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# Psychosocial aspect of nursing personnel's work environment according to the demand-control model

*Aspecto psicossocial do ambiente de trabalho de profissionais de enfermagem segundo o modelo demanda-controle*

*Aspecto psicosocial del ambiente de trabajo del personal de enfermería según el modelo demanda control*

*Lucas Carvalho Santana*[I]; *Lúcia Aparecia Ferreira*[I]; *Marli Aparecida Reis Coimbra*[I]; *Marina Pereira Rezende*[I]; *Cíntia Machado Dutra*[I]

[I]*Universidade Federal do Triângulo Mineiro, Uberaba, MG, Brazil*

**ABSTRACT**

**Objective:** to evaluate the psychosocial aspect of the work environment of nursing personnel at a university hospital. **Method:** in this exploratory, quantitative, cross-sectional study of 124 nursing professionals at a university hospital in Minas Gerais state, data were collected between July and September 2018. The Job Stress Scale (JSS) was used. The study was approved by the research ethics committee of the Universidade Federal do Triângulo Mineiro. **Results:** participants were allocated to quadrants of the Demand-Control model, and the following prevalences were identified: 30.6% in high-stress situations; 28.2% in low-stress; 21.8% in active work; and 19.4% in passive work. **Conclusion:** assessment of the psychosocial aspect of the work environment found higher rates of individuals in high-stress jobs among nursing personnel on the wards (41.9%) and in the surgical sector (33.3%).

**Descriptors:** Nurse Practitioners; Working Environment; Occupational Stress; Occupational health.

**RESUMO**

**Objetivo:** avaliar o aspecto psicossocial do ambiente de trabalho de profissionais de enfermagem de um hospital universitário. **Método:** estudo transversal, exploratório e quantitativo realizado com 124 profissionais de enfermagem de um hospital universitário do interior de Minas Gerais, A coleta de dados foi realizada entre os meses de julho e setembro de 2018 e utilizou-se a *Job Stress Scale* (JSS). O presente estudo foi aprovado pelo CEP/UFTM. **Resultados:** os profissionais foram alocados nos quadrantes do modelo Demanda-Controle e identificou-se a seguinte prevalência: 30,6% na situação de alta exigência; 28,2% na de baixa exigência; 21,8% de trabalho ativo e 19,4% na situação de trabalho passivo. **Conclusão:** a avaliação do aspecto psicossocial do ambiente de trabalho evidenciou maiores taxas de indivíduos em situação de trabalho de alta exigência entre profissionais de enfermagem atuantes nas enfermarias (41,9%) e no setor de bloco cirúrgico (33,3%).

**Descritores:** Profissionais de Enfermagem; Ambiente de Trabalho; Estresse Ocupacional; Saúde do trabalhador.

**RESUMEN**

**Objetivo**: evaluar el aspecto psicosocial del entorno laboral del personal de enfermería de un hospital universitario. **Método:** en este estudio exploratorio, cuantitativo y transversal de 124 profesionales de enfermería de un hospital universitario del estado de Minas Gerais, se recolectaron datos entre julio y septiembre de 2018. Se utilizó la Job Stress Scale (JSS). El estudio fue aprobado por el comité de ética en investigación de la Universidade Federal do Triângulo Mineiro. **Resultados:** los participantes fueron asignados a cuadrantes del modelo Demanda-Control, y se identificaron las siguientes prevalencias: 30,6% en situaciones de alto estrés; 28,2% en bajo estrés; 21,8% en trabajo activo; y el 19,4% en trabajo pasivo. **Conclusión:** la evaluación del aspecto psicosocial del ambiente de trabajo encontró tasas más altas de individuos en trabajos de alto estrés entre el personal de enfermería en las salas (41,9%) y en el sector quirúrgico (33,3%).

**Descriptores:** Enfermeras Practicantes; Ambiente de Trabajo; Estrés Laboral; Salud laboral.

## INTRODUCTION

Studies in the field of occupational health have highlighted the lack of neutral relations between work and the health/disease process, which reinforces the concept that every productive activity has the potential to promote health or produce disease, depending on how the organization and the work process elements are configured, and the way they are articulated with the worker's subjective characteristics[1,2].

