Original Article

Analysis of work capacity and stress among nursing professionals with musculoskeletal disorders

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Análise da capacidade no trabalho e estresse entre profissionais de enfermagem com distúrbios osteomusculares

Análisis de la capacidad de trabajo y estrés entre profesionales de enfermería con trastornos musculoesqueléticos

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ABSTRACT

Objective: To characterize the sociodemographic aspects, work capacity and stress of nursing workers affected by musculoskeletal disorders and to analyze the association between musculoskeletal comorbidities, capacity, stress and social support.

Methods: Cross-sectional study, conducted in two hospitals in Manaus. The Work Capacity Index and the Job Stress Scale were used, translated and validated in nursing workers for more than one year, with musculoskeletal pain in the last three months, with a minimum duration of two hours.

Results: The study had a majority of women and technicians, aged 42 ± 10.7 years, with moderate capacity (34.7 ± 5.11) associated with musculoskeletal comorbidities. The stress affected 56% and the capacity correlated weak and inverse to stress and direct to the social support.

Conclusions: There was a predominance of women and technicians, and musculoskeletal pain was associated with a decrease in capacity. Social support was associated with increased capacity and decreased stress.

Keywords: Worker´s health. Musculoskeletal pain. Musculoskeletal diseases. Nursing team.

RESUMO

Objetivo: Caracterizar os aspectos sociodemográficos, capacidade no trabalho e o estresse dos trabalhadores de enfermagem acometidos por distúrbios osteomusculares e analisar a associação entre comorbidades osteomusculares, capacidade, estresse e o apoio social.

Métodos: Estudo transversal, realizado em dois hospitais de Manaus. Utilizou-se o Índice de Capacidade para o Trabalho e o Job Stress Scale, traduzidos e validados, em trabalhadores há mais de um ano na enfermagem, com dor osteomuscular nos últimos três meses, de duração mínima de duas horas.

Resultados: O estudo apresentou maioria de mulheres e técnicos, com idade de 42 ± 10,7 anos, sendo a capacidade moderada (34,7 ± 5,11) associada às comorbidades osteomusculares. O estresse acometeu 56% e a capacidade correlacionou-se fraca e inversa ao estresse e direta ao apoio social.

Conclusões: Houve predomínio de mulheres e técnicos, sendo que as dores osteomusculares foram associadas a uma diminuição da capacidade. O apoio social associou-se ao aumento da capacidade e diminuição do estresse.

Palavras-chave: Saúde do trabalhador. Dor musculoesquelética. Doenças musculoesqueléticas. Equipe de enfermagem.

RESUMEN

Objectivo: Caracterizar los aspectos sociodemográficos, capacidad en el trabajo y el estrés de los trabajadores de enfermería acometidos por trastornos musculoesqueléticos y analizar la asociación entre comorbilidades musculoesqueléticas, capacidad, estrés y apoyo social.

Métodos: Estudio transversal, realizado en dos hospitales de Manaus. Se utilizó el Índice de Capacidad para el Trabajo y el Job Stress Scale, traducidos y validados, en trabajadores desde hace más de un año en la enfermería, con dolor musculoesquelético en los últimos tres meses, de una duración mínima de dos horas.

Resultados: El estudio presentó la mayoría de mujeres y técnicos, con edad de 42 ± 10,7 años, siendo la capacidad moderada (34,7 ± 5,11) asociada a las comorbilidades musculoesqueléticas. El estrés acomete 56% y la capacidad se correlacionó débil e inversamente al estrés y directa al apoyo social.

Conclusiones: Predominio de mujeres y técnicos, siendo que los dolores musculoesqueléticos se asociaron a una disminución de la capacidad. El apoyo social se asoció al aumento de la capacidad y disminución del estrés.

Palabras clave: Salud laboral. Dolor musculoesquelético. Enfermedades musculoesqueléticas. Equipo de enfermería.

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INTRODUCTION

The nursing work is associated with several risks, with emphasis on ergonomic and psychosocial factors, which negatively interfere with workers' health and productivity. In this sense, the routine of the nursing professional with movement of loads, execution of repetitive movements and the organization of work; accompanied by high demands of work, adoption of inadequate body postures, low control of activities and social support, have contributed to the onset of musculoskeletal disorders[1-2].

