

## Association between depression and work stress in nursing professionals with technical education level<sup>1</sup>

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Objective: to analyze the relationship between depression and work stress in nursing professionals with technical education level of a teaching hospital in a city of the state of São Paulo. Methods: a cross-sectional study was carried out with 310 nursing technicians and nursing assistants, randomly selected. The outcome analyzed was the report of depression and its relationship with high levels of work stress, measured using the Job Stress Scale. Descriptive statistics and logistic regression were performed. Results: the prevalence of depression in this study was 20%, and it was more expressive in females, aged over 40 years, living without a partner and in smokers. The chance of depression was twice as high among professionals showing high levels of work stress, even after multiple regression adjusting. Conclusion: depressive symptoms were strongly associated with high stress levels among nursing assistants and nursing technicians, evidencing a problem to be considered along with the planning of specific intervention programs for this population, as well as the need for better cases management by the supervisors.

Descriptors: Depression; Stress Psychological; Cross Sectional Studies; Nursing.

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## Introduction

Depression is a mental disorder characterized by sadness, lack of confidence, adynamy, decreased energy, loss of confidence and self-esteem, sense of guilt, suicidal ideation, decreased concentration and inadequate pattern of sleep and appetite. It can be understood as a continuation of negative feelings and can lead to dysfunction of the individual<sup>(1-2)</sup>.

On the world stage, depression can be considered as a public health problem due to its high prevalence and to the functional disability that it causes<sup>(3)</sup>.

The distribution of the prevalence of depressive disorders occurs in an unequal manner in the population, being more significant in women<sup>(4)</sup>, less favored economic classes<sup>(5)</sup>, young individuals<sup>(6)</sup> and in individuals with chronic diseases<sup>(7)</sup>. The prevalence of depression may vary among populations. In the United States, for example, 12% of women suffer from depression yearly, whereas the disease reaches 7% of the male population<sup>(8)</sup>. In Brazil, it is estimated that about 6% of the general population had depression in 2003<sup>(6)</sup>.

The damage to the population is not associated only to the deleterious consequences on the biopsychosocial spheres of individuals, interfering actively also in the labor sphere. Depression affects the quality of life of individuals and productivity in the workplace, which may result in financial loss arising from absenteeism<sup>(1)</sup>.

The professionals who interact most part of the time with individuals in need of support are the most susceptible to mental illness<sup>(1,9)</sup>. Among them, it is highlighted the nursing professionals who work directly with the intimacy, pain and fears that are part of the human suffering. Relationship problems in the work environment, difficulties of relocating, strenuous working days, system of shifts, as well as exposure to physical, chemical and biological agents equally constitute predisposing factors for the onset of depression<sup>(1,10)</sup>.

The relationship between depression and the worker is directly modulated by stressors in the work environment. Work stress, defined as a result of the imbalance between the demands of professional practice and worker's coping ability, is associated with professional strain, negatively affecting the mental health of workers<sup>(11)</sup>. The prevalence rates of depression or depressive symptoms among nursing professionals are higher than 20%<sup>(2,12)</sup>, considered high when compared with the general population.

This study aims to analyze the relationship between depression and work stress among nursing professionals

with technical education level of a teaching hospital in a city of the state of São Paulo.

## Methods

In this study, resources of the quantitative, cross-sectional and descriptive-exploratory approach were used. It was developed in a large hospital in a city of the state of São Paulo.

The research population covers all nursing technicians and nursing assistants working in that hospital. It was decided to carry out the study in this population (nursing technicians and assistants), considering that these professionals perform high demand workloads and have little control on the work performed, due to their type of training and constant supervision by the professional nurse.

According to information of the Human Resources sector, at the beginning of data collection, the hospital employed 987 nursing assistants and 148 nursing technicians, totaling 1135 employees. The initial study sample consisted of 338 participants. The sample size was calculated to detect an expected prevalence of 50%, with 95% confidence interval and maximum error of 5%. Randomization was carried out using the SPSS software and data collection occurred from July to January 2013.

The professionals who performed their professional activities, at least for a year and of both genders were included in the sample. The professionals who were away from work or on vacation during the data collection period were excluded from the research.

Considering the ethical aspects of research involving human subjects (Resolution 196/96), this study received authorization of the facility for its achievement and was subject to evaluation by the Ethics and Research Committee of the School of Nursing of Ribeirão Preto, University of São Paulo (EERP/USP) and approved under Opinion number 23.433/2011, with CAAE protocol number 01658912.0000.5393. The Ethics and Research Committee of the Clinical Hospital of the Faculty of Medicine of Ribeirão Preto, University of São Paulo (HCFMRP/USP), also approved it.

