

Prediction of Driving Behaviors Base on Theory Planned Behavior (TPB) Model in Truck Drivers

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Abstract: BACKGROUND AND OBJECTIVE: Traffic injury is one of the main causes of mortality and disability in the world. Base on the World Health Organization (WHO) report, annually almost 500 thousands of people killed and 50 million persons injured because of the traffic injuries. Purpose of this study was prediction of driving behaviors based on theory planned behavior (TPB) in Bandar Abbas truck Cargo terminals. **MATERIALS AND METHODS:** Our research was a cross-sectional study that conducted on 240 truck drivers, in Bandar Abbas city truck Cargo terminals, at June 2013. The instrument used for gathering data was a questionnaire that included demographic characteristic and TPB constructs. For prediction driving safety behavior were used multiple regression analyses with significance level at 0.05. **RESULTS:** The mean (\pm SD) age of drivers and their driving history were 38.3 (\pm 9.8) and 13.8 (\pm 9) years, respectively. Multiple regression analyses show that attitude and perception of drivers can be predicted their intention for safety driving behavior. Drivers who had more positive attitude and perception more likely had been intention and perception for safety driving behaviors. **CONCLUSION:** This study conducted on truck driver in Bandar Abbas of Iran and their findings suggested that are needed appropriate and designated interventional programs for improvement of attitude and perception of Iranian truck drivers.

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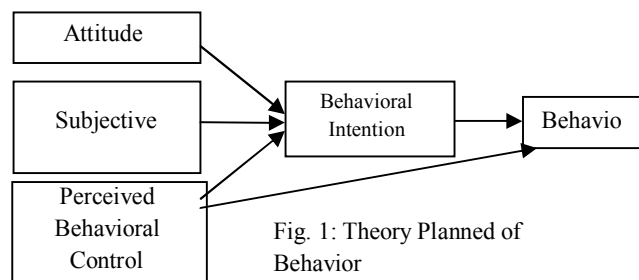
Key words: Theory, Planned Behavior, Driving, Injury, Traffic

Introduction

Traffic injury is one of the leading causes of mortality and disability in the world. Base on the World Health Organization (WHO) report, annually almost 500 thousands of people killed and 50 million persons injured because of traffic injuries. Ninety percent of these killed and injured individuals belong to low or middle income countries (1-2). USA traffic injuries statistics indicated that approximately 16290 people killed in the crash of motor vehicles at the first half of 2012 year. This statistics show nine percent increase compared with 14850 individuals killed at the first half of 2011 year (3). Statistics show that in Iran the number of killed persons per 1000 vehicles at the road is very higher than developed countries (4). From 2000 to the end of 2009, 235050 individuals were killed during motor vehicle accidents in Iran (5). In Iran, during 2003 occurred more than 25000 deaths due to road accidents in which, 5000 of these deaths belonged to truck accidents (6). According to the report of Iranian Ministry of health, in year of 2005 were killed 23764 persons because of road accidents in which, truck had second order cause of death with 17% after motorcars with 31.9% (7). In

Iran, annually occurred more than 400000 road accidents and in the world our country had the first order of deadly traffic injuries. The highest proportion of traffic injuries death were happen in countryside roads when occurred an accident between trucks and other types of vehicles (60.5%) (8). Researchers showed that most traffic accidents were happened because of human factors (9). One of the human factors that influenced on the occurring of traffic accident is behavioral habits (10). In truck drivers one of the behavioral habits can be affected on the road accidents is safety behavior (11). For prediction of individual behaviors result of traffic accidents, can be used theory of planned behavior (TPB) with wide variety of behavior such as occupational health (12) dietary behaviors (13) physical activity (14). Furthermore, this theory had been used for specific driving behaviors such as Safety belts (15), drunk driving (16) and driving with high speed (17). The theory of planned behavior is base of reasoned action theory. This model can predict the occurrence a specific behavior provided that person had intention for doing it. According to this model, behavioral intention for doing a behavior was specified by three agents. These

factors include: a positive attitude toward behavior, subjective norms and perceived behavioral control (fig.1) (12).



Attitude i.e. what extent the behavior is desired, pleasant, useful or enjoyable for persons, it depends on the individuals judgment about the effects and consequences of the behavior (18). Subjective norms are perceived social pressure to perform a behavior or in other words are a reflection of social influences in the doing a behavior (19). Perceived behavioral control i.e. the degree an individual feels about doing or not doing an act controlled by his (her) willing. The perceived behavioral control could directly and also indirectly through the intention affect the behavior (20). The Purpose of this study was prediction of driving behaviors based on theory planned behavior in Bandar Abbas truck Cargo terminals.