One of the main repercussions of musculoskeletal disorders is related to the leave of absence of nursing professionals from their work activities, associated with a decrease in work capacity or disability[3]. Thus, it is important to understand these associations in order to give subsidies to interventions in the nursing work field, in order to prevent musculoskeletal disorders, their repercussions and to enable the promotion of health of the workers involved.

According to the scientific literature, psychosocial factors have been related to the occurrence of musculoskeletal disorders and, possibly, decreased capacity to work[1,4]. Among the theoretical references that support the studies on this subject, Karasek's demand-control model stands out[5]. According to this model, the psychological exhaustion, which can be characterized by the relationships between the demands of work and the degree of freedom available to the worker for decision-making, can contribute to the onset of musculoskeletal disorders. In this sense, the greater the demand for work and the less control of the worker over his/her decisions, the greater the possibility of psychological exhaustion, which may increase the probability of becoming ill[5].

As a possible mitigating element of the relationship between demand and control, there is the social support, which comprises all the useful social interactions available in the workplace, such as the relations between co-workers or managers[5].

The understanding of the factors that are associated with musculoskeletal disorders in nursing professionals depends on epidemiological indicators from different national and international regions, so that convergences can be found and intervention actions programmed. However, it is possible to observe that there is a shortage of evidences from nursing professionals in the northern region of Brazil.

Thus, it is expected to answer the following research question: Do nursing workers with musculoskeletal pain associated with comorbidities of musculoskeletal disorders present work capacity, stress levels and social support different from those without comorbidities? Therefore, in view of what has been exposed, this study aimed at characterizing the sociodemographic aspects, work capacity and stress of the nursing workers affected by musculoskeletal disorders, and to analyze the association between musculoskeletal comorbidities, capacity, stress and social support.

METHOD

A cross-sectional study, conducted between August and October of 2015, in two public hospitals in Manaus-AM, with a medium to high complexity level of care, being part of a doctorate research[6]. Both hospitals have developed activities for assistance, teaching and research. The Federal Hospital is a university hospital, administered by the Brazilian Company of Hospital Services; and the State Hospital is a Foundation. The Federal Hospital used to have at the time 159 beds and the State Hospital 200 beds. The specialties served were cardiology, general practice, gastroenterology, geriatrics, gynecology, neurology, orthopedics, pulmonology and urology. Both hospitals have an Intensive Care Center (ICU), performing only elective surgeries, they do not have emergency services and only meet the demands of the Unified Health System. The Federal Hospital, at that time, used to be organized in 8 nursing posts and the State Hospital in 10 posts. Each station used to have at least one responsible nurse. The professionals used to work on a 12-hour shift and 36 hours of rest. The employment relationship of nursing workers was statutory or CLT members and the contractors were outsourced from companies providing services or nursing cooperatives.

The target population was all the nursing professionals, of both genders, allocated in outpatient clinics, nurseries, ICUs, surgical centers, material centers and sterilization. The inclusion criteria were: to have been working for at least one year in the nursing area, to have had at least one episode of musculoskeletal pain in the last three months, lasting at least two hours. The criteria for pain classification are the same as those adopted by the group of the University of Leeds, which have developed a research on musculoskeletal pain and incapacitation in nursing professionals[7]. The exclusion criterion was to present other employment links out of the nursing area.

The sampling has been made by convenience, through an approach performed at each workplace. The disclosure of the study has been made in work environments, with the authorization of the head manager, in all the shifts and scales. For each participant, an opaque envelope containing the Work Capability Index (WCI) (8) and Job Stress Scale (JSS) questionnaires have been delivered[9]. All the participants have been oriented on how to complete the

questionnaires and asked to deliver them on the same day or on the next shift for the researcher. If any item of the instruments were not properly filled, the worker would be approached again. The refusal to fill in the missing data has been considered as a drop in participating in the study.

