

Investigating the predictive of risk-taking attitudes and behaviors among Iranian drivers

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ABSTRACT

Background: World Health Organization findings shows that up to year 2020 the number of fatality due to driving accidents will increases up to 65%, which is 80% is in developing countries. Iran has one of the highest rates of road traffic accident mortality rate in the world. **Materials and Methods:** The cross-sectional study was carried out in the center and west of Iran upon 540 ordinary and taxi drivers who were driving regularly from bus terminals and the travel agencies to other cities. Data collection tool is a questionnaire that measuring driving risk taking by two items of risky driving behaviors and risk taking attitudes. **Findings:** The results of this study showed that the averages of risk driving behaviors scores were higher than the average of risk taking attitudes scores. The results of logistic regression test showed that the risky driving behaviors can be a predictor of driving accidents due to individuals' risk taking ($P = 0.014$). Among all these variables, attitude toward rule violations and speeding, aggressive driving and violation of the road laws respectively are important predictive of drivers' risk taking ($P < 0.0010$). **Discussion and Conclusion:** Although attitude toward risk taking has been located at a low level by different ways, a desired result was not obtained from the reduction of those high risky behaviors; in fact, high-rate of accidents and traffic incidence in Iran indicates this matter well.

Key words: Driving behavior, risk taking, risk-taking attitudes, road accidents

INTRODUCTION

Vehicles, which are characteristics of civilization have turned into a big problem in different social and public health respects due to increasing the number of the road and city accidents and high mortality rate.^[1] The most important factor behind

death of those who are between one to forty is injuries caused by the variety of accidents that includes 12% of illness being; furthermore, this one is a third factor behind the total mortality.^[2] Meanwhile, causes of injuries are including road accidents and findings of World Health Organization (WHO) show that 25% of losses due to injuries throughout the world. It is predicted that until 2020, the number of death cases due to driving accidents increase up to 65% throughout the world and up to 80% in developing countries.^[3] The vital point is to the extent that WHO suggested the motto of "safe road" in 2004.^[4] The organization has put the responsibility upon the Health Department For collecting information, investigating about driving accidents, and interfering in traffic safety.^[5]

Iran has one of the highest rates of road traffic crashes mortality rates in the world; furthermore, driving accidents, after heart maladies, is nationally regarded as the second factor behind death in Iran.^[6] The road traffic crashes mortality rate in Iran was 30/100,000 people in which is 23 and 14 times higher in comparison with the world and Eastern Mediterranean

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respectively.^[7] According to the statistics of Iranian Legal Medicine Organization, from the perspective of losses rate, the number of dead people due to accidents had 10% growth in the year.^[8] The index of the number of death to one hundred thousand persons has had an ascending trend over the last decade and has increased from 5.20 in 1996 to 5.40 in 2006. Growth rate of the index has almost been stopped due to reduced birth rate and measures adopted in the safety area, to an extent that the number has reached 31.2 in 2009, which reduced 25% in comparison with 2006. However, according to the statistics of Road Maintenance and Transportation Organization of Iran, the number of accidents, injuries and its losses is still increasing every year.^[9]

Traffic accidents are a complex phenomenon, which is caused by the non-linear combination and interaction of homogeneous agents. Vital factors involved in occurrence of incidents are man, vehicles, road and environment from which contribution of man factor has been calculated 95%, the road and environment 28% and of vehicles 8%.^[10] Analyzing the road accidents in Iran shows that from the four factors, man is accounted as the most important agent of accidents.^[11] Among these factors, drivers' errors, risky behaviors of some professionals in the roads and a large portion of the public are the biggest contributors to the incidents.^[12] Risky driving, defined as "those patterns of driving behavior that place drivers at risk for morbidity and mortality involving legal violations but not alcohol or drug use," is a main risk factor for traffic crashes.^[13] Risky driving has been consistently recognized as a key contributor to road crashes, and many studies have observed an association between several risky driving behaviors and road crashes, particularly for younger drivers.^[14,15] Risky driving behaviors such as speeding, passing violations, tailgating, lane-usage violations, right-of-way violations, illegal turns, and control signal violations happen most frequently.^[16] Therefore, attempt to change the behaviors has a great impact upon reduction of accidents and their consequences.^[17] Changing risky driving behaviors like other risky behaviors, requires "a concept basis for helping to explain how the behavior occurs, how health education is conducted and how health education affects this ongoing behavior."^[18]

