Investigating the effect of psychological factors and spiritual health on drivers' behavior: using the structural equation modeling approach

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Abstract

Background & Aims: Nowadays, traffic accidents are one of the major causes of death worldwide. Therefore, it is essential to determine the modifiable risk factors in order to reduce traffic accidents. This study aimed to investigate the relationship between the psychological factors, the spiritual health, and the drivers' behavior of the employees of Shahid Beheshti University of Medical Sciences.

Materials & Methods: This cross-sectional study examined the data on 3245 participants in the Health Cohort Study of Shahid Beheshti University of Medical Sciences. The required information was collected using general health questionnaire (GHQ-28), Manchester driving behavior questionnaire (MDBQ), spiritual health questionnaire (SHEL), aggression questionnaire (AGQ), and Beck's anxiety and depression questionnaires. The data were analyzed with the help of structural equation modeling using SPSS 25 and Amos 24 software.

Results: The study used the information on 1386 people. Moreover, 754 of these people were men. All of the correction indices highlighted the good fit of the hypothesized model (CMIN/DF=3.3, GFI=0.96, AGFI=0.94, CFI=0.97, TLI=0.97, IFI=0.97, NFI=0.95, SRMR=0.03, RMSEA=0.04). According to the model, aggression (β=0.45, p<0.001), depression (β=0.05, p<0.001), anxiety (β=0.29, p<0.001), and physical and social dysfunction (β=0.29, p<0.001), significantly increased the drivers' dangerous driving behavior. On the other hand, spiritual health had an inverse and significant relationship (p<0.001, β=-0.4) with risky driving behavior.

Conclusion: The results of this study showed that psychological factors and spiritual health affected the drivers' behavior. Therefore, it is necessary to implement effective interventions regarding these factors to reduce traffic accidents.

Keywords: Aggressive Driving, Psychological Factors, Risk Behavior, Spirituality, Structural Equation Modeling

Introduction

The accidents which involve a road vehicle such as a car, a motorcycle, or a bicycle which is used to transport people or goods from one place to another are called traffic accidents. Nearly 1.35 million people lose their lives each year due to traffic accidents. Moreover, 50 million people suffer from injuries which are caused by these accidents (1-3).

The cost of traffic accidents is almost 3 percent of the gross domestic product (GDP) of a country. This cost increases to 5 percent in low-income and middle-income countries. Even though the low-income and middle-income countries have about 60 percent of the vehicles of the world, over 90 percent of all of the road deaths occur in them. Traffic accidents are mostly preventable. According to the latest road safety report which was published by the World Health Organization (WHO), 20.5 people out of every 100,000 people die from road accidents in Iran (1).

The relevant studies have classified the factors in the traffic accidents into three main categories including: human factors, vehicle factors, and road factors. According to these studies, human-related factors are the most common causes of accidents (4,5). In Iran, the driver's behavior was an influential factor in 95% of cases. Moreover, it was the main cause of casualties in 9% of these accidents (6).

Driving behavior refers to the pattern which is chosen and followed by the driver in his/her driving (7). A large number of external and internal factors affect the driving behavior (8). The results of the relevant studies have indicated that personality traits have an indirect effect (i.e. mediating role) on the driving behavior (9-11). Furthermore, the driving deviations are strongly related to the psychological factors, which are significantly associated with the number of traffic accidents (3,11-14). There is a strong correlation between sensation-seeking and driving behavior nonetheless, the psychological factors are the most influential factors in the above-mentioned behavior (15,16). A study, which tried to determine the predictive factors in dangerous driving and traffic accidents by using hierarchical regression approaches,

concluded that personality traits were directly related to dangerous driving and increased the number of crashes (12,17).

Likewise, spiritual health (i.e. one of the health dimensions) affects the driving behavior (18). People with higher spiritual health behave more reasonably and more ethically than the others. Moreover, they drink less alcohol and feel less stressed, less anxious, and less aggressive than the other people (12). These behaviors can reduce traffic accidents (4,10,12,19,20). Spirituality and religiosity can affect a person's attitude. The people, who are more spiritual, can easily manage their stress and behaviors. Consequently, they avoid risky driving and cause fewer traffic accidents (10,11,21).

