

**OCCUPATIONAL STRESS IN PROFESSIONALS FROM A
LARGE UNIVERSITY HOSPITAL IN BRAZIL**

**ESTRESSE OCUPACIONAL EM PROFISSIONAIS DE UM GRANDE HOSPITAL
UNIVERSITÁRIO NO BRASIL**

**ESTRÉS OCUPACIONAL EN PROFESIONALES DE UN GRAN HOSPITAL
UNIVERSITARIO EN BRASIL**

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Abstract

Objective: The objective was to analyze and explain work stress in technical-administrative professionals who work in a public university hospital in Brazil.

Method: The research was of a descriptive and explanatory nature, where 101 professionals were surveyed, corresponding to 70% of the population.

Results: They indicated that 70.6% had stress. The prevalent symptoms were fatigue and anxiety. The sources of tension predominantly indicated coexistence with emotionally unbalanced individuals. The main indicators of impact on work were demotivation and the difficulty of remembering recent facts. The strategies used to cope with stress most used by those surveyed who did not show any manifestations of stress were the possibility of resting on weekends and enjoying regular holidays. Women presented, on average, occupational stress higher than that of men. In relation to health, it was observed that those identified with stress were the ones that most revealed problems in this area. Significant correlations of medium to great intensity were identified, between occupational stress and sources of tension at work, sources of tension of the individual, indicators of impact at work and regulatory mechanisms.

Recommendations: Enables a better understanding of the impacts of the work environment on the physical and psychological health of the respondents. It contributes to the researched institution by revealing the variables that generate stress, as well as the consequences of the risk of illness of professionals, enabling the adoption of measures related to the management and organization of work that can minimize situations of excessive tension in the work environment.

Keywords: Occupational stress; Brazilian technical-administrative professionals; Brazilian public university hospital.

Resumo

Objetivo: O objetivo foi analisar e explicar o estresse no trabalho em profissionais técnico-administrativos que atuam em um hospital universitário público no Brasil.

Método: A pesquisa foi de natureza descritiva e explicativa, onde foram pesquisados 101 profissionais, correspondente a 70% da população.

Resultados: Indicaram que 70,6% apresentaram quadros de estresse. Os sintomas prevalentes foram fadiga e ansiedade. As fontes de tensão indicaram predominantemente a convivência com indivíduos desequilibrados emocionalmente. Os principais indicadores de impacto no trabalho foram a desmotivação e a dificuldade de lembrar fatos recentes. As estratégias de enfrentamento ao estresse mais utilizadas pelos pesquisados que não apresentaram manifestações de estresse foram possibilidade de descanso nos finais de semana e gozo de férias regulares. As mulheres apresentaram, em média, estresse ocupacional superior ao dos homens. Em relação à saúde, observou-se que aqueles identificados com estresse, foram os que mais revelaram problemas nesta área. Identificou-se correlações significativas de média a grande intensidade, entre estresse ocupacional e fontes de tensão no trabalho, fontes de tensão do indivíduo, indicadores de impacto no trabalho e mecanismos de regulação.

Recomendações: Possibilita melhor compreensão dos impactos do ambiente de trabalho na saúde física e psíquica dos pesquisados. Contribui com a instituição pesquisada ao revelar as variáveis que geram estresse, bem como as consequências do risco de adoecimento dos profissionais, possibilitando a adoção de medidas relativas à gestão e organização do trabalho que possam minimizar as situações de tensão excessiva no ambiente de trabalho.

Palavras chave: Estresse ocupacional; Profissionais técnico-administrativos brasileiros; Hospital universitário público brasileiro.

Resumen

Objetivo: El objetivo fue analizar y explicar el estrés laboral en profesionales técnico-administrativos que trabajan en un hospital universitario público en Brasil.

Método: La investigación fue de carácter descriptivo y explicativo, donde se encuestó a 101 profesionales, que corresponden al 70% de la población.

Resultados: indicaron que el 70,6% tenía estrés. Los síntomas prevalentes fueron fatiga y ansiedad. Las fuentes de tensión indicaban predominantemente la convivencia con individuos emocionalmente desequilibrados. Los principales indicadores de impacto en el trabajo fueron la desmotivación y la dificultad de recordar hechos recientes. Las estrategias utilizadas para hacer frente al estrés más utilizado por los encuestados que no mostraron ninguna manifestación de estrés fueron la posibilidad de descansar los fines de semana y disfrutar de las vacaciones regulares. Las mujeres presentaron, en promedio, estrés laboral más alto que el de los hombres. En relación a la salud, se observó que aquellos identificados con estrés fueron los que más revelaron problemas en esta área. Se identificaron correlaciones significativas de mediana a gran intensidad, entre estrés laboral y fuentes de tensión en el trabajo, fuentes de tensión del individuo, indicadores de impacto en el trabajo y mecanismos reguladores.