The formation of the groups with and without diagnosis of musculoskeletal disorders occurred through a self-report of the participants in the application of the WCI[8]. The WCI has made it possible to reveal how well a worker is able to perform his/her work[8]; to characterize the participants for sociodemographic aspects (age, marital status and schooling) and for professional aspects (if the worker was outsourced, work shift and main job requirements). Additionally, the participants have been asked about their work place (outpatient clinic, ICU, nursery, surgical center, material center and sterilization) and about the professional category to which they belonged (assistant, technician and nurse). The score produced by the WCI could range from 7 to 49. From 7 to 27 it means low capacity for work, from 28-36 moderate capacity, 37-43 good capacity, and 44-49 great capacity[8].

The JSS[9] has been used to evaluate the level of stress, being composed of 17 questions and three dimensions. The first dimension has evaluated the work demands, related to the time and the speed to accomplish the tasks and conflicts between the different activities. The second was related to control, use and development of skills and authority for decision making. The third was related to social support, attributed to the social relations at work[5,9].

According to the theory of the demand-control model[5,9], through the score obtained in each dimension it is possible to classify each participant in high/low demand, control or social support. The high/low rating cut score was obtained by calculating the median of each dimension, considering the responses of all the survey participants.

The scores obtained by each individual for the assessed dimensions were compared to the median. When the value obtained was less than or equal to the median, the dimension evaluated was classified as low. When the value was greater than the median, the assessed dimension was classified as high.

By combining the classifications of the demand/control dimensions of each individual, the four categories of the Karasek's quadrants have been produced[5,9]: high wear (high demand and low control); low wear (low demand and high control); active work (high demand and high control) and passive work (low demand and low control).

The individuals categorized as high wear or passive work have been considered the groups at greatest risk for the development of psychological wear or illness, either by the wear generated by the work or by demotivation. The social support has been considered as a possible attenuating factor for occupational stress/occupational wear[5,9]. The stress assessment has also been performed by dividing the control demand score (D/C). Thus, the greater the value of the demand in relation to the control, the greater the stress at work; and the lower the value of the demand in relation to the control, the lower the stress at work[5,9].

All the data produced has been organized into an Excel® table by double typing. The statistical analyzes have been performed in the R Program, version 3.2.3. The socio-demographic characteristics have been presented in the format of frequency (%), averages and standard deviation. Fisher's exact test and the Chi-square test have been applied to verify the association of the categorical variables; and the Wilcoxon test for continuous variables. Correlation tests have been used among the variables age, demand, control, social support, D/C ratio, JSS categories, WCI and WCI categories, in order to describe and associate some behaviors, using the Spearman correlation test. The correlations have been classified in magnitude, according to the coefficients: $< 0,4$ (weak correlation), $\geq 0,4$ to $< 0,5$ (moderate correlation) and $\geq 0,5$ (strong correlation)[10]. A value of $P \leq 0,05$ has been adopted.

All the ethical requirements required in the Resolution of the National Health Council 466/2012 have been respected. The project has been approved by the Ethics Committee No. 5393, CAAE: 37136814.9.0000.5393.

RESULTS

All the nursing professionals participating (n=214) have reported having musculoskeletal pain, with or without comorbidities of musculoskeletal disorders, according to the data obtained by completing the WCI instrument. Of the 214 workers, 55.1% have reported having at least one musculoskeletal comorbidity associated with musculoskeletal pain.

The average age of the participants was 42±10.7, with predominance for the age group between 32 and 42 (40.7%). The majority of the participants were female (89.3%), married or living with a partner (60.8%) and with a high school education level (55.1%).

The average WCI index was 37.3±5.63, and when the WCI was distributed in categorized groups, 3.7% have been classified as having low capacity, 39.7% moderate capacity, 44.4% good capacity, and 12.2 % great capacity.

When associating the categories of work capacity with sociodemographic variables (gender, age, marital status and level of education), no statistically significant associations have been observed.

Most of the professionals surveyed were from the surgical clinic (27.6%), nursing technicians (67.8%), civil servants (53.7%), evening shift or alternating shifts (58.4%) and believed that their work activities presented physical and mental requirements (87.4%).

When associating the occupational characteristics (work place, professional category, outsourcing, evening shift or alternating shifts and work requirements) with the categories of work capacity, no significant differences have been found. The data is presented in Table 1.

