

Driving Behavior among Different Groups of Iranian Drivers Based on Driver Coping Styles

Abstract

Background: This study aimed to assess driving behavior of Iranian drivers based on their coping styles (problem-oriented, emotion-oriented, and avoiding). **Methods:** This study was conducted on 610 drivers divided into four different groups. The drivers' behaviors and coping styles were evaluated using driver behavior questionnaire (DBQ) and coping inventory for stressful situations. **Results:** The results showed a significant difference among the three coping styles regarding the mean scores of DBQ dimensions ($P < 0.001$). In addition, the emotion-oriented drivers obtained higher mean scores compared to those with other coping styles. **Conclusions:** It can be concluded that emotion-oriented drivers were more susceptible to crashes compared to those with problem-solving and avoidance coping styles.

Keywords: Coping styles, driving behavior, emotion-oriented drivers

Introduction

Car crashes bring about lots of human and financial losses every year. Based on the reports, traffic crashes are the primary cause of physical disability in the world.^[1] Based on the World Health Organization's report in 2002, more than 10,200,000 individuals are killed, and more than 50,000,000 ones are severely injured in road crashes every year.^[2] In the USA, crashes take the life of almost 45,000 individuals and cause more than 2,000,000 debilitating injuries every year. In Europe also, more than 40,000 individuals are killed, and 150,000 ones are disabled because of car crashes every year.^[3] Moreover, the overall costs of traffic crashes have been estimated to be almost 518,000,000,000 dollars in the world.^[4] Based on the reports by the Iranian Legal Medicine Organization, 12,198 individuals were killed, and 217,190 ones were injured in car crashes in the first 8 months of 2014. In addition, 17994 individuals were killed, and 315,719 ones were injured in car crashes in 2013.^[5] The financial costs of car crashes include 1%–1.5% and 2% of GNP in developing and developed countries, respectively.

The three major factors of car crashes include roads, automobiles, and humans. Brake system malfunction, car

obsolescence, and dim lights are among the factors related to automobiles. In addition, the environmental factors, such as weather and road disrepair, may also cause crashes. However, in most cases, human errors are among the primary factors that cause crashes. It is quite obvious that human behavior plays a critical role in the complex chain of crashes. Four factors, including slips, errors, deliberate violations, and undeliberate violations, are the human factors that may cause or facilitate car crashes. While driving a vehicle, individuals have to repeatedly and dynamically evaluate situations, make decisions, and take appropriate actions. This sequence is so important that negligence can lead to crashes even in short distances.^[6] There are some factors that can affect this sequence. One of these factors is stress. The results of many studies have shown that human errors and violations resulted from high levels of stress. In general, any factor that leads to physical and mental tension or losing one's balance is a stress factor. When facing stress, body shows reactions to get back the lost balance. This action is called stress. Stress or mental pressure is a reaction, which is caused by the existence of a factor and enables one to cope with that factor.^[6] Different stresses reduce individuals' resistance by affecting their personal and social coping abilities. They

Saeid Lotfi,
Saeid Yazdanirad¹,
Siyamak
Pourabdiyan,
Akbar
Hassanzadeh²,
Aliakbar Lotfi³

Department of Occupational Health Engineering, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran, ¹Department of Occupational Health Engineering, School of Health, Tehran University of Medical Sciences, Tehran, Iran, ²Department of Statistics and Epidemiology, School of Health, Isfahan University of Medical Sciences, Isfahan, Iran, ³Department of HSE, School of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran

Address for correspondence:

Dr. Siyamak Pourabdiyan,
Department of Occupational Health Engineering, School of Health, Isfahan University of Medical Sciences, Isfahan 81746-73461, Iran.
E-mail: pourabdian@hlth.mui.ac.ir

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also have negative effects on physical and mental health in the long run. Besides, it has been reported that stress might result in physical and mental diseases, cause problems in operation and compatibility, and finally decrease the quality of life.^[7] Overall, the causes of stress can be divided into several categories, namely, individual, group, organizational, and extra-organizational factors.^[6]

To prevent risky behaviors and consequently, a horrible crashes, one should be able to rationally cope with this mental pressure or stress, which might be the result of past or momentary issues.^[8] In this regard, individuals are divided into three groups; problem-oriented individuals who try to solve problems rationally and purposefully, emotion-oriented ones who show self-oriented reactions to reduce stress instead of finding a rational solution, and those who try to reduce their emotional pressure by avoiding stressful situations.^[8] Researchers have reported that in response to different stressful situations, individuals react based on their evaluation of the stress factor, compare the result of their evaluation to available resources for avoidance, and finally respond appropriately.^[9] Therefore, the kind of avoidance depends not only on the source of stress but also on individuals and their evaluation.

