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OCCUPATIONAL STRESS AND ASSOCIATED FACTORS: A STUDY ON PROFESSORS

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ABSTRACT: To estimate the frequency of stress among professors and to check its association with sociodemographic variables, work characteristics and nutritional status. Cross-sectional study with 84 professors from the Human and Natural Sciences area, using the instruments: abbreviated IPAQ, Karasek and Theorell and Job Stress Scale demand-control scales. Nutritional status was defined by Body Mass Index (BMI), health status and work characteristics were self-reported. It was observed that 64.3% professors had low stress levels. Although the prevalence found is lower than in other studies, 35.7% showed high stress and passive work (n = 30). Among the stressors, we highlight the administrative duties (p = 0.012) and the time exercising the administrative position (p = 0.024). Overweight predominated in the sample. It is essential to rethink the management model of these institutions so as not to damage the health and performance of higher education professionals.

KEY WORDS: Education, higher; Faculty; Occupational health; Occupational stress.

ESTRESSE OCUPACIONAL E FATORES ASSOCIADOS: UM ESTUDO EM PROFESSORES

RESUMO: O objetivo deste trabalho é estimar a frequência de estresse entre professores e verificar sua associação com variáveis sociodemográficas, características de trabalho e estado nutricional. Trata-se de estudo transversal com 84 professores da área de Ciências Humanas e Naturais, através dos instrumentos: IPAQ abreviado, escala demanda-controle de Karasek e Theorel e *Job Stress Scale*. O estado nutricional foi definido pelo Índice de Massa Corporal (IMC), o estado de saúde e as características de trabalho foram autorreferidas. Observou-se que 64,3% dos docentes apresentaram baixos níveis de estresse. Embora a prevalência encontrada seja menor do que em outros estudos, 35,7% mostraram alto estresse e trabalho passivo (n = 30). Dentre os estressores, destacam-se os deveres administrativos (p = 0,012) e o tempo exercendo o cargo administrativo (p = 0,024). O excesso de peso predominou na amostra. Diante disso, é fundamental repensar o modelo de gestão dessas instituições de modo a não prejudicar a saúde e atuação do profissional do ensino superior.

PALAVRAS-CHAVE: Ensino superior; Estresse ocupacional; Docentes; Saúde do trabalhador; Saúde ocupacional.

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INTRODUCTION

Stress is understood as the unspecific reaction of the organism to any positive or negative events that alter the life of an individual. This is a normal behavior essential to human survival that generates the fight or flight response[1]. In the work environment, stress has gained strong evidence, being characterized by feelings of exhaustion, cynicism, negativism and detachment from the work itself[2].

International surveys find that work-related stress has a major impact on local productivity and the economy in general, as it directly and negatively affects the performance of workers. In addition to the impact on their health and well-being, stressful work can result in increased absenteeism, as well as low motivation, satisfaction and commitment; increasing human, social and financial costs[3].

Among the professions with the highest stress levels, teaching is considered one of the most stressful and challenging these days. Several professors contend with an overly exhausting routine, although they recognize that their job is the most important for the development of society[4].

The main cause of health problems among professors has been the work environment. Factors such as the organizational structure of institutions, the accumulation of functions, the lack of peer support, student indiscipline, the demand for scientific production and the need for continuing education adversely affect not only the performance and quality of the teaching-learning process, but also the quality of life and health of professors[4-7].

In this context, the nutritional status of an individual is strongly affected by the extrinsic environment. The state of stress threatens the balance of the body, and becomes an aggravating to eating behavior. Stressful situations alter hormone levels and cause chemical changes that tend to trigger eating disorders and consequent overweight[8].

Due to this diversity of stress triggering factors, there are also several instruments that measure occupational stress levels. The most classic and widely used tool among health researchers is the demand-control model, developed by Karasek and Theorell[9]. Based on three dimensions, the model makes it possible to understand the combination of job demand, decision latitude and social support in the work environment.

In this perspective, this study aimed to estimate the frequency of stress among professors, in the area of Human and Natural Sciences, and check its associations with sociodemographic variables, work characteristics and nutritional status.

METHODOLOGY

This is an observational, cross-sectional and descriptive study. The study sample is a non-probabilistic of convenience, composed of effective professors in the areas of Human Sciences (Psychology, Literature, History, Social Sciences, Geography and Philosophy) and Natural Sciences (Biology and Oceanography) of a Federal University, of both sexes, in exclusive commitment regime to teaching and in full labor activity.

