



Identification of Factors Affecting Driving offenses and Sleep Quality in Iranian lorry Drivers

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ABSTRACT: Accidents are directly related to driving offenses, and drivers who commit more offenses, are more prone to accidents. Therefore, reducing driving offenses can reduce accidents. Hence, the recognition of common driving offenses among heavy vehicle (truck) drivers and the effective factors in directing them to reduce driving offenses can consequently reduce the frequency and severity of accidents. Thus, there is a necessity for further studies to research in this regard more than ever before. The main objective of this study is to identify and investigate the impact of important and effective factors on lorry drivers committing offenses. To achieve this goal, initially, all independent variables were collected and classified via completed questionnaires within 45 days in two cities of Tehran and Mashhad, among 392 drivers. Then required statistical tests were used to investigate the relationship between each independent variable and dependent variable which in this research is driving offenses. The results showed that by reducing the distance travelled by the driver, the probability of committing overloading among lorry drivers decreases. Also, with a reduction in vehicle life ranges from 11- 15 years to 6-10 years, speeding offenses increased significantly. Drivers with fewer shorter vehicles are more likely to commit a speeding violation. Finally, the result was that the lower the level of lorry driver's education, the greater the likelihood of committing cell phone-related violations while driving.

Review History:

Received: Jul. 17, 2019

Revised: Sep. 27, 2019

Accepted: Oct. 10, 2019

Available Online: Oct. 23, 2019

Keywords:

Lorry drivers

Driving offenses

Sleep quality

Load transportation

Multivariate logistic regression..

1. Introduction

Transportation and logistics play an important role in the economy of countries, while, road transport is one of the most important modes of transportation for road transportation, especially in developing countries [1].

In Iran, similar to other developing countries, load transportation, which is mainly driven by semi-heavy and heavy vehicles, plays an important role in the distribution of export and import freights.

Increasing the traffic of heavy vehicles on the roads and consequently, increasing the likelihood of accident has become one of the main concerns of drivers and policymakers [2]. Accidents are directly related to driving offenses; In other words, driving offenses are among the most important factors that lead to accidents [3]. And drivers with more offenses experience more accidents [4]. Thus, reducing driving offenses can reduce accidents.

Studying the causes of accidents shows that errors and violations are a major cause of 74 percent of accidents [5]. This leads to the concern of identifying the factors that lead to driving offenses and reduce the outbreak of accidents. Most studies point to the fact that accidents depend on three factors: human, vehicle, and road [6]. and the human factor is the most important in the analysis of traffic accidents [7]. Therefore, driving offenses are also a major cause of accidents and in many studies, to access this factor, examination of

inappropriate driving behaviors has been used which is related to behavioral characteristics and driver attributes [6-12].

2. Methodology

The main objective of this study was to identify and evaluate the impact of important factors affecting cargo lorry drivers committing traffic-driving offenses. To achieve this goal, all independent variables are the main objective of this study was to identify and evaluate the impact of important factors affecting cargo lorry drivers committing driving offenses. To achieve this goal, all independent variables are categorized first and the chi-square Pearson test with a p-value of 0.05 is used to investigate the relationship between each independent variable and the dependent variable that is driving offenses in this research. Then, with the significant variables in committing driving offenses known, a multivariate logistic regression model was developed, and using this method, the effect of variables on the perpetration of infringements by lorry drivers was evaluated. It should be noted in this study, the type of driving offenses was classified into five categories as a dependent variable including overweight truck, non-seat belted driver, speeding, technical diagnosis, talking with mobile phones were the effective factors identified within the category for each truck comprised of the driver, vehicle, mileage, and driver sleep status.

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3. Results and Discussion

The results show that, for the drivers younger than 30 years old, the inclination to commit overloading is higher in the age group over 50. Moreover, the results of statistical analysis show that drivers who travel between 61-100 thousand kilometers throughout the year tend to be less likely to commit overloading than those who drive more than 200 thousand kilometers, and the probability of committing an overload driving offenses about 96.5 percent decreases. In other words, by reducing the mileage driven by the driver, the likelihood of committing overloading among the lorry drivers has decreased.

The results analysis of a speeding model indicates that the lorry drivers, aged between 6 -10, are more likely to commit speeding than lorry drivers aged over 20 years. Also, lorry drivers aged between 11 -15 are more likely to commit speeding than lorry drivers aged over 20 years. In other words, it concluded that by decreasing the lifetime of the vehicles from 11 -15 years to 6 - 10 years, the rate of speeding violation increases significantly, and drivers with the lower lifetime vehicles are less likely to commit these driving offenses. Reviewing the statistical analysis showed that Drivers who have 1 to 10 years of driving experience are more likely to commit speeding than those who have had more than 20 years of experience. So, the less experienced the driver, the rate of committing speeding increases. Also, drivers who drive between 151,000 and 200,000 kilometers throughout the year are less likely to commit speeding than those who drive more than 200,000 kilometers a year, and the likelihood of committing speeding is reduced by 96.5%. finally, it concluded that the drivers who had discharge and freighting five or six times per month, less likely to commit speeding than those who had more than 12 discharges and freighting each month.

The results analysis of the talking to cell phone driving offenses model showed that drivers with an undergraduate academic background are more likely to commit this driving violation than those who have higher education. Furthermore, drivers with middle school education are more likely to commit a talking to a cell phone than those who have a bachelor's degree.

4. Conclusions

The main objective of this study was to identify and investigate the impact of important and effective factors on lorry drivers committing driving offenses. To achieve the desired goals, information on the history of driving offenses, sleep quality, and demographic characteristics of the driver as well as other information required in the vehicle information, environmental conditions, and information on discharge and freighting was obtained through the completion of the questionnaire for 45 days among 392 heavy vehicle drivers in two major cities of Tehran and Mashhad. The results of the analysis from the statistical models in this study showed that by reducing the mileage driven by the driver, the likelihood of committing overloading among the lorry drivers reduced. Considering that the average traffic of lorry drivers on routes are more than out-of-town routes, it seems that the probability of overloading are higher in in-town routes and the necessary measures must be taken to control them, such as excessive

tonnage control in the in-town routes, using portable weighbridges or the obligation to issue a bill of lading by companies.

The results analysis of the speeding driving offenses model indicates that by decreasing the lifetime of the vehicles from 11 -15 years to 6 - 10 years, the number of speeding increases significantly, and drivers with the lower lifetime vehicles are less likely to commit these driving offenses. Also, drivers who have 1 to 10 years of driving experience are more likely to commit speeding than those who have had more than 20 years of experience. Therefore, the less experienced the driver, the rate of speeding increases. The results obtained in this section can also be used to prioritize the installation of remote control devices (GPS or Sept.) on the fleet.

Finally, the analysis of the results of the talking to cell phone model showed that drivers with an undergraduate background are more likely to commit these driving offenses. The result also indicates the need for training courses for these groups of drivers will have a greater impact on the reduction of lorry drivers' driving offenses.

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HOW TO CITE THIS ARTICLE

A., Sheikholeslami, A., Moghadari, E., Ayazi, *Identification of Factors Affecting Driving offenses and Sleep Quality in Iranian lorry Drivers*, *Amirkabir J. Civil Eng.*, 53(3) (2021): 247-250.

DOI: [10.22060/ceej.2019.16775.6338](https://doi.org/10.22060/ceej.2019.16775.6338)



