ASSOCIATION OF OCCUPATIONAL STRESS WITH OBESITY, SLEEP QUALITY, AND PHYSICAL ACTIVITY LEVEL IN INDUSTRIAL SECTOR WORKERS

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ABSTRACT

Stress negatively impacts physical and mental health, contributing to obesity, sleep disorders, and sedentary behavior. Obesity, associated with chronic diseases such as diabetes and hypertension, is a public health problem. Regular physical activities help reduce stress and improve overall health, while poor sleep quality is linked to various health issues. The study evaluated the perception of stress and its relationship with obesity, sleep, and physical activity in 158 workers from a company producing thermal insulation solutions. The results showed that individuals with low stress practice on average 123 minutes of physical activity per week and sleep 7.0 hours per night, while those with high stress practice on average 58.3 minutes of physical activity per week and sleep 6.3 hours per night, highlighting the importance of promoting physical exercise and good sleep quality to reduce stress and improve health.

Keywords: stress; obesity; sleep; physical activity.

INTRODUCTION

Stress is a physical and mental condition that can cause or aggravate various diseases, affecting physiological, psychological, and behavioral health. It is associated with changes in eating behavior and can lead to obesity, inadequate diet, sleep disorders, and decreased physical activity (CAMPOS; LEONEL; GUTIERREZ, 2020). Obesity and poor sleep quality are factors that require attention as they are related to lifestyle habits. Obesity is characterized by excess body fat and is a public health problem associated with chronic diseases such as heart disease, type 2 diabetes, hypertension, occupational stress, among others (VALENZUELA et al., 2023; ULGUIM et al., 2020).

Regarding sleep deprivation and poor quality due to occupational stress, there is an increased risk of cardiovascular diseases, obesity, and psychological disorders such as anxiety and depression (MAO et al., 2023). Factors such as sedentary lifestyle, alcohol consumption, and stress also affect sleep quality (AKKSILP et al., 2023). It is necessary to emphasize that adequate levels of physical activity bring significant benefits to physical and mental health. Regular exercise improves cardiovascular

conditioning, reduces the risk of chronic diseases such as diabetes and hypertension, and has positive impacts on mental health by reducing stress (POIRIER et al., 2023).

Given the above, it is important to investigate the relationship between stress, obesity, sleep, and physical activity level, as chronic stress can aggravate these aspects and contribute to obesity and other chronic conditions. The objective of this study was to associate the subjective perception of stress in relation to obesity, sleep quality, and physical activity level in workers of a company producing thermal insulation solutions for construction.

METHODOLOGY

Sample

This is an analytical cross-sectional study. The study was conducted in a company producing thermal insulation solutions for construction in the Anápolis Agroindustrial District (DAIA), in Anápolis-Goiás. Industrial workers with at least six months of experience and aged between 18 and 59 years were included. Those with previous cardiovascular or chronic obstructive pulmonary disease, as well as any cognitive deficit, were excluded from the sample.

Workers were recruited by invitation and 161 agreed to participate, but 158 workers completed all stages. The sample power was calculated using GPower software (version 3.1, Universitat Dusseldorf, Germany), considering the statistical tests (comparison between groups and association between categorical variables), a medium effect size (w) of 0.3, a significance level of 5%, and 158 workers, achieving a power of 85%. The study followed Resolution 466/12 of the National Health Council and was submitted to the Research Ethics Committee of UniEVANGÉLICA, opinion no. 6.898.839, and all participants signed the Free and Informed Consent Form.

Study Design

Data collection took place on the company's premises, lasting about 30 minutes at various times between June and July 2024. A questionnaire assessing stress using the Job Stress Scale was applied, anthropometric measurements for obesity (waist circumference and BMI) were collected, a questionnaire for sleep quality (Pittsburgh) and the physical activity level of the workers (IPAQ-short) were administered. An identification form was filled out containing age, sex, and work profile, which included work sector and shift.

Assessment Protocols

Occupational stress was assessed with the Job Stress Scale (JSS) questionnaire, which has 17 items and a score ranging from 0 to 60 points, classified as low and high by the 50th percentile (P50) (ALVES et al., 2004). BMI (kg/m²) was calculated from body mass divided by height squared and classified as eutrophic < 25kg/m² and ≥ 25 kg/m² as overweight/obesity. Waist circumference was measured at the midpoint between the superior iliac crest and the last costal arch at the end of expiration. Reference values for abdominal obesity are above 88 cm for women and 102 cm for men (REZENDE et al., 2006).