Data were collected by postgraduate students, trained individually and in their own work environment. For data collection, it was used a questionnaire on sociodemographic, working and health conditions, as well as the *Childhood Trauma Questionnaire* - CTQ<sup>(13)</sup> scale and the Job Stress Scale (JSS)<sup>(14)</sup>.

The dependent variable was the reporting of depression at some point in life. The question used was

applied in the health supplements of the National Survey by Household Sample from 2003 to 2008: "Has any doctor or health professional ever said that you have depression?". This type of variable has been used in studies that evaluate reports of depression, respiratory diseases and other health conditions<sup>(7,15)</sup>. The High Level of Work Stress Exposure was the main independent variable, collected using the Work Stress Scale (JSS).

For control, the variables used were: gender (male and female), age (collected as quantitative variable and categorized as about 40 years), religious practice (yes or no), marital status (with or without partner), work complexity level (medium or high, according to the work unit), time of employment in the institution (about 15 years), work leave in a year (yes or no), tobacco use (yes or no), reporting of chronic diseases (yes or no) and early stress (yes or no).

High Level of Work Stress Exposure was the independent variable of interest and it was measured using the Working Stress Scale (Job Stress Scale). In the model proposed by Karasek, this scale was originally developed in Sweden, for evaluation of occupational stress<sup>(14)</sup>, which was summarized and validated for Portuguese by Alves<sup>(16)</sup>. This scale addresses three categories equivalent to the dimensions: psychological (demand), work (control) and social support. It consists of 17 questions, with five to evaluate the demand, six to evaluate the control and six for social support. To calculate the level of work stress exposure, it was carried out a combination involving only the demand and control dimensions, resulting in the low, intermediate and high categories. For the demand and control dimensions, the response options are presented in a Likert-type scale, ranging from "frequently" (4) and "never/almost never" (1). For the dimensions of interest of the present study, it was used the dichotomizing with the cutoff point on the average, after confirming normal distribution, according to the recommendations of the *Job Content Questionnaire User's Guide*<sup>(17)</sup>, yielding low control ( $\leq 17$ ), high control ( $\geq 18$ ), low demand ( $\leq 13$ ) and high demand ( $\geq 14$ ).

To determine the type of job, the answers were distributed in four categories of the *Job Strain Model* proposed by Karasek<sup>(17)</sup>: low strain job (low demand and high control), passive job (low demand and low control), active job (high demand and high control) and high strain job (high demand and low control). Finally, the four types of job were re-grouped to provide the Level of Occupational Stress Exposure, according to its three categories: High (high demand, independent variable), Intermediate (active and passive jobs) and Low (low demand). In this study, it was considered only professionals presenting high levels.

The early stress independent variable was evaluated by the Childhood Trauma Questionnaire (CTQ)<sup>(13)</sup> scale. The brief version of the CTQ, used in this study and consisting of 28 items, has been modified and validated, keeping the same properties of the original version, however, with faster application. The items of the CTQ are answered in a Likert-type scale, which ranges from 1 (never) to 5 (always), with inverted scoring in the items 5, 7, 10, 13, 15, 16, 19, 21, 22, 26 and 28.

This questionnaire was translated and adapted to Portuguese in 2006, by Grassi-Oliveira<sup>(17)</sup>. In the validation study<sup>(18)</sup>, it was performed exploratory and confirmatory factor analyzes regarding the construct validity, pointing out the following subtypes of early stress, whose score ranges from 5 to 25: Emotional Abuse (statements 3, 8, 14, 18 and 25), Physical Abuse (statements 9, 11, 12, 15 and 17) and Sexual Abuse (statements 20, 21, 23, 24 and 27); Physical Negligence (statements 1, 2, 4, 6 and 26) and Emotional Negligence (statements 5, 7, 13, 19 and 28). The statements 10, 16 and 22 correspond to the scale of control of minimization/denial of abuse experience<sup>(13)</sup>.

The scoring of the CTQ is achieved by the sum of points related to each statement of each dimension, totaling five scores in the end. For the individual be rated with early stress in childhood, it is necessary to score in the ratings of *moderate-severe* or *severe-extreme*. The ratings of the CTQ are described in Figure 1<sup>(13)</sup>.