Since no comprehensive researches have been conducted on the ability to cope with critical situations while driving and its effect on car crashes in Iran, the present study aims to compare problem-oriented, emotion-oriented, and avoidance coping styles with respect to confronting critical situations in drivers with and without the experience of car crashes.

Methods

This cross-sectional, descriptive-analytical study was conducted on 610 car drivers in Isfahan with the help of traffic police and Unit of Road Violations and Accidents of Isfahan province. The participants were selected using simple random sampling. All the participants were volunteers who had a driving license for at least 5 years. These participants were divided into four groups: (1) drivers who had experienced a car crash in the last 5 years and were determined to be at fault by traffic police, (2) drivers who had not experienced a car crash in the last 5 years, (3) drivers who had experienced a car crash due to inefficiency of their vehicles, and (4) drivers who were not at fault in the car crash. The inclusion criteria of the study for the drivers responsible for a car crash included having experienced a car crash in the last year, being at fault by >75% according to traffic police and insurance company, not suffering from acute mental health problems, and having driving experience for at least 1 year. On the other hand, the exclusion criteria were suffering from neurotic mental diseases for any reason after the crash, unwillingness to participate in the study, diagnosis of severe psychological problems during the survey, lacking a

driving license for any reason, and having crashes caused by a cell phone, drunk driving, drug abuse, and drowsiness.

The information related to the type of driving behavior was gathered using driving behavior questionnaire (DBQ), and the information about individuals' styles for coping with critical situations was collected using the coping inventory for stressful situations (CISS; Endler and Parker, 1990). At first, both questionnaires were explained to the participants. After that, the participants' demographic information, including age, gender, and education level, and information about the cause and severity of the crash were collected. Finally, the participants completed both DBQ and CISS.

DBQ contains four behaviors done by drivers divided into two major categories: violations (deliberate and undeliberate) and mistakes (including slips and errors). The items of this questionnaire are answered on a Likert scale ranging from 0 to 5 (never = 0, rarely = 1, sometimes = 2, often = 3, very often = 4, and always = 5). In this questionnaire, the items are different in two aspects; the kind of behavior and the amount of risk caused by this behavior for others. Moreover, there are three divisions based on the amount of the risk of these behaviors: (1) behaviors that expose other drivers to no risk and only cause anxiety for others (low-risk behaviors), (2) behaviors that are likely to put others into trouble (behaviors with medium risk), and (3) behaviors that certainly endanger other drivers (high-risk behaviors). DBQ was translated in Iran, and the reliability and internal consistency of its different parameters were evaluated on 293 drivers using exploratory factor analysis. Accordingly, consistency coefficients of 0.77, 0.81, 0.86, and 0.65 were obtained for slips, errors, deliberate violations, and undeliberate violations, respectively.^[10] In addition, Alavi *et al.* investigated the psychometric properties and the factorial structure of the Manchester driver behavior questionnaire (DBQ) in 800 Iranian drivers and the results showed that the factors reliability ranged from 0.65 to 0.75. The test-retest correlations of the DBQ and split-half reliability were 0.56 and 0.77, respectively.^[11]

CISS scale contains 48 questions, measuring problem-oriented, emotion-oriented, and avoidance coping styles (each containing 18 questions). The items of this questionnaire are responded using a Likert 5-score scale ranging from 1 (never) to 5 (always). Higher scores in each category determine which coping style is mostly used by individuals. The reliability coefficient of CISS was reported to be 0.90 for problem-oriented, 0.85 for emotion-oriented, and 0.82 for avoidance coping style.^[12]

After all, the data were analyzed using descriptive statistics, such as mean and standard deviation. Besides, one-way ANOVA and Kruskal-Wallis test were used regarding the means of the study variables. All the analyses were performed using the IBM SPSS Statistics, version 21.

Results

This study was conducted on 462 males and 148 females with the mean age of 35.75 ± 9.76 years. The academic degree of participants was as follows: 9.1% of people did not have a high school diploma, 35.6% had a high school diploma, 9.2% had a A.D. degree (2 years of higher education), 35.7% had a B.A., 7.7% had an M.A., and 2.6% had a Ph.D.

Based on the results, 33% of the participants were responsible for a car crash, 17.2% had experienced a crash due to inefficiency of their vehicles, 16.7% were not at fault in car crashes, and 33.2% had no experience of a car crash. The results of Kruskal–Wallis test indicated a significant difference among the four groups regarding education level ($P = 0.03$). Accordingly, the highest levels of education were related to the participants who were not responsible for the crash, while the lowest education levels were related to those who had experienced a crash due to their vehicles' inefficiency.