Recomendaciones: Permite una mejor comprensión de los impactos del entorno laboral en la salud física y psicológica de los encuestados. Contribuye a la institución investigada al revelar las variables que generan estrés, así como las consecuencias del riesgo de enfermedad de los profesionales, lo que permite la adopción de medidas relacionadas con la gestión y la organización del trabajo que pueden minimizar las situaciones de tensión excesiva en el entorno laboral.

Palabras clave: estrés laboral; Profesionales técnico-administrativos brasileños; Hospital universitario público brasileño.

1 Introduction

The great transformations that have been occurring in the world of work and in organizations have been increasing the demands on workers, mainly in the mental sphere, making them vulnerable to the development of stress manifestations (Quick et al., 1997; Levi, 2005; Cooper, 2008; Koohaas, 2011; ILO, 2012).

This new world of work characterized by high technology and growing insecurity can transform workers into alienated individuals and victims of excessive stress. This environment may constitute a precipitating factor of imbalance between the psychic pressures arising from the occupational environment and the psychic structure of the workers, leading to manifestations of occupational stress (Zille, 2005; Cooper, 2008, 2016, 2018).

There is a consensus in the literature that intense stress can negatively impact the individual's physical and mental health (Cooper et al., 2001) and may, in extreme situations, cause heart disease, generalized pain, gastrointestinal disorders, anxiety, including mortality (Karasek et al., 2000; Levi, 2005).

The theme "stress at work" has aroused great interest of the scientific community and its results indicate that the levels of stress are increasing in diverse occupational categories. For example, in the UK, occupational stress in public servants increased from 10.8% in 2006 to 22.4% in 2013 (Glazer & Liu, 2017).

Recent research shows that 70% of workers in Malaysia experience intense and very intense stress (Javaid et al., 2018). In Brazil, several studies point out the increase of occupational stress in managers, security professionals, educators, communicators, health professionals, retailers, among other categories (Tamayo, 2007; Maffia & Zille, 2013; Bezerra et al., 2013).

As a consequence of stress, workers have reduced the performance and quality of their work. In the UK approximately thirty per cent of the workforce has been placed on medical leave for an average of 20 days per year for work-related illnesses, while an estimated 50% of workers continue to work even sick (Glazer & Liu, 2017).

These results are pointed out as consistent with research by the International Labor Organization (ILO, 2012) which reports that 50 to 60% of workdays lost due to absences are attributed to factors associated with stress at work.

Foucault (1996) already described the context and nature of work in hospital institutions as unhealthy and painful. This environment is composed of several professional categories that deal with the physical and emotional pain of the patient and his family, as well as illness and death. It is an environment of extreme pressure and contradictions.

In addition, hospital work is characterized by overloading of activities, poor organization of work, insufficient human and material resources, presence of needy patients at all levels, and precarious interpersonal relationships among the different hierarchical levels. The professionals who work in emergency and emergency care services, due to the fact that they deal with the duality between life and death at all times, experience experiences of pleasure and suffering at work that are even more compromising (Barbosa & Soler, 2003; Zille et al., 2018).

From the point of view of relevance, this study expands the available knowledge about the subject when addressing occupational stress in technical-administrative professionals of a

Brazilian public university hospital, about which few data on occupational stress are found. Pressure to meet goals and deadlines, overwork, and harmful hospital environment can lead to increased tension, as well as physical and mental exhaustion of these professionals, which can lead to excessive stress (Bianchi, 2001; Peduzzi & Anselmi, 2002).

The study is part of a research project that studies professionals working in public hospitals linked to the Brazilian Unified Health System (SUS). Thus, as the research institution becomes aware of the factors that cause excessive pressure at work and its consequences for workers, it can adopt policies and actions to mitigate the problems and its consequences.

The main purpose of this study is to analyze and explain the manifestations of occupational stress in technical and administrative workers in a public university hospital in Brazil.

2 Theoretical Background

According to Cooper et al. (1988), the term stress comes from the Latin "stringere", which means "tighten". It has been in the Anglo-Saxon vocabulary since the seventeenth century and is used to describe "adversity" or "affliction." In the eighteenth century, the word stress is used to express pressure or strong effort of the human body. It is only in the twentieth century that the term gains the contemporary scientific connotation from the studies of Selye (1956).

Stress is a reaction that occurs in the individual, caused by psychic disorder, which can result in physical, psychic and behavioral symptoms. Such occurrences are especially present in workers' lives and can cause significant damage to their health (Cooper, 2008).

Selye's first observations on stress (1936, 1954) were based on studies by the German physiologist Bernard, who argued that the ability to maintain a constant internal balance, the homeostasis, is one of the most characteristic traits of all living things.

Still based on the studies of physiologist Cannon, Selye (1954) observed that living beings, in general, had mechanisms that enabled them to mobilize their internal systems for a reaction to combat the eminences of aggression to their physical integrity. This reaction was called "fight or flight syndrome". According to this syndrome, the individual reacts to adverse environmental, emotional and physiological situations, preparing for a quick and effective response, in order to protect his body from the aggressive situation.