Subtypes	Rating			
	No to minimum	Mild to Moderate	Moderate to Severe	Severe to Extreme
Emotional abuse	5 - 8	9 - 12	13 - 15	$\geq 16$
Physical Abuse	5 - 7	8 - 9	10 - 12	$\geq 13$
Sexual Abuse	5	6 - 7	8 - 12	$\geq 13$
Emotional Negligence	5 - 9	10 - 14	15 - 17	$\geq 18$
Physical Negligence	5 - 7	8 - 9	10 - 12	$\geq 13$

Figure 1 - Ratings of the subtypes of Early Stress according to severity (Adapted from Bernstein et al., 2003)<sup>(13)</sup>

A pilot study was carried out with the first 20 participants. After data analysis, there was no need for changes in the original proposal for the approach of participants or data collection and consequently, the results of this pilot study were included in the study, continuing the collection.

Descriptive analysis of the dependent and independent variables was performed, using the Chi-square test, to assess the relationship among the variables. In this study, the Cronbach's alpha value for internal reliability of the CTQ scale was 0.85 and 0.74 for the JSS.

Multiple regression analysis using Stata 9 and crude analysis of the outcome (depression) with each of the independent variables were performed. Those presenting  $p < 0.20$  were included in the multivariate model according to the *Stepwise Forward* method, when the association between depression and high level of work stress was adjusted for all independent variables. It was maintained in the analysis, those with  $p < 0.20$  or that fitted to the measurements obtained from another dimension.

## Results

It was interviewed 310 nursing technicians and nursing assistants, from July to January 2013, totaling a response rate of 91.7%. The participants were mostly women (76.1%), aged over 40 years, with religious practice (92.5%) and with a partner (58.1%). In relation to working conditions, most of the interviewees work in sectors considered of high complexity (77.9%) and for less than 15 years in the institution.

About 50% were out of work due to illness in the past year. Most respondents reported having at least one chronic disease (76.1%) and 11.3% use tobacco. About a third (37.3%) reported early stress in childhood and 17.4% work under high stress level.

Medical diagnosis of depression was reported by 20%, which was higher among: women (24.5%), aged over 40 years (24.4%), people who do not live with a partner (28.5%), work for more than 15 years in the institution (26.9%), had work leave in the last year (28.4%), have a high level of work stress (35.2%), smokers (37.1%), have at least one chronic disease (26.6%) and have experienced early stress (37.1%). Further details about these data is shown in Table 1.

In the crude analysis, it was investigated the chances of occurrence of depression according to the variables of interest. There was statistical significance among all conditions, except for religious practice ( $p = 0.212$ ) and work complexity level ( $p = 0.237$ ). It is highlighted the relationship between depression and work leave, chronic disease, high level of work stress and early stress ( $p < 0.001$ ). The values observed for the other variables under study are shown in Table 2.

Nursing technicians and nursing assistants with high levels of work stress had prevalence of depression 2.69 times higher when compared to those without work stress in the crude model (Table 3). In the subsequent models, with adjustments for demographic, socioeconomic, work and health conditions, magnitude of the Odds Ratio (OR) decreased. However, prevalence was 2.03 times higher in the group exposed to high levels of work stress ( $p = 0.048$ ).

Table 1 - Sample characteristics and prevalence of depression, according to sociodemographic variables, working conditions and health conditions, among nursing technicians and nursing assistants. Ribeirão Preto, SP, Brazil, 2013

Variable	Sample (%)	Depression Prevalence (%) (95%IC)	P value*
Depression	310	62 (20.0)	-
Gender			< 0.001
Male	74 (23.9)	6.8 (1.1 - 12.6)	
Female	236 (76.1)	24.5 (18.7 - 29.6)	
Age Group (years)			0.002
< 40 years	89 (28.7)	8.9 (2.9 - 15.0)	
≥ 40 years	221 (71.3)	24.4 (18.7 - 30.1)	
Religious Practice			0.212
Yes	284 (92.5)	19.1 (14.4 - 23.6)	
No	23 (7.5)	30.4 (10.1 - 50.8)	
Marital Status			0.002
With partner	180 (58.1)	13.9 (8.8 - 19.0)	
Without partner	130 (41.9)	28.5 (20.6 - 36.3)	

(continue...)