Traffic accidents are mostly preventable. Notwithstanding, the actions which have been taken in this regard do not sufficiently meet these human challenges. If this increasing trend continues, the number of the deaths which are caused by road traffic will increase to 2.1 million. Moreover, its burden will be ranked eightieth by 2030 (22). Most studies on the factors in driving behavior in Iran have only focused on the correlation between the causes and their direct effects on each other. That is, they have disregarded a number of the potential correlations between the variables. Considering the indirect impact of the factors on driving behavior, in this study, the researchers investigated the direct and indirect effects of psychological aspects and spiritual health on driving behavior of the employees of Shahid Beheshti University of Medical Sciences by adopting the structural equation modeling approach.

Materials & Methods

This study was a cohort-based cross-sectional study. The participants were selected from among the participants of the employees' health cohort study of Shahid Beheshti University of Medical Sciences (SBMU). They were the participants of the first phase of the cohort study of this university (23). This cohort study was a prospective study and selected ten thousand employees from among the sixteen thousand

people who worked at this university. The researchers used the convenience sampling method to select these participants. Using administrative automation, sending SMSs, and getting help from the employee representatives constituted the ways of inviting employees to take part in this study. In order to conduct the study, first, written informed consent was obtained from the participants. Next, the data were collected using self-reports, interviews, examinations, and various tests.

This study examined the information on 3245 members of SBMU. The data on each member were entered into a separate Excel sheet. Consequently, the data on each member were merged with each ID number. We cleaned the data based on the inclusion criteria (driving at least three hours per week) and the exclusion criteria (not driving or driving less than three hours per week, and providing incomplete data). Finally, we used the information on 1386 people.

In structural equation modeling, the suitable sample sizes are determined by calculating the ratio of a sample size to free parameters in the model. Accordingly, the 5:1 ratio (5 samples for each free parameter) is the minimum value, and the 20:1 ratio is the best sample size (24). Therefore, the study needed the data on at least 190 employees. Nonetheless, the other researchers have stated that 200 samples are needed to use this method. They have noted that a large sample size makes the modeling more accurate and more reliable (25). Therefore, the number of the participants of this study was sufficient.

The information, which was needed to conduct the study, was collected using Manchester driving behavior questionnaire (MDBQ), spiritual health questionnaire, Beck anxiety questionnaire, Beck depression questionnaire, AGQ aggression questionnaire, and general health questionnaire (GHQ-28).

Manchester driving behavior questionnaire:

Reason and his colleagues developed the Manchester driving behavior questionnaire in 1990. This questionnaire comprises 50 questions and has four dimensions (slips, mistakes, intentional violations, and unintentional violations) (26).

The original version of this retest reliability questionnaire with an interval of one week for 80 people had a correlation coefficient of 0.81 for errors and a correlation coefficient of 0.75 for violations. The psychometric analysis confirmed the validity and reliability of this questionnaire in Iran (the reliability indices of slips, mistakes, intentional violations, and unintentional violations were equal to 0.82, 0.82, 0.73, and 0.77 respectively) (27,28). In the present study, Cronbach's alpha index of this questionnaire was 0.90.

Spiritual Health Questionnaire:

A panel of experts at Jihad university institute developed the spiritual health questionnaire. This questionnaire involves twelve items and five subscales. The items are scored on a Likert scale. The higher scores on the questionnaire show high spirituality. In this study, Cronbach's alpha index of this questionnaire was 0.69.

Beck Anxiety Questionnaire:

Beck and his colleagues developed the Beck anxiety questionnaire in 1990 (29). This questionnaire is a self-report questionnaire and comprises 21 items. An individual's total score on the questionnaire shows the state of his/her anxiety. This questionnaire has been validated in Iran in various age and gender groups. All of these studies have indicated that the validity and reliability indices of this instrument are satisfactory (30). In the present study, Cronbach's alpha index of this questionnaire was 0.92.

Beck Depression Questionnaire:

Beck and his colleagues developed the Beck depression questionnaire in 1961 and examined it in different age groups and populations (31). There are various types of this questionnaire. Nonetheless, its usual form comprises 21 items. The validity and reliability of this questionnaire have been confirmed in Iran (32). In this study, the Cronbach's alpha index of the questionnaire was 0.90.

AGQ Aggression Questionnaire:

Arnold H. Buss and Perry developed the AGQ aggression questionnaire which is used for assessing aggression (33). It involves 30 items which are scored on a 4-point Likert scale. The total scores which are

lower than the average score show that the individuals' level of aggression is low, and vice versa. The psychometric properties of this questionnaire are acceptable (34). In this study, Cronbach's alpha index of this questionnaire was 0.91.

