

## Occupational Stress and Work Capacity of Nurses of a Hospital Group<sup>1</sup>

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The study aimed to evaluate the relationship between occupational stress and the work capacity index of 368 nurses (82.1% of the population) of a Hospital Group. A questionnaire with socio-occupational questions was used as well as two scales: the Job Stress Scale and the Work Capacity Index. The group of nurses was predominantly female (93.2%), worked in care activities (63.9%), had undertaken at least one Postgraduate course (76%) and were satisfied with the unit where they worked (70.5%). Occupational stress was present in 23.6% of the nurses, of these 15.2% presented High Strain work and 8.4% Passive Work. Social Support exercised a significant positive influence on all groups - exposed or not to occupational stress. Regarding the Work Capacity, this was Moderate (28-36 points) for 51.4% of the nurses and Good (37-43 points) for 47.4%. There was no correlation between stress and work capacity.

Descriptors: Stress, Physiological; Nurses, Male; Occupational Health; Working Conditions; Nursing Research.

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## Estresse laboral e capacidade para o trabalho de enfermeiros de um grupo hospitalar

Este estudo teve como objetivo avaliar a relação entre o estresse laboral e o índice de capacidade para o trabalho, de 368 enfermeiros (82,1% da população) de um grupo hospitalar. Utilizou-se um questionário com questões sócio-ocupacionais e duas escalas: a Job Stress Scale e o índice de capacidade para o trabalho. O grupo de enfermeiros era predominantemente feminino (93,2%), trabalhando em atividades assistenciais (63,9%), possuía pelo menos um curso de pós-graduação (76%) e satisfeito com a unidade onde trabalhava (70,5%). O estresse laboral está presente em 23,6% dos enfermeiros, e, desses, 15,2% apresentam alta exigência no trabalho e 8,4% trabalho passivo. O apoio social exerce influência positiva significativa sobre todos os grupos - expostos e não expostos ao estresse laboral. Quanto à capacidade para o trabalho, essa é moderada (28-36 pontos) para 51,4% dos enfermeiros e boa (37-43 pontos) para 47,4%. Não há correlação entre o estresse e a capacidade para o trabalho.

Descritores: Estresse Fisiológico; Enfermeiros; Saúde do Trabalhador; Condições de Trabalho; Pesquisa em Enfermagem.

## Estrés laboral y capacidad para el trabajo de enfermeros de un grupo hospitalario

Se trata de un estudio con objetivo de evaluar la relación entre el estrés laboral y el índice de capacidad para el trabajo de 368 enfermeros (82,1% de la población) de un Grupo Hospitalario. Se utilizó un cuestionario con cuestiones socio ocupacionales y dos escalas: la Job Stress Scale y el Índice de Capacidad para el Trabajo. El grupo de enfermeros es predominantemente femenino (93,2%), trabaja en actividades asistenciales (63,9%), posee por lo menos un curso de posgraduación (76%) y está satisfecho con la unidad donde trabaja (70,5%). El estrés laboral está presente en 23,6% de los enfermeros, de estos 15,2% presentan Alta Exigencia en el trabajo y 8,4% Trabajo Pasivo. El Apoyo Social ejerce influencia positiva significativa sobre todos los grupos expuestos y no expuestos al estrés laboral. En cuanto a la Capacidad para el Trabajo, está es Moderada (28-36 puntos) para 51,4% de los enfermeros y Buena (37-43 puntos) para 47,4%. No se encontró correlación entre el estrés y la capacidad para el trabajo.

Descriptorios: Estrés Fisiológico; Enfermeros; Salud Laboral; Condiciones de Trabajo; Investigación en Enfermería.