Table 1 - (continuation)

Variable	Sample (%)	Depression Prevalence (%) (95%IC)	P value*
Work Complexity Level			0.237
Intermediate Complexity	64 (22.2)	14.1 (5.3 - 22.8)	
High Complexity	225 (77.9)	22.7 (17.2 - 28.2)	
Time of Employment in the Institution			0.019
< 15 years	195 (62.9)	15.9 (10.7 - 18.1)	
≥ 15 years	115 (37.1)	26.9 (18.7 - 35.2)	
Work Leave (in the year)			< 0.001
No	155 (50.0)	11.6 (6.5 - 16.7)	
Yes	155 (50.0)	28.4 (21.2 - 35.6)	
High Level of Work Stress			0.002
No	256 (82.6)	16.8 (12.2 - 21.4)	
Yes	54 (17.4)	35.2 (22.0 - 48.3)	
Smoke			0.007
No	275 (88.7)	17.8 (13.3 - 19.8)	
Yes	35 (11.3)	37.1 (20.3 - 54.0)	
Presence of Chronic Disease			< 0.001
No	88 (28.4)	3.4 (0.1 - 7.3)	
Yes	222 (71.6)	26.6 (20.7 - 32.4)	
Early Stress			< 0.001
No	213 (68.7)	12.2 (7.8 - 16.6)	
Yes	97 (31.3)	37.1 (27.3 - 46.9)	

\*Chi-square Test

Table 2 - Logistic regression analysis of depression, according to sociodemographic variables, working conditions and health conditions, among nursing technicians and nursing assistants. Ribeirão Preto, SP, Brazil, 2013

Variable	Odds Ratio (95%IC)	P value
Gender		0.002
Male	1	
Female	4.39 (1.69 - 11.42)	
Age Group (years)		0.003
< 40 years	1	
≥ 40 years	3.27 (1.48 - 7.20)	
Religious Practice		0.223
Yes	1	
No	1.86 (0.73 - 4.75)	
Marital Status		0.002
With Partner	1	
Without Partner	2.47 (1.40 - 4.36)	
Work Complexity Level		0.258
Intermediate Complexity	1	
High Complexity	1.79 (0.83 - 3.87)	
Time of Employment		0.02
< 15 yes	1	
≥ 15 yes	1.95 (1.11 - 3.43)	
Work Leave (in the year)		< 0.001
No	1	
Yes	3.02 (1.65 - 5.51)	
High Level of Work Stress		0.003
No	1	
Yes	2.69 (1.41 - 5.14)	

(continue...)

Table 2 - (continuation)

Variable	Odds Ratio (95%IC)	P value
Smoke		0.009
No	1	
Yes	2.72 (1.28 - 5.78)	
Presence of Chronic Disease		< 0.001
No	1	
Yes	10.26 (3.12 - 33.69)	
Early Stress		< 0.001
No	1	
Yes	4.24 (2.37 - 7.59)	

Table 3 - Multiple regression analysis between depression (yes/no) and high level of work stress (yes/no), among nursing technicians and nursing assistants. Ribeirão Preto, SP, Brazil, 2013

Model	Depression (OR)		P value
	No	Yes	
Crude Model*	Reference	2.69	0.003
Model 2†	Reference	2.59	0.005
Model 3‡	Reference	2.17	0.028
Model 4§	Reference	2.08	0.029
Model 5¶	Reference	2.03	0.048

\*Crude Model: Depression + High Stress Level

†Model 2: Crude Model + Gender

‡Model 3: Model 2 + Early Stress

§Model 4: Model 3 + Age Group

¶Model 5: Model 4 + Time of Employment in the Institution

## Discussion

Nursing technicians and nursing assistants who work with high levels of work stress had higher prevalence of depression, even after adjustment of the demographic, socioeconomic and health conditions. The literature points out that, the work performed with high stress levels is harmful to both mental health and physical health of individuals and is associated with several signs and symptoms of illness at work<sup>(18-19)</sup>.

The prevalence of depression, mentioned in this study was 20%, and more expressive in females, aged over 40 years, living without a partner and among smokers, similar to other studies in similar populations<sup>(1-2)</sup>. High level of work stress was present in 17.4% of nursing professionals with technical education level and strongly related to depression.

These findings are consistent with the national and international literature. In a study performed in 2013, with nursing workers in the South of Brazil, the prevalence of high demand job was 21.8% and the prevalence of common mental disorders was 20.6%<sup>(20)</sup>. In a literature review on the occurrence of depression in

nursing workers, the average prevalence was 28.8%<sup>(1)</sup>. Still regarding to jobs with high stress level, another study with nursing professionals in Brazil, the prevalence was 21.2%<sup>(11)</sup>.

Work stress can be defined as individual reactions to the characteristics of the work environment, perceived by the worker, rising from an imbalance between individual technical skills and work requirements<sup>(21)</sup>. This imbalance can lead to psychological and physical suffering for the worker, causing physical disease and mental disorders.