In relation to stress at work, when measuring demand, control and social support dimensions, the median found for demand was 14, for control was 17 and for social support was 19. When combining demand and control, it was possible to classify workers in the categories of the Karasek's quadrants, which is the data shown in Chart 1.

By associating the categories of the demand-control model with the sociodemographic variables surveyed, no statistically significant associations have been found. However, for the occupational characteristics surveyed, a statistically

Table 1 – Occupational characteristics of nursing professionals and their distribution in categorized groups of work capacity, Manaus, 2015

Variables	Low n = 8 (100%)	Moderate n = 85 (100%)	Good n = 94 (100%)	Great n = 27 (100%)	Total n = 214 (100%)	*P-Value*
Place of Work						***0.51***[f]
Outpatient Clinic	1(12.5)	10(11.8)	9(9.6)	2(7.4)	22(10.3)	
Surgical Center	0	6(7.0)	10(10.6)	0	16(7.5)	
Intensive Care Center	0	7(8.2)	11(11.7)	6(22.2)	24(11.2)	
Surgical Clinic	4(50)	26(30.6)	20(21.3)	9(33.3)	59(27.6)	
Medical Clinic	1(12.5)	18(21.2)	19(20.2)	2(7.4)	40(18.7)	
Nephrology Clinic	0	1(1.2)	3(3.2)	1(3.7)	5(2.3)	
Neurological Clinic	1(12.5)	1(1.2)	3(3.2)	0	5(2.3)	
Orthopedic Clinic	0	6(7.0)	6(6.4)	1(3.7)	13(6.1)	
Hemodialysis	0	4(4.7)	7(7.4)	1(3.7)	12(5.6)	
Material Center and Sterilization	1(12.5)	6(7.0)	6(6.4)	5(18.5)	18(8.4)	
Professional Category						***0.71***[f]
Nursing Assistant	0	6(7.1)	7(7.4)	2(7.4)	15(7.0)	
Nursing Technician	8(100)	55(64.7)	64(68.1)	18(66.7)	145(67.8)	
Nurse	0	24(28.2)	23(24.5)	7(25.9)	54(25.2)	
Outsourced Worker						***0.63***[f]
Yes	3(37.5)	36(42.4)	48(51.1)	12(44.4)	99(46.3)	
No	5(62.5)	49(57.6)	46(48.9)	15(55.6)	115(5.7)	
Evening Shift or Alternating Shifts						***0.51***[f]
Yes	4(50)	47(55.3)	60(63.8)	14(51.9)	125(58.4)	
No	4(50)	38(44.7)	34(36.2)	13(48.1)	89(41.6)	
Job Requirements						***0.51***[f]
Mental	0	4(4.7)	5(5.3)	3(11.1)	12(5.6)	
Physical	0	5(5.9)	6(6.4)	4(14.8)	15(7.0)	
Physical and Mental	8(100)	76(89.4)	83(88.3)	20(74.1)	187(87.4)	

Source: Research data, 2015.

[f] Fisher's Exact Test

		Demand	
	(Median)	Low (≤14)	High (>14)
Control	High (>17)	**Low wear** 22% of workers	**Active work** 22% of workers
	Low (≤17)	**Passive work** 28.9% of workers	**High wear** 27.1% of workers

Chart 1 – Distribution of the nursing professionals (n=214) in the categories of demand-control model

Source: Research data, 2015.

significant association has been observed in the professional category, in which the nursing technicians have showed a higher concentration in the passive work profile and high wear. The nurses, however, have concentrated on active work and low wear. The table 2 shows the occupational characteristics associated with Karasek's quadrants categories.

In the calculation of the stress index by the demand/control division, the average found was 0.85±0.20. When correlating the WCI with the stress index by the demand/control ratio (r=-0.159; *P*=0.02), it was possible to find weak and inversely proportional correlation. The WCI has also been correlated with the demand, control, and social support dimensions, and a weak correlation has been found to be inversely proportional to the demand (r=-0.149; *P*=0.02) and directly proportional to social support (r=0.285; *P*<0.001).

Additionally, when correlating the stress index by the demand/control ratio with social support, it was possible to observe a weak and inversely proportional correlation (r=-0.340; *P*<0.001).

