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Original article

Sleep quality in long haul truck drivers: A study on Iranian national data

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ABSTRACT

Purpose: Iran has a high rate of road traffic accidents. Poor quality of sleep brings about loss of attention, which is an important cause of road traffic accidents particularly in monotonous roads. The causes of poor quality of sleep in occupational drivers are multifactorial. The objective of the present study was to assess the prevalence of poor sleep quality among occupational drivers with rotating work schedules and analyze its different risk factors.

Methods: 2200 professional long-haul truck drivers who had been referred to the Occupational Health Clinic for routine education course were invited. We obtained data from eight provinces from various parts of Iran during 2012–2013. Data were collected using a questionnaire including questions about demographic and job characteristics. Pittsburg Sleep Quality Index (PSQI) was used to assess drivers' sleep quality.

Results: Mean working (driving) time was (9.3 ± 2.5) hours daily and (55.5 ± 18.29) hours weekly. About 23.5% of the drivers reported history of smoking, 14.5% had low job satisfaction and 60% had irregular work schedule. 16.4% of drivers had an accidents leading to injury during the past five years. The mean PSQI score was 4.2 ± 2.7 ; 54% had a PSQI > 5 (poor quality of sleep). Multivariate logistic regression showed that smoking, job satisfaction, history of accidents, shift work and work hours per day were the most important risk factors for poor sleep quality.

Conclusion: Results obtained from the current study showed a high prevalence of poor quality of sleep among professional drivers. It warrants more attention to this significant problem using some measures to improve working conditions in professional drivers, as well as health promotion interventions.

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Introduction

Iran ranks the 18th largest country in the world with 1,648,195 km² surface area. This country is bordered with seven country included Azerbaijan, Armenia, Turkmenistan, Iraq, Turkey, Pakistan, and Afghanistan. Also, Iran is located in the geographic center of the Eco member states of the Economic Cooperation Organization. For these reasons, Iran has a lot of advantages in terms of economic and commercial opportunities. The only way for properly and timely use of these opportunities is having an effective, cheap, efficient and secure transportation system that

facilitates trade between Asia, Europe and other countries in this region.¹ These situations have provided plenty of job opportunities for drivers in the road transport system in the country and thousands of people are working as a driver in Iran.²

In addition to these opportunities, driving can be a serious threat to the personal and social health. Each year, thousands of people lose their lives in Iran due to road accidents. Clearly, reduction of mortality and damages resulting from these accidents allow investment in other sectors.² Iran had the highest rate of deaths due to road accidents in the world from many years ago. Also, mortality due to car accidents is the second leading cause of death in Iran.³

Sleepiness is one of the most important causes of fatal road accidents.⁴ A study was conducted in Norway on 29,600 drivers who had involved in an accident. According to the data from this study, drowsiness was a contributing factor in 3.9% of all accidents. This percent increased to 18.6%, 8.1% and 7.3% in night-time

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accidents, driving more than 150 km in one trip, and personal injury accidents, respectively.⁵

Despite many studies that emphasize the importance of sleep health in professional drivers, many aspects of this subject remain unclear or contradictory. For example, the proportions of car accidents related to sleep problems have been reported very different in the various countries. These rates are 1%–3% in the US, 10% in France and 33% in Australia.^{6–8}

In Iran, more than 700,000 persons have selected professional driving as their main job. Meanwhile, the majority of them have to work all hours of the day due to job requirements and economic needs. So, it is highly probable that drivers is forced to drive in their two peaks of sleepiness according to their circadian rhythms including early hours of the morning and the middle of afternoon. Also, the professional truck drivers are at greater risks for suffering from some sleep disorders such as obstructive sleep apnea and poor sleep hygiene compared to general population. All the points mentioned above may lead to poor quality of sleep in this group.^{9,10}

A study conducted by Sadeghniaat and Labbafinejad among lorry drivers showed that 7.3% of them have driven with sleepiness sometime. Moreover, 4.9% and 1% of them almost always and always have driven with sleepiness, respectively. Also, they found that excessive daytime sleepiness increases the risk of accidents more than 2 times.¹⁰ Another study conducted by Halvani including 200 truck drivers. Their results showed that 29.5% of drivers suffered from accidents in the last decade. One of the main causes of accidents in their study was drivers' sleepiness and poor sleep quality.¹¹

High prevalence of road accidents in Iran and the important role of sleep quality in causing crashes merit a comprehensive research to determine the quality of sleep in professional drivers. Therefore, the present study was designed to evaluate the quality of sleep and its related factors among Iranian professional drivers. Results from this study will provide necessary information for administrative programs and health recommendations to reduce traffic accidents.