The work environment has occupational aspects which cause risks, integrate the work process and relate to the work elements, which can produce psychological overload in individuals and are capable of generating suffering and illness. Psychosocial aspects can be mentioned among these, as they are complex and involve characteristics related to the individual (personality), the work environment (demands and control over the task) and the social environment (cultural factors)[3,4].

Corresponding author: Lucas Carvalho Santana. E-mail: lucas_enfer@hotmail.com.
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Some authors have highlighted the importance of the Demand-Control Model in investigating the psychosocial work environment and the effects of occupational stress on health, addressing its diverse repercussions. The main prediction of this model is that the work performed in a situation of high demand represents a health risk, thereby leading to workers' physical and mental illness[4-7]. The referenced model is accepted internationally by the academic community and widely used in scientific research related to the theme[6,8-11].

Psychosocial factors have been related to the onset of cardiovascular diseases, musculoskeletal disorders, changes in mental health, and possibly lead to decreased work ability[4,12,13]. Furthermore, it has repercussions on the worker's life, directly affecting health and quality of life, with consequences of absenteeism, low performance, high turnover, and violence in the workplace[1,14,15].

Conducting studies in the occupational health area of nursing professionals, especially analyzing the psychosocial work environment is important due to the nature of the activities that these professionals perform, since the quality and effectiveness of their work can have a decisive impact on patients' health. In addition, nursing professionals are continually exposed to pressure situations, work overload and poor working conditions.

Given the context, the objective of this article is to assess the psychosocial aspect of the work environment of nursing professionals at a university hospital.

## THEORETICAL REFERENCE

The Demand-Control Model was proposed by Robert Karasek in the late 1970s and relates two psychosocial aspects in the workplace to the risk of illness: psychological demand and worker control over work[6,16].

Psychological demand is related to the psychological demands that the worker faces to carry out their work activities. The worker's control over work is related to two aspects: the use of skills (the degree to which work involves learning, repetition and creativity) and autonomy in the work process (ability to make decisions at work and influence management policy)[17,18].

The psychosocial work environment is evaluated based on the combination of high and low levels of the demand and control dimensions, establishing four specific work situations which suggest different risks to workers' health: high demands, active work, passive work and low demands[6, 7].

A highly demanding situation (high demand and low control) is one which presents adverse reactions of greater psychological distress; active work (high psychological demand and high control) enables the professional to have a wide possibility of deciding how and when to develop their tasks, as well as using their intellectual potential for this purpose; passive work (low psychological demand and low control) produces a gradual atrophy of learning skills; and a situation of low demand (combining low demand and high control) is configured in a highly comfortable and ideal state of work[7].

Insertion of a third dimension was subsequently proposed by Johnson in considering that social support would act as an important moderator of the impact of demand, configuring as a relevant protection system for workers against pressures in the work environment. Thus, social support at work was incorporated as a third element for analysis of the Demand-Control Model[4].

Social support at work refers to the social interaction existing in the work environment between colleagues and managers for cooperation in performing work activities. It plays an important role in reducing wear on workers and health risks[16,19].

According to the assumptions of this model, occupational stress results from the interaction between high psychological demands and less control in the work production process, in addition to less social support received from colleagues and bosses. This condition can have harmful consequences for the worker's physical or mental health[18].

It can also be said that the imbalance between psychological demand and control over the production process results in wear and tear and a loss of skills and interest, thereby affecting worker health[20].

## METHOD

This is a cross-sectional, descriptive and exploratory study with a quantitative focus conducted in a university hospital in the interior of Minas Gerais between the months of July and September 2018. The methodological steps of the study were guided by the STROBE tool.

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The study population is composed of 746 professionals from the nursing team (nurses, nursing technicians and nursing assistants) from the various sectors of the institution. The inclusion criteria were: professionals working at the hospital and who were not away from their work activities during the data collection period.