The groups with and without the diagnosis of musculoskeletal disorders have been compared to the WCI variables, WCI categories, stress index by demand/control ratio and Karasek's quadrants. Statistically significant differences have been found for the WCI and for the WCI categories. The data is presented in Table 3.

DISCUSSION

The study showed a predominance of females when addressing the issue of musculoskeletal disorders in nursing professionals, which corroborates with the scientific evidence[11-12]. Thus, the association of women in nursing is highlighted in order to increase the chances of up to 2.26 times for lumbar pain when compared to men[11], or to the prevalence of more frequent or more intense muscular pain[12].

One of the possible explanations is related to the anthropometric differences or the characteristics of the muscular fibers between men and women[13]. The musculature of women generally presents a higher proportion of type I fibers, making them more resistant to fatigue, though weaker, if compared to men. Moreover, the height and length of the limbs also influence the aspects of muscle strength and endurance, which may contribute to the development of musculoskeletal disorders[13]. Therefore, these characteristics need to be taken into consideration in ergonomic projects of nursing professionals working spaces, especially if considered the predominance of female workers, looking for the prevention of the onset of these disorders.

The execution of the nursing work demands physical and mental loads from the professionals, which has been recognized by 87.4% of the participants. Both physical and mental aspects have been presented in the literature as responsible for the appearance of musculoskeletal disorders in nursing workers[1-2].

Concomitant with the exposure to physical and mental loads, a significant proportion of outsourced workers has been observed, which, in a way, contributes to negative repercussions between workers and patients, replicating a neo-liberal model in the hospital environment, through the precariousness work relationships[14]. This fact raises the interest and necessity of conducting research aimed at the repercussions of outsourcing nursing workers on the health area and the onset of musculoskeletal disorders.

The average WCI value found was good for work[8]. However, it should be emphasized that the index presented was close to the moderate classification, which corresponds to a variation of 28 to 36 points.

This index was similar to the values found by other studies, which have approached nursing professionals with musculoskeletal disorders[15-16]. However, in relation to the distribution of frequencies in WCI categories, a study carried out in São Paulo (17) has showed a higher frequency of participants in the good and great categories compared to the present study. A possible explanation for the observed difference may be related to the restriction of the work places used in the study in São Paulo[17], which included only professionals from two units, medical and surgical, which differs from the present

Table 2 – Occupational characteristics of nursing professionals and their distributions in the Karasek's quadrants, Manaus, 2015.

Variables	Low wear n = 47 (100%)	Active work n = 47 (100%)	Passive work n = 62 (100%)	High wear n = 58 (100%)	*P-Value*
Place of Work					***0.43***[ſ]
Outpatient Clinic	3(6.4)	5(10.6)	7(11.3)	7(12.1)	
Surgical Center	2(4.3)	4(8.5)	3(4.8)	7(12.1)	
Intensive Care Center	9(19.1)	3(6.4)	6(9.7)	6(10.3)	
Surgical Clinic	12(25.5)	14(29.8)	19(30.6)	14(24.1)	
Medical Clinic	10(21.3)	8(17.0)	12(19.4)	10(17.2)	
Nephrology Clinic	0	2(4.3)	1(1.6)	2(3.4)	
Neurological Clinic	1(2.1)	0	2(3.2)	2(3.4)	
Orthopedic Clinic	3(6.4)	1(2.1)	8(12.9)	1(1.7)	
Hemodialysis	1(2.1)	5(10.6)	1(1.6)	5(8.6)	
Material Center and Sterilization	6(12.8)	5(10.6)	3(4.8)	4(6.9)	
Professional Category					***<0.001***[ſ]
Nursing Assistant	3(6.4)	1(2.1)	5(8.1)	6(10.3)	
Nursing Technician	29(61.7)	24(51.1)	50(80.6)	42(72.4)	
Nurse	15(31.9)	22(46.8)	7(11.3)	10(17.2)	
Outsourced Worker					**0.53**[ſ]
Yes	22(46.8)	24(51.1)	24(38.7)	29(50)	
No	25(53.2)	23(48.9)	38(61.3)	29(50)	
Evening Shift or Alternating Shifts					***0.32***[ſ]
Yes	24(51.1)	25(53.2)	37(59.7)	39(67.2)	
No	23(48.9)	22(46.8)	25(40.3)	19(32.8)	
Job Requirements					***0.53***[ſ]
Mental	3(6.4)	4(8.5)	4(6.5)	1(1.7)	
Physical	4(8.5)	1(2.1)	5(8.1)	5(8.6)	
Physical and Mental	40(85.1)	42(89.4)	53(85.5)	52(89.7)	

Source: Research data, 2015.
ſ Fisher's Exact Test, ſ Chi-Square

study, that allowed the insertion of professionals from different sectors of the hospitals.

