Original Article

The Relation between Human Traffic Accident and Personality Traits

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Abstract

Background and Objectives: Accidents of motor vehicles are one of the largest causes of traumas, disabilities, and mortalities. Driving accident and crashes with more than 20000 deaths/year are the second cause of morality in the nation after cardiovascular diseases. Personality traits of a person may affect his/her dangerous driving behaviors and perception of health and risk. **Materials and Methods:** This case–control study was conducted on accident victims referred to Hasheminejad Hospital in Mashhad during 2017–2018 and conducted on two case and control groups. The researchers directly interviewed case group patients using a Temperament and Character Inventory-125 questionnaire. **Results:** The mean age of the participants was 32 in the case group and 34 in the control group. The most common vehicle was motorcycle in the case group and car in the control group, respectively. In "novelty seeking," the mean scores were 3.3 ± 9.94 and 8.32 ± 3.57 in the case and control groups, respectively ($P = 0.02$). In "harm avoidance," mean scores were 7.72 ± 2.65 and 8.68 ± 3.57 in the case and control groups, respectively ($P = 0.02$). **Conclusion:** The present study demonstrated that accident rates reduced as age increased. It was also cleared that personality traits played a major role in the human factor of traffic accidents. Thus, preventive measures could be made and educational packages could be produced at the school level and younger ages aimed at changing some personality traits to some extent.

Keywords: Accidents, personality, traffic

Introduction

In the society of today, driving is quite essential for work, social life, recreation, educational, economic and creative activities, etc. However, accidents of motor vehicles are one of the largest causes of traumas, disabilities, and mortalities.[1]

Traffic accidents are complicated phenomena caused by human, technical, and other circumstantial risks.[2] Identifying the most probable factors of human and nonhuman risks affecting accident intensity may be used as a basis for effective prevention of traffic accidents.[3] There are various statistics about mortality rates of traffic accidents, in which countries with low and medium incomes get the highest ranks in terms of traffic accidents mortality rates (respectively, 21.5 and 19.5 people per 100,000 population).[4-6] Human-related factors are the biggest cause of such traffic accidents,[7] such that they account for 60%–70% of all accidents.[8] Based on studies, factors affecting accident rates are human factor (70%–75%), vehicle factor (10%–15%), and road factor (10%–15%). Concerning the human factors, the most human factor behind accidents is the personality traits of people. Personality traits

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of a person may affect his/her dangerous driving behavior's and perception of health and risk. Some personality traits, such as risk attitudes and decision-making, are a major factor in high-risk behaviors resulting in accidents.[2,8] A study on the relationship between personality, dangerous driving, and involvement in accidents may provide insight into factors directly related to accidents.[9,10] Personality theories confirm the existence of relationships between personality traits, such as risky behaviors and delays in decision-making and offenses.[11] It has been confirmed that a relationship exists between an incompatible personality, psychological pressures, and ineffective coping strategies.[12-14] It seems logical that a person who has risky behavior or delay in decision-making cannot behave properly in a critical situation and lead to an accident.[1,2]

Thus, in view of the significance and necessity of driving in the modern world, and the high rates of accidents in Iran, and the prominent role of the human factor in causing those accidents, the present study was conducted to examine the relationship between driving behaviors and personality traits. In addition, a big city like Mashhad was chosen as the subject of the study due to its huge traffic and accident rates. Accidents caused by its massive population and hosting of pilgrims, as well as diverse cultural values and personality traits of residents and pilgrims coming from various ethnic and cultural backgrounds (increased due to migration of various groups and ethnicities to this religious metropolis).

Materials and Methods

This case–control study was conducted on 120 accident victims referred to Hasheminejad Hospital in Mashhad from September 2017 to September 2018. The Organizational Ethics Committee of the Mashhad University of Medical Sciences approved the research project, under project No. 951716 and code IR.MUMS.fm.REC.1396.642. Inclusion criteria for accident victims included all accident victims referred to a trauma center of Shahid Hasheminejad Hospital and were capable of answering questions of the personality trait test. Participants in this study were among the patients admitted to the trauma Emergency Department. Exclusion criteria included lack of 18 full years (legal age), patient's lack of willingness to participate, lack of mental or psychological capacity to answer questionnaires, being in critical conditions, and lack of physical power to answer the questions. At the same period, 120 noninjured individuals were chosen and put into the control group.