According to Selye (1956), the identification of the mechanisms by which body reactions seek balance was the basis for the development of his theoretical study on stress. The moment an individual perceives an adverse situation his body begins to produce warning reactions that help prevent damage to his physical and mental health.

The reaction to stress develops in three phases: a) Warning phase - is the good phase of stress, in which a significant amount of adrenaline is produced, making the body vigorous and energized for the fight or flight actions, combating the stressors; b) Resistance phase - if the stressor continues, the behavior will be resistance. At this stage, the body consumes the maximum energy to maintain balance. If the effort is sufficient to deal with the situation, the stressor is eliminated and the body returns to homeostasis; Exhaustion phase - is considered the critical phase of stress because the stressor causes an important psychic imbalance in the body, leading the individual to experience physical, psychic and behavioral symptoms that will cause stress. Depending on the severity of this stress it can lead to physical and mental illness, as well as to death.

According to Couto (2014), stress can be classified into some typologies: overload stress, stress of monotony, eustress or distress, acute or chronic stress.

Overload Stress occurs when the psychic environment experienced by the individual requires more effort than their psychic structure can handle. According to Lipp (2005) work overload is the most identified stressor in occupational stress research. Reduction in work performance is one of the main consequences of the excessive demands of the occupational context.

In the *Stress of Monotony*, the individual is subjected to a level of psychic demand much lower than his psychic structure demands and can supports (Selye, 1974). This type of stress occurs in context of repetitive, low-stimulating monotonous work with poor interpersonal relationships. Most of the time, this type of stress evolves to depression (Couto, 2014).

Eustresse is considered the positive stress, which produces feelings of fulfillment, contentment, a sense of accomplishment, and victory. This is considered the stress of life. With positive results achieved, positive emotions are aroused, there is a sense of accomplishment and overcoming challenges. The manifestations of eustresse occur, for example, in situations such as escaping from a danger situation, overcoming a few milliseconds to obtain a record in a competition, overcoming a challenge in the organization, among other situations of the same nature (Couto, 2014; Zille et al., 2016, 2018).

Distress is considered as dysfunctional stress. It is the stress of defeat, which occurs when the efforts made by the individual are not rewarded at the same level as the efforts made. This produces in the individual the feeling of disappointment that generates hopelessness and insecurity. Therefore, this is considered a negative stress because it consumes the energy of the individual, making him weakened on the psychological, physical and behavioral levels (Selye, 1956, 1959; Couto, 2014).

Acute Stress refers to brief episodes whose symptoms are evident and last for hours, days, or a few weeks, and then disappear. However, it significantly alters the physiology of the body and provokes reactions that lead the individual to resist and detach from stressful situations. As a consequence, it can cause psychological trauma in the individuals submitted to it (Selye, 1956, 1959; Couto, 2014).

Finally, chronic stress is characterized by the constancy of stressors, which can be intense or moderate. It is the type of stress most identified in organizations. As such their symptoms last longer and can cause significant problems to the physical and mental health of individuals. In Brazil, chronic stress was identified in 50% to 70% of workers from different work contexts (Zille, 2005; Zille et al., 2008; Zille & Zille, 2010; Zille, et al., 2016, 2018; Pereira, 2018; Gonçalves, 2018). Brazilian workers are considered the most stressed in the world, after the Japanese (ISMA, 2010).

2.1 Occupational stress

Stress arising from work situations is called occupational stress. It is a reaction of the individual to the threats experienced in their work environment. These threats are stressors that lead to an imbalance between the individual's psychic structure and their occupational environment, affecting their well-being (French, 1983; Litchfield et al., 2016).

According to Paschoal and Tamayo (2004, p. 46) "for something in the organization to be a stressor it must be perceived as such by the employee." These authors define occupational stress as a process in which the individual perceives the demands of work as stressors, which, when exceeding their coping skills, produce negative reactions in the worker.

Stress in the workplace has dysfunctional consequences for both individuals and organizations. The main consequences are high rates of accidents at work, relationship problems, excessive delays and absences, sick leave and high turnover. All of this negatively affects the performance of workers and organizations (Lip, 2005).

According to Karasek (2000), the combination of high demands at work and the lack of autonomy to making decisions are important factors in the production of occupational stress. He also states that stress is a major concern and is directly related to workers' health. The economic costs of work stress can reach hundreds of billions per year in many parts of the world, in addition to their direct relationship to illness, especially heart disease, leading to a significant number of deaths.

Cooper et al. (1988) and Cooper (2001) and Gilboa et al., (2008) consider that all occupations have stressors, which can be classified into six broad categories: intrinsic work factors; individual's role in the organization; interpersonal relationships; career development; climate and organizational structure; and home and work interface.

Several authors (Canova & Porto, 2010; Zille et al., 2018) emphasize that the international literature shows that the main factors that generate occupational stress are related to the nature of the task, the occupational role of workers, the worker individual characteristics, social support and conflicts.