Materials and methods

The data for this cross-sectional study were collected during 2012–2013. 2200 professional long-haul truck drivers from eight provinces who had been referred to the Occupational Health Clinic for routine education course and annual periodic examination were invited to participate in the study. We eliminate 700 questionnaires with inappropriate or missing responses, then we ran our analyses on the remaining 1500 drivers (response rate was 68.2%).

The protocol of the study had been approved by Tehran University of Medical Sciences. Informed consent was obtained from all drivers for their participation and use of their records after explanation of study protocol.

Data were collected using a questionnaire including questions about socio-demographic characteristics (age, educational level, marital status and smoking history) and job characteristics (daily driving hours, monthly driving hours, history of road accidents during five past years, job satisfaction and type of shift work schedule). The drivers had four types of shift work schedules including fixed morning shift (6:00 to 14:00), fixed evening shift (14:00 to 22:00), fixed night shift (22:00 to 6:00) and rotating shift work (all the above types).

The Pittsburg Sleep Quality Index (PSQI) was used for collecting data about self-reported sleep quality during the previous month. This questionnaire assesses subject's attitude about sleep quality with a sensitivity of 89.6% and specificity of 86.5%.^{12,13} The PSQI consists of 19 items that yields a global score about sleep quality and 7 components scores (each from 0 to 3 points): self-reported sleep quality, sleep latency, sleep duration, habitual sleep

efficiency, sleep disturbance, use of sleep medications, and daytime dysfunction. The sum of the total components scores yields one global score with the range of 0 through 21; while higher scores represent poorer sleep quality. A cutoff score of 5 has been recommended for this questionnaire, with scores more than 5 representing poor sleep quality.¹³

The PSQI has been translated and verified for its validity and reliability in several languages. Farrahi and her colleagues have translated this questionnaire into Persian in 2011. They assessed validity and reliability of PSQI in two groups of psychiatric patients and healthy people. Cronbach's alpha coefficient of questionnaire was 0.77 for all subjects, 0.52 for the patient group, and 0.78 for the control group. The sensitivity and specificity of questionnaire for discrimination between insomniac patients and control subjects were 94% and 72% for cutoff value of 5, and 85% and 84% for cutoff value of 6.¹⁴

The obtained data were analyzed using SPSS software version 11.5. Logistic regression analyses and calculation of odd's ratio were conducted to examine the factors associated with poor sleep quality in the drivers. For this purpose, all variables were examined initially in univariate models. Then, multivariate logistic regression analyses were performed to determine final model. Reported differences were accepted significant at the level of 0.05 or less.

Results

The final participants included 1500 male drivers. The mean age of them was (36.6 ± 9.4) years (ranged 22–72). About education level, 861 drivers (57.4% of the participants) had diploma or higher. Most of them were married (84.9%), while 14% and 1.1% were single and widowed, respectively. Two hundred and forty-seven of drivers (16.4%) had an accidents leading to injury during the past five years. 23.5% of the drivers reported cigarette smoking. The mean number of cigarette smoking per day was 6.8 ± 10.1 , and mean years of smoking was 8.8 ± 11.72 with mean pack/year of 9.47 ± 7.21 .

Mean driving hours was 9.3 ± 2.5 per day and 55.5 ± 18.29 per week. Only 40.7% of the drivers had sufficient satisfaction from their work and 44.9% of them had relative satisfaction. Also, nearly 14.4% of them were completely unsatisfied from their work. Most of them needed to work morning shift (86.2%). But, 34.5% and 9.6% worked at the evening and night shift, respectively. Then, more than 30% of them worked more than one shift.

The mean PSQI global score was 5.75 ± 2.75 . About 934 drivers (62.3%) had poor sleep quality according to the cutoff 5 for PSQI questionnaire. The prevalence of poor sleep quality was 88.03% for drivers with night shifts and 69.13% for drivers who were working more than one shift.

Table 1 represents the risk factors associated with poor sleep quality using univariate logistic regression. The results showed significantly increased odd's ratio among several factors, including education level, smoking history, working in morning (conservative role), evening and night shift, number of shift work, job satisfaction, hours of work per day and week with poor sleep quality.

Table 2 demonstrates the risk factors associated with poor sleep quality using multivariate logistic regression. With this model, the variables associated with poor sleep quality were smoking history, job satisfaction, having a history of accidents in the past five years, working in evening and night shift, and hours of work per day.

Discussion

The current study demonstrated that the mean score of PSQI was 5.57 ± 2.75 among Iranian professional truck drivers, and 62.3% of them had poor quality of sleep. In a study of Emkani et al, the mean score of sleep quality was 6.98 ± 0.34 in 100 inter-city bus

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