

Awareness and Attitudes toward the Safety of Motorcyclists: A Training Approach, 2016

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Abstract

Introduction: Due to the high level of vulnerability, motorcyclists are considered a priority for research and intervention. Therefore, this study aimed to improve the society's awareness and attitudes toward motorcycle traffic safety.

Method: This study involved a randomized clinical trial conducted in 2016 among trauma patients and their caregivers in Shahid Rajaei hospital, Shiraz. Block randomization was used to divide the patients into study and control groups. Data collection was done using a researcher-made questionnaire called "Awareness & Attitude associated with Motorcycle Traffic Safety"; the questionnaire was found reliable with a Cronbach's alpha of 78%. We made use of a pairwise T-test to make our intergroup comparisons; in cases of non-normal data, a non-parametric alternative was employed. The one-way analysis of variance (ANOVA) was used to study the inter-variable relationships.

Results: Participants included 276 patients, 138 in each group. Generally, 72.7% of the population consisted of males and the rest were females. The participants had a mean age of 31.38±10.46 years. Our pairwise T-test in the case group revealed a significant difference in attitudes and awareness of the subjects before and after the intervention ($P < 0.001$). The one-way ANOVA indicated the influence of marital status on the level of awareness after training. Furthermore, training had the highest impact on the age-group of 47-62 years old.

Conclusion: Training would lead to increased awareness and improved attitudes in society toward motorcycle traffic safety, and would indirectly be an effective step toward improvement of traffic culture and reduction of road traffic accidents (RTA).

Keywords: Accident prevention, Safety behavior, Motorcyclists

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Introduction

Road traffic accidents (RTAs) have a special significance due to their specific characteristics as high incidence, high severity and direct involvement of people, which are all more distinct in developing countries such as Iran (1). Among road users, motorcyclists are in a priority for research and intervention due to their high vulnerability (2). The structural characteristics of motorcycles cause the riders to experience more serious injuries than other motor-vehicle drivers(3).

According to reports from the World Health Organization (WHO), more than 50% of road traffic fatalities in the world occur among the age-group of 15-44. Thus, it has been shown that the structured teaching programs are effective in improving knowledge and attitude of college student on road

traffic accident(4, 5). Research shows that it is often the wrong behavior of drivers that leads to collisions(6).

Lack or shortage of accurate data regarding awareness, attitudes and practices of different social groups in relation to driving is an important issue which should be considered in any planning for prevention and improvement of traffic-related problems(7). The most efficient way to reduce such incidents is to implement preventive solutions and educational programs; in other words, we must use the literature in the field to develop our plans toward changing attitudes, behaviors and lifestyles in the society(8). Numerous studies have confirmed the positive effects of educational interventions related to prevention of RTAs. Following training, these studies achieved results such as reduced trauma incidence and mortality rates, as well as reduced lengths of

hospital stay (9-11). Toward effective design and implementation of educational programs on traffic safety, particularly in developing countries, we must act in accordance with the available research and evidence on traffic collisions and the specific socioeconomic conditions(12). Furthermore, interventions that use a combination of multiple educational methods in longer periods of time have proven more effective compared to others(13).

There are many methods used to reduce RTA, such as using helmet. For example, perceived behavioral control and social norms can be influential in using the helmet in a traditional setting, which can be used in planning head injury prevention programs for motorcyclists(14, 15). Since the relatives of RTA victims are more accessible and have the highest influence on patients, they were selected as the target group in this study. It is of great importance to increase the awareness and correct the attitude of the public in relation to injuries caused by motorcycle accidents and the effective role of protective equipment such as helmets in preventing said injuries. Therefore, this study focused on prevention of motorcycle accidents within the topics of primary prevention, increased awareness and improved attitude toward traffic safety.