These authors point out that, in Brazil, researches show that the main factors that predispose workers to occupational stress are work overload, family-work interference, organizational climate, gender (eg, women are more stressed than men), lack of physical activity, personal values incompatible with those of the organization, little autonomy to perform the work, high degree of physical and mental effort in performing the activities, lack of participation in decision making, risks related to physical safety, lack of social support, and lack of organization interventions to predict and eliminate stressors in the occupational environment

2.2 Stress symptoms and sources of stress

Regarding the manifestations of stress, physical and psychic reactions occur. The most common physical symptoms are increased sweating, tension and muscle aches, tachycardia, hyperactivity, nausea and insomnia. Regarding psychic symptoms, the prevalent ones are anxiety, anguish, irritability, difficulty in interpersonal relationships, self-doubt, excessive concern of general nature and emotional hypersensitivity (Lipp, 2001, 2005; Canivet et al., 2014).

Occupational stress can trigger illness when the tension is not relieved and the individual becomes increasingly exhausted and depressed. In the physical field, some diseases may occur, such as gastritis, ulcers, hypertension, and herpes, among others. If the stress situation gets worse and there is no treatment, there is a risk of problems such as heart attack,

stroke and depression, among others. It is emphasized that it is not the stress that causes disease. Stress only makes room for diseases that the individual already has predisposition (Cooper et al., 2001; Levi, 2005; Cooper, 2008; Couto, 2014; Braun et al., 2016).

According to Couto (1987, p. 75), the sources of tension can be understood “as a state in which the organism is prepared to act physiologically and psychologically. The tension or the propensity to tension varies according to the personality traits of each individual. Tension is not an inherent trait of an individual's personality, but a trait acquired throughout his or her life.

For Lipp (2003), stress can have internal and external stressors. Stressors are associated with lifestyle, the way a person reacts to life events and the characteristics of his personality. External sources may be related to the challenges of everyday life, such as problems at work, family, finances, loss of close relatives, insecurity in the face of news of violence and aggression.

With regard to the occupational environment, some threatening situations may represent sources of stress, such as lack of time to fulfill all work commitments, negative thoughts, different pressures regarding professional activities, lack of adequacy between the motivations and interests of the worker and his work environment (Molina 1996; Tamayo 2007).

Researches carried out in several organizational sectors of Brazil (Zille et al., 2013, 2016), show that the main sources of excessive tension related to work that lead to stress are: perform several activities at the same time with a high degree of charge by managers; work with tight and intense schedules; work culture based on obsession and compulsion for results, (eg, nothing is good, improvement is always necessary); and the work overload caused by the intensive use of technologies.

According to Humphrey and Humphrey (1986) the sources of tension at work are “harmful stimulus” and that each individual reacts to them differently, according to their individual characteristics related to gender and personality. In the work context, the sources of tension are mediated by individual differences. This means that in the same work situation, negative and stressful events do not affect all workers equally. Thus, it is argued by Zille et al., (2016) that it is not the sources of tension that generate stress per se but the way the worker reacts to them according to their individual characteristics.

2.3 Strategies to cope with stress

The term "coping" has been used in psychology more recently, but its etymological origin goes back to the French verb "couper", which derives from the noun "coup" which means "coup". In the twentieth century, the term "cope" was incorporated into the Anglo-Saxon vocabulary, whose expression "to cope with" can be translated as coping, or successfully managing (Pizzato, 2007).

According to Lazarus and Folkman (1984), psychological coping strategies are related to the psychoanalytical description of the adaptation and defense mechanisms that are directed to coping with stress through instinctive, affective, impulsive behaviors and intrapsychic conflicts. Through this perspective, the defense mechanisms are considered as primary and automatic manifestations in order to regulate negative emotions and reduce anxiety.

The strategies of *coping* or stress coping strategies act in three dimensions: a) some of them focus directly on the problem; b) others focus in the cognitions and emotions caused by stressful events and; c) others may focus simultaneously on both dimensions. These strategies are specific to each situation; therefore, the stressed individual can adopt strategies such as tolerating a given situation, reducing the intensity of the emotions in a given situation, confronting, accepting, ignoring or even suppressing a threat. A specific coping strategy cannot be considered good or bad. It may be functional or dysfunctional, depending on its effectiveness in achieving the objectives of restoring an individual's balance to a given situation (Coelho et al., 2003, Hernández et al., 2002).

2.4 Reference model for the study of occupational stress - MTEG

The model was developed and validated by Zille (2005), who, after adapting his constructs, served as a reference for the development of this study.

It is structured in five constructs: sources of stress at work (FTT), individual stresses (FTI), regulation mechanisms (MECREGUL), stress symptoms (SYMPTOMS) and work impact indicators (IMPACTS). The first-order constructs are explained by second-order constructs, which in turn are explained by the corresponding indicators, and the exception is made to the IMPACTOS construct, which is explained directly by its indicators. Work processes, work relations, insecurity in working relationships and coexistence with individuals with difficult personality are second-order constructs that explain the FTT.