Once signing some consent and waver forms, and ensuring that they did not meet exclusion criteria, the patients were registered for the study. The study was conducted on two case and control groups, and patients who met the inclusion criteria were entered into the study by convenience sampling.

The two groups were balanced so far as possible in terms of age, gender, education, and history of driving. The researchers directly interviewed case group patients using a temperament character inventory (TCI)-125 questionnaire [Table 1]. Dr. Hossein Kaviani had already confirmed the reliability and validity of that questionnaire, and it was used on a global scale.[14] Once the questionnaires were completed, the collected data was put to analysis. According to the works of Dr. Akbari,[14] and using mania variable (a personality trait), with a type 1 error of 5% and power of 80% for each group, the sample size was determined to be 100 and then increased to 120 taking into account dropouts. The total size of the sample for this study was therefore 240 subjects.

Once collected, the data were entered into the SPSS25 of T-Mobile software. The first round included descriptive statistics, by calculating dispersion and central indices of the variables. The research hypotheses were tested by Chi-square correlation test. This step was then followed by inferential statistics, using parametric tests, or else by nonparametric tests. Furthermore, the OR value was analyzed for this study.

Results

The 240 participants included 120 injured patients and 120 control members. The mean age of the participants was 32 in the case group and 34 in the control group ($P = 0.07$). Among those, 211 people (87.9%) were male, and 29 (12.1%) were female ($P = 0.07$). The number of male participants was larger in the case group, while female participants prevailed in the control group ($P < 0.001$). The level of education of both case and control groups was studied, and the highest level in both groups was secondary school ($P = 0.01$). The most common vehicle was motorcycle in the case group and car in the control group ($P = 0.001$). The case group included 81 married and 39 single people, while the control group included 98 married and 22 single ones ($P = 0.01$). The people participating in the study were divided into 3 groups based on their driving history: less than 10 years, 10–20 years, and more than 20 years of driving. In the case group, 68 people had driven <10 years, 40 between 10 and 20, and 12 more than 20 years. The control group had 72 people with <10 years of driving, 34 with 10–20 years, and 14 with more than 20 years ($P = 0.65$) [Table 2]. All variables have normal distribution in the Kolmogorov–Smirnov test, so an independent *t*-test was used. Results of analyzing various questionnaire dimensions included the following:

For novelty seeking, harm avoidance, persistence, reward dependence, cooperation, and self-directedness were evaluated in two groups [Table 3].

Discussion

Driving accident and crashes with more than 20000 deaths/year are the second cause of morality in the nation after cardiovascular diseases. In addition, second only to Sierra Leone, Iran, has the highest rates of road accidents mortality among 190 countries of the world. A person is killed in traffic accidents each 19 min, totaling to 23,000 dead and 2,80,000 injured in 8,00,000 accidents per year.[1] Human-related factors are the most cause of traffic accidents,

Table 1: Temperament character inventory

TCI
NS
HA
RD
PS
SD
CO
ST

TCI: Temperament and character inventory, NS: Novelty seeking, HA: Harm avoidance, RD: Reward dependence, PS: Persistence, SD: Self-directedness, CO: Cooperativeness, ST: Self-transcendence

