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RESEARCH

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Work process and disposal of stress between teachers of biological sciences and health

Processo de trabalho e disposição ao estresse entre docentes de ciências biológicas e da saúde

Procedimiento de trabajo y disposición al estrés entre docentes de ciencias biológicas y de la salud

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ABSTRACT

Objective: The study's purpose has been to explore the relationship between stress disposition and the work process among university professors. **Methods**: It is an exploratory research with both quantitative and qualitative approach, which was carried out with professors of Health and Biological Sciences academic area by using self-applicable instruments. **Results**: The prevalence of stress found among professors was 35%. Considering the different investigated aspects of the work process, as follows: undergraduate and postgraduate courses, work regime, workload, administrative activity; no condition had shown a significant relationship with stress, its stages of evolution or symptomatology. Most professors attribute stress determination to administrative issues inherent in work and conflicts with students and co-workers. Faced with stress, professors often look for engaging with physical and leisure activities, contacting friends and family, and try to improve their personal skills. **Conclusion**: Stress was significantly present in the teaching environment, regardless of the work process.

Descriptors: Psychological stress, professors, health sciences.

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RESUMO

Objetivo: Explorar a relação entre disposição ao estresse e processo de trabalho junto a docentes universitários. Métodos: Pesquisa quantiqualitativa, realizada com docentes das Ciências Biológicas e da Saúde, utilizando instrumentos auto-aplicáveis. Resultados: A prevalência do estresse entre os docentes foi de 35%. Considerando os diferentes aspectos investigados do processo de trabalho: curso de graduação e pósgraduação, regime de trabalho, carga horária, atividade administrativa; nenhuma condição apresentou relação significativa com o estresse, suas fases de evolução e sintomatologia. Grande parte dos docentes atribui a determinação do estresse a questões administrativas inerentes ao trabalho e ao atrito com estudantes e colegas de trabalho. Para o enfrentamento do estresse, os docentes manifestam com frequência a prática de atividades físicas e de atividades de lazer, a busca pelo contato com amigos e familiares e o aprimoramento de habilidades pessoais. Conclusão: O estresse esteve significativamente presente no meio docente, independente do processo de trabalho exercido.

Descritores: Estresse Psicológico; Docentes; Ciências da Saúde.

RESUMEN

Objetivo: Explorar la relación entre disposición al estrés y proceso de trabajo junto a docentes universitarios. Métodos: Investigación cuantitativa, realizada con docentes de las Ciencias Biológicas y de la Salud, utilizando instrumentos auto-aplicables. Resultados: La prevalencia del estrés entre los docentes fue del 35%. Considerando los diferentes aspectos investigados del proceso de trabajo: curso de graduación y posgrado, régimen de trabajo, carga horaria, actividad administrativa; Ninguna condición presentó una relación significativa con el estrés, sus fases de evolución y sintomatología. Muchos de los docentes atribuyen la determinación del estrés a cuestiones administrativas inherentes al trabajo ya la fricción con estudiantes y compañeros de trabajo. Para el enfrentamiento del estrés, los docentes manifiestan con frecuencia la práctica de actividades físicas y de actividades de ocio, la búsqueda por el contacto con amigos y familiares y el perfeccionamiento de habilidades personales. Conclusión: El estrés estuvo significativamente presente en el medio docente, independiente del proceso de trabajo ejercido.

Descriptores: El estrés psicológico; Docentes; Ciencias de la Salud.

INTRODUCTION

Nowadays, stress is an emerging public health issue that affects a large part of the world's population. A study by the International Stress Management Association (ISMA) points to Brazil as the second country in the world with the highest level of stress. According to the World Health Organization (WHO), stress already represents a global epidemic and this phenomenon is the object of study of several areas such as medicine, biology, sociology, psychology and related areas.²

In the theoretical field, the term stress is represented by the state coming from the perception of stimuli that provoke emotional excitation and that, disturbing the homeostasis, trigger an adaptation process characterized by innumerable systemic manifestations with physiological and psychological reflexes.^{3,4}

