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To study the relationship between occupational injury and AHI adjusted for age, sex, and BMI in patients referring to the sleep clinic at Baharloo Hospital, Tehran

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***Abstract*---**The aim of this study was to examine the relationship between occupational injury and AHI adjusted for age, sex and BMI in patients referring to the sleep clinic at Baharloo Hospital, Tehran. The study is practical in purpose and descriptive in experimental methods. Patients with obstructive sleep apnea were divided into her three groups based on the apnea hypopnea index (AHI): mild: AHI = 14-5, moderate: AHI = 15-29, and severe: AHI ≥ 30. The sample size was set to 259 individuals. Data analysis was performed using SPSS software. The mean body mass index for the sample population is 29.79 with a standard deviation of 5.4. The mean and standard deviation of the ages of the study population are 41.5 and 9.7 years, respectively. Results showed that hypopnea-apnea index and lack of treatment in patients with obstructive sleep apnea were associated with occupational injuries, even after adjusting for the effects of age, gender, and BMI variables.

Keywords*---occupational accidents, apnea hypopnea, body mass index, patient gender.***

Introduction

Today, occupational injuries are considered one of the most important problems in both developed and developing countries (1). However, statistics on occupational injuries are higher in developing countries than in developed countries (2). According to the OECD, an accident at work is the injury, illness or death of a person caused by an accident at work (3); arising in the performance of duties and arising to the insured person. The purpose of the service is when the insured person is entrusted to work in the workshop or related premises, building or area or, by order of his employer, to work outside the workshop area. One of these times is when the insured travels from home to workshop and vice versa. Employment accidents also include accidents that occur while you are taking steps to rescue or assist an injured other insured person.

In one study, 53% of workplace accidents were caused by work-related errors and 47% were related to unsafe working conditions (4). Alcohol consumption, some drugs, work shifts, and sleep problems are among the many factors that lead to job failure (5). One disorder that causes sleep disturbance is obstructive sleep apnea (6). Obstructive sleep apnea syndrome causes a reduction or disruption of airflow in the upper airway, resulting in physiological and metabolic disturbances (7). Typical signs and symptoms of obstructive sleep apnea include daytime sleepiness, chronic snoring, and morning headaches (7). Because obstructive sleep apnea is a relatively common condition, a survey of Americans found that approximately 13% of men and 6% of women between the ages of 30 and 70 had an AHI greater than 15. (7). Obstructive sleep apnea syndrome causes serious health problems such as atrial fibrillation, depression, congestive heart failure, stroke, hypertension, diabetes, and coronary artery disease (8), and the syndrome has been associated with several work-related injuries. (9, 10, and 17) 11). Importantly, most people with obstructive sleep apnea are unaware of their condition, so the condition remains undiagnosed and untreated (12).

A study titled Investigation of the Causes of Occupational Accidents of Sweatshop Workers in the Sari Forest examined 136 cases of accidents in the forests outside Sari recorded in the occupational accident records of 1388-1390. Research has shown that 53% of accidents are due to unsafe practices and 47% are due to unsafe working conditions. The most commonly injured members in this study were hands, feet, and eyes, ranked first to third, with 56, 51, and 18 cases, respectively. The average lost time for the injured was 66.11 working hours per accident. (4) A study of sleep disturbances due to breathing disorders and work-related accidents included 704 patients with obstructive sleep apnea, we compared work-related accidents that occurred in, consisting of 580 people from the general population. In this study, the frequency of occupational accidents was higher in patients with obstructive sleep apnea than in controls. Investigators in this study emphasize early detection and treatment of obstructive sleep apnea as a way to reduce the incidence of work-related injuries (5).

A study titled Diagnosis and Treatment of Obstructive Sleep Apnea in Adults cited aging and obesity as two effective factors in increasing cases of obstructive sleep apnea. Polysomnography has been mentioned as the standard diagnostic test for the diagnosis of obstructive sleep apnea, and methods such as weight loss, CPAP,

and surgery using various methods are available for the treatment of this syndrome. proposed and studied (8). An article titled 'The role of snoring and daytime sleepiness in occupational injuries' concluded that early detection and treatment of breathing disorders that lead to sleep disturbances is a solution to reduce occupational injuries (9). In a Canadian study titled Sleep Disorders and Work-Related Injuries, sleep disorders were associated with work-related injuries and were more common in women than in men (13).