General Health Questionnaire (GHQ-28):

In this study, general health referred to the individuals' physical symptoms and social dysfunction. It was assessed using the GHQ-28 questionnaire. Goldberg developed this questionnaire. It has four dimensions (social dysfunction, depression, anxiety, and physical symptoms) (35). In a study in Iran, the researchers used a parallel test method for determining the reliability and validity of this questionnaire. The results showed that the validity and reliability indices of this questionnaire were satisfactory in this society (36). In this study, only two dimensions of this questionnaire (i.e. social dysfunction and physical symptoms) were used. The Cronbach's alpha index of the questionnaire was 0.77 in the present study.

Data Analysis Strategy:

In order to analyze the data, descriptive statistics, Pearson correlation analysis, and structural equation modeling were used in this study. Moreover, SPSS 25 and AMOS 24 software were used to develop and evaluate the relevant model.

After checking the assumptions of modeling, we created the observational variables using the item-parceling method (37). Parceling reduces model complexity and improves parameter consistency. Based on the dimensions of each questionnaire, different item parceling was conducted. The Isolated Item Parceling was conducted for multi-dimensional questionnaires. In these questionnaires, each dimension is considered to be a parcel. Nonetheless, Item to Construct Balance Parceling was conducted for the other questionnaires such as the depression questionnaire.

Structural equation modeling (SEM) (25, 38) and maximum likelihood estimation (MLE) were used to investigate the relationships between the variables. SEM includes measurement models and structural models. The measurement model examines the relationship between the manifest variables and the latent variables. Moreover, it determines whether the manifest variables really measure the latent variable. One factor in the measurement model is factor loading, which has a value in the range of zero to one. A factor loading which is less than 0.3 shows a weak relationship and a factor loading that is in the range of 0.3 to 0.6 is acceptable. Furthermore, a factor loading which is greater than 0.6 is desirable (39). Another factor in this model is the fit of the measurement model. The structural model describes the relationship between latent variables. CMIN (X2/df), GFI, AGFI, CFI, NFI, TLI, RMSEA, and SRMR indices were used to evaluate the fit of the model and to confirm the model.

Results

Based on the results of the analysis, the participants ranged in age from 23 to 65 years. Their average age was 42 years. The results of gender distribution analysis showed that 54.4% of the participans were male and the rest of them were female. Moreover, 81.5% of 1386 participants were married, and nearly 85% of them had never experienced a traffic accident.

Assumptions:

In this study, the value of the Durbin-Watson test was equal to 1.9. This value highlighted the independence of residuals and showed that there were not any correlations between them. Correlation coefficients, scatter plots, and regression line drawing of the independent variables showed the existence of an almost linear relationship between the variables (Table 1). The examination of the relationship between the student values of the residuals and the predicted values confirmed the existence of a linear relationship between them. The plot of the standardized residuals against the unstandardized predicted values was used to check the assumption of homoscedasticity. It was not funnel or fan-shaped. The multicollinearity was checked by examining a correlation matrix, tolerance values, and variance inflation factor (VIF). According to the results, none of the correlations were above 0.90. all of the tolerance values were higher than 0.1, and all of the VIFs were less than 10.

Case wise diagnostic was used to check the existence of outliers. Ten samples had a standardized residual with a standard deviation which was greater than ±3. Leverage and Cook's values were used to determine the influential points. According to the results, these outliers did not affect the model fit.

Therefore, they remained in the study. According to the p-p plot of Regression standardized residual, the q-q plot of studentized residuals, and the histogram the distribution was normal. Finally, Skewness and kurtosis values were calculated.

Table 1. The value of Pearson's correlation coefficient and its significance level between the variables which were used for modeling

Variables		1	2	3	4	5	6
1 Anxiety	Correlation	1					
	Significance level						
2 General health	Correlation	0.42					
	Significance level	< 0.001					
3 Spiritual health	Correlation	-0.22	-0.16	1			
	Significance level	< 0.001	< 0.001				
4 Depression	Correlation	0.62	0.41	-0.27	1		
	Significance level	< 0.001	< 0.001	< 0.001			
5 Aggression	Correlation	0.45	0.31	-0.31	0.44	1	
	Significance level	< 0.001	< 0.001	< 0.001	< 0.001		
6 Driving behavior	Correlation	0.36	0.21	0.26	0.32	0.49	1
	Significance level	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	

Test of the Measurement Model:

In this study, first, the measurement model (M1) was tested, and the modification indices (i.e. covariance between errors) were added to the model based on the theoretical evidence of their relationships.