Methods

The present interventional study was conducted in July 2016, in Shahid Rajaei hospital, Shiraz, the main referral center for trauma cases. The participants entered the study through census; written informed consents were obtained at the beginning. Afterwards, by using randomization method the subjects were divided into intervention and control groups. Inclusion criteria were age over 15, willingness to participate, a stable condition both physically and emotionally, and a history of more than one week of hospitalization in Rajaei hospital. Individuals under 15 years of age, emergency and ICU patients and their relatives, and people who hadn't received a full training program were excluded from the study. In this research, data were collected using a researcher-made questionnaire titled "Awareness and Attitude associated with Motorcycle Traffic Safety". Demographic information included age, gender, marital status, education, occupation and motorcycle license. Based on ICD-10, motorcycle accidents were classified under the categories V00-V09 (13). To assess the effects of training in different age-groups, the subjects were divided into the age-groups of 15-30, 31-46, 47-62 and 63-78 years.

Totally, 276 patients and patient caregivers (138 in each of the case and control groups) were enrolled

in the study. After obtaining the consent from, the participants' information were recorded with ethics. The awareness and attitude questionnaires were first distributed among the control group; this group received no training. One week later, the group completed the questionnaires again. Then, it was time for the case group to fill out the questionnaires. Telephone contacts served to check and complete the missing information in the questionnaire.

The "Awareness and Attitude associated with Motorcycle Traffic Safety" questionnaire includes 20 items, out of which 12 assess the level of awareness (Items 1, 3, 4, 6, 11, 12, 13, 14, 16, 17, 18 & 20) and 8 make an evaluation of attitude (Items 2, 5, 7, 8, 9, 10, 15 & 19). The items are rated based on a 3-point Likert scale (agree, disagree, no comment). In all items, "agree" received 3 points, "disagree" was scored 1 point, and 2 points were given to the "no comment" choice. There was a minimum score of 12 and a maximum score of 36 in the awareness dimension; in the attitude dimension, minimum score was 8 and maximum score 24.

In the course of the questionnaire's development, 45 items were first designed in relation to motorcycle traffic safety. The questions were then assessed by 12 traffic experts, who scored the items according to Lawshe's content validity approach (1. Item is essential 2. Item is appropriate but not essential 3. Item is not appropriate).

The appropriate questions were then selected based on each item's CVR (Content Validity Ratio); in this regard, 20 questions out of 45 had an acceptable score. Thus, the questionnaire's content validity was ensured. To validate and standardize the questionnaire, a total of 200 relatives of the patients (10 individuals per each item) completed the questionnaire. Cronbach's alpha was used to assess the reliability of the questionnaire (14); in this regard, the alpha value was obtained as 73%, which was standardized as follows:

$$CVR = \frac{\text{Number of experts selecting the "essential" choice} - \frac{\text{Number of all experts}}{2}}{\frac{\text{Number of all experts}}{2}}$$

Procedure and Educational Content

This interventional study commenced after receiving approval from the ethics committee of Shiraz University of Medical Sciences and being registered in the official website of the Iranian Registry of Clinical Trials (IRCT) under the code no. IRCT2016091729837N1. Unlike the case group who attended the training program, the control group received no training. Interventions involved multiple methods of education, including a collection of

short educational video clips, animations and short documentaries related to motorcycle traffic safety and distribution of educational pamphlets and posters. Moreover, a 3-hour training workshop was held for the case group regarding prevention and reduction of motorcycle accidents. One week following the intervention, the questionnaires were redistributed among the case group in order to assess the impact of the educational program. After final collection of the questionnaires, the training program was performed for the control group due to ethical considerations.

Statistical Methods

Data were categorized using descriptive statistics. A pairwise T-test was used for intergroup comparisons. Furthermore, normality of data distribution was assessed via the Kolmogorov-Smirnov test; in the cases of non-normal distribution, a non-parametric equivalent of the T-test was employed. The one-way analysis of variance (ANOVA) was used to study the inter-variable relationships between attitude and awareness with occupation and education status. For evaluation of the attitude and awareness relationship with age, license and marital status, we used correlation and independent t-test, respectively. Data were analyzed using SPSS version 22.

Results

Out of the 276 participants, 138 were assigned to the case group and the remaining 138 formed the control group. Overall, there were 202 men (72.7%) and 75

women (27%) in the study. Participants had a mean age of 31.38 ± 10.46 , with 17 being the minimum and 72 the maximum age. Table 1 presents our population's demographic characteristics stratified by group (case-control).