The sample size calculation considered an exposure prevalence to occupational stress of 56.5% according to a study performed in a university hospital in the southeastern region of Brazil[21]. Thus, a sample of 124 professionals was subsequently obtained when considering the prevalence of 56.5%, an accuracy of 8% and a 95% confidence interval for a finite population of 746 professionals.

The sample was randomly selected using the IBM® SPSS® version 21 software program using a nominal list of the nursing staff provided by the institution's nursing management. The professionals were invited to participate in the study, and those who accepted received the data collection instruments in the sector and working hours so that they could respond in a timely manner. The completed instruments were collected by the researchers two days after delivery.

An instrument for sociodemographic and professional characterization and the Portuguese version of the Job Stress Scale (JSS) were used for effective data collection. It is a scale that was originally developed in Sweden (Job Content Questionnaire) and called the Job Stress Scale, short version after cultural adaptation to Portuguese and validation. This questionnaire was used because it is an internationally recognized scale for assessing occupational stress and psychosocial aspects of work based on the theoretical Demand-Control Model, in addition to being adapted and validated for Portuguese[6,16]. It is worth mentioning that the authors were granted authorization to use the scale in this study.

The JSS is a Likert-type scale composed of 17 items which are distributed in three dimensions as follows: five items assess Demand, six assess Control and six the Social Support dimension. Each item on the scale has four alternative answers with scores ranging from one to four. Thus, the Demand dimension has a maximum score of 2, and the Control and Social Support dimensions have a maximum score of 24. The higher the score for each dimension of the scale, the greater the perceived demand, control or social support[16].

The recommendation of the researchers who validated the JSS was followed to identify the high and low demand groups and the high and low control group, and the medians of the said dimensions were used as the cut-off point. Thus, professionals who had scores equal to or greater than the median were included in the group with high demand, control or social support; and those with scores below the median were allocated to the group with low demand, control or social support.

The data were processed using the IBM® SPSS® version 21 software program. Descriptive statistics were calculated using the summary measures of position (mean and median) and of variability (amplitudes). We also employed a bivariate analysis through association measures with contingency tables (relative risk, odds ratio and respective confidence intervals), in addition to applying the Pearson's chi-squared test for independent groups for dichotomous demographic and occupational predictors. This study considered a significance level of 5% ($p<0.05$).

The research followed the rules established by the current legislation that governs the conduct of research with human beings, and was approved by the Research Ethics Committee of the Federal University of Triângulo Mineiro (CEP/UFTM) through the opinion no. 2,635,368. The study participants consented to participate in the study by signing an informed consent form, being previously advised by the researcher about the research objectives and clarified that they would not be subject to risks or losses, and that they could give up participating in the study at any time.

## RESULTS AND DISCUSSION

The sample consisted of 124 nursing professionals, as shown in Table 1.

A majority of female professionals was observed (87.9%). This data is corroborated by several studies carried out with this population of professionals, showing that the Brazilian nursing team is structurally and historically female[22-25].

Regarding sociodemographic data, it should also be noted that the studied nursing team is composed of young individuals (76.6% are up to 45 years old), a fact confirmed in the Brazilian Nursing Profile survey in which 74.9% of nursing professionals were found in the age group of up to 45 years[25].

The sample was analyzed according to the three dimensions proposed by the scale used: demand, control and social support. The median of the total score of each dimension was used as the cut-off point to perform the bivariate statistical analysis.

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**TABLE 1**: Sociodemographic and professional characterization of the sample (n=124). Uberaba, Minas Gerais, Brazil, 2018.