The results of Kruskal–Wallis test on the information obtained from CISS questionnaire also showed a significant difference among the four study groups concerning the frequency distribution of coping styles ($P = 0.03$). Accordingly, problem-oriented coping style was the least frequent and emotion-oriented coping style was the most frequent style observed in the group of drivers at fault of a crash. The results of the statistical analysis of the information related to different groups' experience of car crashes based on CISS questionnaire have been presented in Table 1.

The results of one-way ANOVA on the information obtained from DBQ revealed a significant difference among the three coping styles regarding the mean scores of slip, mistake, and general error ($P < 0.001$). In other words, the participants' coping styles were significantly associated with their mean

scores of slip, mistake, and general error. In addition, the highest mean scores of slip, mistake, and general error were related to the emotion-oriented coping style, while the lowest mean scores were related to the problem-oriented coping style. The results of one-way ANOVA also demonstrated a significant difference among the three coping styles with respect to the scores of deliberate violations, undeliberate violations, and general violations ($P < 0.001$). In other words, the participants' coping styles were significantly related to their mean scores of deliberate violations, undeliberate violations, and general violations. Moreover, the highest scores of deliberate violations, undeliberate violations, and general violations were related to the emotion-oriented coping style, while the lowest scores were related to the problem-oriented coping style. The results of one-way ANOVA also indicated a significant difference among the three coping styles regarding the overall mean score of DBQ ($P < 0.001$). Accordingly, the highest mean score of DBQ was related to the emotion-oriented coping style. The results of statistical analysis of the information obtained from DBQ in different groups based on their coping styles have been presented in Table 2.

The study results revealed a significant relationship between coping styles and the severity of the crashes ($P < 0.001$). Accordingly, the crashes were significantly less severe in the problem-oriented group compared to the other groups [Table 3].

The results of one-way ANOVA indicated a significant relationship between the drivers' age and their coping styles ($P < 0.001$). Accordingly, the older participants were problem-oriented, while the younger ones were emotion-oriented. However, the results of Chi-square test showed no significant relationship between gender and coping style. On the other hand, the results of

Table 1: Different groups' experience of car crashes based on Coping Inventory for Stressful Situations Questionnaire

Character type	Individuals responsible for a car crash, frequency (%)	Individuals with no experience of a car crash, frequency (%)	Individuals who were not at fault of a crash, frequency (%)	Individuals who had a crash due to their vehicles' inefficiency, frequency (%)
Problem-oriented	85 (43.1)	116 (58.0)	51 (50.0)	51 (39.0)
Emotion-oriented	68 (34.5)	53 (26.5)	28 (27.5)	32 (30.8)
Avoidance	44 (22.3)	31 (15.5)	23 (22.5)	21 (20.2)

Table 2: DBQ in different groups based on coping styles

Variables	Mean±SD			P
	Problem-oriented	Emotion-oriented	Avoidance	
Slip	10.24±5.03	21.73±7.52	14.30±7.92	<0.001
Mistakes	8.94±5.05	18.13±7.82	13.31±7.92	<0.001
General error	9.85±4.67	20.65±7.92	14.01±7.44	<0.001
Deliberate violations (100)	17.84±6.17	36.97±11.00	31.53±8.92	<0.001
Undeliberate violations (100)	10.56±8.50	24.69±10.24	16.35±10.36	<0.001
General violations (100)	16.75±5.92	33.42±10.35	29.25±8.42	<0.001
DBQ (100)	12.61±4.69	25.76±8.04	20.10±7.07	<0.001

SD=Standard deviation, DBQ=Driver behavior questionnaire

Table 3: Severity of crashes in different groups based on their coping styles

The severity of the crash	Coping styles			P
	Problem-oriented, n (%)	Emotion-oriented, n (%)	Avoidance, n (%)	
Low	61 (71.8)	23 (33.8)	17 (38.6)	<0.001
Medium	16 (18.8)	21 (30.9)	11 (25.0)	<0.001
High	8 (9.4)	24 (35.3)	16 (36.4)	<0.001

independent *t*-test indicated that the total mean score of DBQ was significantly higher in the males compared to the females ($P < 0.001$).