This Table shows that the majority of the participants in both case and control groups were single men with motorcycle licenses. Furthermore, these individuals mostly had academic degrees and were self-employed. Overall, the mean scores for attitude were 12.15 and 13.21 among patients' relatives before and after training, respectively. The relatives had an overall mean score of 15.34 and 16.37 for awareness before and after the intervention, respectively. Table 2 provides the mean scores of awareness and attitude for patients' relatives stratified by group (case-control).

According to our statistical tests, the two study groups (case-control) were generally similar before training. Meanwhile, the awareness and attitudes of the two groups were the same prior to the intervention. However, we found a significant difference between the groups after the relatives attended the training program ($P < 0.001$), which indicates the effectiveness of our interventions. Moreover, there were significant differences between the changes of attitude and awareness in the case and control groups.

Due to the absence of educational interventions, the mean scores of awareness and attitude did not change that much in the control group. In the case group, however, the pairwise T-test revealed

Table 1: Frequency distribution of the study variables based on demographic characteristics stratified by group

Variable		Case Group Frequency (%)	Control Group Frequency (%)	P value
Gender	Male	96 (69.6)	105 (76.1)	0.12
	Female	33 (23.9)	42 (30.4)	0.45
Marital Status	Married	57 (41.3)	61 (44.2)	0.53
	Single	81 (58.7)	77 (55.8)	0.63
Motorcycle License	With License	84 (60.9)	99 (71.79)	0.15
	Without License	54 (39.1)	39 (28.3)	0.08
Education	Illiterate	2 (1.4)	2 (1.4)	0.98
	Elementary School	4 (2.9)	2 (1.4)	0.75
	Middle School	19 (13.8)	17 (12.3)	0.63
	High School	53 (38.4)	52 (37.7)	0.95
	Higher Edu.	60 (43.5)	65 (47.1)	0.63
Occupation	Clerical Worker	19 (13.8)	21 (15.2)	0.75
	Laborer	9 (6.5)	8 (5.8)	0.75
	Housewife	21 (15.2)	17 (12.3)	0.65
	Student	23 (16.7)	23 (16.7)	0.98
	Retired	11 (8.0)	6 (4.3)	0.53
	Self-employed	44 (31.99)	50 (36.2)	0.15
	Other	11 (8.0)	13 (9.4)	0.75

Table 2: Effects of training on awareness and attitudes stratified by group

Variable		Case Group mean±SD	Control Group mean±SD	P value
Attitude	Pre-training	2.70±12.23	2.86±12.06	0.112
	Post-training	3.10±13.92	2.75±12.50	<0.001
Awareness	Pre-training	3.20±15.47	3.56±15.21	0.089
	Post-training	3.72±17.18	3.49±15.57	<0.001
Overall	Pre-training	5.02±27.71	5.76±27.28	0.074
	Post-training	5.93±31.15	5.48±28.07	<0.001

Table 3: Relationship between the study variables and post-training awareness and attitudes in the case group

Variable	Attitude		Awareness			
	Statistical index value	P value	Statistical index value	P value		
Age	Correlation	0.80	0.75	Correlation	0.64	0.93
Marital Status	Independent t test	1.08	0.30	Independent t test	7.15	0.01
Gender	Independent t test	0.02	0.89	Independent t test	0.29	0.59
License	Independent t test	0.02	0.87	Independent t test	1.45	0.23
Occupation	Anova test	0.88	0.51	Anova test	1.72	0.11
Education	Anova test	0.22	0.92	Anova test	0.87	0.48

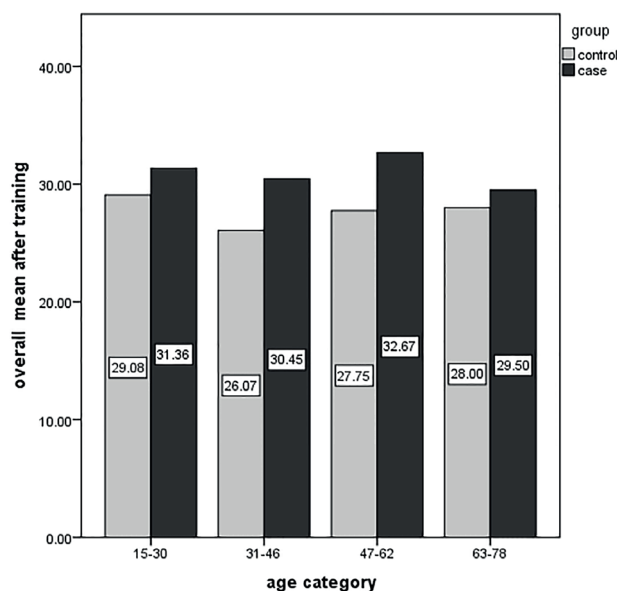
significant differences in the attitudes and awareness of the participants after training ($P<0.001$).