Interest in the study of stress at work has been increasing in the scientific literature, particularly in recent years. One reason for increased research on this topic is the negative impact of stress on workers' health and well-being, as well as on the performance of their activities.² The stress found

in the work environment is related to the ability to adapt to different situations experienced, always involving the balance between requirement and competence.^{1,3}

When it comes to working in the area of education, this seems to be a stressful environment par excellence, since teaching is considered one of the professions most susceptible to stress.^{6,7} Factors such as an environment without adequate physical structure, added to low wages, a dubious perspective on professional growth, excessive workload, and lack of interest among students, among others, result in high levels of stress in teaching.^{6,8}

In particular, higher education professors, in addition to some of the factors discussed above, are faced with increasingly demanding jobs, as well as the need to reconcile the support with teaching, research and extension, resulting in an intense load of activities. Hence, in the course of this process, the university professor may feel more charged due to the increase of the required responsibilities, such as the incentive to publications, the need to participate in newsletters, scientific events and student orientations, besides the planning of his classes, resulting in the intervention of their physical, cognitive and affective capacities.

Faced with the understanding that stress is a common condition in the context of work since it permeates the daily life of relationships, the central objective of this study is to explore the relationship between stress disposition and the work process among university professors. It is also emphasized that the search for understanding the phenomenon of stress in higher education is a basic step for the elaboration of intervention plans regarding the life quality at work.

METHODS

It is an exploratory research with both quantitative and qualitative approach that was performed with a population of university professors from the Biological Sciences and Health Sciences area of a public university in the south of Brazil (n=161), considering professionals with different institutional work processes.

Aiming to contemplate the objectives of this investigation, two self-administered questionnaires were used for the collection of quantitative information; a sociodemographic one, containing the variables: age, gender, marital status and the different aspects of the teaching work process: undergraduate and postgraduate course, work regime, workload, administrative activity, and a validated research questionnaire in Brazil and in effect in the Brazilian Society of Psychology, denominated 'Inventory of Stress Symptoms for Adults of Lipp' - ISSL. ¹⁰ For the qualitative step was used an unpublished self-applied instrument, composed of open guiding questions, aiming to identify the professor's conception about stress and their perception about the presence of this phenomenon at work. The data were collected from February to May 2016.

The information collected through the ISSL was explored following the four-phase model (alertness, resistance, near-exhaustion and exhaustion) that proposes

a method of stress evaluation that emphasizes somatic and psychological symptomatology etiologically linked to it. ¹⁰ The data referring to the characteristics of the work process were described and analyzed together with the quantitative data of the ISSL form, through the chi-square test and descriptive analysis, to verify the presence of associations with stress.

For the tabulation of the qualitative information, descriptive statistics and the Thematic Content Analysis Technique were employed, 11 being the most prevalent registry units discussed in light of the national and international literature.

The subjects were approached in their work environment, at a considered moment, and the objectives of the study, mean, and intermissions of the collection, the form of analysis and dissemination of results were explained. The individuals, when in agreement, of free will and spontaneous participation participated in the research by means of the signing of the consent term.

The research was approved by the Ethics Committee in Research with Human Beings of the *Universidade Estadual de Ponta Grossa (UEPG)* (Legal Opinion No. 1,090,293/2015), according to the Resolution No. 466/12 from the National Health Council.

RESULTS

Considering the total sample, 150 professors participated in the study. The loss of individuals occurred due to the period of professional leave at the time of application of

the questionnaire. The mean age presented was 42 years, predominantly female and married. Regarding the aspects of the work process, 52% worked only with the undergraduate degree, 65% were dedicated exclusively to the university and 79% had a workload of 40 hours per week. Still, 42% stated that they participated in administrative activities within the educational institution.

Quantitative approach

After applying the ISSL instrument, it was verified that 52 professors were in a situation of stress (35%). Of this total, 86.5% of the individuals were in the resistance phase, 7.8% in the near-exhaustion phase, 5.7% in the alert phase and none in the exhaustion phase. Regarding the symptomatology of individuals with stress, there was a predominance of symptoms of mixed origin (48%). **Tables 1** and **2** detail, respectively, data on the prevalence of stress among university professors, according to the evolution model and type of symptom, subdividing them according to aspects of the work process.

