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Job stress, burnout, and job satisfaction in sleep apnea patients

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ABSTRACT

Objective: To assess job stress, burnout, and job satisfaction in patients with obstructive sleep apnea syndrome (OSAS).

Methods: A total of 182 patients with OSAS and 71 healthy individuals completed the Job Content Questionnaire, the Maslach Burnout Inventory – General Survey, the Index of Job Satisfaction, the Epworth Sleepiness Scale, and the Pittsburgh Sleep Quality Index. All participants were assessed with full-night polysomnography.

Results: Survey scores of patients diagnosed with OSAS only differed from those of the control group in the emotional exhaustion dimension ($P = 0.015$). According to a multivariate analysis, the apnea–hypopnea index (AHI) was only correlated with perceived support at work (β coefficient = 0.142; $P = 0.048$). Associations were found between subjective sleep quality, perceived support from coworkers, and supervisors ($\beta = 0.157$; $P = 0.025$), psychological demands ($\beta = 0.226$; $P = 0.001$), emotional exhaustion ($\beta = 0.405$; $P = 0.000$), and cynicism ($\beta = 0.224$; $P = 0.002$). The study also revealed associations between excessive daytime sleepiness and the burnout dimensions emotional exhaustion ($\beta = 0.232$; $P = 0.000$) and cynicism ($\beta = 0.139$; $P = 0.048$).

Conclusion: Objective parameters of OSAS such as the AHI seem to have limited influence on the psychosocial aspects of the occupational life of patients with OSAS. There is evidence of significant associations between the subjective symptoms of the disease, such as daytime sleepiness, subjective sleep quality, job stress, and burnout.

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1. Introduction

Obstructive sleep apnea syndrome (OSAS) is a chronic breathing disorder characterized by repeated episodes of limited air flow during individuals' sleep that lead to a decrease in nocturnal oxygen saturation and micro-awakenings [1]. In western societies, this syndrome has a prevalence of 24% in middle-aged men and 9% in middle-aged women [2], and is associated with the development of hypertension, cardiovascular and cerebrovascular disorders and abnormalities in glucose metabolism [3].

OSAS has a variety of symptoms such as snoring, apneas reported by the bed partner, frequent awakenings and sleep agitation and fragmentation. Patients with OSAS experience fatigue and the feeling of having had non-restorative sleep. They often report

morning headaches, mood changes (e.g. depression and anxiety [4,5]), cognitive difficulties (e.g. loss of short-term memory and longer reaction times [6,7]), and sexual problems [8].

Most of the functional difficulties reported by patients with OSAS are secondary to excessive daytime sleepiness (EDS), which is the symptom with the greatest impact of patients' everyday life [9]. Due to EDS and its above-mentioned repercussions on patients' physical and cognitive function, such patients have a greater number of traffic accidents [10] and accidents at the workplace [11]. People diagnosed with OSAS or who exhibit symptoms of this disease have been found to have higher levels of absenteeism and work disability compared with controls [12], and EDS is often the most important factor determining the high prevalence of sick leave and the productivity decrease observed in such patients [13–15].

Some authors have explored the relationship between sleep disorders, job stress, and burnout syndrome. Workers who have a sleep disorder such as insomnia or OSAS have reported higher job stress compared with that of healthy individuals [16]. Åkerstedt et al. [17] argue that sleep may be involved in the development of burnout, as individuals with symptoms of burnout also report sleep fragmentation. People with high levels of burnout syndrome are

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considered to have sleep characterized by low efficiency, high latency, a lower proportion of deep sleep, longer periods of wakefulness, poorer subjective sleep quality, and non-restorative sleep [18].

As regards aspects related to psychosocial occupational health, the authors of the present study found very few publications on stress, burnout and job satisfaction in patients with OSAS. The scientific evidence found referred to other sleep disorders such as insomnia or daytime sleepiness. Such evidence suggests that, compared with healthy individuals, patients with OSAS may also be exposed to a higher risk of experiencing psychosocial difficulties at work. Indeed, patients with OSAS have a sleep disorder that causes fatigue, daytime sleepiness and sleep fragmentation, thus preventing them from getting proper rest and recovering from fatigue. As a result, they may have a high risk of experiencing psychological difficulties and emotional distress at work. Considering this, we designed an ex-post-facto study to explore the relationship between the presence of a diagnosis of OSAS and its main symptoms (i.e. excessive daytime sleepiness and poor subjective sleep quality) and job stress, burnout and job satisfaction. This study was performed following Hartley's recommendations [19].

2. Methods

A total of 253 consecutive patients from two sleep units (Centro de Saude de Val Miñor, Pontevedra, and Hospital Universitario Reina Sofia, Cordoba, in northern and southern Spain, respectively) were included in this study. All subjects were suspected of having OSAS because of the daytime hypersomnolence, loud snoring, nocturnal choking, and awakenings or apneic events (or all four) reported by the subject or a bedmate. The sample was composed of 204 men and 49 women aged between 22 and 65 years. Mean age was 46.85 ± 9.50 years. The clinical group included 182 patients diagnosed with OSAS and the control group included 71 individuals without OSAS. We only selected individuals who were employed – or had been unemployed for a maximum of six months – at the time of the survey, were willing to cooperate, and gave signed informed consent. Exclusion criteria included a diagnosis of any other sleep disorders or serious limiting diseases, addiction to alcohol or other drugs and treatment with neuroleptic drugs, tranquilizers or other drugs that may cause sleep alterations or excessive daytime sleepiness.