Our one-way ANOVA to determine the main effects of the study variables on awareness and attitudes of the participants after training showed that none of the variables had any effect on attitude; however, the result of independent t-test showed that marital status had an impact on the level of awareness following the intervention (Table 3).

Figure 1 displays the results of the evaluation of the overall influence of our training program in different age-groups. As can be observed in the Figure, training had the highest impact on the age-group of 47-62. Meanwhile, the mean scores of case and control groups he most showed differences in this age-group.

Discussion

Our study results revealed the positive effect of educational interventions on the participants' awareness and attitudes. In the case group, the awareness mean score increased from 15.47 before the intervention to 17.18 after it; there was also an increase from 12.23 to 13.92 in the group's attitude mean score. Improving the attitude of the society toward adherence to traffic laws can be a key factor in accident prevention(16). Numerous studies have evaluated the awareness and attitudes of different social groups related to compliance with traffic regulations (16-19). In a study in Bandar Abbas on the knowledge, attitudes and practices of drivers with regards to traffic laws, around 30.2% of the 169 drivers with 6-10 years of driving experience had adequate

**Figure 1:** Total mean scores after training in different age-groups stratified by group (case-control)

knowledge on adherence to rules. Furthermore, 43.5% of the drivers in the 31-40 age-group had a positive attitude toward adherence to traffic regulations(17). Moreover, in a study in Saudi Arabia evaluating the knowledge and attitude of medical students toward traffic laws, 75% of the students had proper knowledge on the rules and regulations; in that study, 66.6% of the students believed that the lack of adequate knowledge on traffic regulations is the reason behind high-speed driving and road traffic collisions(18).

According to our study results, training had different effects in different age-groups relate to increased awareness and positive attitude toward adherence to traffic laws. Our training program had

the highest impact on the age-group of 47-62. Also, the most difference between the mean scores of the case and control groups was observed in this age-group. In another study on the knowledge, attitude and practice of drivers, most individuals with adequate knowledge on traffic laws were in the 31-40 age-group(19). Moreover, the results of the present study indicated a significant association between marital status and awareness which can be due to their greater experience. In Yonesian et al.'s study on the knowledge, attitude and practice of motor-vehicle drivers toward traffic laws, married people had more positive attitudes and better practices(20), which is consistent with our findings.

In this study, a training program was held to increase the awareness levels and improve the attitudes toward motorcycle traffic safety. Researchers believe that due to the high vulnerability of motorcycle users, this group is in priority for research and intervention(21). Negative attitudes toward helmets is one of the main factors leading to reduced helmet use among motorcyclists(22). In the present study, the participants received training on motorcycle safety, especially helmet use and the characteristics of standard helmets. In this regard, our results indicated improved awareness and attitudes after training. A case-control study in the UK evaluated the attitudes toward motorcycle traffic safety in 2010; their case group consisted of motorcycle riders injured in traffic accidents and the control group included motorcyclists working in gas stations. Their results showed that adherence to regulations and use of helmets and protective clothing depended on a rider's attitude and level of experience(23). The educational interventions in the present study involved training on level-1 prevention of accidents, which was performed among physically and emotionally stable patients and their relatives aiming to reach increased awareness levels and improved attitudes. Various target groups are commonly used in traffic-related interventional research designs; our choice in particular was due to the accessibility of patients and their relatives, as well as their hands-on encounter with trauma. There have been numerous studies on prevention of RTAs, most of which have involved design and execution of pre-post interventional programs. These interventions were mainly held for the general population of drivers, road drivers, young individuals, students and/or parents to young children. These studies reported outcomes such as reduced incidence of RTAs and relative injuries, increased usage of safety equipment, decreased driving speeds, and reduced rates of drink driving (24-26).