Driving will be dangerous especially if the driver is willing to take the risk in the roads.^[19] Many people engage in driving behaviors that are risky, either inadvertently or with the intention to "take the risk."^[20] Perhaps because they tend to be inexperienced and lack the skills needed to negotiate difficult on-road driving situations or having positive attitudes to taking risks.^[21] Risk taking has been identified as an important contributor to occurrence of many health problems like accidents.^[22] Classic definition of risk is incidence as well as consequences that follow necessarily.^[23] Whereas, the definition of risk in incidence is what is engaged in behaviors, which includes potential negative outcome.^[24] The relationship between risk taking attitude and risky driving behaviors has been proved.^[14,25,26]

In recent years, our country has been turned into a center of crisis, moreover; recent studies and investigations of World Bank have officially considered the state of Iran traffic safety critical.^[27] Based on the reports of the Legal Medical Organization and Road Maintenance and Transportation Organization of Iran, 241240 of people have been killed on roads over 1380's. The most losses were related to "drivers," and the highest mortality rate in vehicle accidents was related to motorcars.^[28] Many factors have a role in incidents; the outcome of every unsafe action is an incident which will result in death or injury of drivers and passengers. Hence, drivers' error is the major agent in accidents. Due to this matter that individuals must avoid risks intrinsically, and saving themselves and others' lives is a religious and intellectual duty it is questionable that why risk taking and doing risky behaviors are in high levels?

MATERIALS AND METHODS

The most widely method used to investigate risky driving behaviors is based on self-reports which is the best method to collect information.^[29] Risk taking can be measured by a questionnaire having two items of risk taking behaviors and risk taking attitudes.^[30] Hence, in the present study, data collection tool is a questionnaire that measuring risk taking by two items of risky driving behaviors and risk taking attitudes. To design the questionnaire, previous studies were used.^[14,25,31,32] This 60-question questionnaire was made up of two parts. The first part includes demographic information and accident records and the second part includes risky driving behaviors and risk taking attitudes, in which respondents show every deviation in driving by Likert Scale from 1 (never) to 5 (almost always). Risky driving behaviors include speeding, distraction while driving, aggressive driving, violation of the road laws, not using the seat belts and incautious driving. Risk taking attitudes include attitudes toward rule violation and speeding, attitude toward the careless driving of others and concern for others [Figure 1].

This cross-sectional study was carried out in the center and west of Iran (Isfahan and Kermanshah) upon 540 ordinary and taxi drivers who were driving regularly from bus terminals and travel agencies to other cities. Because an overwhelming majority of inter-urban drivers consists of men, therefore, women drivers not consider in this study. Then data were analyzed by the SPSS V.18 software by using the Pearson correlation, and logistic regression.

After devising the questionnaire, to assess its validity, experts were asked to judge. In fact, the questionnaire was given to experts and chief of road police Officer in Isfahan to modify questions. In a pilot study, to assess reliability, 30 professional drivers were asked to answer questions and mark the ones which were unclear. Data obtained were analyzed by the SPSS V.18 software to assess the validity and reliability.

FINDINGS

To assess the stability of indices, Cronbach's alpha test was used, which was equal to 0.863. As it can be seen in Table 1, the amount of Cronbach's alpha is at a high level in most cases.

The mean age of drivers with driving experience of 17.62 ± 12.61 was 41.39 ± 13.21 ; also 15.6% had BSc and upper degree, 55% had diploma degree, and 29.4% had degree under diploma. 51.5% of drivers had the experience of accidents (in the last year had at least one accident) and in 47.8% of the accidents occurred, driver had driving offense. 11.5% of these accidents have resulted in physical injuries. From these persons, 1.9% has reported their skill level of driving weak, 54.4% good, 34.4% very good, and 18.3% excellent.