Through the bivariate analysis of these different work processes, it was observed that no exposed condition had a significant relation with the prevalence of individuals affected by stress (p>0.05). Regarding the phases of stress evolution, although postgraduate professors showed a higher frequency of this phenomenon in their near-exhaustion phase, this result was also not significant in this aspect (p=0.14121) and in the other variables under investigation (p>0.05).

Table 1 - Distribution of stress prevalence among university professors according to the work process and evolution model*. *Ponta Grossa* city - *Paraná* State, 2015.

	Without stress	With stress	p-value	Alertness	Resistance	Near- exhaustion	Total	p-value
	n(%)	n(%)		n(%)	n(%)	n(%)	n(%)	
Post graduation	47(66)	24(34)	- 0.53821 -	0(0)	21(87.5)	3(12.5)	71(100)	- 0.14121
Graduation	51(65)	28(35)		3(11)	24(86)	1(3)	79(100)	
Exclusive employment bond	60(61)	38(39)	- 0.14663	3(3)	31(33)	3(3)	98(100)	- 0.53687
Not exclusive employment bond	38(73)	14(27)		0(0)	13(25)	1(2)	52(100)	
Workload of 40h	76(64)	43(36)	0.45014	2(2)	37(31)	4(3)	119(100)	- 0.50107
Workload of 20h	22(71)	9(29)	- 0.45914	1(3)	8(26)	0(0)	31(100)	
Performs administrative activity	43(67)	21(33)	0.681	2(3)	17(27)	2(3)	64(100)	0.56524
Does not perform administrative activity	55(64)	31(36)		1(1)	28(33)	2(2)	86(100)	

Source: Authors, 2017.

No significant differences were found in the analysis of the distribution of stress symptomatology, despite differences in the prevalence of different types of symptoms for undergraduate and graduate professors (p=0.251).

Table 2 - Distribution of stress prevalence among university professors according to the work process and symptom type*. *Ponta Grossa* city - *Paraná* State, 2015.

	Physical	Psychological n(%)	Mixed n(%)	Total n(%)	p-value
	n(%)				
Post graduation	5(21)	10(42)	9(37)	24(100)	0.25158
Graduation	6(21.5)	6(21.5)	16(57)	28(100)	
Exclusive employment bond	10(10)	11(11)	17(18)	38(100)	- 0.32336
Not exclusive employment bond	1(2)	5(10)	8(15)	14(100)	

	Physical	Psychological	Mixed	Total		
	n(%)	n(%)	n(%)	n(%)	p-value	
Workload of 40h	8(7)	14(12)	21(17)	43(100)	- 0.59126	
Workload of 20h	3(10)	2(6)	4(13)	9(100)		
Performs administrative activity	5(8)	5(8)	11(17)	21(100)	0.66764	
Does not perform administrative activity	31(36)	6(7)	11(13)	14(100)		

Source: Authors, 2017.

Qualitative approach

The result achieved through the process of categorization of guiding questions follows below, with an indication of prevalence (**Chart 1**). There was no division by the aspect of the work process since the meanings about stress were very similar among the professors investigated, a condition that reinforces the quantitative findings, of the difference between the variables investigated.

Chart 1 - Domains and categories resulting from the information based on the stress dimension according to university professors. *Ponta Grossa* city - *Paraná* State, 2015. (Multiple answers, n = 150)

STRESS					
Conception	Influence at work	Coping			
Determining factors	Psychological outcomes	Leisure activities			
Meetings, deadlines, bureaucracy,	Lack of concentration (33%)	Rest, go out, go to see movies (33%)			
collections, administrative problems (48%) Attrition with students and teachers (31%)	Discouragement (18%) Impatience (10%)	Listening to music, playing hobbies, playing video games (19%)			
Lack of infrastructure and staff (8%)	impatience (10%)	gaines (1976)			
Injustice (5%)	Interpersonal outcomes	Social interaction			
Routine activities, lifestyle (1%)	Poor quality of the	Conviviality with family/friends (52%)			
Proceeding factors: physical Metabolic processes: hormonal alteration, biochemical changes, insomnia (57%) Body tiredness (33%)	relationship with the students (65%) Poor communication with employees, co-workers (35%)	Physical activities Practices of body awareness: pilates, yoga, meditation, dance class (76%) Sports practices (24%)			
Intellectual exhaustion (10%) Proceeding factors: psychological Non-specific emotional and psychological	Work outcomes Decline in quality and performance (58%)	Professional help Medical assistance (21%) Psychological assistance (45%)			
alteration (28%) Anxiety (27%) Irritability (15%)	Decreased willingness, motivation (23%) Difficulty in decision-making actions (7%)	Personal skills Increasing the capacity of planning and organizing actions (30%) Optimizing the relationship with the students (29%) Searching for solutions to problems (21%) Expanding the dialogue (20%)			