In a study in France (2008), 261676 drivers participated in a 2-day training course aiming at promotion of driving safety. After training, the participants were encouraged to reflect on their driving behavior in terms of lifestyle, beliefs, social rules and attitude toward dangerous driving. Moreover, there was a special focus on the drivers' awareness and reduction of high-risk driving in that study. Their results were analyzed during the training sessions and put to discussion among the participants, which showed an increase in the awareness levels following the intervention (27). Duperrex et al. did a study on the impact of safety education for pedestrians on the injury prevention; they found that training had significant effects on the behavior of pedestrians. In this regard, the safety education had led to improved attitudes in the experimental group; the mean score increased from 0.17 pre-intervention to 1.48 post-intervention in this group; the group also had a mean awareness score of 0.16 before the training, which increased to 1.01 afterwards(25). Their findings were consistent with our results.

Strengths, Limitations and Suggestions

The educational intervention performed toward reduction of traffic accidents and promotion of proper driving culture is considered a strength of this study. According to our knowledge and search, very few studies have addressed this subject across the globe. In Iran, however, this is the first time such a study is conducted in a central trauma hospital. Furthermore, due to the differences in learning skills, various educational methods were used in this study, such as face-to-face training, the use of video clips, animations and documentaries, posters and educational pamphlets. However, as a result of the study limitations, we weren't able to distinguish the training programs based on groups. Our suggestion is to design the training programs based on the specific characteristics of each group in terms of age, gender and level of education. Furthermore, longer follow-up periods were not possible due to the patients being discharged or the relatives being substituted.

Conclusion

Educational interventions lead to increased awareness and positive attitudes in society toward adherence to laws for motorcycle traffic safety. Training can indirectly be an effective step toward improvement of traffic culture in the community and reduction of road traffic accidents.

Conflict of Interest: None declared.