| Variables | n | % |
|---|---|---|
| **Gender** | | |
| Male | 15 | 12.1 |
| Female | 109 | 87.9 |
| **Age** | | |
| Up to 30 years | 14 | 11.3 |
| 31 to 45 years | 81 | 65.3 |
| 46 to 60 years | 25 | 20.2 |
| Over 60 years | 4 | 3.2 |
| **Marital status** | | |
| Single | 38 | 30.6 |
| Married or in a stable union | 66 | 53.2 |
| Widowed | 1 | 0.8 |
| Divorced | 19 | 15.3 |
| **Have children?** | | |
| Yes | 90 | 72.6 |
| No | 34 | 26.8 |
| **Position held** | | |
| Nursing assistants | 15 | 12.1 |
| Nursing technicians | 85 | 68.5 |
| Nurses | 24 | 19.4 |
| **Education level** | | |
| High school | 46 | 37.1 |
| Post-secondary | 38 | 30.6 |
| Post-graduation | 40 | 32.3 |
| **Time since graduating** | | |
| Up to 5 years | 6 | 4.8 |
| 6 to 10 years | 41 | 33.1 |
| 11 to 15 years | 30 | 24.2 |
| 16 to 20 years | 25 | 20.2 |
| Over 21 years | 22 | 17.7 |
| **Weekly working hours** | | |
| 36 hours | 90 | 72.6 |
| 40 hours | 34 | 27.4 |
| **Work shift** | | |
| Day | 63 | 50.8 |
| Night | 61 | 49.2 |
| **Time employed in the institution** | | |
| Up to 5 years | 63 | 51.2 |
| 6 to 10 years | 16 | 13.0 |
| 11 to 15 years | 16 | 13.0 |
| 16 to 20 years | 13 | 10.6 |
| Over 21 years | 15 | 12.2 |
| **Salary received*** | | |
| Up to 2 salaries | 10 | 8.2 |
| 2 to 5 salaries | 79 | 64.7 |
| 5 to 10 salaries | 31 | 25.4 |
| More than 10 salaries | 2 | 1.6 |
| **Other employment** | | |
| Yes | 15 | 12.2 |
| No | 108 | 87.8 |

Source: Research data, 2018.
*Minimum salary in force during the data collection period.

The median found for the demand dimension in this analysis was 16, while 16.5 was found for control, and 18 for social support. Considerably varied values are found in. the literature given that the cut-off point for the dimensions depends on intrinsic characteristics of the studied sample. In a similar study carried out in two public hospitals in the northern region of Brazil, median data of 14 was found for the demand dimension, 17 for control and 19 for social

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support[12]. Research conducted in the state of Rio de Janeiro identified a median of 10 for the demand dimension, 12 for control and 11 for social support[26].

It is important to mention that the nursing professionals at the institution of the present study had a lower control/demand ratio when comparing to the aforementioned studies, which implies less autonomy for decision-making and greater psychological distress. Such a situation can contribute to compromise the worker's income, with low autonomy and few learning opportunities, which can result in demotivation and low self-esteem, and contribute to harmful repercussions on the workers' health[12].

Regarding the distribution of the JSS dimensions according to the education level of the position held, the members of the nursing team who occupy a higher level position presented greater psychological demand in relation to those of a medium level position (p = 0.01). However, there was no statistically significant difference between the levels of positions held for the control and social support dimensions.

The perception of greater psychological demand by professionals in higher education positions was also observed in a study carried out with nursing professionals at a university hospital in the central-west region of Brazil[27] and in two public hospitals in northern Brazil[12].

A possible explanation for this occurrence is the way in which the nursing service is organized in Brazil. The nurse is responsible for coordinating the team, managing the stocking sector, prescribing, evaluating and executing highly complex activities; and nursing technicians have their actions focused on the performance of activities prescribed and coordinated by nurses[12]. Higher education professionals absorb stressors when performing such activities related to an inadequate staffing of professionals, lack of materials and work overload, among others, generating greater psychological demand in relation to nursing technicians.

Some authors believe that the perception of high psychological demand by nurses is inherent to the profession, as nursing "deals with sick human beings 24 hours a day who need care to maintain life and meet their basic human needs"[27].

The professionals were allocated into four quadrants by dichotomizing the JSS dimensions according to the recommendations of the Demand-Control Model: highly demanding work (combination of high demand and low control); active work (combination of high demand and high control); passive work (combination of low demand and low control); and work with low demand (combination of low demand and high control), as shown in Table 2.

**TABLE 2:** Distribution of professionals in the quadrants of the Demand-Control Model (n = 123). Uberaba, Minas Gerais, Brazil, 2018.

| Situation | n | % |
|---|---|---|
| High demand | 38 | 30.6 |
| Active work | 27 | 21.8 |
| Passive work | 24 | 19.4 |
| Low demand | 35 | 28.2 |

Source: Research data, 2018.