There is a high correlation between risk taking attitudes and risky driving behaviors ($P < 0.001, r = 0.442$). In Table 2, the relationship between different variables has been displayed. There is a positive significant relationship between most

Table 1: Number of items, mean scores and Cronbach's alpha for all measures

Measures	Number of item	Mean (range 1-5)	SD	Cronbach's alpha
Risky driving behavior				
Speeding	6	1.97	0.022	0.54
Distraction	7	1.99	0.027	0.81
Aggressive driving	7	2.38	0.027	0.65
Violation of the road laws	8	1.77	0.024	0.74
Not using seat belts	2	1.7	0.037	0.61
Drive with incautious	4	2.04	0.037	0.62
Risk-taking attitudes				
Attitude toward rule violations and speeding	10	2.15	0.025	0.85
Attitude toward the careless driving of others	3	2.22	0.031	0.9
Concern for others	3	2.07	0.039	0.59

SD = Standard deviation

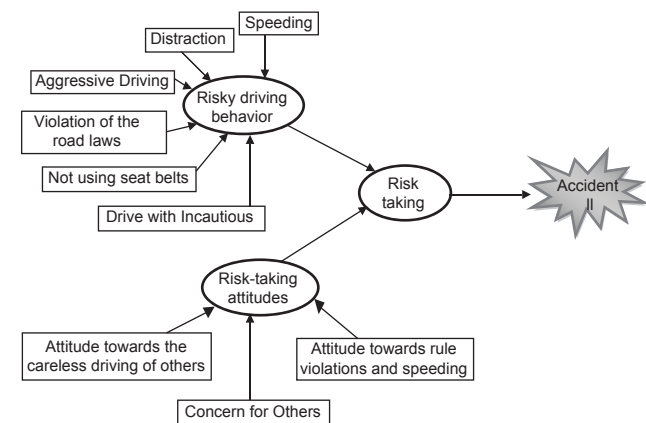


Figure 1: Conceptual model

variables and just between distraction while driving, and concern for others a reverse relationship was noticed.

The results of logistic regression Test showed that both independent variables of risky driving behaviors and risk taking attitudes are important for predicting the amount of individual's risk taking ($P < 0.001$). However, risky driving behaviors had the highest regression coefficient ($\beta = 0.73$ for risky driving behaviors and $\beta = 0.43$ for risk taking attitude) which shows that risky driving behaviors have an important impact upon the rate of drivers' risk taking. The logistic regression test also shows that risky driving behaviors can be a predictor driving accidents due to individuals' risk taking ($P = 0.014$). Aggressive driving, violation of the road laws and distraction are predictors of high risky driving behaviors, and attitude toward rule violation and speeding are predictors of risk taking attitudes ($P < 0.001$). Among all of these variables, attitude toward rule violations and speeding, aggressive driving and violation of the road laws respectively are most important predictors of drivers' risk taking ($P < 0.0010$) [Figure 2].

Total mean of all risky driving behaviors was 2.01 ± 0.38 and total average of risk taking attitudes was 1.98 ± 0.46 . It has also been specified that among risky driving behaviors, the following behaviors have allocated the highest percents to themselves respectively: Wrong and improper overtaking, not giving up against other drivers' behaviors, talking with other passengers while driving and not reducing the speed while drivers behind are trying to overtake. Frequency of the behaviors mentioned by drivers was from sometimes to always. Given risk taking attitudes of drivers, a majority of them agree that rule violation is not an indicator of a bad driver. On the contrary, they believe that driving with high speed is exciting, and a good driver is a person who can drive faster than others.

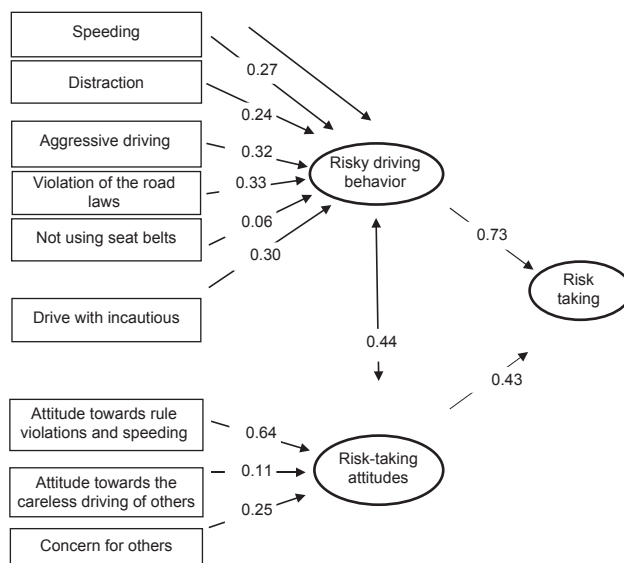


Figure 2: Estimated model (N = 540)