## Introduction

Stress is currently a common term and features in the quotidian of health professionals. Reports from nurses, who feel stressed, are verbalized daily in the reality of a teaching hospital of Porto Alegre, confirming nursing as the fourth most stressful of occupations<sup>(1)</sup>. Furthermore, the increasing occurrence of absences from work for health reasons has caused concern among managers and colleagues, faced with the effects this generates in the work quotidian. From May 2007 until April 2008, according to data provided by the

personnel department of this institution, there were 782 sick leave incidences of nurses. These amounted to 1,087 days of medical certificated absenteeism (leave of up to 15 days) and 676 days of absences over 15 days, where nurses had to contact the National Social Security Institute. At this time the institution had 456 nurses on the staff, who had a mean of 1.71 days of medical certificate absences and 3.86 days of sick leave of over 15 days in the year. The majority of absences were due to problems that could result from stress, such

as immunological, osteomuscular, cardiovascular and gastrointestinal disorders<sup>(2-3)</sup>. When viewing stress as injurious to the health of the nurses in this institution, there is motivation to investigate elements with the potential to trigger stress, in order to obtain subsidies to introduce actions to preserve the work capacity and quality of life<sup>(2)</sup> of these professionals.

An individual is subjected to stress when they need to face demands that they evaluate as greater than their resources, in a way that they cannot produce an effective response<sup>(3)</sup>. In such a situation, the body emits a response to stress, with a significant increase in physiological, cognitive and motor activation. The consequences of this activation depend on the duration and intensity of the stressor event. Thus, when the stress response is frequent and intense, it may adversely impact, with psychosomatic or psychophysiological manifestations. Occupational stress in turn refers to the stimulus of the working environment and aversive responses faced with these stimuli<sup>(3)</sup>. In this state, the person may establish interpersonal relationships permeated by conflict, making the workplace a tensioning scenario of the human, social and hierarchical relationships. The maintenance of the physical and mental health of the person or their illness is related to the interpretation of the outside world and to the resources at their disposal to meet the demands and the stimuli to which they are exposed. The greater the comprehension and control of the pressures and situations that influence the person, the better the produced adaptation and responses will be. However, if the occupational stress predominates, its effect on the individual will be negative, discouraging the conduct of their duties, provoking feelings of loneliness, impotence, and despondency<sup>(2)</sup> and diminishing their work capacity, which is defined as how well the employee is and how capable they can perform their job, according to the requirements, to their health status and to their physical and mental resources<sup>(4)</sup>. Thus, the healthcare services of the worker should have the attention focused on both employee participation in matters relating to their health, as well as on the social, political, and historic determination dynamics, considering that the association of these elements influences the work capacity and the health-sickness process<sup>(4)</sup>. In this perspective, these services should develop promotional and health monitoring activities and stimulate the construction of conduct aimed at the well-being of the individuals and the adoption of a model of healthy living.

Therefore, the health professionals themselves and the institutions should create mechanisms to analyze the

capacity of the workers in the different realities. For this, some instruments have been constructed, among which is the of the Work Capacity Index (WCI), which evaluates the capacity of the worker to perform their work, and can predict the risk of incapacity in the near future<sup>(4)</sup>. Its authors recommend that it is re-applied periodically in order to monitor the evolution of the health of the worker. Therefore, this study was carried out to evaluate the relationship between the occupational stress of nurses working in a Hospital Group and their capacity to perform the work.

## Method

This is a descriptive study with a quantitative approach. The study site was a Hospital Group (HG), located in Porto Alegre, in the State of Rio Grande do Sul, Brazil. The HG, which consists of four hospitals and 12 primary health units (PHU), is an institution for care, teaching and research focused exclusively on the care of patients within the Brazilian National Health System. The HG has 1,490 beds and 7,300 employees, of whom 502 are nurses. The study employed a census sample which included all of the 448 nurses who were performing their usual functions in the HG, in July 2009. Of these 34 (7.6%) did not return the questionnaire, 45 (10.1%) refused to participate in the study and one (0.2%) was excluded due to inadequate filling of the questionnaire. At the end of this data collection the sample was composed of 368 nurses (82.1% of the population). For the data collection a questionnaire consisting of questions to characterize the subjects was used, as well as the Job Stress Scale (JSS) to measure the stress of nurses and the Work Capacity Index (WCI). The JSS is a reduced version of the *Karasek Job Content Questionnaire*, designed in Sweden by Tores Theorell in 1988, containing 17 questions - five to evaluate demand, six for control and six for social support<sup>(5)</sup>.