Data were collected from September to December 2016 and from March to June 2017. All professors were invited to participate in the study during the coordination body meetings of each program. Subsequently, by telephone contact, in person or by e-mail, individual times were scheduled for data collection. Professors who did not complete the questionnaire, or on probation, under license, pregnant women and/or lactating mothers were excluded from the research.

Sociodemographic data were collected, such as marital status, sex, age and whether the participant lives in the city where he/she works. The Brazilian Criteria of Economic Classification (CCEB) was used to economically classify the sample[10].

The physical activity level was evaluated using the short version of the International Physical Activity Questionnaire (IPAQ), validated for the Brazilian population.[11] Individuals who reported performing at least 150 minutes of physical activity with frequency equal to or greater than 5 days a week were classified as active. Only topics related to leisure and mode of transportation and to the sum of physical activities were analyzed, in order to avoid overestimating the physical activity level.[12]

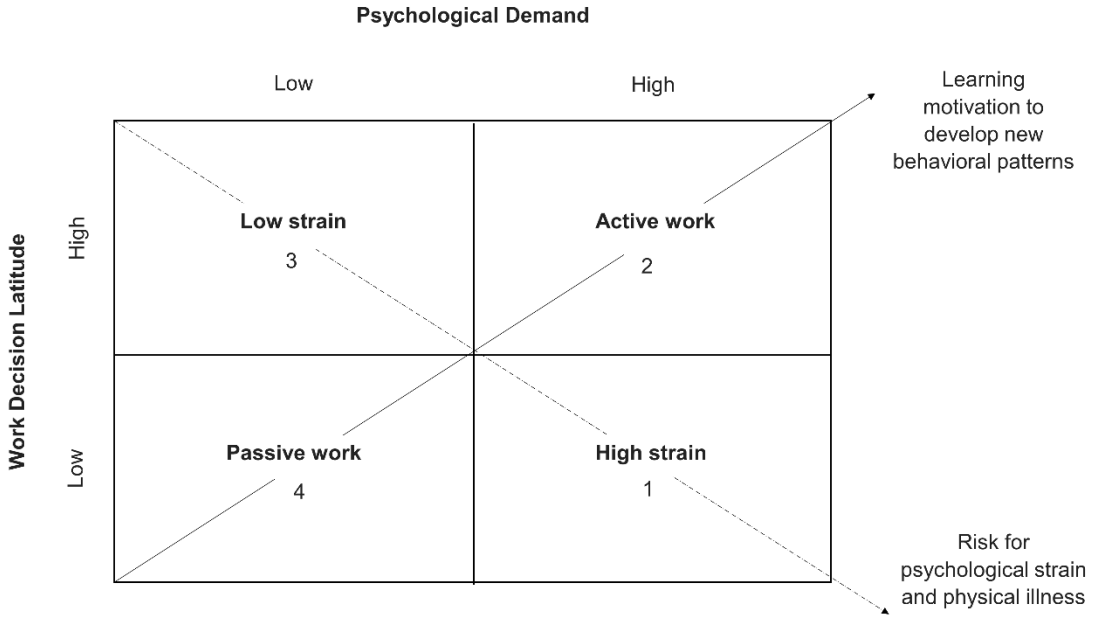

Figure 1. Scheme adapted from the Demand-Control model by Robert Karasek and Theorell[9].

Nutritional status was defined by the Body Mass Index (BMI) (Weight/Height²) and the values were categorized according to the parameters indicated by the World Health Organization[13] and regrouped into low weight/normal weight (BMI <25 kg/m²) and overweight/obesity (BMI ≥ 25 kg/m²).

The variables related to self-rated health included in the survey were: self-report of the presence of chronic diseases, symptoms related to stress, number of medications used, alcohol consumption and smoking.

The characteristics of the work covered issues such as: working time in the institution, working time as a professor, exercising administrative positions, time in administrative positions, stress and social support.

To assess the occupational stress level, the demand-control model developed by Robert Karasek and Theorell[9] was used, in the summarized version adapted to Brazil from the Job Stress Scale[14]. This version consists of 17 questions, 5 for evaluation of psychological work demand (5-20 points), 6 questions to assess control over work (6-24 points) and 6 questions to assess social support (6-24 points). The scores for each dimension were added up and, according to the median, categorized as "high" or "low". These groups were intercepted to define the four quadrants of the model developed by Karasek (Figure 1): high wear (high demand and low control), active work (high demand and high control), low wear (low demand and high control) and passive work (low demand and low control).

Karasek and Theorell[9] argue that work activities that involve high demand and low control (high wear) or low demand and low control (passive work) are harmful to workers, as they favor physical and psychological illness. The quadrants favorable to work are low demand and high control (low wear) and high demand and high control (active work).