The results showed that the fit of the model (M2) was satisfactory. In this measurement model, the standardized factor loading of most of the items was greater than 0.7 (Table 2).Nonetheless, the standardized factor loading of one of the items was 0.22.

Table 2. Descriptive statistics for the variables which were utilized in the structural equation modeling (SEM)

Latent variable	Indicator variable	Item	Standardized loading	Mean	Std	Skew	Kurt
Driver behaviour α=0.90	Errors	Bh1	0.69	10.55	2.60	1.33	2.20
	Slips	Bh2	0.72	12.19	3.09	0.85	1.15
	Unintentional violations	Bh3	0.72	8.62	2.20	0.66	0.41
	Intentional violations	Bh4	0.81	9.78	2.48	1.53	3.01
Spiritual health α=0.69	Personal	Sp1	0.39	10.92	2.52	-0.24	-0.69
	Social	Sp2	0.55	13.05	1.52	-0.61	0.28
	Transcendental	Sp3	0.63	13.67	1.47	-1.42	2.49
	Opinion	Sp4	0.65	7.11	1.27	0.07	0.29
	Environment	nSp5	0.22	0.48	0.14	0.93	-1.5
Dysfunction (General health) α=0.77	Social dysfunction	Mf1	0.71	4.58	3.03	0.93	0.97
	Physical symptoms	Mf2	0.44	6.40	2.27	-0.08	1.23
Aggression α=0.91	Anger	Vh1	0.77	9.07	3.57	-0.19	-0.35
	Hostility	Vh2	0.69	5.30	2.5	-0.01	-0.40

Verbal	Vh3	0.75	3.11	2.32	0.64	-0.12	
Physical	Vh4	0.67	3.38	2.86	1.04	0.90	
Depression α=0.90	Df1	Df1	0.84	2.59	2.82	1.48	2.52
	Df2	Df2	0.88	2.22	2.42	1.48	2.89
	Df3	Df3	0.80	2.43	2.74	1.35	1.63
Anxiety α=0.91	Af1	Af1	0.85	2.72	2.74	1.39	2.39
	Af2	Af2	0.83	0.23	0.02	0.18	-1.19
	Af3	Af3	0.83	1.24	0.94	0.10	-0.85

Dimensions created for depression: Df1, Df2, Df3, Dimensions created for anxiety: Af1, Af2, Af3

Test of the Structural Models:

After examining the measurement model, we tested the structural model (S). The hypothesized model did not fit well prior to its reformation. We removed statistically insignificant paths one by one and added error covariance to the model based on the proposed modification index of the software. The desired model had an acceptable fit. Nontheless, we tested an alternative model (A). Finally, the following model (Figure 1) was confirmed as the final model. The fit indices of the final model were favorable (Table 3).

Table 3. Fit indices of the final model

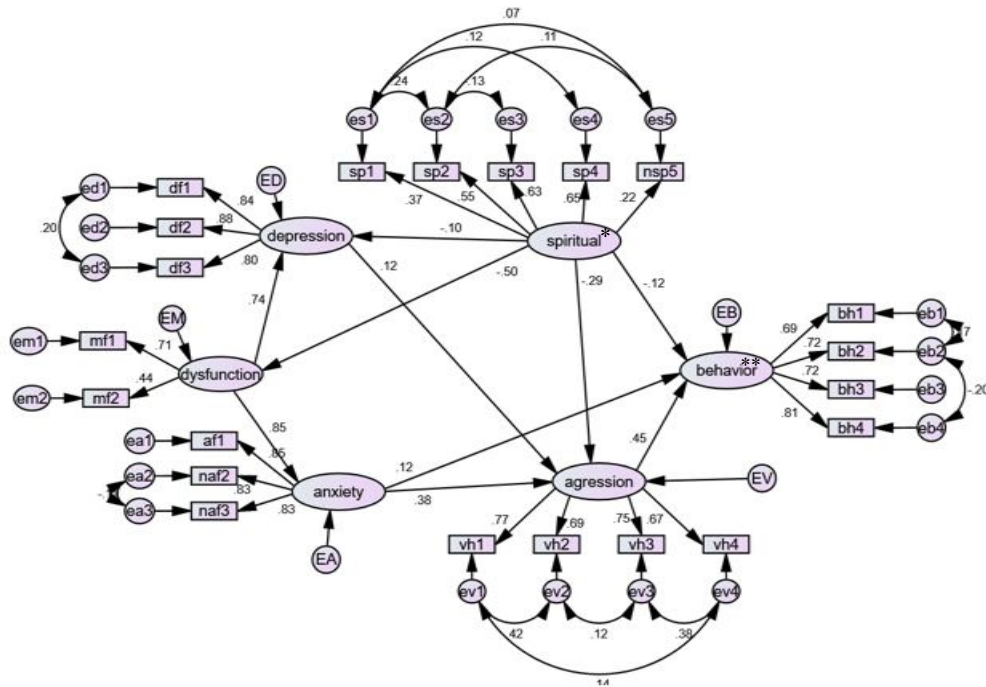| Model Fit Index	CMIN/df	RMSEA	SRMR	GFI	CFI	NFI	TLI	IFI	AGFI
Model Fit Summery	3.3	0.04	0.03	0.96	0.97	0.95	0.96	0.97	0.94
Acceptable Values	< 5	< 0.05	< 0.08	> 0.90	> 0.90	> 0.90	> 0.90	> 0.90	> 0.90