The study, entitled Factors Associated with Workplace Accidents in Seasonal Workers, examined 69 seasonal workers aged 14 to 24 years. The results of this study show that there are more occupational accidents among women. Increased workweeks and alcohol consumption were also among the reasons for the increase in work-related injuries. To reduce work-related injuries, researchers suggest looking at both work and non-work factors (14). In a 2017 case-control study, Investigating Several Occupational and Non-Occupational Factors Associated with Accidents at Work, 180 industrial workers from eight factories in the city of Tehran were examined. of shift workers suffered more hand injuries than fixed shift workers (15). According to the materials mentioned, the aim of this study was to investigate the association between occupational injury and AHI adjusted for age, sex and BMI in patients referring to the sleep clinic at Baharloo Hospital, Tehran .

Method

The current research is applied in terms of purpose and description in terms of experimental methods. A list of all eligible individuals (workers who had a polysomnogram at this center prior to April 31, 2017 and for whom relevant information is available) was extracted by referencing the Baharloo Hospital Sleep Clinic archives. it was done. Individual names were numbered by reference order and selected according to sample size by a sequential sampling procedure. Clients undergoing polysomnography. Based on the polysomnography results interpreted by the sleep doctor, the patients were divided into her three groups:

1) No problem

2) Having obstructive sleep apnea

3) Having other sleep disorders

Clients who did not undergo polysomnography were divided into two groups. The first group is the group with no snoring disorder, ESS < 10 and STOP-BANG < 3. This group was considered fine (related to OSA). A second group included subjects who met one or more of the conditions of the first group (no snoring disorder, ESS<10 and STOP-BANG<3). I didn't think it would be possible to assess with a high degree of certainty whether these people had problems (related to OSA). This group was excluded from the study.

Patients with obstructive sleep apnea were divided into three subgroups based on the apnea hypopnea index (AHI).

a) Mild :AHI5-14 =

b) Moderate :AHI15-29=

c) severe :AHI 30 ≤

To extract the required information, we designed a data collection sheet, extracted the information from the file, recorded it, and recorded it during the investigator's phone call with the subject subjects. In this study, a workplace accident refers to any event (whether or not an injury occurs) that can result in injury.) and when performing skilled work at the person's workplace or outside the workplace.

To calculate the sample size, the proportion of occupational accidents in patients with sleep disorders was considered at 27% and the error at 20% of prevalence. Therefore, the sample size was set at 259 of hers. Based on information available in hospital sleep center databases, 1081 people were eligible to participate in the study, sampling was performed using context-sensitive methods, and an even number of people were contacted. Of these, 131 were unemployed in his 2 years after polysomnography, 27 did not agree to participate in the study, and 55 misregistered phone numbers, handed over calls, or answered calls. was excluded from the study because it was not Finally, 327 data collection forms were completed. Data analysis was performed using SPSS software.

Result

The results showed that 91.1% of the sample members are men and 8.9% are women. 5.8% of the sample have primary education, 12.5% middle school, 2.8% high school, 24.8% diploma, 7.3% postgraduate, 27.8% bachelor, 12.5% postgraduate and 6.4% PhD. It was found that 89.6% of the sample members have obstructive sleep apnea (AHI ≥ 5). According to the frequency observed in the sample members, 15.3% have mild type, 24.2% have moderate type and 50.2% have severe type of obstructive sleep apnea

The mean body mass index for the sample population is 29.79 with a standard deviation of 5.4. The details of this index are summarized in the table and graph (1).

Table 1: The composition of the sample members in terms of body mass index

N	Valid	327
	Missing	0
Mean		29.7915
Median		29.0000
Mode		26.00
Std. Deviation		5.35592
Variance		28.686
Skewness		1.071
Std. Error of Skewness		.135
Kurtosis		2.397
Std. Error of Kurtosis		.269

Minimum	18.00
Maximum	52.00

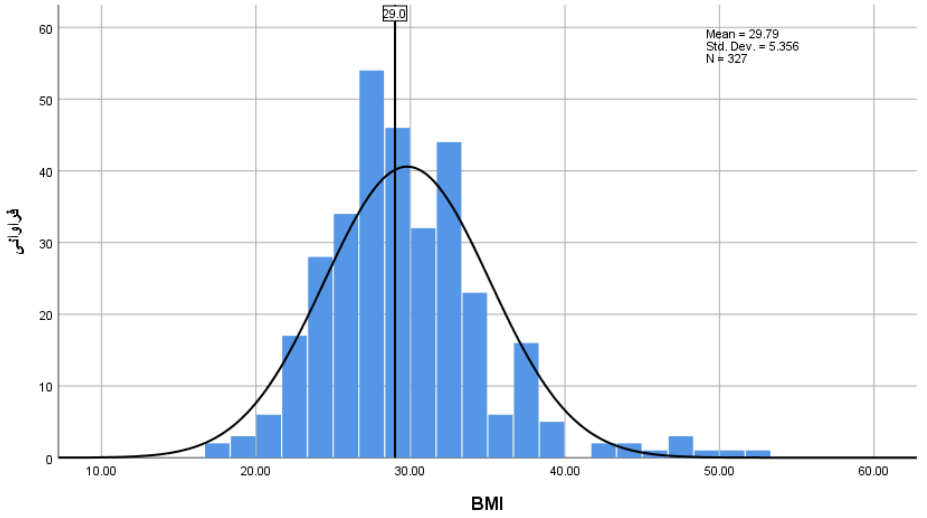

Chart 1: The composition of the sample members in terms of body mass index

As can be seen in the table and graph (2), the mean and standard deviation of the studied population are 41.5 and 9.7, respectively.