For the purpose of this analysis, the active work and low wear quadrants, and the passive work and high wear quadrants were regrouped, classifying them into non-stressed and stressed, respectively. To evaluate social support, scores were assigned to the median of this dimension, being categorized as high support and low support.

Data were organized and analyzed using the IBM SPSS Statistics for Windows 22.0 software (Armonk, NY: IBM Corp). Central tendency measures (mean and median) were used to describe numerical variables. Dispersion measures (standard deviation and interquartile range) were used for continuous variables and percentage measures for categorical variables.

Pearson's chi-square test (x^2) and Fischer's exact test were applied to test differences in proportions, establishing a significance level of 5% ($p < 0.05$).

The study was approved by the Human Research Ethics Committee of the Health Sciences Center of the Federal University of Espírito Santo (UFES), under the Certificate of Presentation for Ethical Appreciation (CAAE): 56159316.5.0000.5060 and followed the precepts of the Declaration of Helsinki. All professors included in the research were informed about the objectives of the study and signed the informed consent.

RESULTS

Of the 217 permanent professors in the Department of Human and Natural Sciences, 12.9% (n = 28) did not meet the inclusion criteria, and of the 189 eligible professors, 44.9% (n = 85) accepted to participate in the study. Among the 85 professors interviewed, one refused to complete the stress assessment questionnaire, totaling 84 study participants.

The sociodemographic, socioeconomic and work variables associated with the level of stress are listed in Table 1. The results indicated a balance between the male and female genders (42 individuals of each sex). The mean age was 49 ± 10.1 years, the predominant age group was over 50 years (45.2%, n = 38), and most professors lived and worked in the same city (67.9%, n = 57). Regarding marital status, 58.8% (n = 50) professors lived with a partner and, in the majority, 70.2% (n = 59) belonged to socioeconomic class A.

The psychological work demand dimension had a median score of 15.2 and the dimension control and autonomy over work had a median score of 19.9. Later, the values found were grouped to establish the Karasek quadrants (Figure 1).

Most professors considered their work to be low wear (40.5%, n = 34). Of all professors, 23.8% (n = 20) considered having an active work, 22.7% (n = 19) considered having a highly demanding work and teachers who classified their work as passive represented the lowest percentage (13% n = 11). In addition, 35.7% (n = 30) professors were considered stressed and 64.3% (n = 54) of the study population was considered stress-free. The variables performing administrative positions ($p = .012$) and time in administrative positions ($p = 0.024$) were associated with the Karasek quadrants (Table 1).

Professors in administrative positions (66.7%, n = 20) were associated with some level of occupational stress. The presence of stress was also associated with time in administrative positions; professors who worked in administrative functions for two years or less have been emphasized.

Among the characteristics related to self-rated health status, behavioral data and level of stress (Table 2), no variable was associated with the presence of stress.

Regarding nutritional status, the results showed that most professors were classified as overweight/obese (67.9% n = 57). In addition, when analyzing the presence of stress, the prevalence of overweight (BMI ≥ 25 kg/m²) was higher among stressed professors (Figure 2). Although the percentage of overweight/obese professors among stressed participants is higher than among non-stressed teachers, this difference was not significant.

Table 1. Stress level by sociodemographic, socioeconomic and work characteristics among professors in human and natural sciences, 2017

Variables	Not Stressed		Stressed		p value	Total	
	n	%	n	%		n	%
Gender				%	0.495*		
Female	29	53.7	13	43.3		42	50
Male	25	46.3	17	56.7		42	50
Age group					0.894*		
Younger than 40 years	13	24.1	8	26.7		21	25
From 40 to 50 years	17	31.5	8	26.7		25	29.8
Older than 50 years	24	44.4	14	46.7		38	45.2
Marital Status					0.356*		
Living with a partner	29	53.7	20	66.7		49	58.3
Single	25	46.3	10	33.3		35	41.7
Socioeconomic Class					0.625*		
A	39	72.2	20	66.7		59	70.2
B1 and B2	15	27.8	10	33.3		25	29.8
Living and working in the same city					0.627*		
Yes	38	70.4	19	63.3		57	67.9
No	16	29.6	11	36.7		27	32.1
Teaching time at the institution					0.178*		
10 years or less	22	40.7	17	56.7		39	46.4
11 years or longer	32	59.3	13	43.3		45	53.6
Total teaching time					0.364*		
20 years or less	28	51.9	19	63.3		47	56.0
21 years or longer	26	48.1	11	36.7		37	44.0
Performing Administrative Duties					**0.012**†		
Yes	20	37.0	20	66.7		40	47.6
No	34	63.0	10	33.3		44	52.4
Time Spent in Administrative Duties					**0.024**†		
None	34	63.0	10	33.3		44	52.4
2 years or less	15	27.8	17	56.7		32	38.1
More than 2 years	5	9.3	3	10.0		8	9.5
Social Support					0.072*		
Low support	21	38.9	18	60.0		39	46.4
High support	33	61.1	12	40.0		45	53.6

n=84. *Person´s chi-squared test. †p <0,05.