Fig. 1. Structural and final model of the factors in the driving behavior of employees of Shahid Beheshti University of Medical Sciences. * spiritual health **driving behavior

Table 4 and Table 5 show the standard direct, indirect, and total effects of all of the variables on driving behavior and on each other.

Spiritual health had a direct effect on depression, functional and social disorders, aggression, and driving behavior. Moreover, it had an indirect impact on depression, aggression, and driving behavior. The direct relationship between spiritual health and anxiety was not significant. Nonetheless, spiritual health indirectly influenced this variable. Spiritual health had the biggest and the smallest total effects on aggression and driving behavior respectively. Moreover, it had the most direct effect on dysfunction. Furthermore, the

direct effects of dysfunction and depression on driving behavior were not statistically significant. Notwithstanding, these two variables had indirect effects on driving behavior.

In addition, the direct effects of dysfunction and depression on driving behavior were not statistically significant However, these two variables had indirect effects on driving behavior.

Additionally, anxiety affected the driver's behavior both directly and indirectly. Although these effects were small, they were meaningful. The total effect of this variable on aggression and driving behavior was statistically significant. Finally, aggression had a direct impact on driving behavior.

Table 4. Regression coefficients of the independent and dependent variables in the theoretical model

independent variable	dependent variable	beta	Standard beta	SE	C.R	p value
Spiritual health	Dysfunction	1	-0.50	0.14	-7.96	0.000
Spiritual health	Depression	-0.23	-0.10	0.09	-2.68	0.007
Spiritual health	Aggression	-0.54	-0.29	0.09	-5.86	0.000
Spiritual health	Driving behavior	-0.20	-0.12	0.07	-2.73	0.006
Depression	aggression	0.10	0.12	0.04	2.66	0.008
Dysfunction	depression	0.74	0.74	0.04	17.20	0.000
Dysfunction	anxity	0.96	0.85	0.04	20.70	0.000
Anxiety	aggression	0.28	0.38	0.03	8.66	0.000
Anxiety	Driving behavior	0.08	0.12	0.03	3.09	0.002
Aggression	Driving behavior	0.41	0.45	0.04	9.19	0.000

Table 5. The standardized total effect and the standardized direct and indirect effects of the independent variables on the driving behavior of the employees of Shahid Beheshti University of Medical Sciences.

Relation	Direct Effect	Indirect Effect	Total effect
Spiritual → behaviour	-0.12	-0.28	-0.40
Aggression → behaviour	0.45	0	0.45
Depression → behaviour	0	0.05	0.05
Dysfunction → behaviour	0	0.29	0.29
Anxiety → behaviour	0.12	0.17	0.29

Discussion

In this study, the driving behavior model, which was tested using structural equation modeling, was developed based on the hypothesis that factors such as spiritual health, dysfunction, depression, anxiety, and

aggression can directly and indirectly affect the driving behavior.

According to the results, the direct effect of dysfunction on driving behavior was not significant. Nonetheless, this variable influenced driving behavior

indirectly by affecting anxiety and aggression variables. These indirect effects were small. Notwithstanding, they were statistically significant. The results of the studies by Shakeriniya et al. (9), and Abdoli et al. (4) showed the existence of a positive direct relationship between dysfunction and driving behavior. This result does not support the results of our study.