Source: Authors, 2017.

DISCUSSION

The 20th Century was marked, among other aspects, by an intense and continuous process of organizational changes in production, technological means and major transformations in interpersonal relationships in the work environment, leading to an increase of stress in society. Especially in the area of higher education, there are occurrences of stressful situations that can impair the performance of the professor and his health, putting at risk the development of teaching. 9,12,13

The professors involved in the present study belong to the large area of Health and Biological Sciences, where research indicates that these professionals are subject to high anxiety levels, indicators of illness at work and development of mental disorders. ^{5,14} These studies corroborate the high objective and subjective prevalence of stress among the participants of the present study, regardless of the work process carried out by the investigated professor. This

condition may be linked to the fact that they are routinely exposed to the compromised performance concomitant with the academic formation and the process of illness of individuals experienced during the care of human beings in the institutions. ¹² Another theory would be a kind of chronic difficulty of professors in public universities manage their work processes, either because of the precariousness of working conditions or because of low investments in higher education, which entails direct effects on the depreciation of professors' health. ¹⁵

In the first phase of stress, named alert, the individual will present the so-called positive stress, referring to an automatic preparation for a given action. ¹⁰ Only 5.7% of the individuals presented themselves at this stage. The resistance phase was prevalent for 86.5% of the professors investigated, which was characterized by the prolongation of the stressors of the previous phase, when the body comes into action to prevent the complete wear of energy. ¹⁰ Research shows that it is common for most professors

with stress to try to resist stressors, unconsciously seeking to reestablish internal balance. 12,16

Amongst the strategies for coping with stress, the investigated professors often manifest the practice of physical activities and leisure activities, the search for contact with friends and family and the improvement of personal skills, such as increasing their capacity for planning and organization of actions. Similar strategies are also pointed out in the literature as measures to minimize the effects of stress on the body. Some professors also mentioned that they face the situation with the support of doctors and psychologists, sometimes having to resort to the use of medication.

Nonetheless, the persistence and intensity with which the stressors are experienced by the professor, associated with continuous attempts to adequately address the stress factors, can also increase their vulnerability to this phenomenon leading them to more advanced and limiting phases.⁶

Few professors in the present study were in the near-exhaustion phase (7.7%), and there were no individuals in the more advanced phase. These findings can be explained by the physical and psychic condition, limiting that individuals with high stress are exposed, often impeding the development of their work activities.⁸

As to the symptomatology of the stress frames exposed by the subjects, there was a prevalence of mixed symptoms, considering both psychological and physical symptoms. In the instrument used psychological factors are the sudden enthusiasm, emotional sensitivity, excessive irritability, nightmares, desire to escape from everything, among others; and examples of physical symptoms include tingling sensation of the extremities, dry mouth, cold hands and feet, insomnia, tachycardia, knot in the stomach and change of appetite. The qualitative analysis also pointed to important physical and psychological changes, with emphasis on metabolic processes and emotional changes. Studies confirm the occurrence of several manifestations resulting from stress involving non-specific symptoms of depression, anxiety or well-defined disorders, as well as biochemical and hormonal alterations resulting in constant fatigue.12 Furthermore, authors indicate that university professors may experience situations that indicate stress a discontinuous form, with times more difficult than others, occurring periods for the reestablishment of energies and return to the state of homeostasis.4,12

Even with the low prevalence in the more advanced stages of stress, a third of the professors investigated present some degree of stress and physical and psychic symptoms, a condition that deserves to be viewed with caution and suggests the poignant need of the development of institutional policies of intervention on the factors determinants of health and illness of workers in processes and work environments, with emphasis on the stress phenomenon.