The Demand-Control model in the study evaluates the work demand (a construct related to stress) and the control of activity (a dimension that evaluates the aspects concerning the use of skills and the decision-making authority regarding the work). The Social Support evaluates the work environment, the kind of support received from the immediate supervisors as well as the colleagues. The model was categorized into four quadrants: Passive Work (low demands and low control); Active Work (high demands and high control), High Strain (high demands and low control) and Low Strain (low demands and high control). The values that do not

fall into low or high are classified in the Intermediate group. Stress arises when individuals face High Strain, i.e. high work demands with reduced control to cope with them. Passive Work can also provoke harmful health problems due to the decline in learning, the gradual loss of previously acquired skills and disinterest in the professionals affected<sup>(6-7)</sup>.

The other scale used was the WCI which evaluates seven aspects: 1) the person's current work capacity compared with the best of their life; 2) the work capacity compared with the work demands; 3) total number of self-perceived diseases diagnosed by the physician; 4) estimated loss of work due to illness; 5) absence from work due to illness; 6) self prognosis of work capacity; and 7) mental resources. The results can vary between a score of seven to 49 points, with a score of seven to 27 classified as the group with Low work capacity, 28 to 36 with Moderate capacity, 37 to 43 Good, and 44 to 49 with Excellent work capacity. The results can be used collectively or individually<sup>(4)</sup>.

Data collection was conducted from March to August 2009, by the researcher through individual invitations to the nurses of the institution, with the delivery of the Terms of Free Prior Informed Consent and of the instrument to their respective workplaces. Data analysis was performed using the software Statistical Package for the Social Sciences. Initially, the internal consistency of the three dimensions of the JSS (Demand, Control and Social Support) and of the WCI were calculated, through the Cronbach's alpha correlation coefficient, which estimates the overall consistency of a scale. Values above 0.70 are generally acceptable<sup>(8)</sup>. Next, the descriptive analysis of the study variables (identification data, JSS scores and WCI points) was performed. To test differences between the groups of the JSS and the WCI the chi-square and Mann-Whitney tests were used<sup>(8)</sup>. A visual analogue scale from zero to 100 was also used, to evaluate the satisfaction with the remuneration of the work.

To test the differences between the scores of the JSS groups, the data of the nurses were organized into two groups: non-stressed (Low Strain and Active Work) and stressed (High Strain and Passive Work). Regarding the WCI data, due to the low percentage of nurses with Low and Excellent work capacity, the data were grouped into two groups - Low/Moderate Capacity and Good/Excellent Capacity - in order to perform the statistical tests. From this allocation, the differences were tested between the distributions of the nurses according to the other variables studied.

The research project was approved by the Research Ethics Committee of the institution under study, under number 247/08, on February 11, 2009. The study complied with the criteria set out in resolution 196/96 of the National Health Council, ensuring the rights and obligations with respect to the scientific community and the study subjects<sup>(9)</sup>.

## Results

Initially the internal consistency of the scales was calculated, using Cronbach's alpha. The *Job Stress Scale* presented 0.72 in the dimension Demand, 0.65 in Control and 0.77 in Social Support; The Work Capacity Index obtained an alpha of 0.77. The characterization of the participants showed the prevalence of females (93.2%), with 64.8% (n=237) married or with a partner. The mean age was 40.7 years (SD 9.4), with the mean time since graduation of 14.6 years (SD 8.9), and the mean time working in the institution of 10.9 years (SD 9.8).

Table 1 - Distribution of nurses according to site of work and occupational characteristics. Porto Alegre, Brazil, 2009

Variables	n	%
Group (n=360)*		
Hospital 1	178	49.4
Hospital 2	58	16.1
Hospital 3	68	18.9
Hospital 4	28	07.8
Primary Health Units	28	07.8
Function in the institution (366)*		
Care	234	63.9
Administrative	35	09.6
Both	97	26.5
Unit of work (n=357)*		
Open (26= PHU and 168= Hospital)	194	54.3
Closed	139	38.9
Mixed	24	06.7
Unit of work (n=316)*		
Adult	168	53.2
Pediatric	63	19.9
Mixed	85	26.9
Work in another institution (368)*		
No	306	83.2

\* The calculation included only the nurses who answered this question.