Table 2: Intercorrelations (pearson’s r) between factors measuring risk taking (N=540)

Variable	1	2	3	4	5	6	7	8	9
Speeding	1								
Distraction	0.371**	1							
Aggressive driving	0.324**	0.006	1						
Violation of the road laws	0.428**	0.484**	0.102*	1					
Not using seat belts	0.270**	0.320**	0.157*	0.430**	1				
Drive with incautious	0.182**	0.309**	0.326**	0.145**	0.098*	1			
Attitude toward rule violations and speeding	0.376**	0.179**	0.289**	0.274**	0.123**	0.399**	1		
Attitude toward the careless driving of others	0.078	0.015	0.195**	0.092*	-0.003	0.234**	0.378**	1	
Concern for others	0.259**	-0.409**	0.279**	0.087*	-0.012	0.216**	0.194**	0.199**	1

**Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level

Finally, it was clarified that there is a reverse relationship between rate of drivers’ risk taking and age ($P < 0.001$); namely, by aging, the rate of risk taking has been reduced [Chart 1]. There is a significant relationship between the rate of risk taking and educations ($P < 0.001$). In fact, risk taking in those who have BSc and upper degree is significantly more than that of those who are under diploma [Chart 2].

There was also a reverse relationship between rate of risk taking and driving experience ($P = 0.037$). There is a significant relationship between the rate of risk taking and number of accidents. In other words, those who had more accidents had more rate of risk taking ($P = 0.037$). Totally, the rate of drivers’ risk taking was more moderate (83.1%) and none of the individuals of the population had high-risk taking [Chart 3].

DISCUSSION

Most of studies have used interview, questionnaire and polls to analyze driving accidents or they benefited from an observational study methods to determine different errors of drivers and the errors, which create existing conditions in road accidents.^[33] Self-reports of driving accidents can be an indicator of individual’s driving behaviors in future, also one of the major motivations of man for a driving offense is their risk taking. In the present study, which has been carried out about aiming at measuring the amount of risk taking, a questionnaire has been designed as much as possible according to the Islamic culture of Iran. Because drivers’ behaviors are different from that of other countries such as using alcoholic drinks, which is a normal matter in other countries but in our country is opposite to our religion and rule, it is not possible to use the questionnaire designed in other countries. However, the questionnaire had high validity and reliability to measure the amount of risk taking in Iranian drivers. In studies which have done to measure risk taking, respondents were asked to show how they take risks in a variety of actions (with responses from never too often). The average score in every scale was made based on existing items inside each scale. High score in the scale showed that driving is highly dangerous.^[25] In the questionnaire, risk taking was also measured by Likert Scale and the average score has been made up of existing items.