Recognizing stress as a disease and admitting it to be increasingly evident in the framework of higher education institutions is the first step in the process of improving the quality of mental health of the professors. Subsequently, it is necessary to develop strategies that subsidize the recognition of the agents that drive stress in order to plan and invest in strategically directed and more effective actions.

The perceptions revealed by the university professors attributed the stress determination to administrative issues inherent to their work in the institution and the friction with students and co-workers.

"Meeting and reports, opinions and extras to the preprogrammed activities make me feel 'do not give an account', leaving me always stressed."

"Living with students and co-workers who do not fulfill their function, as well as excessive meetings, unbalance me psychologically."

Workplace overload, lack of control over activities, collections, deadlines, meetings, bureaucracy and high levels of pressure due to job-related obstacles are work-related psychosocial risks. 4,6,7,17 Likewise, quality of interpersonal relationships at work is an important factor in determining the potential stressor. Conflicts among members of a workgroup can be positive in stimulating the search for solutions to a particular problem; however, if this situation is continuous and there is a lack of cohesion among those involved, it may cause frustration and dissatisfaction and favor the appearance of physiological changes in the individual. 6,17

Therefore, it is suggested to rethink the managerial, organizational and bureaucratic activities in order to make them less stressful and repetitive, without losing its functionality, and also indicates the development of integrated and standardized information programs and/or simplification and adequacy to avoid the development of duplicate bureaucratic activities and to optimize the time spent.

Considering the interpersonal difficulties, it is recommended to use the teaching staff for the qualification of interpersonal relationships. Since the training of university, professors are primarily committed to training the professor about scientific knowledge of what to teach, not preparing it for ways to experience their profession and the possible points of professional exhaustion. Provide an institutional space for discussion and reflection on the current teaching challenges and interpersonal relationships at work favors the construction of a work environment more beneficial for the conservation and/or recovery of metal health.

Relating now to professors' conception of the influence of stress on work, much of it relates to a decrease in concentration, a drop in the quality and performance of activities, and especially a decline in the quality of the relationship with students. Authors affirm that the exaggerated production of the hormones generated by the stress (adrenaline and cortisol) causes important casualties in the field of work.²⁰

"Stress influences the lack of concentration, which ultimately impairs performance in activities that require reading and hearing, so the work becomes slower." "In recent times I have noticed changes in my sleep and decreased tolerance for students and patients."

"Stress and anxiety slow down my productivity, requiring more effort and anxiety control to focus on my daily work."

With a view to reducing work-related casualties, in addition to minimizing the stressors, stresses the crucial importance of investing in the viability of professors' self-realization, with interventions aimed at improving working conditions, self-esteem, protagonism and professional appreciation and its potential. The professor needs to feel motivated so that he can carry out his work with more quality and efficiency.⁸

The study points out as a limitation the approach to the interview of professors, minutes before or shortly after the development of their activities and the experience of a phase of interventionism of union relations and striking movements, present in the investigated institution. These factors may have hindered the trustful apprehension of answers among some professionals.

CONCLUSIONS

Stress was significantly present in the teaching environment, regardless of the characteristics of the work process, manifesting in different levels of evolution. The resistance phase of the stress that stands out constitutes to starting a pathological biological stage that implies in interventions.

The perceptions about the stressful situations brought by the professors translate aspects widely present in the higher teaching, suggesting that the daily life of these professionals is, by itself, a stressing agent.

Hence, it is suggested that higher education institutions invest in strategies that may reduce occupational stress, such as frequent periodic evaluations to identify potential organizational problems that trigger stress; instrumentalization of the teaching staff for the qualification of interpersonal relationships; implementation of psychological exams and follow-up as routine in the institution for early-stage identification of stress and adequate preventive intervention; creation or expansion of open spaces for dialogue; offer of preventive therapeutic methods, individual and collective, among other actions that stimulate autonomy, self-realization and professor appreciation.

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