In this study, spiritual health had a major effect on general health (functional and social disorders). That is, an increase in the spiritual health was accompanied by a decrease in dysfunction. Likewise, Khodaveisi et al. (40) concluded that the increase in spiritual health improved the general health. The results of the study by Ziyapour et al. (41) indicated that there was a positive significant relationship between the employees' general health and their spiritual health. Moreover, based on the results, the employees' higher and stronger levels of spiritual health reduced their psychological damage. Finally, the results highlighted the fact that all of the dimensions of public health were related to the spiritual health. The results of the study by Akbari et al. (42) showed that spiritual health had a greater effect on the general health in comparison with the physical health. Ghous et al. (18) reported that there was a strong significant relationship between the spiritual factors and general health. The results were in line with the results of the previous studies.

In this study, spiritual health directly and indirectly affected the driving behavior and improved the individuals' performance. The indirect effects of spiritual health on driving behavior were greater than their direct effects on this behavior. These findings are in line with the results of the studies which were conducted by Lee et al. (43), and Ghous et al. (18).

The direct effect of anxiety on driving behavior was smaller than its indirect effect on this behaviour. High anxiety increased aggression and resulted in dangerous driving behaviors. The results of the study by Alavi et al. (19) indicated that anxiety was not related to traffic accidents.Nonetheless, there was a significant relationship between a wide range of anxiety types, including panic disorder, generalized anxiety disorder,

and obsessive-compulsive disorder and the driving behavior along with the number of traffic accidents. This finding was in line with the results of the other studies. Fathi (44) reported that the severity of anxiety symptoms in drivers was related to the high-speed driving style. That is the people with more anxiety symptoms liked to drive faster than the other people. Lucidi et al. (45) concluded that there was a significant relationship between high anxiety and the positive attitude toward driving rules. This finding does not support the findings of the other studies including our study. High anxiety increases the rate of traffic accidents and the risky driving behavior. The reaction time increases in anxious people and automatically increases the number of their driving accidents.

According to the results of the structural equation modeling, depression did not directly affect the drivers' behavior. Nonetheless, it had indirect effects on this behaviour. Most of the studies have reported the existence of a positive relationship between driving behavior and depression. For example, in the study by Alavi et al. (19), depression was related to the occurrence of a traffic accident. Moreover, the results of the study by Ansari et al. (46) indicated that there was a significant difference between the high-risk drivers and the normal drivers in terms of their depression. Most of the relevant studies have reported the existence of a direct relationship between depression and driving behavior. Nonetheless, this finding does not support the findings of our study.

Based on the results of the study by Shakerinia et al. (9) the most positive relationship was observed between aggression and the driving behavior. In the study which was conducted by Lucidi et al. (45), traffic aggression, slips, and errors were inversely related to the attitude toward driving rules. The aggressive person has more negative attitudes towards driving rules.Likewise, Ge et al. (47) concluded that perceived stress and aggression during driving were related to the dangerous driving behavior. Moreover, the results of the study by Sumer et al. (15) showed that abnormal behaviors such as high speed can predict psychological symptoms, sensation seeking, and aggression. These

results support the results of our study. According to our results, aggression increased risky behavior. The aggressive people are less emotionally stable and make decisions based on their emotions. As a result, they are not able to control their behavior and lose their concentration during their driving. This issue constitutes the reason behind the aggressive people's risky traffic behavior.

Conclusion

Based on the findings of this study, the driver's behavior was influenced by various psychological and behavioral factors that play significant roles in a person's driving style. In certain driving conditions, these factors cause a series of reactions which may prevent or increase the traffic accidents. Spiritual health and aggression are considered to be two of the above-mentioned factors. Spiritual health improves a person's driving performance. On the other hand, aggression increases the probability of the car accidents. Therefore, there is a need to take major steps by influencing these factors in order to reduce traffic accidents.

Acknowledgments

Conflict of interest

The authors have no conflict of interest in this study.

Ethics approval

This study was carried out in consultation with the technical officer of the SBMU health cohort. Moreover, it was approved by the ethics committee of Shahid Beheshti University of Medical Sciences, Tehran (code: IR.SBMU.PHNS.REC.1398.145).

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Data availability

The raw data supporting the conclusions of this article are available from the authors upon reasonable request.

References

1. WHO Organization. Global status report on road safety 2018. Geneva; 2018.

2. Soori H, Eyni E, Iranfar M. The state of traffic accidents in the world and in Iran, a review of the results of the World Health Organization report. Safety Promot Inj Prev. 2013;1(2):53-63. (Persian)

3. Rahimi N, Asadolahi Z, Afsharipour A. A study on the relationship between spiritual health and level of anxiety in the students of nursing and midwifery faculty. J Relig Health. 2017;4(2):56-64. (Persian)

4. Abdoli N, Farnia V, Delavar A, Esmaeili A, Dortaj F, Farrokhi N, et al. Poor mental health status and aggression are associated with poor driving behavior among male traffic offenders. Neuropsychiatr Dis Treat. 2015;11:2071.