At both medical centers, data on patients' demographic characteristics, sleep and medical history, medication use and habits were obtained between 2010 and 2012 with the use of a standardized questionnaire administered before the start of overnight polysomnography (PSG). All participants were assessed with full-night PSG for the diagnosis of OSAS. The PSG included three electroencephalogram (EEG) channels (F4–M1, C4–M1 and O2–M1), two electro-oculogram (EOG) channels, two chin and two tibial electromyogram (EMG) channels, and one electrocardiogram (ECG) channel. Peripheral oxygen saturation (SaO_2), heart rate, and snoring frequency were recorded. Air flow was measured with a nasal cannula and thermistor. Thoracic and abdominal effort was measured with elastic bands. Sleep studies were manually reviewed by specialized professionals following the recommendations of the American Academy of Sleep Medicine [20]. Apnea was defined as continuous cessation of airflow for >10 s, and hypopnea was defined as a reduction in airflow for >10 s with oxygen desaturation $\geq 3\%$. The apnea–hypopnea index (AHI) was calculated as the total number of episodes of apnea and hypopnea per hour of sleep. The exposure group was previously defined as having $\text{AHI} \geq 5$ (i.e. five or more events per hour of sleep); the control group was composed of patients with an $\text{AHI} < 5$. The method and diagnostic criteria used were the same in the two medical centers.

Before going to bed for the sleep study, all participants completed a questionnaire aimed at obtaining general information, such

as socio-demographic data, previous diseases, medication use, use of stimulants, type of job, and job characteristics (e.g. schedule, number of hours of work, shifts, and type of job contract). Data on education level were organized into five categories (i.e. no education, primary education, secondary education, vocational training, college education). Jobs were classified into 10 groups of occupations following the International Standard Classification of Occupations (ISCO-08) [21].

The presence of excessive daytime sleepiness was assessed with the Epworth Sleepiness Scale (ESS) [22,23] and subjective sleep quality was evaluated with the Pittsburgh Sleep Quality Index (PSQI) [24,25]. Job stress was assessed with the Job Content Questionnaire (JCQ) [26,27]. This questionnaire is composed of 22 items that refer to three subscales: psychological demands (six items), job support (nine items), and job control (seven items). Responses range from 1 (strongly disagree) to 4 (strongly agree). The three dimensions have good internal consistency, with Cronbach's $\alpha > 0.70$.

Burnout was assessed with the Maslach Burnout Inventory – General Survey (MBI-GS) [28], Spanish adaptation by Gil-Monte [29]. This version of the questionnaire has 16 items which, as pointed out in the manual, are distributed into three subscales: professional efficacy (six items), emotional exhaustion (five items), and cynicism (five items). Subjects rate each item of the questionnaire on a Likert scale in which they indicate the frequency with which they have experienced the situation described in the item. This frequency scale has seven levels ranging from 0 (never) to 6 (every day). The subscales had the following reliability values, measured with Cronbach's α : 0.85 for professional efficiency, 0.83 for emotional exhaustion, and 0.74 for cynicism.

Participants' job satisfaction was measured with the Index of Job Satisfaction, Spanish adaptation by Ortega and Martín [30,31]. This instrument is composed of 19 items that assess various aspects of job satisfaction: task significance, positive motivation, negative motivation, satisfaction with the task, and job suitability. It is also possible to obtain a total score of job satisfaction by adding up the scores of each item. Items are rated on a six-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). The instrument has high internal consistency, with Cronbach's α of 0.93.

The characteristics of the sample were expressed in means and standard deviations for quantitative variables and in percentages and absolute numbers for qualitative variables. Student's *t*-test was used to compare job stress, burnout, and job satisfaction between the clinical group and the control group. A linear regression model was used to analyze the influence of objective and subjective variables along with the presence of OSAS on job stress, burnout, and job satisfaction.

The project was approved by the clinical research ethics committees of the medical centers that participated in the study. Participation in the study was totally voluntary. Subjects were duly informed of the objectives of the research and gave signed informed consent.

3. Results

Table 1 shows the main socio-demographic and health characteristics of the sample, divided into the clinical group and the control group. The two groups did not differ in age or education level but differed in sex ratio, body mass index, and job type. Both samples were similar as regards comorbidities, except for the presence of hypertension, which was significantly more prevalent in patients with OSAS compared with healthy individuals.

Table 2 includes data on the presence of physical stressors at work, symptoms of somatization of stress, subjective sleep quality, excessive daytime sleepiness, and objective sleep variables obtained with the polysomnography. Both samples differed

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