The most prevalent situation in the study was highly demanding (30.6%). It is the most harmful situation to the organism, as it is related to the appearance of physical and mental illnesses. Persistence in this work situation can trigger several effects to professionals' health: cardiovascular disease and hypertension; mental health, especially depression and anxiety; and the immune system[4].

There is no unanimity regarding the results found in the scientific community regarding the allocation of professionals in the quadrants of the Demand-Control Model. The prevalence ranges between 20.8% and 30.8% for the group of high demands at work; between 18.9% and 27.9% for the low demand group; 7.6% and 32.1% for the active work quadrant; and between 19.2% and 44.3% for the passive work group[12,22,26,28]. Despite the variations found, the results obtained in this study are similar to those available in the literature.

As shown in Table 3, there was statistical significance in allocating professionals into the Demand-Control Model quadrants according to the activity sector (p = 0.02). Professionals in the wards and operating room had higher rates of individuals in highly demanding work, reaching 41.9% and 33.3%, respectively; the highest rate in

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the emergency room was of professionals who perform active work (50.0%); passive work and low demand quadrants had the same prevalence in the sterilized material center (37.5%); and the highest rate in the ICU was low-demand work (44.4%).

**TABLE 3:** Distribution of professionals in the Demand-Control Model quadrants according to the sector in which they operate (n = 123). Uberaba, Minas Gerais, Brazil, 2018.

| Work sector | Demand-Control Model quadrants | | | | | | | | p |
|---|---|---|---|---|---|---|---|---|---|
| | High demand | | Active work | | Passive work | | Low demand | | |
| | n | % | n | % | n | % | n | % | |
| Wards | 18 | 41.9 | 8 | 18.6 | 8 | 18.6 | 9 | 20.9 | |
| ICU | 9 | 25.0 | 4 | 11.1 | 7 | 19.4 | 16 | 44.4 | |
| Operating room | 6 | 33.3 | 5 | 27.8 | 5 | 27.8 | 2 | 11.1 | 0.02 |
| Emergency room | 4 | 22.2 | 9 | 50.0 | 0 | 0.0 | 5 | 27.8 | |
| Sterilized Material Center | 1 | 12.5 | 1 | 12.5 | 3 | 37.5 | 3 | 37.5 | |

Source: Research data, 2018.
p: Significance level (p<0.05)

Data from a study carried out in northern Brazil corroborate these findings, in which the majority of professionals in the operating room are allocated to the highly demanding group; and most professionals from the ICU and the sterilized materials center perceive low demands at work[12].

The situation of high demand in the operating room can be explained by the fact that cases of urgency/emergency are recurrent in the institution under study, and professionals have to perform their actions quickly and accurately. In addition to this there is also inadequate staffing and work overload. The presence of a greater number of ICU professionals and central sterilized materials in the low-demand group can be justified by the fact that such professionals have high control in their developed activities and due to the predictability of their tasks to be performed.

## CONCLUSION

Given the above, and according to the evaluation of the psychosocial aspect of the work environment, a greater psychological demand was perceived in the professionals who hold a higher education position in relation to the professionals in the secondary education (p = 0.01); moreover, higher rates of individuals in highly demanding work situations were identified among professionals working in the wards and operating room, reaching 41.9% and 33.3%, respectively (p = 0.02).

The evidence indicates the need to develop actions aimed at the psychosocial care of nursing professionals, especially those with higher education and working in the ward and operating room sectors in order to prevent illness and absence from work.

The need to reinforce social support at work on the part of colleagues and managers is emphasized considering that this aspect is considered a protector and can act in order to minimize the negative effects arising from exposure to stressors.

It is worth adding that this study has limitations which must be considered when interpreting the results. Generalizing the findings is limited since data collection was restricted to a single hospital. Another issue concerns the cross-sectional design of the study in which causality is limited. Therefore, the importance of carrying out longitudinal studies is emphasized in order to analyze the influence of the risk factors presented herein.

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