Statistically significant differences between the WCI and workers of the various sectors have not been found. The absence of significant differences between the sectors may be related to the inclusion in this study of only individuals affected by musculoskeletal disorders, which may have contributed to the homogenization of the groups.

Another evidence that may reinforce the influence of musculoskeletal disorders on the WCI found is the fact that the average index found was closer to a group of individuals without musculoskeletal disorders, aged 60-79 years old (WCI=37.6), who have been surveyed by Monteiro[18]. However, new observations and studies with longitudinal trimming would be necessary to be performed in order to verify the magnitude and direction of the influence of the musculoskeletal disorders on the capacity at work.

Some studies involving nursing professionals[15-16] evidenced a decrease in the WCI with an increase in the age of the workers, however, in this study, this trend has not

Table 3 – Association between the presence or the absence of diagnosis of musculoskeletal disorders for stress and capability to work, Manaus, 2015

Variable	No diagnosis n = 96 (%)	With diagnosis n = 118 (%)	Total n = 214 (%)	*P-Value* (0,05)
Stress - Index D/C				***0.08***$^{\Phi}$
Median (IQR*)	0.8 (0.7; 0.9)	0.8 (0.8; 0.9)	0.8 (0.7; 0.9)	
Karasek's Quadrants				***0.274***$^{\chi}$
Low wear	27(28.1)	20(16.9)	47(22)	
Active work	19(19.8)	28(23.7)	47(22)	
Passive work	26(27.1)	36(30.5)	62(29)	
High wear	24(25)	34 (28.8)	58(27.1)	
WCI				***<0.001***$^{\Phi}$
Median (IQR*)	41 (38;43)	34.8 (31; 39)	38 (33;42)	
WCI categories				***<0.001***$^{\|}$
Low capacity	1(1)	7(5.9)	8(3.7)	
Moderate capacity	17(17.7)	68(57.6)	85(39.7)	
Good capacity	55(57.3)	39(33.1)	94(43.9)	
Great capacity	23(24)	4(3.4)	27(12.6)	

Source: Research data, 2015.
*Interquartile Range, $^{|}$Fisher's Exact Test, $^{\chi}$Qui-Square, $^{\Phi}$Wilcoxon's Test

been observed. It should be emphasized that the WCI has been developed based on the aging of the working population and on the need to preserve the work capacity, considering the physiological repercussions of aging[8]. In this way, the different age ranges have a direct influence on the index behavior.

A possible explanation for not have been found WCI differences between the ages was that there was a concentration of participants (65.9%) in the age group between 30-49 years old, and only 10.7% of the sample presented age below 29 years old, and 23.4% was over 50 years old. Thus, the irregular distribution of ages may have favored the absence of statistically significant differences.

According to the presented profile, it is possible to observe a concentration of professionals with musculoskeletal pain in a productive age group, which arouses the interest and necessity of the development of actions with the objective of mitigating risks and intervening in the nursing work conditions, in order to reverse the development of these disorders and to prevent the emergence of new harmful conditions.

In the present study, the highest concentration (56%) of workers was in the Karasek's quadrants, harmful to workers' health[5]. It is known that the high demand in the nursing work environment increases the chances in almost twice of the development of self-reported musculoskeletal pain in some regions of the body, compared to workers who are classified as low demand[19]. In addition, the passive work profile contributes to the worker's performance to be compromised by being associated with a highly repetitive work process, with low autonomy and few learning opportunities, which may result in demotivation and low self-esteem, and to contribute to harmful repercussions to the workers' health[5].