The level of physical activity was assessed by the International Physical Activity Questionnaire (IPAQ-short) (MATSUDO, S. et al., 2001) and divided into: low (0-239 minutes/week), moderate (240-299 minutes/week), and high (300 minutes or more/week) (LLOYD-JONES et al., 2022). The Pittsburgh Questionnaire assessed sleep quality and the global score ranges from 0 to 21, where the higher the score, the worse the sleep quality, and it is classified as: 0 to 4 points (good), 05 to 10 points (poor), and >10 points (presence of sleep disorder) (BERTOLAZI et al., 2011).

Data Analysis

Data were described as mean, standard deviation, frequencies, and percentages. Normality was verified by the Kolmogorov-Smirnov test. Comparisons between groups were made with the Student's t-test for independent samples (normal) and the Mann-Whitney test (non-normal). The association between categorical variables was tested by the Chi-square test, with $p<0.02$. The analysis was performed using the Statistical Package for Social Science (SPSS, version 27.0, IBM, Armonk, NY).

RESULTS

The characterization of the participants is described in Table 1. Among the workers, 53.8% had a higher subjective perception of stress. Regarding the service sector, 91 (57.6%) were from the administrative sector, 56 (35.4%) from the production sector, and 11 (7.0%) from the food sector. The majority worked the day shift (88.6%), 08 (5.1%) the afternoon/night shift, and 10 (6.3%) the night shift

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Tabela 1- Caracterização da amostra e comparação dos parâmetros de obesidade, NAF e qualidade do sono de trabalhadores do setor industrial (n=158).

Variáveis	Baixo estresse (n=85)	Alto estresse (n=73)	p*
Sexo n (%)	**n (%)**	**n (%)**	
Masculino	57 (67,1)	46 (63,0)	0,595
Feminino	28 (32,9)	27 (37,0)	
	Média (dp)	**Média (dp)**	
Idade (anos)	33,9±9,9	33,1±9,8	0,250
Massa corporal (kg)	78,4±16,2	79,1±15,2	0,814
Estatura (m)	1,7±0,0	1,7±0,1	0,569
Índice de Massa Corporal (kg/m²)	26,4±4,7	27,1±5,1	0,579
Circunferência de cintura (cm)	88,9 ±12,6	89,3 ± 15,2	0,955
Escore percepção de estresse	23,9±1,8	31,7±4,7	<0,001
NAF moderada (min/sem)	134,7±194,8	115,7±221,6	0,458
NAF vigorosa (min/sem)	123±199,3	58,3±155	0,006
Escore de Pittsburg	7,1±3,6	6,9±3,1	0,533
Horas de sono (h)	7,0±1,4	6,3±1,5	0,005

NAF: nível de atividade física; dp: desvio-padrão. *Dados para p<0,05.

There was an association between the subjective perception of stress and sleep hours. Workers with a higher perception of stress slept less than seven hours per night (80.8%, p=0.003).

Tabela 2- Associação das medidas antropométricas, nível de atividade física, qualidade e horas do sono de acordo com a percepção de estresse (n=158).

Variáveis	Baixo estresse (n=85) n (%)	Alto estresse (n=73) n (%)	p
Índice de massa corporal			
Eutrófico	37 (43,5)	28 (38,4)	0,510
Excesso de peso	48 (56,5)	45 (61,6)	
Circunferência de cintura			
Acima do previsto	20 (23,5)	20 (27,4)	0,577
Dentro do previsto	65 (76,5)	53 (72,6)	
Nível de atividade física			
Baixo nível	33 (38,8)	34 (46,6)	
Moderado nível	7 (8,2)	5 (6,8)	0,614
Alto nível	45 (52,9)	34 (46,6)	
Qualidade do sono			
Boa	25 (29,4)	14 (19,2)	
Ruim	45 (52,9)	49 (67,1)	0,184
Distúrbio do sono	15 (17,6)	10 (13,7)	
Horas de sono			
Menor ou igual 7 horas	50 (58,8)	59 (80,8)	0,003
Maior que 7 horas	35 (41,2)	14 (19,2)	

CONCLUSION

It is concluded that high levels of stress are linked to lower vigorous physical activity and reduced sleep hours. Therefore, it is crucial to promote sleep quality and encourage regular physical activity to reduce stress. Interventions in these aspects can improve health and overall well-being, aiding in stress management.

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