Table 2. Stress level by self- assessed health and behavioral data among professors in human and natural sciences, 2017

Variables	Not stressed		Stressed		p value	Total	
	n	%	n	%		n	%
Health Status					0.073		
Very good/ good	37	68.5	26	86.7		63	75
Regular/poor	17	31.5	4	13.3		21	25
Number of medications					0.564		
None/ 1 medication	45	83.3	23	76.7		68	81.0
2 or more	9	16.7	7	23.3		16	19.0
Self-reported diseases†					0.586		
None/ 1 disease	10	18.5	7	23.3		17	20.2
2 diseases or more	44	81.5	23	76.7		67	79.8
Self-reported stress symptoms‡					0.999		
2 or fewer	10	18.5	5	16.7		15	17.9
3 or more	44	81.5	25	83.3		69	82.1
Physical Activity Level					0.797		
Active	39	72.2	23	76.7		62	73.8
Not very active	15	27.8	7	23.3		22	26.2
Alcohol Consumption					0.274		
Yes	41	75.9	26	86.7		67	79.8
No/ not anymore	13	24.1	4	13.3		17	20.2
Tobacco Smoking					0.313		
Yes	9	16.7	2	6.7		11	13.1
No/ not anymore	45	83.3	28	93.3		73	86.9

n=84. *Person´s chi-squared test. **p <0,05.

† **Self-reported Diseases:** high cholesterol, diabetes, depression, chest, pain, asthma, emphysema, chronic bronchitis, stroke, stomach or duodenal ulcer, gastritis, herniated disc, stress injury, arthritis, heart attack, Alzheimer´s diseases, Parkinson´s diseases, kidney disease, cancer and hepatitis, among others. ‡ **Self-reported stress symptoms:** insomnia, stress, nervousness, irritability, dizziness, headache, nausea, vomiting, tiredness, malaise, severe itching, skin blemishes, eye redness, lack of appetite, joint pain, sneezing, difficulty breathing, mental confusion, muscle pain, excessive sweating.

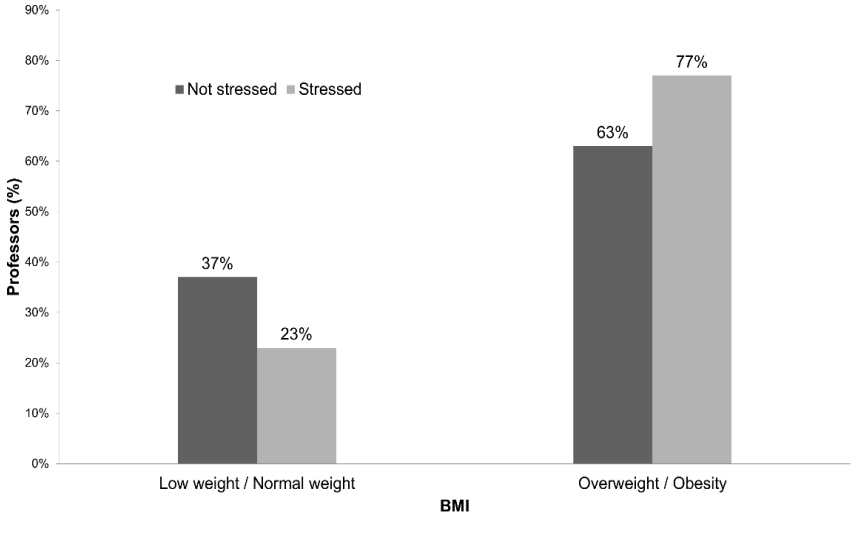

Figure 2. Nutritional status, according to the presence of stress, in professors at the Center for Human and Natural Sciences.

DISCUSSION

The analyzed professors are more often classified as exercising active and low-wear work (64%). The results found are similar to the findings of Kirchhorf[15] with 107 nursing professors (93.5%), those of Sá et al.[16] with professors in the health area (67%) and those of Stephan[17], with 159 teachers from one university in Minas Gerais. Although the prevalence of stress found in this study is lower than in other studies, more than a third of the professors showed high stress and passive work (35.7% n = 30), revealing a considerable number of professors with stress. This result corroborates most of the findings on teaching work, which identify high levels of stress in the professor population[4,6,7,18].