Table 2: Driving history of the participants base on 10-year division

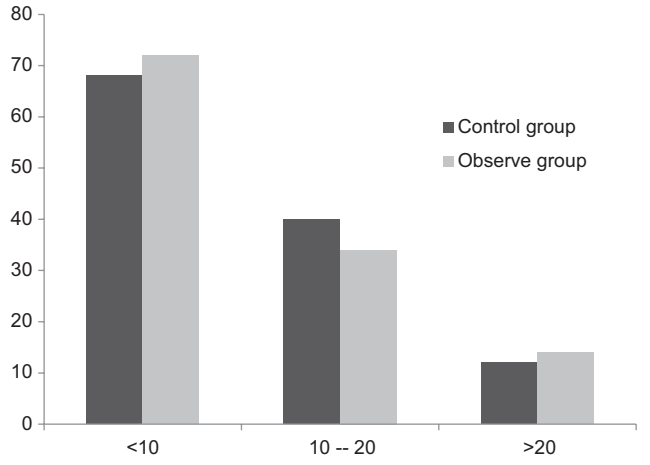

Table 3: Analysis of mean questionnaire dimensions

	Control group	Observe group	*P*
Novelty seeking	9.94±3.3	8.32±3.18	0.02
Harm avoidance	7.72±2.65	8.68±3.57	0.03
Persistence	3.21±1.57	3.29±1.35	0.71
Reward dependence	8.43±1.91	8.75±2.15	0.25
Cooperative	16.84±3.17	16.54±3.95	0.61
Self-directedness	13.75±2.4	13.36±3.77	0.44
Self-transcendence	8.59±2.1	8.98±2.63	0.32

and the main factor behind accidents is the personality traits of people. The results of this study demonstrated that the average age of the injured members in the case group was lower than the control group. The number of male participants in the case group was higher than female ones in the control group. Of course, this difference could be due to the area where our hospital is located, where there main cause of accidents is motorcycles. The education level of most members of both groups was secondary school, and most injured participants used motorcycles. Most members of the case and control groups had driving histories of <10 years.

In terms of Cloninger's TCI questionnaire, the case group had higher novelty-seeking scores than the control group, and this novelty seeking can lead to high-risk behaviors in people, because this seeking may be regardless of the consequences. Our study confirmed these consequences in the control group and we showed that the incidence of accidents is higher in these individuals. The case group also had lower scores in harm avoidance in comparison to the control group. Harm avoidance, especially younger and less experienced ones, can lead to harm to oneself and others.[9] As observed in our study, the greater the avoidance of injury, the lower the likelihood of an accident. In other personality dimensions, such as self-directing, reward-dependence, persistence, cooperation, and self-transcendence, there was no significant difference between the two groups. These findings can be accepted considering the young age of the study participants because with increasing age, conservative behavior increases. Findings of Haghshenas *et al*. in 2005[15] and Sumer *et al*. in 2005[16] in the field of unsafe driver behavior have indicated that there was a positive significant relationship between neuroticism and dangerous driving behaviors. Having negative feeling such as excitement, stress, anger, sense of guilt, and a constant prevailing sense of being pestered, a neurotic person lacks the required level of attention and focuses while driving and hence engages in dangerous driving behaviors. These results also go with those of Brown and Victoria in 2006[17] and Hanson in 2003.[18] A study by Amado *et al*. also demonstrated a positive relationship between impulsivity (a subset of nervousness trait) and aggressive driving.[19] Torbjoern and Hilde conducted a study on personality and personal differences in 2002 and demonstrated that people with high scores in personality traits such as ambition and nervousness engaged in dangerous driving much more than people with lower scores in the same categories. These people also gained higher scores in ignoring traffic signs and speeding. In the same studies, it was also shown that dangerous drivers had experienced accident or near-accident states resulting in bigger financial and bodily injuries in comparison to other drivers.[20]

Restrictions, strengths, and weaknesses

Given the fact that the present study included a large number of participants in case–control groups, it may add to our knowledge and awareness of personality issues and disorders in traffic accidents victims and help us get to the roots of such issues in the country and create frameworks for effective preventive measures and that would in turn reduce the huge rates of casualties, physical and mental traumas, and medical expenses imposed on the nation by traffic accidents.

Like other studies, this effort had its own limits and restrictions, including among others the fact that it was only carried out in a single province.

Conclusion

The present study demonstrated that accident rates reduced as age increased. In addition, in terms of personality dimensions, members of the case group (accident victims) had higher scores in terms of novelty seeking and lower ones in terms

of harm avoidance in comparison to members of the control group. According to such results, it could be concluded that due to maturity or reduced risk taking, people's personality traits gradually shift toward moderation and that reduce the rate of traffic accidents in later ages. It was also cleared that personality traits played a major role in the human factor of traffic accidents, and thus, preventive measures could be made and educational packages could be produced at school level and younger ages aimed at changing some personality traits to some extent. The present study showed that most members of the case group had secondary school graduation degrees. This requires more research that is comprehensive in its own turn.