The nurses that work 36 hours per week were satisfied with the remuneration, which obtained a mean of 69.3 points with an SD of 18.4, on a scale of zero to 100. The majority of the professionals (54.3%) operated in the open units.

Table 2 - Satisfaction of the nurses with the institution and the work. Porto Alegre, Brazil, 2009

Variables	n	%
Number of people in the work scale (362)*		
Sufficient	184	50.8
Daily activities are routine and repetitive (366)*		
Frequently	83	22.7
Sometimes	200	54.6
Rarely	68	18.6
Never or almost never	15	4.1
Received training during the previous year (365)*		
Frequently	131	35.9
Sometimes	153	41.9
Rarely	64	17.5
Never or almost never	17	4.7
Have time for leisure (368)*		
Frequently	155	42.1
Sometimes	174	47.3
Rarely	34	9.2
Never or almost never	05	1.4
Feel satisfied with the site of work (366)*		
Frequently	258	70.5
Sometimes	101	27.6
Rarely	07	1.9
Feel valued in the institution of work (365)*		
Frequently	95	26.0
Sometimes	196	53.7
Rarely	58	15.9
Never or almost never	16	4.4
The organization of the work unit is good (363)*		
Frequently	163	44.9
Sometimes	162	44.6
Rarely	31	8.5
Never or almost never	07	1.9

\* The calculation included only the nurses who answered this question.

Regarding post-graduate courses taken by the nurses of the HG, it was found that 279 (76%) had completed at least one post-graduate course, of which 30% had taken two or more courses. Among the courses, 7.69% were MSc courses and the others *Lato Sensu* in the areas: hospital (24.45%), administration (23.08%), collective health (10.99%), pediatrics (7.69%), education (4.39%), mental health (1.39%) and general specializations (11.26%).

The organization of work units of the HG, despite presenting some variations from one sector to another, was considered satisfactory by 44.9% of the nurses. It is also important to note that 70.5% of these professionals feel satisfied with the site where they work. However, only 26% feel frequently valued in the Institution in which they work, i.e. in the HG.

Table 3 - Distribution of the nurses according to the quadrants of the Karasek's Demand-Control Model. Porto Alegre, Brazil, 2009

Quadrants of Karasek's model	n	%	Social Support		p-value *
			Mean	SD	
Low strain	76	20.7	18.5	2.3	0.000
Active work	159	43.2			
High strain	56	15.2	16.7	3.3	0.000
Passive work	31	08.4			
Intermediates	46	12.5			
Total	368	100			

\* Mann-Whitney nonparametric test to compare groups.

The nurses of the High Strain /Passive Work group, denominated the 'stressed group', perceive less Social Support from their colleagues and managers, compared with the Low Strain/Active Work group, a factor that can increase the stress experienced or be a generator of this.

Table 4 - Distribution of the nurses according to the Work Capacity Index- WCI. Porto Alegre, Brazil, 2009

WCI classification	Scores	n	%
Low	07-27	02	0.6
Moderate	28-36	186	51.4
Good	37-43	172	47.4
Excellent	44-49	02	0.6
Total		362	100.0

Among the nurses of the PHUs, 70.4% present a Low/Moderate work capacity, 59.4% work in open units and 57.9% work with adult patients. Despite the prevalence of nurses with physician diagnosed diseases (66.3%), only lesions on the arms and hands showed statistical differences between the Low/Moderate and Good/Excellent work capacity groups ( $p < 0.05$ ).

High Strain /Passive Work (stressed) and Active Work/Low Strain (non-stressed) groups presented no statistical differences with the WCI scores Low/Moderate and Good/Excellent work capacity ( $p < 0.548$ ).

In summary, Table 5 shows the work and personal variables that present statistical differences with the groups of the JSS, High Strain/Passive Work and Low Strain/Active Work, and the WCI, Low/Moderate Capacity and Good/Excellent Capacity. The work site classified as an adult or pediatric unit was the only one that showed a difference in both scales.