5. Morowatisharifabad MA. The Health Belief Model variables as predictors of risky driving behaviors among commuters in Yazd, Iran. Traffic Inj Prev. 2009;10(5):436-40.

6. Asivandzadeh e, Farshad A-A, Alimohammadi I, Abolghasemi J, Jamalizadeh Z. The relation of aggression with the average of speed and lane deviation in taxi drivers of Tehran. Iran Occup Health. 2018;15(4):1-7. (Persian)

7. Haghshenas H, Hoseini M, Jamshidi M, Azizi H. Relation of personality traits with driving behavior in city of Shiraz in 2005. Hakim Res J. 2008;11(3):47-54. (Persian)

8. Disassa A, Kebu H. Psychosocial factors as predictors of risky driving behavior and accident involvement among drivers in Oromia Region, Ethiopia. Heliyon. 2019 Jun 1;5(6):e01876.

9. Shakerinia I, Mohammadpoor M. Relationship between psychological characteristics mental health, aggression and driving habits in dangerous drivers. SSU_Journals. 2010 Aug 15;18(3):225-33. (Persian)

10. Malekpour F, Mohammadiyan Y, Malekpour A, Salimi S, Sarkari A. Study of relationship between personality, attitudes to safety and risky behavior among motorcycle drivers in Tehran city. Saf Health Work. 2012;2(2):61-8.

11. Alavi S, Mohammadi M, Soori H, Jannatifard F, Mohammadi-alhory S. The Determination of Cognitive-Behavioral Features of Bus and Truck Drivers during Road Accidents in 2013-2014. J Saf Promot Inj Prev. 2016;3(4):223-34. (Persian)

12. FadakarGablo P, Younesi J, Mousavipanah S, Sadeghi M. The mediating role of public health, aggression and risk-taking in predicting driving behavior. Scientific Quarterly of Rahvar. 2015;4(12):55-76. (Persian)

13. Yadegarzaiei Z, Mohseni R, Labbi M. Sociological analysis of high-risk driving behaviors in Tehran metropolis. Rahvar Scientific Quarterly. 2016;14:95-128. (Persian)

14. Ghasemi V. Estimating the optimal sample size in structural equation models and assessing its adequacy for social researchers. Iranian Journal of Sociology. 2011;12(4):138-61. (Persian)

15. Sümer N. Personality and behavioral predictors of traffic accidents: testing a contextual mediated model. Accid Anal Prev. 2003;35(6):949-64.

16. Gudarzi M, Shirazi M. Investigating the relationship between stimulation and high-risk driving behavior. Journal of Psychology. 2005;33(9):34-50. (Persian)

17. Monteiro RP, de Holanda Coelho GL, Hanel PH, Pimentel CE, Gouveia VV. Personality, dangerous driving, and involvement in accidents: Testing a contextual mediated model. Transp Res F: Traffic Psychol Behav. 2018;58:106-14.

18. Ghous MT, Ambak K, Hamsaari RW, Mustapha AS. Enhancing road safety behaviour using a psychological and spiritual approaches. InMATEC Web of Conferences 2017 (Vol. 103, p. 08011). EDP Sciences.

19. Alavi SS, Mohammadi MR, Souri H, Kalhori SM, Jannatifard F, Sepahbodi G. Personality, driving behavior and mental disorders factors as predictors of road traffic accidents based on logistic regression. Iran J Med Sci. 2017;42(1):24-31.

20. Omidiyan M. Personality Type and Driving Behavior in Yazd University Students. National Congress of Social Psychology of Iran; 5 March 2014; Tehran 2014. (Persian)

21. Khoshnevis E, Esmaeli A. Determination of risk perception based on driving behavior components among high-risk drivers in Tehran. journal of Police medicine. 2019;5(5):321. (Persian)

22. Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS medicine. 2006;3(11):e442.

23. Soori H, Alipour A, Akbari M, Argani H, Asadpour Piranfar M, Aghdaei A, et al. A review on health cohort study of employees in Shahid Beheshti University of Medical Sciences (SBMU Cohort). Pajoohandeh Journal. 2017;22(6):346-55. (Persian)

24. Jenatabadi HS. A Critical Story about Sample Size, Outliers, and Normality Criteria in Structural Equation Modelling. Outliers, and Normality Criteria in Structural Equation Modelling (April 26, 2015). 2015.