Responsibilities above limits, style and quality of life and motivation are second-order constructs that explain FTI. Interaction and timing, regular rest, work experience and physical activity are second-order constructs that explain MECREGUL. Finally, the second-order constructs that explain the SYMPTOMS are: hyperexcitability and sense of humor; psychic symptoms, sympathetic nervous system and gastric; and symptoms of increased tone, dizziness / vertigo, lack of appetite and relaxation. The composite reliability of the first-order constructs at the time of validation of the model were respectively: FTT (0.8839), FTI (0.7055), MECREGUL (0.6928), SYMPTOMS (0.8949).

The MTEG made it possible to classify the levels of stress intensity from the parameters developed by Zille (2005), with a) absence of stress: a good balance between the psychic structure of the individual and the psychic pressures arising from work situations; b) mild / moderate stress: indicates the occurrence of stress manifestations, however in a compensated degree, and may not generate important impacts for the individual; c) intense stress: it indicates an important way to coexist with some of the main symptoms of stress, such as nervousness, anxiety, anxiety, fatigue, difficulty concentrating at work, insomnia, pain in the muscles of the neck and shoulders due to tension, among others; and d) Very Intense stress: the individual presents significant problems of concentration, as well as important difficulties in carrying out their activities in a general way, previously performed with normality. The work starts to be impacted in a very important way. The organic and psychic conditions present significant changes, and the need for clinical and psychological treatment is imminent, aiming at controlling and / or eliminating the causes of imbalance in the relationship between the psychic pressures arising from the environment and the psychic structure of the individual. The symptoms are the same ones mentioned in the intense stress situation, but with greater intensity (Zille, 2005, p.191).

2.5 Research hypotheses

Taking as reference the theoretical context presented, we have the following hypotheses for the study:

Hypothesis 1a: The sources of stress at work positively influence the manifestation of occupational stress.

Hypothesis 1b: The individual's sources of tension positively influence the manifestation of occupational stress.

Hypothesis 1c: The mechanisms of regulation (coping) negatively influence the manifestation of occupational stress.

Hypothesis 2a: Occupational stress positively influences work impact indicators.

3 Methodological procedures

This is a descriptive and explanatory research with a quantitative approach based on a quantitative case study (Yin, 2015).

The population consists of 145 technical and administrative professionals from a large public university hospital located in southeastern Brazil. The sample was calculated using Barnett (2002), with a sampling error of 5%, reaching the required number of 101 individuals. This sample made it possible to perform all the statistical analyzes required for the study.

Data collection was performed by applying an online questionnaire (Google Docs Platform), adhering to the MTEG, consisting of 86 closed questions and 4 open questions. The Likert scale was used, ranging from 5 points (never, rarely, sometimes, often and very often).

Data were processed in SPSS version 20.0., and analyzed using descriptive and inferential statistics. First it was held the analysis of missing data, extremes, means, medians, standard deviation, minimum and maximum data for each of the evaluated dimensions.

To identify differences between the mean occupational stress in relation to demographic, functional, life and health data, T-Student and ANOVA tests were performed. For all analyzes, $\alpha = 5\%$ was considered.

Subsequently, the relationship between stress and study variables (sources of work stress, individual stress, work impacts and regulation mechanisms) were evaluated through correlation analysis and linear regression analysis. The correlation analysis was aimed at identifying the existence of a linear relationship between two variables. The linear regression, in turn, aimed to predict changes in the dependent variable according to changes in the independent variable (simple regression) or more than one independent variable (multiple regression) (Hair et al., 2009). Two regressions were performed, one multiple and one simple, considering that stress was now either a dependent variable, or as an independent variable.

4 Results and discussion

As for the demographic profile of the surveyed women, 61.8% predominated; with an age range varying from 26 to 40 years (48.0%). The individuals aged 41-50 years represented 23.5%, a very close percentage of those aged between 51 and 60 years (21.6%). Regarding marital status, 51.0% are married or living with a spouse and 43.0% are single. The predominant education was higher education, 63.8%. This shows the high academic qualifications of the respondents, considering that the requirement for the position is complete high school.

Regarding the sector of activity, respondents reported working in the area of purchasing (15.7%), radiology (13.7%), financial (6.9%), hospitalization unit (5.9%), hospitalization (5.9%), information technology (3.9%) and infrastructure (3.9%). Regarding alcohol consumption, 57.8% said they consumed alcohol, of which 86.4% consume moderately.

The incidence of disease was also observed in 36.3% of respondents, with a higher prevalence of hypertension (27.5%) and gastritis (23.5%). Research has shown that these diseases may be related to stress manifestations (Couto, 1987, 2014, Levi 2005; Cooper, 2008). Most (67%) stated that they practice hobbies such as listening to music, dancing, walking, watching TV, reading and traveling.

4.1 Occupational stress analysis

For the analysis of occupational stress, the weighted average of the symptoms was calculated according to the model proposed by Zille (2005). The average mentioned was analyzed and the individuals were grouped in stress levels according to Table 1.