The relationship between depression and work stress is significantly related to working conditions in nursing professionals with technical education level<sup>(1)</sup>. The work performed by these professionals is characterized by the low control of the activities performed, work overload, repetitive tasks, high level of competitiveness and low pay<sup>(10)</sup>. These factors can lead to stress development and, if not solved, they can lead to deterioration of mental health, manifested by depression or other mental disorders<sup>(22-23)</sup>.

The main factors related to depression in nursing workers can be subdivided into internal and external to the work environment. The organization of work is pointed out as the major factor by a literature review carried out in 2007, followed by the social relations at work and working conditions. Socio-demographic characteristics, female gender, age over 59 years and low family income are among the main factors external to the work environment. In addition, individual characteristics, such as skills of problem coping and family support, are also critical in the development of stress and depression<sup>(1)</sup>.

A study performed with nursing professionals of Portugal, pointed out that the main stressful situations are related to decision-making, in which the errors can lead to serious consequences, inflexibility of the hierarchical superiors, work of preparing technical reports, difficulty in dealing with failures and professional problems<sup>(24)</sup>.

As consequence of depression related to work stress, it is mentioned the tension and dissatisfaction at work, factors that can act in a bidirectional fashion, as the stress load on the worker and his co-workers increases. The stress-related depression at work also harms the physical and mental health, absenteeism, quality of care, which could increase the employee turnover in the sectors<sup>(1)</sup>.

The relationship between high levels of work stress and occurrence of depression can be considered bidirectional, as it has consequences such as deterioration of the quality of life, work satisfaction and relationships with co-workers and may cause more stress and worsening of depressive disorders<sup>(24)</sup>.

In addition to factors triggering depression, related to high level of work stress, factors that protect workers from these situations could be mentioned. A study carried out in 2011 pointed out that having support from supervisors, regular meals, physical exercises, better possibilities of use of the skills and greater job satisfaction may decrease the occurrence of work-related stress and depression<sup>(2)</sup>. In addition, more free weekends and less emotional stress also contribute to the improvement of work by decreasing the level of stress and depression<sup>(25)</sup>.

As limitations of this study, it is pointed out that transversal data collection may prevent the establishment of causal and chronological relationship among the events of interest. Longitudinal studies can be developed in further investigations, to establish the cause and effect relationship among the phenomena studied.

It is also worth mentioning the limitations caused by diagnostic and memory biases. In many situations, people may believe to have depression, by presenting similar symptoms to that disclosed by the media, even without a more accurate medical diagnosis. The memory biases are established, once the outcome was measured retrospectively, which can also lead to underestimation of the magnitude of depression.

Despite the limitations presented, the study achieved a high response rate and distribution of the sample similar to other hospital units, with different complexity profiles. The magnitude of the association studied was also very expressive, showing strong inter-relationship between depression and high levels of work stress.

## Conclusion

In the light of the epidemiological situation observed in the studied sample, with strong association between depression and high level of work stress

among nursing workers with technical education level, the design of strategies for prevention and treatment of this population group becomes essential. These issues should be considered when planning specific intervention programs, as well as the need for a better management of cases by the supervisors.

The focus of preventive action should be related to restructuring actions of the working conditions, allowing more free time for leisure activities, expansion of managerial support, greater incentive to the use of the professional skills, better division of workload and greater professional recognition. In addition, the development of specific programs of treatment for healthcare professionals should be encouraged in health institutions, such as better management of the existing cases by the supervisors and favorable working environments.

## References

1. Manetti ML, Marziale MHP. Aspects associated to work-related depression on nursing staff. *Estudos Psicol. (Natal)*. 2007;12:79-85.
2. Gao YQ, Pan BC, Sun W, Wu H, Wang JN, Wang L. Depressive symptoms among Chinese nurses: prevalence and the associated factors. *J Adv Nurs*. 2012 May;68(5):1166-75.
3. World Health Organization. Revised global burden of disease (GBD) 2002 estimates. Geneva: World Health Organization; 2005.
4. Van de Velde S, Bracke P, Levecque K. Gender differences in depression in 23 European countries. Cross-national variation in the gender gap in depression. *Soc Sci Med*. 2010;71(2):305-13.
5. Everson SA, Maty SC, Lynch JW, Kaplan GA. Epidemiologic evidence for the relation between socioeconomic status and depression, obesity, and diabetes. *J Psychosom Res*. 2002 Oct;53(4):891-5.
6. Barros MBdA, César CLG, Carandina L, Torre GD. Social inequalities in the prevalence of chronic diseases in Brazil, PNAD-2003. *Ciênc Saúde Coletiva*. 2006;11:911-26.
7. Boing AF, Melo GR, Boing AC, Moretti-Pires RO, Peres KG, Peres MA. Association between depression and chronic diseases: results from a population-based study. *Rev Saúde Publica*. 2012 Aug;46(4):617-23.
8. Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005 Jun;62(6):617-27.