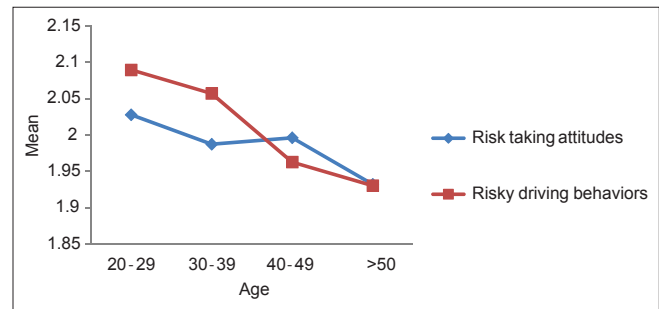


Chart 1: Correlation between age and risk-taking variables

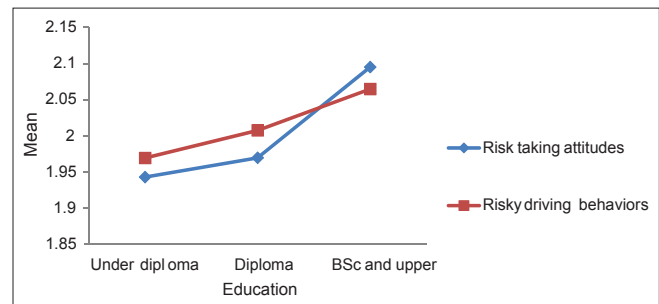


Chart 2: Correlation between education and risk-taking variables

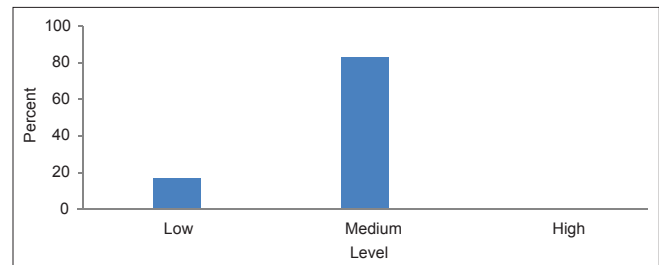


Chart 3: Risk-taking level

Like other studies, a significant relationship was noticed between two variables of risk taking attitude and risky driving behaviors,^[31,34] It is unlike other studies carried out upon this respect which showed that attitude is predictive of risk taking,^[21,25] in the present study, risky driving behaviors are a stronger predictors of risk taking in Iranian drivers. However, in these studies it has been mentioned because attitude and behavior are measured simultaneously, it is

difficult to claim that attitude is predictive of risk taking.^[25] The results show that in Iran although attitude toward risk taking has been located at a low level by different ways, a desired result was not obtained from the reduction of those high risky behaviors; in fact, high rate of accidents and traffic incidences in Iran indicate this matter well. Furthermore, between these two variables, just risky driving behaviors are predictive of accidents due to risk taking of Iranian drivers, which is congruent with other studies. Moreover, from among a variety of variables have been mentioned in the study, attitude toward rule violation and speeding are the strongest predictive for risk taking of Iranian drivers, which absolutely match the findings of a study carried out by Shams in Iran and Iversen.^[13,14]

The results of the present study showed that there is a reverse relationship between the rate of drivers' risk taking and age; which means, by increasing the age, the amount of risk taking has been reduced. This is congruent with most studies carried out in this field like the studies carried out by Fernandes *et al.*,^[21] Clinton *et al.*,^[35] Tronsmoen.^[36] When drivers are young, they are willing to speed and do high risky behaviors due to lack of sufficient skills and internal excitement. By aging and increasing driver's experience, amount of risk taking has been reduced. The results also showed that there is a reverse relationship between the amount of risk taking and driving experience as a study carried out by Lin in Taiwan showed that risk taking is reduced by increasing the experience.^[37,41-45]

Educational level is an effective agent upon drivers' perception while driving in traffic flows. If a person had a suitable education, their perception from environmental conditions and dangerous factors would grow, and they would pay more attention to road signs and barriers. In the present study, there is a relationship between the amount of risk taking and education. In fact, risk taking of those who have Bachelors' or higher degree is significantly more than those who are under diploma. Similar results were reported by Tuokko,^[38] that is, congruent with a study carried out by Almadani.^[39]

In the present study, there is also a significant relationship between risk taking and number of accidents. In other words, those who had more accidents have obtained a higher risk taking score. In the study carried out by Lin *et al.* upon the impact of accident experience on risk taking in young persons, they concluded that those who have accident experience have obtained a higher risk taking score based on risk taking factors.^[38]

CONCLUSION

The current study shows that more evaluation is required concerning the impact of traffic safety interventions on attitudes and behaviors of Iranian drivers. To reduce the amount of risk taking, the first important factor is increasing

police control, reforming the penalties and effectiveness of driving fines. One of ways for effectively of driving fines is making the deadline of fines payments in a short time. Another factor is culture building in a way that driving laws be institutionalized. In the driving test in Iran, attention is paid to the driver' celerity more than any other factors. Whereas, in countries which have more organized driving laws, compliance with laws is noticed more and training needed is provided in this respect. Therefore, in this area necessary training must be provided. Insurance policies need to be modified in our country. To increase the amount of the risk aversion and need to be arranged, according to the driver's character and records.

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