Table 1 - Criteria for analysis of occupational stress occupational

Occupational stress level	Weighted average value
No stress	< 1,75
Mild / moderate stress	> or = 1,75 to < 2,46
Intense stress	> or = 2,46 to 3,16
Very intense stress	> or = 3,16

Source: Zille (2005)

Table 2 presents the grouping of those surveyed by stress levels and the descriptive analysis of each level. It is observed that 70.6% of respondents showed stress manifestation at varying levels. This means that, for this occupational group, there is an imbalance between the psychic structure of the worker and the psychic pressures related to his occupational context.

Table 2 - Stress level analysis

Stress Level	Frequency			X	Med	DP	MI	MX	Percentis	
	N	%	% Acum. (stress)						25	75
No stress	30	29,4	--	1,45	1,50	0,23	1,03	1,74	1,28	1,67
Mild / moderate stress	36	35,3	35,3	2,06	2,07	0,19	1,77	2,37	1,85	2,23
Intense stres	30	29,4	64,7	2,73	2,69	0,17	2,47	3,14	2,58	2,87
Very intense stress	6	5,9	70,6	3,37	3,31	0,21	3,22	3,78	3,23	3,49
Global analysis	102	100,0	70,6	2,16	2,10	0,61	1,02	3,78	1,71	2,63

Source: Research Data, 2018.

For 35.3% of workers stress manifestations occur at intense or very intense levels. For these professionals, important changes in the relationship between the occupational environment and the psychic structure are necessary to minimize or avoid the personal and organizational problems that this level of stress may cause.

For the same above percentage of workers, stress manifestations occur at a mild / moderate level and may not have serious consequences for individuals and the organization. However, as Zille (2005) argues, the maintenance of mild / moderate stress and its worsening over time can generate behavioral, emotional and organic impacts on these workers, which may affect their professional activities.

The present study reveals that 70.6% of respondents have manifestations of stress. These results reinforce the results of Brazilian studies with workers from different occupational categories, which reveal the incidence of stress around 70% of workers (ISMA, 2010; Silva, 2015; Pego et al., 2016; Gonçalves, 2016; Zille et al., 2016; Gonçalves, 2018; Pereira, 2018; Nunes & Zille, 2018, Zille et al., 2018).

4.2 Sources of tension at work and symptoms of stress

To analyze the symptoms of stress, the participants were divided into two groups: those classified in the *absence of stress* category were kept in this same group and those classified as mild / moderate stress, intense stress and very intense stress were grouped into *some level of stress*.

Results show that more than a third of respondents classified in the category with *some level of stress* show symptoms such as fatigue (55.6%), anxiety (44.4%), neck and shoulder pain (41.7%). , nervousness (37.5%) and anxiety (33.3%). These data are consistent with Brazilian research on the subject (Couto, 1987; Zille, 2005; Zille, Braga & Marques, 2008; Zille, Braga & Zille, 2015; Zille et al., 2016; Zille et Al., 2018). Therefore, these results are

important because stress symptoms manifested over time may cause illness (Belkic et al., 2000; Cooper, Dewe & O'driscoll, 2001; Levi, 2005), and decreased individual's productive capacity (Rees, 1995; Jex, 1998; Chen & Cunradi, 2008; Couto, 2014).

In relation to the sources of tension, these were divided into two categories: those directly related to work (sources of tension deriving from work) and those related to the characteristics of individuals (sources of tension of the individual). The individuals surveyed were again separated into two groups: "absence of stress" and "some level of stress".

In the overall analysis, the data revealed that both the tension sources resulting from the work and those related to the individuals, taking into account their personal characteristics, the incidence of tension was significantly higher in the group of individuals with manifestation of stress, which was an expected premise and was confirmed in this research.

In relation to the individuals with *some level of stress*, the **source of tension at work** that manifested itself with greater frequency and intensity was *the coexistence with people who were emotionally stressed and unbalanced* (33.3%). Other sources of tension pointed out as relevant were *performing several activities at the same time with high degree of collection* (31.9%) *complex work performance that results in physical and emotional wear and tear* (27.8%). These data indicate a need to review the way individuals interact in the work environment with colleagues, peers and superiors, as well as work organization and management in order to reduce stress levels and consequently stress manifestations.

Regarding the **source of individual tension**, those who present intense or very intense tension represented 35.3% of the respondents.

As for the respondents with **some level of stress**, the most frequently indicated source of stress was *to lead a very rush of life, with little or no free time to perform other activities* (58.3%). Other sources of tension related to the individual identified as important were: to have the impetus to perform more and more work in less and less time; think and / or carry out two or more activities at the same time, without completing them (47.2%) having had a lot of day-to-day work commitments (34.7%); unable to disconnect from work, even in other environments; and have rest times taken by professional activities.

The incidence of these sources of tension was also identified in previous researches with workers working in public hospitals (Santos, 2015; Gonçalves, 2016). Therefore, adding to the results of the present research a substantial database on the subject could already be

used by hospital organizations and individuals interested in mitigating the identified problems related to occupational stress.