9. Baba VV, Galperin BL, Lituchy TR. Occupational mental health: a study of work-related depression among nurses in the Caribbean. *Int J Nurs Stud*. 1999 Apr;36(2):163-9.
10. Mark G, Smith AP. Occupational stress, job characteristics, coping, and the mental health of nurses. *Br J Health Psychol*. 2012 Sep;17(3):505-21.
11. Kirchhof ALC, Magnago TSBdS, Camponogara S, Griep RH, Tavares JP, Prestes FC, et al. Working conditions and social-demographic characteristics related to the presence of minor psychic disorders in nursing workers. *Texto Contexto Enferm*. 2009;18:215-23.
12. de Vargas D, Dias AP. Depression prevalence in Intensive Care Unit nursing workers: a study at hospitals in a northwestern city of Sao Paulo State. *Rev. Latino-Am. Enfermagem*. 2011 Sep-Oct;19(5):1114-21.
13. Bernstein DP, Stein JA, Newcomb MD, Walker E, Pogge D, Ahluvalia T, et al. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. *Child Abuse Negl*. 2003 Feb;27(2):169-90.
14. Karasek RA, Theorell T, Schwartz JE, Schnall PL, Pieper CF, Michela JL. Job characteristics in relation to the prevalence of myocardial infarction in the US Health Examination Survey (HES) and the Health and Nutrition Examination Survey (HANES). *Am J Public Health*. 1988 Aug;78(8):910-8.
15. Wehrmeister FC, Menezes AM, Cascaes AM, Martinez-Mesa J, Barros AJ. Time trend of asthma in children and adolescents in Brazil, 1998-2008. *Rev Saúde Publica*. 2012 Apr;46(2):242-50.
16. Alves MGM, Chor D, Faerstein E, Lopes CS, Werneck GL. Versão resumida da "job stress scale": adaptação para o português. *Rev Saúde Publica*. 2004;38(2):164-71.
17. Karasek RA, Theorell T. *Healthy work-stress, productivity, and the reconstruction of working life*. New York (US): Basic Books; 1990.
18. Grassi-Oliveira R, Stein LM, Pezzi JC. Translation and content validation of the Childhood Trauma Questionnaire into Portuguese language. *Rev Saúde Publica*. 2006 Apr;40(2):249-55.
19. Melnyk BM, Hrabie DP, Szalacha LA. Relationships among work stress, job satisfaction, mental health, and healthy lifestyle behaviors in new graduate nurses attending the nurse athlete program: a call to action for nursing leaders. *Nurs Adm Q*. 2013 Oct-Dec;37(4):278-85.
20. Urbanetto Jde S, Magalhaes MC, Maciel VO, Sant'anna VM, Gustavo Ada S, Poli-de-Figueiredo CE, et al. Work-related stress according to the demand-control model and minor psychic disorders in nursing workers. *Rev Esc Enferm USP*. 2013 Oct;47(5):1180-6.
21. Paris L, Omar A. Predictores de satisfacción laboral en médicos y enfermeros. *Estudios Psicol. (Natal)*. 2008;13:233-44.
22. Gherardi-Donato ECdS, Luis MAV, Corradi-Webster CM. A Relação Estresse, Uso de Álcool e Trabalho. In: Rossi AM, Perrewé PL, Meurs JA, editors. *Stress e qualidade de vida no trabalho: stress social - enfrentamento e prevenção*. São Paulo: Atlas; 2011. p. 42-53.
23. Ribeiro RP, Martins JT, Marziale MHP, Robazzi MLdCC. Work-related illness in nursing: an integrative review. *Rev Esc Enferm USP*. 2012;46:495-504.
24. Gomes AR, Cruz JF, Cabanelas S. Occupational stress in health professionals: a study with Portuguese nurses. *Psicol Teoria Pesqui*. 2009;25:307-18.
25. Ruggiero JS. Health, work variables, and job satisfaction among nurses. *J Nurs Adm*. 2005 May;35(5):254-63.

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