Table 5 - Variables that presented statistical differences in the analysis of the JSS and WCI. Porto Alegre, Brazil, 2009

Variables	p-value*	
	JSS	WCI
Hospital (1,2,3,4)	0.462	0.027
Post-Graduation (yes, no)	0.005	0.093
Marital status (with and without a partner/spouse)	0.011	0.638
Function in the institution (care or management)	0.013	0.088
Unit of work (open or closed)	0.358	0.015
Unit of work (adult or pediatric)	0.037	0.024
Daily activities are routine and repetitive (yes, no)	0.003	0.763
Received training during the previous year (yes, no)	0.023	0.412
Feel satisfied with the site of work (yes, no)	0.000	0.325
Feel valued in the institution of work (yes, no)	0.007	0.067
Social support (yes, no)	0.000	0.076

p-value obtained by chi-square test of independence (<0.05). \* Mann-Whitney nonparametric test to compare groups.

## Discussion

In analyzing the internal consistency of the scales used in this investigation, the Cronbach's Alpha values of the two are similar to those found in studies with other samples<sup>(5,10-11)</sup> and ensure the internal consistency and reliability of these instruments for the study sample<sup>(8)</sup>.

The professional qualification of the sample, in which 76% of the nurses had post-graduate qualifications, was high compared with other studies with nurses (72.72%<sup>(11)</sup>, 50.8%<sup>(12)</sup> e 70.8%<sup>(13)</sup>). However, the other characteristics were similar to those reported in other surveys conducted in public institutions<sup>(1,13-14)</sup>, i.e. showing age and length of service higher than in private institutions<sup>(15-16)</sup>. The 69.3 point measurement of satisfaction with the remuneration was higher than the data from another study<sup>(13)</sup> which showed this as low and a source of stress. It is inferred that these differences arise from the employment stability provided by the public position and the guaranteed salary, which ratify and encourage the nurses to maintain an employment contract for so many years (mean 10.9, SD 9.8 years).

Regarding the organization of the work units of the HG, this was considered satisfactory by the nurses and 70.5% felt satisfied with the site where they work, evidencing good management of the different work sites and the importance of the proper allocation of the professionals in the work positions. However, only 26% felt valued in the institution, a feeling that may be associated with the work environment and the interpersonal relationships<sup>(13)</sup>.

The lack of value of the nurses of the sample can be attributed to their lack of participation in the decision-making process of the institution, where positions are indicated by the managers, under the influence of the Ministry of Health. Due to this system, the management of the Hospital Group generally changes with every political mandate disrupting the continuity of some actions. These systematic alterations make long-term projects unviable and sometimes disrupt productive actions, leading to the demotivation of the workers.

Concerning the work, 15.2% of the nurses were considered to have many demands and a low level of control, i.e. with High Strain. Adding this percentage to the 8.4% with Passive Work (low demands and low control), it can be verified that 23.6% may be vulnerable to work stress<sup>(6)</sup> and to present loss of skills or disinterest. Although these percentages are similar to the national literature<sup>(11,17)</sup>, the mean of Social Support perceived by the High Strain and Passive Work groups is lower than that of the Low Strain and Active Work groups ( $p < 0.05$ ), which can potentialize the stress experienced. Therefore, Social Support can be visualized as an action to be used, in order to prevent and/or reduce work stress.

Regarding the site/unit of work in the HG, there was no difference between the scores of the groups who worked in the open or closed units, which differs from several publications that emphasize the stress in closed or specialized units<sup>(1,11-12,16,18-20)</sup>. However, the nurses working in units with adult patients, performing routine and repetitive activities and who did not do any training in the previous year, were more stressed than the others ( $p < 0.05$ ). Also, among the nurses without post-graduate qualifications and those who were married, higher percentages of stress ( $p < 0.05$ ) were found, which leads to the inference that the search for knowledge, prepares the individual to face difficulties at work, relieving the stress, which differs from another study<sup>(13)</sup>, in which the support of the spouse or partner relieved the stress.