Discussion

The results of this survey indicated a relationship between individuals' coping styles and their driving behaviors. This relationship suggests that there were more errors, violations, and crashes among the emotion-oriented and avoidance individuals compared to the problem-oriented ones. Each individual's driving behavior falls generally in a series of behavioral patterns called character.^[13] Charles *et al.* explained that character refers to a set of behavioral patterns and clear methods applied by individuals to confront different situations and daily routines.^[14] Our study indicated that lack of stress signs alone could not be a predictor of wrong or hasty behaviors and decision making. The importance of this issue lies in the fact that stress has been mentioned to be a predictor of risky behaviors in most studies, while stress signs are not necessarily observed in emotion-oriented coping style all the time (they are evident in critical situations). Assessment of the relationship between character and risky driving and crashes represents the factors, which are directly related to crashes.^[15] Amado *et al.* demonstrated that individuals' characters affected their driving manner and the number of crashes.^[16] Besides, Lajunen suggested that sensation seeking, more than anything else, predicted the possibility of showing aggression while driving.^[17] In the survey conducted by Gulian *et al.*, five major factors were believed to cause stress while driving. These factors were aggression, to abhor driving, tension and frustration associated with unsuccessful overtaking, stimulation and excitement while overtaking, and decrease in caution and concentration.^[18] The results of some other studies also indicated that lack of mental control and sensational acting could lead to risky driving behaviors and consequently, crashes. For instance, the study conducted by Ge *et al.* on 242 drivers revealed that anger mediated the relationship between stress and risky driving behavior. In addition, the role of this mediation was stronger in aggressive and emotional drivers.^[19] Similarly, Inversen *et al.* performed a research on the relationship between character and risk-taking driving and crashes among Norwegian drivers and reported that individuals with higher levels of anger, tension, and irritability were more risk-taking compared to those with lower levels of these parameters.^[20] The results of the above-mentioned studies

are generally consistent with those of the present survey. The results of some studies indicated that when confronting mental pressures, individuals addicted to drug and alcohol mostly used emotion-oriented rather than problem-oriented coping style.^[21,22] The results of Peterson *et al.*'s observation also revealed a relationship between increase in mental health and problem-oriented coping style. In fact, individuals who applied problem-oriented coping style used cognitive skills to solve problems.^[23] The results of the present study also indicated that problem-oriented individuals experienced crashes less compared to the other groups. The results also revealed that the frequency distribution of avoidance coping style was lower in the participants with no experience of crashes compared to the other three groups. This might be related to their character features because even if they are not at fault of a crash, they are not able to prevent it appropriately. Yet, this idea has to be investigated in further researches.

The present study findings showed that individuals' age was related to their style in coping with crises, such a way that as individuals got older, their style in coping with mental pressures became more problem-oriented. In general, the youth are usually more emotion-oriented. The results of the study performed by Durkin *et al.* on drivers indicated that young drivers were prone to risky behaviors because they did not seriously consider high speed to be an abnormal behavior.^[24] Official statistics also indicated that the highest risk of crash was related to the youth and its rate in young individuals was 2-fold higher than that among older ones.^[25]

Based on the results of the present study, driving behavior scores of males were higher compared to females, which imply that men have riskier behaviors compared to women. Dejoy also carried out a research on young drivers aged 18–24 years and indicated that in comparison to women, young men were more optimist and felt less risk about their driving skills.^[26] Similarly, Adli and Balbissi stated that crash rate was significantly higher in men, which was the result of their lack of attention and impatience. These results are in agreement with those of the current study.

Our study results revealed that the participants with higher education levels were among the group that was not at fault of crashes, while those with lower education levels belonged to the group that had experienced a crash due to vehicle inefficiency. This might be attributed to the fact that because individuals with low education levels are usually

among low-income groups, they use low-quality vehicles that are more probable to be inefficient.

Conclusions

The results of this study indicated that the rate of car crashes and violations was higher among the emotion-oriented and avoidance individuals, respectively, compared to the problem-oriented ones. This is due to the problem-oriented individuals' rational solving of unforeseen problems while driving and their appropriate evaluation of situations for taking the right action. These results imply that instead of evaluating individuals' alcohol and drug abuse, one can discuss its consequences including the manner of coping with crisis, which is more attributable. In this regard, necessary trainings have to be applied to make people familiar with the manners of coping with crises. Such trainings are also necessary for optimizing drivers' behaviors, especially professional drivers so that they could solve problems rationally and avoid emotion-oriented behaviors. By increasing individuals' awareness and consequently, changing their attitude, this may lead to low-risk behaviors while driving and more importantly, an increase in their awareness of risky behaviors in other drivers. Moreover, problem-oriented and emotion-oriented characteristics are recommended to be considered in pre-employment monitoring for professional driving occupations.

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Conflicts of interest

There are no conflicts of interest.

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