4.3 Work impact indicators and individual coping strategies

In relation to the individuals with some level of stress the indicator of possible impact on the work mentioned more frequently was *the demotivation with the work* (22.2%). Other indicators perceived by 20% of the individuals in this group were *the difficulty of remembering recent events previously remembered naturally, and losing control over life events, including work*.

Regulation mechanisms or *coping strategies* were considered relevant by the majority of respondents (56.9%). In this group are the majority of the individuals who present absence of stress, according to Table 2. These individuals believe that the regulation mechanisms are essential to maintain the balance and the psychic structure necessary to withstand the tensions that they experience in the occupational environment.

The strategies considered most effective by individuals who did not present stress manifestations were: the possibility of resting at weekends and holidays (93.3%); enjoy regular vacations (90.0%); to use personal experience in solving difficulties and problems related to work (83.3%); use the free time to relax / rest (80.0%). All these strategies were also identified in previous researches by Zille (2005) and Zille et al. (2016, 2018).

4.4 Relationship between occupational stress and the variables studied

Regarding the variables evaluated, there were significant differences in the average stress in relation to gender and the occurrence of health problems. Women had on average ($M = 2.28$) higher occupational stress than men ($M = 1.95$), $p < 0.008$.

The occurrence of a higher level of stress in females can be explained by the type and intensity of hormones produced, which makes women more prone to stress compared to men (Luz, 2005). Other explanations for this difference may be that women work twice a day, in the company and at home, such as performing and / or guiding domestic activities, as well as guiding their children's educational activities.

In relation to health problems, those who present illness ($M = 2.41$) had, on average, higher stress than those who did not show this occurrence ($M = 2.01$), $p < 0.001$.

In order to evaluate the relationship between the stress manifestations with the variables of tension sources, regulation mechanisms and impact indicators at work, multiple regression and simple regression tests were performed, since stress was defined as a dependent variable or as independent variable.

Through multiple regression analysis, the relationship between stress (dependent variable) and sources of tension at work and regulation mechanisms (independent variables) was evaluated. Through the simple regression, the relationship between stress (independent variable) and the impact indicators at work (dependent variable) was analyzed. The relationships of dependence cited are based on the studies of Zille (2005), in which correlations between medium and high intensity were observed between occupational stress and sources of tension at work, sources of tension of the individual, indicators of work impact and mechanisms of regulation.

4.4.1 Relationship between occupational stress, sources of tension at work, and regulation mechanisms (coping strategies)

Figure 1 illustrates the hypothetical research model, which refers to the relationship between the independent variables and the dependent variable (occupational stress).

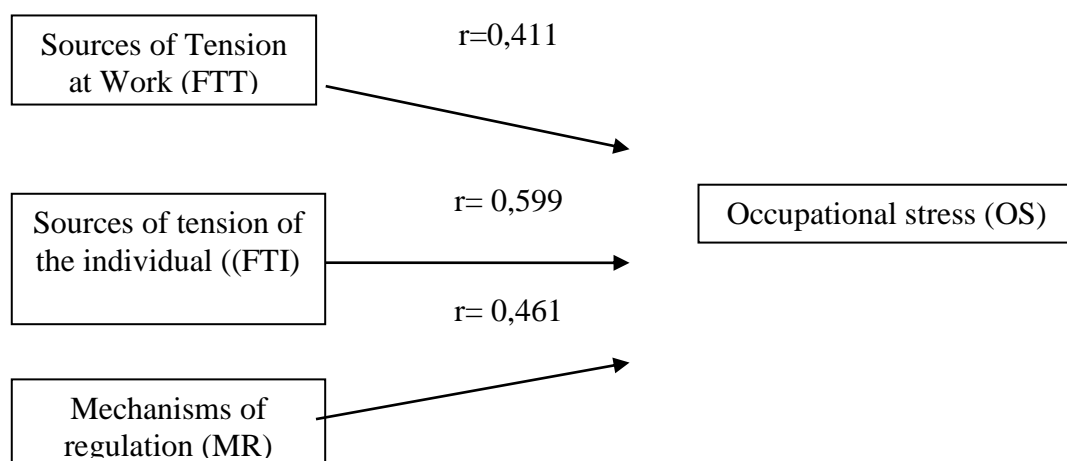


Figure 1 - Hypothetical research model - stress versus stress sources and mechanisms of regulation

Source: based on Zille (2005), 2018.

From the regression model proposed, adjusted R² was identified in the value of 0.387. Thus, it can be inferred that 38.7% of the variations in occupational stress are explained by variations in the mechanisms of regulation and sources of tension of the individual. It is concluded, therefore, that the individual's sources of tension and the mechanisms of regulation impact the levels of occupational stress.

The estimated equation for the case was: $OS = 1.874 + 0.368FTI - 0.229MR$.

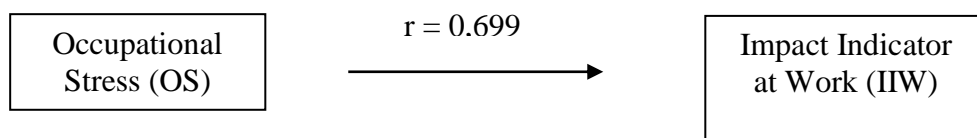
Therefore, increases in the individual's sources of tension lead to increases in occupational stress; and increases in the use of coping mechanisms lead to a decrease in occupational stress levels [$F(3.98) = 22.52; p < 0.000$].