Materials and methods

This cross-sectional study was conducted in June 2013 on truck drivers who had referred to the Bandar Abbas truck Cargo terminals. The sample size was estimated at 240 persons as randomly selected among truck drivers referred to the Cargo terminals. For selection samples, we once every two days randomly selected one terminal among total truck cargo terminals and then, randomly selected 10 drivers among truck drivers parked their truck in the garages. For gathering data, we used a questionnaire tool which completed via ask from truck drivers. Questionnaire had two sections, in first one included questions about demographic variables such as age, education, history of driving, distance traveled to the cargo terminal, etc. and the another section we placed questions for assessing the TPB structures and driving behavior. For designing section of TPB structure of the questionnaire we used previous similar studies and so conducted a pilot study. In the pilot study, the number of truck drivers were invited and via the semi structured interview were extracted their comments about driving behavior specialty about safety behavior

and factors effect on safety behaviors. The question designated based on a likert scale with score 1 to 5. The number of question related to attitude, subjective norms, perceived behavioral control, behavioral intentions, respectively, were 12, 8, 6, 8 items. The min and max scores of attitude were 12 and 60, the min and max scores of subjective norms were 8 and 40, the min and max scores of perceived behavioral control were 6 and 30, the min and max scores of behavioral intentions were 8 and 40. The higher scores respectively indicated more positive attitudes, more subjective norms, higher perceived behavioral control and more intention for doing safe driving behaviors. For determining the validity of TPB section of the questionnaire was used content validity and expert's panel opinion. And so, for determining the reliability of this section of the questionnaire was computed cronbach alpha coefficient for each constructs of TPB. The values of cronbach alpha coefficient were obtained 0.7, 0.65, 0.6 and 0.81 respectively for attitude, subjective norms, perceived behavioral control and behavioral intention.

For evaluation of driving behavior was used Manchester driving behavior questionnaire that was including 49 questions (21-22). Questions of this questionnaire designed base of likert scale from score 0 to 5. Validity and reliability this questionnaire has been confirmed with alpha .9 in Iran (23). The min score of this questionnaire is 0 and max score is 245. In this questionnaire, fewer score was indicated the high risk behavior and higher score was indicated safety behaviors such as speed limit, seat belt use, no use of cell phones during driving and etc. Before filling out of the questionnaire we obtained informed consent of drivers and assured them that their information will remain confidential. Also name and profile truck driver was not recorded.

For statistical analysis of data were used descriptive measure, e.g. mean and standard deviation (SD) and so used correlation coefficient and multiple linear regression. For determining of statistical significance were used p-value lower than 0.05. We used statistical software SPSS version 19 for our analysis.

Results

Base on demographic characteristics mean (\pm SD) age of drivers was 38.3 (9.8) years, their driving history was 13.8 (9) years, most of drivers were diploma (63.3%), married (89.2%), had accident history (69.5%), were truck owner (61.3%) and had daily average driving 500-700 km (Table 1).

Table 1: Demographic characteristics of truck drivers

Variable	Mean(SD)	N	Percent
Age	38.3(9.8)	240	100%
Average history of driving	13.8(9)	240	100%
Marital status			
Single		26	10.8
married		214	89.2
Education			
Under diploma		147	63.3
Diploma		81	33.8
Upper diploma		12	5
Accident history			
Yes		73	30.4
NO		167	69.5
Truck owner			
Yes		147	61.3
No		93	38.8
Daily average driving			
Under 500 km		43	17.9
500-700 km		153	63.8
Up to 700 km		44	18.3

Kendal correlation coefficient among structures of TPB model showed that in table 2. The correlation coefficient between attitude and intention for safety behaviors indicated that there was a positive relation between these two structures that was more than of other structures of TPB model. Also, there was a positive relation between intention and safety driving behaviors. On the other hand, there were negative relations among subjective norms with intention and so subjective norms with safety driving behaviors (Table 2).