Similar to another study<sup>(21)</sup>, there was a higher proportion of nurses in the categories Low Strain and Active Work (77.1%) developing administrative activities, compared with the care activities group, showing that to assist the patient gives less control of the activity which may be due to fluctuations in the health status and the different demands of this individual, which increases the work demands for these professionals. However, the perception of stress in the work did not affect the measures of the WCI of these nurses ( $p < 0.548$ ) because there was no association between these two scales. This finding may be related to the different constructs that

evaluate (demand and control in the work versus the perceived capacity to perform the work).

Regarding the work capacity, the data show a higher frequency (52%) of scores classified as Moderate or Low, a prevalence higher than in other studies, which indicates the need for measures to restore and promote the working competence of these professionals. The first of two studies of nursing teams<sup>(15,22)</sup>, with 387 and 269 workers respectively, identified that 83.2% of the employees presented Good work capacity and the second identified that 51.7% presented Good work capacity and 20.1% Excellent. In an international study, 32.0% of the subjects reported Moderate capacity<sup>(23)</sup>.

Although age is considered an important factor in determining the work capacity<sup>(4,10,24-25)</sup>, in the present investigation there was no difference ( $p < 0.54$ ) between the proportion of nurses in the different age groups nor between the genders ( $p < 0.14$ ), unlike the study of nursing staff that highlights, as well as age, that the lowest scores on the WCI were associated with the female gender<sup>(22)</sup> and the study that validated the scale<sup>(4)</sup>, which found differences between the scores of the age groups 50, 55 and 58 years, which was did not occur in this study that approached younger individuals (mean age 40.7 years, SD 9.4).

It is also worth noting, the significant difference between the scores of the nurses of open and closed units ( $p < 0.015$ ) and adult and pediatric units ( $p < 0.024$ ), with the open units having a significant percentage of nurses with Low/Moderate WCI (59.4%) and the pediatric unit nurses with Good/Excellent WCI (60.3%) Among the open units were nurses from the PHUs, among whom 70.4% were classified in the group with Low/Moderate WCI. These data lead to the consideration that, as identified in another study<sup>(2)</sup>, these professionals require actions that encourage the promotion of the work capacity, stimulating them to develop clinical and managerial skills. Conversely, in the analysis of the scores of the nurses of Hospital 2 (63.8% between Good/Excellent), the opposite was observed. The nursing leadership of the hospital is structured and articulated differently to the other units of the Group, which may have influenced the work capacity scores of the nurses.

Through the findings of this investigation, with a large number of professionals with Low and Moderate work capacity (52%) and occupational stress (23.6%), it appears that these data may be associated with the physical workload, which increases when the professional autonomy decreases, leading to the appearance of suffering in the work.

## Conclusions

The results of this study highlight the need to restore the state of physical and psychological health of the nurses who work primarily in care activities, in open units, and with adult patients. The strategies outlined are aimed at the valorization of the workers and the investment in ongoing education in health, which may have a protective role in the health of the worker, acting against stressors in the work quotidian, at the same time as providing autonomy to the nursing staff.

Another point to be considered is the Social Support, which may constitute a pillar of the occupational conjuncture and a strategy of social organization in the institutions, in order to prevent and/or to reduce occupational stress, since the valorization of the working relationships, as well as the environment, promotes health benefits for the workers. Thus, proactive attitudes in their roles, the search for the construction of scientific knowledge and recognition, the struggle for better working conditions, and the corporate articulation of the professional category, are elements that can construct the Social Support and strengthen the nurses.

Finally, the aspects considered in the present study are elements that can contribute to the conception and development of measures aimed at preserving the work capacity, prioritizing the monitoring and control of occupational stress with emphasis on the psychosocial work relationships, thus, improving the promotion, the protection and the restoration of the health of the workers

Considering the cross-sectional design of this research, success was obtained with the return of the questionnaires (82.1%), however, certain difficulties were found to compare it with the literature and to respond to some concerns. Thus, longitudinal studies would be adequate to provide continuity to the evaluation of these variables and to establish causal relationships.

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