As is shows in the table and graph (2), the mean and standard deviation of the study population are 41.5 and 9.7 respectively.

Table 2: Composition of sample members in terms of age

N	Valid	327
	Missing	0
Mean		41.46
Median		41.00
Mode		37
Std. Deviation		9.699
Variance		94.077
Skewness		.403
Std. Error of Skewness		.135
Kurtosis		-.396
Std. Error of Kurtosis		.269
Minimum		22
Maximum		72

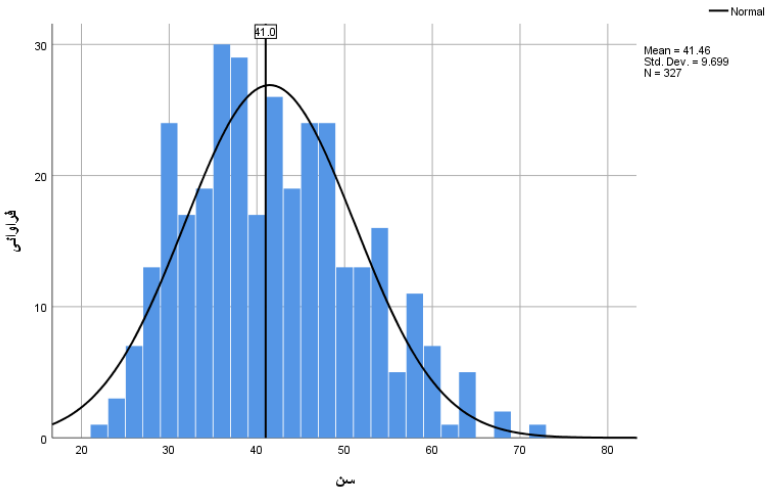

Chart 2: Composition of sample members in terms of age

The following table shows the results of logistic regression to investigate the relationship between apnea and hypopnea index and the occurrence of occupational accidents by adjusting the variables of age, gender and body mass index.

Table 3: Logistic regression results to examine the relationship between AHI and occupational accidents

	B	Sig.	Exp(B)	95% CI	
				lower	upper
AHI	.022	.014	1.022	1.005	1.040
Work group	1.462	.006	4.314	1.517	12.270
Treatment	-1.867	.007	.155	.040	.602

The results showed that even after adjusting the effect of the mentioned variables, the apnea hypopnea index as well as the lack of treatment in people with obstructive sleep apnea are related to the occurrence of an occupational accident (R2 = .205).

Discussion

Daytime sleepiness has always been considered one of the causes of poor attention and concentration, resulting in an increase in workplace accidents. Many factors and conditions contribute to daytime sleepiness, one of which is obstructive sleep apnea. Given the relatively high prevalence of this disease, interest in its effects and consequences is increasing day by day. It is clear that the health and economic impact of work-related injuries is significant and has a significant impact on the growth and prominence of various societies. Based on this, we specifically investigated the relationship between obstructive sleep apnea syndrome and the occurrence of occupational accidents. Various studies have

shown that several factors influence this relationship, some of which were examined in the present study.

This current study found an association between the presence of obstructive sleep apnea and the occurrence of work-related injuries. This is consistent with the results of Ulfberg et al. (5), Hirsh Allen et al. (9), Lindbeg et al. (10) and Kiling et al. 13) Obstructive sleep apnea is known to be one of the causes of daytime fatigue and drowsiness, which is associated with poor sleep quality at night. Drowsiness can lead to poor physical and mental performance in employees and pave the way for workplace accidents.

The relatively high prevalence of obstructive sleep apnea in the working age group, the relationship between this condition and the incidence of work-related injuries, and the incidence of work-related injuries in patients with obstructive sleep apnea with prescribed treatment. workplace guidelines for screening, conducting polysomnography when necessary, prescribing treatment when necessary, and actively pursuing treatment in a variety of occupations, particularly workers and safety-sensitive groups; It seems logical to formulate in the setting, especially given that the cost of treatment and follow-up care for this disease is very high, resulting in patient reluctance to continue treatment. It seems sensible to take protection and insurance measures in the constituency, especially where safety is important.

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