Table 2: Kendall correlation coefficient among TPB constructs

Variable	Intention	Safety driving behaviors
Attitude	.399*	.276*
Perceive behavioral control	.240*	.271*
Subjective norms	-.20*	-.26*
Intention		.331*

* Significant at p-value < .05

The multiple linear regression analysis showed that attitude and perceived behavioral control were predicted the intention for performing safety driving behaviors. In the other word, drivers who had more attitude and perceived behavioral control were more likely had more intention for safety driving behaviors. Also, the multiple regression results revealed that intention for safety behaviors driving and perceived behavioral control were predicted safety driving behaviors. Namely, drivers who had more intention and perceived behavioral control were more likely had safety driving behaviors in practice. Moreover, intention rather than perceived behavioral control were greater predictor for performing safety driving behaviors (Table 3).

Table 3: linear regression of TPB constructs and driving behavior

Variable	R ²	Unadjusted B	Adjusted B	P
Intention	.21			
Constant		10.14		
Attitude		.381	.391	.000
Subjective norms		-.005	-.006	.91
Perceive behavioral control		.285	.225	.000
Safety driving behaviors	.15			
Constant		128.4		
Behavioral intention		1.46	.283	.000
Perceive behavioral control		1.33	.203	.000

Discussion

The aim of this study was determining Predictors of driving behavior base of TPB model in truck drivers of Bandar Abbas cargo terminals. As the results of the

study showed that attitude and perceived behavioral control were predicted intention for safety driving behaviors. In the other word, whatever a driver had positive attitude and also perceived behavioral control

for doing safety behaviors had higher intention for safety driving behaviors. In several studies were conducted about safety driving behaviors, revealed that attitude significantly had relationship with intention for safety driving behaviors. In study was accomplished by Warner and Aberg, drivers who had positive attitude for safety behaviors, their intention for safety behaviors were more than other drivers (24). But, in study of Damian and colleagues, attitude had not revealed a direct relationship for prediction of driving behaviors in truck drivers (25). Also, the study of Aghamolaei and colleagues, attitude was not predictor of driving behavior such as speed limit (26). The study of Cook and Bellis revealed that positive attitude alone not lead to intention and safety behaviors moreover, always driver's knowledge and perception about risky behavior not result to reduce their risky behaviors (27). In our study subjective norms was not predictor of intention for doing safety driving behaviors. Similarly, the study of Damian revealed that subjective norms were not direct predictor of driving behaviors (25). But, in our study not seen significant relationship between subjective norms and intention for safety driving behaviors while, in the study of Damian this relation was statically significant, but weak (25). The study of Aghamolaie and colleagues revealed that subjective norms are predictors of intention for driving with respect to speed limits (26). Also, Warner and Aberg reported that subjective norms are strong predictors for adaption of speed limits (24). In the study of Mehri and colleague subjective norms were predictor of seat belt use and safety driving behaviors (28).

The results current study revealed that intention for safety behavior was predictor for performing safety behavior. In other word, whatever driver had intention for safety driving behavior such as driving with respect to speed limits, no use cell phone during driving, seat belt and other safety behaviors was more lead to perform these behaviors in practice. Other studies were revealed that whatever intention and perceived behavioral control of drivers were higher, the probability for performing unsafe driving behaviors is more for them and so were argued that intention is predictor of real behavior (29).

According to the current study results perceived behavioral control was predictor of intention for safety driving behaviors and so perceived behavioral control was significant predictor of adapting speed limits. Ajzen argued that perceived behavioral control is an important factor that is influenced on behavior when people are not confident in their ability for the performing a specific behavior (18).

According to the results of current study perceived behavioral control is an important predictor of

intention for safety behavior rather than performing safety behavior. Thus, policy makers and managers of transportation area could promote safety driving behavior by supporting perceived behavioral control of drivers as a result; reduce the rate of risky behaviors and traffic injuries. The results of this study imply that could be use of TPB model as appropriate tool for prediction of intention and performing of safety behaviors in truck driver and so the most important predictor of intention for doing safety behaviors is attitude. In other word, whatever a person have positive view rather for doing safety behaviors would be more probable do these behaviors. Also, in this study perceived behavioral control was predictor of intention and safety behaviors. Namely, when the drivers feel that they have more control for performing the safety behavior, in practice doing of these behaviors will be increased them. From the results of this study can be used for planning and developing strategy for promotion safety driving behavior in truck drivers and reinforced the attitude and perceived behavioral control of drivers. The only limitation of this study is that this research was conducted on 240 samples of truck drivers went to Bandar Abbas cargo terminals. Since the samples are belong to one type of drivers and so most drivers come from Hormozgan province of Iran it is difficult to generalized the results of this study to across drivers of the country. Therefore, recommended that should be conducted other studies with larger sample size in other cities and drivers until can be provided broader vision about safety driving behavior and related factors.

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