The majority of riders had an education level under diploma, similar to Heydari et al. (13), Vafaee-Najar et al. (25) and Amirjamshidi et al. (26) studies in Fars, Mashhad and Tehran, respectively. However, in Mehri et al. (29) study in Yazd 54.7% and in McCarrt et al. (30) study in the United States 38% of the participants had college education (13, 25, 26, 29, 30). In the present study, there was no significant relationship between wearing a helmet and age and educational status. Also, in a study carried out by Khan et al. (27) in Pakistan the subjects’ awareness of the helmet law, their marital status and their average age had no effect on wearing or not wearing a helmet (27). Brown et al. and Dee studies, did not reveal any significant relationship between the use of a helmet and age or gender (28, 31). Nevertheless, in McCarrt’s study the frequency of helmet use was related to drivers age (30). In the current study, most participants (52.7%) had no history of accidents by motorcycles, similar to McCarrt’s study (57%). Furthermore, 33.9% of the participants had a history of one accident, 83.8% of which had not worn a helmet and 13.4% had a history of more than one motorcycle accident, 87.2% of which had not worn a helmet. These findings suggest a pattern of persistent high-risk behavior among people who have the experience of an accident for not using a helmet. In Mehri et al. study, only 10.7% of all motorcyclists with a history of motorcycle crash used a helmet and in Moghisi et al. study 55% of the motorcyclists had at least one accident and only two of them were wearing helmets at the time of the accident (29, 32). Also, there was a significant relationship between a previous history of motorcycle accident and wearing a helmet. Arguments against helmet use for motorcycle riders include the claims of increasing the risk of neck injuries and severity of other body injuries in crashes, decreasing of rider visibility and effectiveness of helmets in reducing mortality (7). However, against these claims the results of different studies in different countries have proved that wearing standard helmets significantly decreases mortality rate due to traumas during riding a motorcycle. Also studies showed a decrease in the rates of fatal injuries and deaths of motorcyclists after the helmet-use laws (33, 34). For example, Dee’s (31) study showed that State laws requiring helmet use, reduced motorcyclist fatalities by 27%. Based on the result of the present study, 21.5% of motorcyclists in Kerman wore helmets. This rate was different in other cities of Iran like Tehran during 1999-2000 (8.6%) and 2007 (75%), Mashhad (15.8%) and Ahwaz (10%) (24-26, 35). In Karachi of Pakistan this rate was 56%, in Pamplona of Spain, 19.7%, which increased to 94.8% after the law of compulsory use of a helmet by motorcyclists took effect, in Indonesia 89%, in Texas (1994-2006) 56% and in Ghana 34.2% (27, 28, 36). The reasons for different percentages of using safety helmets by motorcyclists in various studies may be due to cultural behaviors, mandatory motorcycle helmet laws, economic power of people and urban or rural site for riding of motorcycles. Also the type of helmet worn, correct fastening of helmets and cost are secondary issues that are particularly relevant to motorcycle helmet usage in developing countries (7). In the present study the most common reason for not wearing a helmet was the weight of the helmet (77%), and other reasons were the feeling of heat during helmet use (71.4%), neck pain (69.4%), feeling of suffocation (67.7%) and limitations in the movements of the head and neck (59.6%). In Moghisi et al. (32) study looking funny 73.2%, disturbing issues 44.4%, decreased hearing 36.4% and feeling of heat during helmet use 30%, were the most common reasons of not using a helmet. Khan reported that 44% of motorcyclists did not wear a helmet due to physical discomfort and 25% due to visual limitations (27). In a study by Conrad in Indonesia there was differences in time and place where motorcyclists reported wearing helmets. They used helmets rarely at night and physical discomfort and absence of police surveillance was the most common reasons for not wearing helmets (37). Thus, in general it can be concluded that physical discomfort was the most important reason for not wearing a helmet in this study, consistent with the results of other studies. Since in many cases, motorcyclists were the breadwinners of the family and they

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**Table 3. The Relationship Between Using a Helmet and Demographic Characteristics of Motorcyclist**

| Variable               | Adjusted OR | P Value |
|------------------------|-------------|---------|
| Age                    | 1.43 ± 0.074 | > 0.05  |
| Education Level        |             |         |
| Under Diploma          | 2.88 ± 0.13  | > 0.05  |
| Diploma                | 2.81 ± 0.14  |         |
| Academic Education     | 2.47 ± 0.24  |         |
| History of Accident    |             |         |
| One time               | 0.45 ± 0.016 | < 0.05  |
| More than one time     | 0.38 ± 0.062 |         |

a Abbreviation: OR, odd ratio.
were at their productive age, motorcycles’ safety devices become of greater importance. Thus manufacturers of helmets must consider factors that determine the ease of use and motorcyclists comfort, in construction of standard helmets. Also, motorcyclists training and planning for changing their attitudes and behaviors, should be considered in the future to help increase the usage of helmets and decrease risky behaviors during riding.

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Authors’ Contributions

Javad Faryabi: study design, abstraction of data and critical revision of the manuscript for important intellectual content. Mahbobeh Rajabi: data collection, study supervision and manuscript writing. Shahin Alirezaee: intellectual content. Mohamadzadeh M, Shojaee A, Akbari H, et al. Pre-hospital trauma care in road traffic accidents in kashan, iran. Arch. Trauma Res. 2013;3(4):166-71.

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