References

1. Mohammadfam I, Golmohammadi R. Evaluation of safety behavior among coach drivers in Hamadan. 2004.
2. Odero W, Khayesi M, Heda PM. Road traffic injuries in Kenya: magnitude, causes and status of intervention. *Inj Control Saf Promot.* 2003;10(1-2):53-61. doi: 10.1076/icsp.10.1.53.14103.
3. Lin MR, Kraus JF. A review of risk factors and patterns of motorcycle injuries. *Accid Anal Prev.* 2009;41(4):710-22. doi: 10.1016/j.aap.2009.03.010.
4. Ranjan DP, Fahim M, Kirte RC. A cross sectional study to assess the knowledge, attitude and practice towards road traffic safety among adolescent students of a selected Pre-University college in Raichur city. *International Journal Of Community Medicine And Public Health.* 2018;5(6):2446-52. doi: 10.18203/2394-6040.ijcmph20182175.
5. Verma PK, Tiwari K, editors. Epidemiology of road traffic injuries in Delhi: Result of a survey. Regional Health Forum; 2004.
6. Gordon H. Psychiatry, the law and death on the roads. *Advances in Psychiatric treatment.* 2004;10(6):439-45. doi: 10.1192/apt.10.6.439.
7. McEvoy SP, Stevenson MR, Woodward M. Phone use and crashes while driving: A representative survey of drivers in two Australian states. *Med J Aust.* 2006;185(11-12):630-4.
8. Coate D, Markowitz S. The effects of daylight and daylight saving time on US pedestrian fatalities and motor vehicle occupant fatalities. *Accid Anal Prev.* 2004;36(3):351-7. doi: 10.1016/S0001-4575(03)00015-0.
9. Coben JH, Steiner CA, Miller TR. Characteristics of motorcycle-related hospitalizations: comparing states with different helmet laws. *Accid Anal Prev.* 2007;39(1):190-6. doi: 10.1016/j.aap.2006.06.018.
10. Nakamura N, Yamaura A, Shigemori M, Ono J, Kawamata T, Sakamoto T, et al. Epidemiology, prevention and countermeasures against severe traumatic brain injury in Japan and abroad. *Neurol Res.* 2002;24(1):45-53. doi: 10.1179/016164102101199530.
11. Servadei F, Begliomini C, Gardini E, Giustini M, Taggi F, Kraus J. Effect of Italy's motorcycle helmet law on traumatic brain injuries. *Inj Prev.* 2003;9(3):257-60. doi: 10.1136/ip.9.3.257.
12. Nantulya VM, Reich MR. The neglected epidemic: road traffic injuries in developing countries. *BMJ.* 2002;324(7346):1139-41. doi: 10.1136/bmj.324.7346.1139.
13. Elder RW, Shults RA, Sleet DA, Nichols JL, Thompson RS, Rajab W, et al. Effectiveness of mass media campaigns for reducing drinking and driving and alcohol-involved crashes: a systematic review. *Am J Prev Med.* 2004;27(1):57-65. doi: 10.1016/j.amepre.2004.03.002.
14. Ghasemzadeh S, Babazadeh T, Allahverdipour H, Sadeghi-Bazargani H, Kouzekanani K. Cognitive-behavioral determinants of using helmet by motorcyclists in a rural community. *Journal of Transport & Health.* 2017;6:548-54. doi: 10.1016/j.jth.2017.04.007.
15. Cortina JM. What is coefficient alpha? An examination of theory and applications. *J Appl Psychol.* 1993;78(1):98. doi: 10.1037//0021-9010.78.1.98.
16. Martinussen LM. Facilitating improved road safety based on increased knowledge about driving behaviour and profiling sub-groups of drivers: Ph. D Thesis; 2013.
17. Tajvar A, Yekaninejad MS, Aghamolaei T, Shahraki SH, Madani A, Omidi L. Knowledge, attitudes, and practice of drivers towards traffic regulations in Bandar-Abbas, Iran. *Electronic physician.* 2015;7(8):1566-74. doi: 10.19082/1566.
18. Al-Zahrani AH. Knowledge and attitude toward road traffic regulations among students of Health Sciences College in Taif Region, KSA. *Int J Med Sci Public Health.* 2015;4:241-4. doi: 10.5455/ijmsph.2015.2810201447.
19. JA, Gliem RR, editors. Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales 2003: Midwest Research-to-Practice Conference in Adult, Continuing, and Community
20. Yonesian M, Moradi A. Knowledge, attitude and practice of drivers on regulation of traffic in Tehran. *J Sch Public Health Instit Public Health Res.* 2005.
21. Liu BC, Ivers R, Norton R, Boufous S, Blows S, Lo SK. Helmets for preventing injury in motorcycle riders. *The Cochrane database of systematic reviews.* 2008(1):CD004333. doi: 10.1002/14651858.CD004333.pub3.
22. Li LP, Li GL, Cai QE, Zhang AL, Lo SK. Improper motorcycle helmet use in provincial areas of a developing country. *Accid Anal Prev.* 2008;40(6):1937-42. doi: 10.1016/j.aap.2008.06.019.
23. Musselwhite C, Avineri E, Susilo Y, Fulcher E, Bhattachary D, Hunter A. Understanding public attitudes to road user safety: final report. Road safety research report no. 111. 2010.
24. Yahia HA, Ismail A, Albrka SI, Almselati AS,

- Ladin MA. Attitudes and awareness of traffic safety among drivers in Tripoli-Libya. *Research Journal of Applied Sciences, Engineering and Technology*. 2014;7(24):5297-303. doi: 10.19026/rjaset.7.929.
25. Duperrex O, Bunn F, Roberts I. Safety education of pedestrians for injury prevention: a systematic review of randomised controlled trials. *BMJ*. 2002;324(7346):1129. doi: 10.1002/14651858.cd001531.
26. Salvarani CP, Colli BO, Carlotti Junior CG. Impact of a program for the prevention of traffic accidents in a Southern Brazilian city: a model for implementation in a developing country. *Surg Neurol*. 2009;72(1):6-13; discussion -4. doi: 10.1016/j.surneu.2007.10.008.
27. Observatoire National Interministériel de Sécurité Routière [Internet]. Le permis à point en 2008. Retrieved June 13, 2009. Available from: <http://www2.securiteroutiere.gouv.fr/IMG/Synthese/EA PPOINT.pdf>