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Conflicts of interest

There are no conflicts of interest.

References

1. Lucidi F, Girelli L, Chirico A, Alivernini F, Cozzolino M, Violani C, *et al.* Personality traits and attitudes toward traffic safety predict risky behavior across young, adult, and older drivers. Front Psychol 2019;10:536.
2. Romero DL, de Barros DM, Belizario GO, Serafim AP. Personality traits and risky behavior among motorcyclists: An exploratory study. PLoS One 2019;14:e0225949.
3. Zheng Y, Ma Y, Cheng J. Effects of personality traits and sociocognitive determinants on risky riding behaviors among Chinese e-bikers. Traffic Inj Prev 2019;20:838-43.
4. Wang X, Huang K, Yang L. Effects of socio-demographic, personality and mental health factors on traffic violations in Chinese bus drivers. Psychol Health Med 2019;24:890-900.
5. Uijong J, Kang J, Wallraven C. You or me? Personality traits predict sacrificial decisions in an accident situation. IEEE Trans Vis Comput Graph 2019;25:1898-907.
6. Hussain B, Sato H, Miwa T, Morikawa T. Influence of personality traits on aberrant driving behaviors: A comparison of Japanese, Chinese, and Vietnamese drivers. J Safety Res 2020;75:178-88.
7. Ābele L, Haustein S, Møller M, Zettler I. Links between observed and self-reported driving anger, observed and self-reported aggressive driving, and personality traits. Accid Anal Prev 2020;140:105516.
8. Tao D, Zhang R, Qu X. The role of personality traits and driving experience in self-reported risky driving behaviors and accident risk among Chinese drivers. Accid Anal Prev 2017;99:228-35.
9. Ścigała DK, Zdankiewicz-Ścigała E. The role in road traffic accident and anxiety as moderators attention biases in modified emotional stroop test. Front Psychol 2019;10:1575.
10. Yang J, Du F, Qu W, Gong Z, Sun X. Effects of personality on risky driving behavior and accident involvement for Chinese drivers. Traffic Inj Prev 2013;14:565-71.
11. Jazayeri A, Jafarizadeh Z, Pourshahbaz A. Study and comparison between personality traits and coping strategies among opium addicts (within the age of 30-36). Med Sci J Islam Azad Univ 2003;1:3-18.
12. Berzonsky MD, Kuk LS. Identity status, identity processing style, and the transition to university. J Adolesc Res 2000;15:81-98.
13. Hoseininasab D, Poursharifi H, Mohammadi V. The relationship between personality characteristics with differentidentitiesthird female students in Tabriz school year. Educ Adm Res Q 2010;2:81-96.
14. Kaviani H, Haghshenas H. Preliminary study to standardize the temperament and character inventory (Tci-125) in Persian speakers. Adv Cogn Sci 2000;2:18-24.
15. Haghshenas H, Moghaddam A, Moghaddam AA. Application of social desirability scale in association with NEO test for personnel selection. Iran J Psychiatry Clin Psychol 2005;11:52-61.
16. Sumer N, Timo L, Ozkan T. Big Five Personality Traits as the Distal Predictors of Road Accident Involvement. 2005, p. 227.
17. Braun V, Victoria C. Using thematic analysis in psychology. Qual Res Psychol 2006;3:77-101.
18. Hansson S. Ethical criteria of risk acceptance. Erkenntnis 2003;59:291-309.
19. Amado S, Koyuncu M, Kacaroglu G. Evaluation of factors affecting safe driving: Demografic factors, experience, personality and psycho-technical. Turk Pisikol Derg 2004;19:45-7.
20. Torbjoern R, Hilde V. Personality, risk behavior and accident involvment aming Norwegian drivers. Pers Individ Differ2002;33:1251-63.