The lower prevalence of stress among professors may be related to resilience, which, according to Silva Sousa and Araújo[19] is a tendency of university professors as they are able to understand the risk or protection factors, and consequently limit the damage, promoting emotional stability and adaptation, even in the presence of stressors.

The employment and financial stability provided by the public sector is also encouraging, since the fact of staying employed until retirement provides greater job security for the individual and, therefore, less stress[20]. In addition, the regular practice of physical and leisure activities, reported by 73.8% professionals, although not associated with stress, can be perceived as a coping strategy or as a way to relax after stressful situations experienced in daily life[21].

According to Karasek and Theorell[9], low stress or active work and low wear in the work environment have beneficial psychological effects on the individual, as they provide an environment conducive to learning and, therefore, to the development of new behavioral patterns in the face of stressors. According to Stephan et al.[17], this is the ideal working condition, because, even under high demands, the individual will have control over the work process and autonomy to decide when and how to plan work activities, creating strategies to overcome difficulties.

Given the considerable percentage of professors who displayed some level of stress (35.7%), and considering its negative effects on health and teaching performance, the study aimed to identify prevalent stressors in this population. Among the study variables, the following were associated with stress: exercising administrative positions and time in administrative positions.

This pattern of stressors of teaching careers in public institutions has been consistently reported in the literature[5,6,22]. As a result of the university management model, the professor assumes administrative duties that, added to the other common activities of the profession, can trigger a tiring journey, with consequent damage to the worker's health[5-7,23].

According to Borsoi[5], the functions of the administrative position, in addition to being an overload of teaching work, are also invisible, bureaucratic and little valued, since, for university professors, academic production is exclusively focused on research and publication. Borsoi also argues that leading a steering committee or department of a university program creates the opportunity for professors to be subject to criticism and tensions from peers. As a result, committee in this position feel personal dissatisfaction and are therefore more susceptible to physical tension and psychological illness[5].

Stress was also associated with the time in administrative positions; professors who held administrative roles for two years or less had higher stress levels than those who held administrative roles for more than two years. Studies explain that, due to lack of experience, lack of adaptation or because they have not yet developed the necessary skills and strategies to solve problems arising from the position, the professional becomes more prone to stress[5,17].

Regarding self-rated health and behavioral data, it is well accepted that exposure to stressors negatively affects the individual's health[22-25]. However, differently from the expected, no associations were detected between these variables and the presence of stress. Petarli et al.[26] in a study with bank employees also found a low association between the worst self-rated health and exposure to occupational stress through the demand-control model.

As for the anthropometric assessment, there was a predominance of overweight professors. Similar

findings were reported by Andrade, Paciencia and da Paz[27] with about 59.26% overweight and obese professors and Nunes et al.[28] who observed a higher prevalence of overweight among professors in one higher education institution in Teresina, State Piauí, regardless of male or female. Excess weight is also perceived in the Brazilian population, due to the nutritional transition experienced in recent years in our country, reaching about 54% adult population[29,30].

This percentage is even higher when associated with the presence of stress. Stressful situations stimulate the release of glucocorticoids (adrenaline and corticosteroids) that cause chemical changes that destabilize the entire organism, triggering eating disorders and, consequently, obesity[8]. According to Bittencourt, Vaz and Zanin[25], stress also stimulates the reward system, which induces an increase in food intake, especially the consumption of more caloric and palatable foods.

As limitations of this study, we highlight the strike period that occurred at the institution during the research, in which many professors who were available to participate in the study were unable to attend scheduled places and dates, thus partially compromising the sampling.

Although open questions about perceptions of professors about stressors or stress triggering factors were not included in the method used in this study, many professionals reported the lack of investment in their work and the poor infrastructure of the work environment. Therefore, qualitative studies should be conducted, given the breadth of the subject in question.

Our results suggest that exercising administrative positions associated with teaching can increase the level of stress. Nevertheless, these findings should be analyzed to determine the main stressors and associated factors.

CONCLUSION

Professors with active, low-demand work best characterized the study population. However, more than a third of the professors had stress levels, which is a very alarming number, considering the negative outcomes for health and performance of these professionals. Performing administrative positions and time in administrative positions were decisive for confirming occupational stress. Therefore, the management model of higher education institutions should be reconsidered to avoid overloading or hindering the work of higher education professionals. A priori, the health of the teaching professional should be a priority not only of government entities, but the whole society.

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