25. Weston R, Gore Jr PA. A brief guide to structural equation modeling. Couns Psychol. 2006;34(5):719-51.

26. Reason J, Manstead A, Stradling S, Baxter J, Campbell K. Errors and violations on the roads: a real distinction? Ergonomics. 1990;33(10-11):1315-32.

27. Tavakoli Kashani A, Sokouni Ravasani M, Ayazi E. Analysis of drivers' behavior using Manchester driver behavior questionnaire based on roadside interview in Iran. Int J Transp Eng. 2016;4(1):61-74.

28. Oreyzi HR, Haghayegh SA. Psychometric properties of the Manchester driving behavior questionnaire. Payesh (Health Monitor). 2010;9(1):21-8. (Persian)

29. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: psychometric properties. J Consult Clin Psychol 1988;56(6):893.

30. Khesht-Masjedi MF, Omar Z, Masoleh SMK. Psychometrics properties of the Persian version of Beck Anxiety Inventory in North of Iranian adolescents. J Educ Psychol. 2015;1(2):145.

31. Beck A, Ward C, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression-Archives of General. Psychiatry. 1961;4:561.

32. Hamidi R, Fekrizadeh Z, Azadbakht M, Garmaroudi G, Taheri Tanjani P, Fathizadeh S, et al. Validity and reliability Beck depression inventory-II among the Iranian elderly population. JSUMS. 2015;22(1):189-98. (Persian)

33. Buss AH, Perry M. The aggression questionnaire. J Pers Soc Psychol. 1992;63(3):452.

34. Pouravari m, Habibi M, Salehi S, Shayestefard Z, Pouravari M. Psychometric properties of Bass and Perry Aggression Questionnaire: Non-clinical sample group. Pers Individ Differ. 2017;5(14):101-22. (Persian)

35. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. Psychol Med. 1979;9(1):139-45.

36. Nazifi M, Mokarami H, Akbaritabar A, Faraji M, Tabrizi R, Rahi A. Reliability, validity and factor structure of the Farsi translation of GHQ-28 questionnaire at hospitals affiliated to Kerman University of Medical Sciences. J Fasa Univ Med Sci. 2014;3(4):336-42. (Persian)

37. Holt JK, editor Item parceling in structural equation models for optimum solutions. annual meeting of the mid-western educational research association; 2004 13 Oct 2004.

38. Hooper D, Coughlan J, Mullen MR. Structural equation modelling: Guidelines for determining model fit. Electron J Bus Res Methods. 2008;6(1):53-60.

39. Kline P. An Easy Guide to Factor Analysis. 1st ed: Routledge; 1994.

40. Khodaveisi M, Baiat M, Amini R, Roshanaei G. The correlation of general and spiritual health of nursing students in Hamedan University of Medical Sciences in 2016. AJNMC. 2017;25(3):29-36. (Persian)

41. Ziyapour A, Ghaderi A, Vafapour H, Yazani v, Saeedi S, Zangene A. The relationship between mental health and spiritual health dimensions in staff of Kermanshah University of Medical Sciences in 2016. Pizhūhish dar dīn va salāmat. 2018;4(3):34-44. (Persian)

42. Akbari M, Hossaini SM. The relationship of spiritual health with quality of life, mental health, and burnout: The mediating role of emotional regulation. Iran J Psychiatry. 2018;13(1):22-31.

43. Lee KH, Besthorn FH, Bolin BL, Jun JS. Stress, spiritual, and support coping, and psychological well-being among older adults in assisted living. J Relig Spiritual Soc Work. 2012;31(4):328-47.

44. Fathi A. The Role of Mental Health Components in High-Risk Driving Behaviors. Journal of Police Medicine. 2020;9(3):143-8. (Persian)

45. Lucidi F, Mallia L, Lazuras L, Violani C. Personality and attitudes as predictors of risky driving among older drivers. Accident Analysis & Prevention. 2014 Nov 1;72:318-24.

46. Ansari H, Jadidfard K, Karami Dehbaghi M. Comparison of symptoms of mental disorders in drivers of high-risk accidents with the normal population of Tehran (2014). Journal of Police Medicine. 2015;5(4):265-72.

47. Ge Y, Qu W, Jiang C, Du F, Sun X, Zhang K. The effect of stress and personality on dangerous driving behavior among Chinese drivers. Accident Analysis & Prevention. 2014 Dec 1;73:34-40.