The source variable if stress at work was not included in the model. This finding does not mean, however, that this source of tension is not important for predicting occupational stress levels.

4.4.2 Relationship between occupational stress and work impact indicators

Occupational stress is then assessed as the antecedent of impact indicators at work, according to the research model proposed in Figure 2.

Figure 2 - Hypothetical research model - occupational stress versus impact indicators at work



Source: Prepared by the authors based on Zille (2005), 2018.

As a result of the proposed regression model, R² adjusted for the value of 0.484 was identified. It can be inferred, therefore, that 48.4% of the variations of the indicators of impact at work are explained by the variations of occupational stress [$F(1,100) = 95,599; p < 0.000$]. The estimated equation for the case was: $IIW = 0.069 + 0.952EO$. Therefore, increases in occupational stress lead to an increase in the impact indicators at work.

5 Conclusions

This study reached its objective, describing and explaining the manifestations of occupational stress in the perception of the technical-administrative employees of a large

Brazilian public university hospital, anchored in the Theoretical Model of Explanation of Occupational Stress (MTEG), adapted for this research.

This study identified stress levels, categorizing them by intensity, the main sources of tension that are leading the professionals to develop occupational stress, the prevalent symptoms related to stress, the impact indicators in the work, and coping mechanisms, or coping strategies, used by these professionals to minimize or eliminate stress manifestations.

Regarding the demographic, functional, lifestyle and health profile, the majority of the individuals surveyed are female, with a predominant age range of 26 to 40 years. As for education, the majority have completed higher education. The functional areas in which the majority of those surveyed operate are: purchasing, radiology, finance, hospitalization unit, IT and infrastructure. A little more than half of those surveyed said they made moderate use of alcohol. Approximately one third, they claim to have some disease, being those of higher incidence the arterial hypertension and gastritis that are diseases that can be related to the stress according to the literature referenced in this study. Regarding hobbies, most practice them like listening to music, dancing, walking, watching TV, reading and traveling.

The results showed that most of the respondents presented a manifestation of stress, ranging from mild to moderate to very intense stress, and the percentage of intense and intense stress is present in a little more than a third of the sample.

The main source of tension at work, of occupational origin, inducing identified stressors was to live with people who were stressed and emotionally unbalanced. The source of tension inherent to the personal characteristics of the respondents, evidenced as more important was to lead the life in a very rush way, performing more and more activities in less time.

The indicators of work stress impacts that manifested themselves most intensely were the lack of motivation towards work, the difficulty of remembering recent events that were previously remembered naturally and the possibility of losing control over the events of life, including work.

Most respondents believe that regulatory mechanisms are relevant. All the indicators evaluated were significantly more frequent in the group of individuals without stress, when compared to those with stress. This finding is in line with the results of Brazilian studies mentioned in this study. The mechanisms of regulation act as reducers of stress levels, that is,

the greater the use of the regulation mechanisms, the lower the levels of stress perceived by the individuals, which was verified in this study.

Women and individuals with a health problem had, on average, higher occupational stress in relation to men and those who did not present illness.

In the relation between occupational stress and tension sources and regulation mechanisms, it was verified that increases in the sources of tension of the individual increase the occupational stress; and increases in the use of regulation mechanisms reduce stress levels. In the analysis of the relationship between occupational stress and work impact indicators, it was verified that increases in occupational stress lead to increases in indicators of work impact.

Regarding the contributions of this study, from the academic point of view, this research confirms the Theoretical Explanatory Model of Occupational Stress - MTEG, by Zille (2005), the antecedents and consequent of occupational stress. The study also contributes to a better understanding of the impacts of the work environment on the physical and psychological health of the professionals surveyed. In addition, it contributes to the research institution by revealing the variables that generate stress in its work context, as well as the consequences of the health professionals' risk of illness to the institutional performance, allowing the adoption of measures related to the management and organization of work that can minimize the situations of excessive tension that has been occurring in the workplace.

Management actions can be adopted to mainly mitigate the problems related to the organization of work as the accomplishment of several activities at the same time with a high degree of collection; the complexity of the work developed, which generates excessive wear and fatigue; and the overload generated by the imbalance between the demands of work and the amount of personnel allocated, which generates tension in the accomplishment of the activities.

As a limitation of the study the scope of its object is pointed out, which was restricted to a specific group of technical-administrative workers of a Brazilian university hospital. Therefore, future research could be carried out with other occupational categories of the researched institution and others with work in the health area, to consolidate the knowledge derived from the present study and from others already published on the subject, in order to further humanize the relationship between the context of hospital work and the individual who works in it. Research of an internal nature would also contribute to a view of other realities, which in a way, could be useful to be analyzed in relation to the Brazilian context.

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