A systematic review with meta-analysis[1] has evidenced the association of high wear with the prevalence (OR=1.56, 95% CI=1.22-1.99) and incidence (Odds Ratio (OR)=1.52; 95% confidence interval (95% CI)=1.14-2.01) of lumbar pain and the prevalence of shoulder pain (OR=1.89; 95% CI=1.53-2.34); (OR=2.21; 95% CI=1.07-4.54) and musculoskeletal pain in any region of the body (OR=1.38; 95% CI=1.09-1.75).

One of the hypotheses suggested for the contribution of the high wear profile to the increased risk of musculoskeletal disorders is that the high labor demand and the low control can imply an acceleration of the work rhythm and overload of activities[19]. This increase is due to the shortage of workers and a large number of patients, which

contributes to the adoption of inappropriate postures during the work activities, favoring the development of musculoskeletal symptoms[19].

In this research, nursing technicians and assistants have been predominant in the passive work and high demand profiles. As for the nurses, their frequencies were more concentrated in low wear and active work. The pattern found can be explained by the way that the nursing service is organized in Brazil.

While the nurses have their activities focused on the management of the nursing services, evaluation, prescription and execution of high complexity care activities, the technicians/assistants have their activities focused on the execution of the care actions prescribed and coordinated by the nurses. Thus, there are different demands and possibilities of control for nurses in comparison with the technicians/assistants, who are more executors and plastered in their actions.

In this sense, it is necessary the conduction of detailed analyzes of the work methods and of the work organization, especially for technicians and assistants, who have demonstrated an association with psychosocial conditions that are compatible with the psychological and consequent development of musculoskeletal disorders[19]. The humanization of the work relations and the valorization of the knowledge of the technicians and assistants in the decision-making and in the organization of the nursing services could be a way to reverse the presented scenario.

The social support, which is one of the resources to reduce the effects of a harmful work environment[5], has been classified as low for 52.3% of the workers in this study. However, the influence of social support, despite the weak magnitude, can be identified through the inversely proportional correlation ($r=-0.34$, $P<0.001$) between the social support and the demand/control of the stress ratio, or, by association with the WCI, in which higher scores of WCI have been associated with higher levels of social support ($r= 0.285$, $P<0.001$).

The repercussions of low social support are associated with an increased chance of developing musculoskeletal disorders[1]. Thus, when evaluating their association with better psychosocial indicators and work capacity, it can be hypothesized that stimulating good relationships between peers and bosses could contribute to improving the working conditions and it could decrease the development of musculoskeletal disorders.

When considering the occupational stress by the demand and control ratio and by the WCI, the correlation was weak, inversely proportional and significant. In this sense, a study[4] has identified an association between nursing workers submitted to high demands in the work environment, in comparison to the low requirement, with an increase of twice the chance of the WCI reduction.

The inclusion of participants with or without medical diagnosis for musculoskeletal disorders has reflected a significant difference only for the WCI, which partially met our expectations. Thus, the group with medical diagnosis has obtained a lower WCI, in addition to higher frequencies of individuals in the low and moderate capacity categories, compared to the non-diagnosed group.

This trend has been confirmed in Monteiro[20], since 36.6% of the group with medical diagnosis was concentrated in the moderate and low categories, and for those without a medical diagnosis, only 15.86% was in these categories. In the present study, the difference between the groups was even greater, with a frequency of 63.5% of the participants diagnosed in the moderate and low capacity categories, compared to 18.7% in the non-diagnosed group. In this sense, it is possible that the workers with a medical diagnosis are related to disorders with more important repercussions for their functional conditions.

The results obtained in this study are consistent with the theoretical model that bases the work capacity index, insofar as the basis of the capacity for work is related to the individual conditions of the worker's health, which, in turn, reflect in their physical functional, psychological and social capacities. Thus, any impact on the individual health will have an impact on the expression of their abilities[8].

A thorough evaluation by a multidisciplinary team of workers' health, with actions aimed at the early identification of problems and improvements in the work place, could support the reversal of the worsening of musculoskeletal disorders and negative repercussions on the work capacity of the nursing professional.

It should be emphasized that the present study has presented some limitations. The method employed does not allow conclusions of causality, and, in this way, it is suggested studies with longitudinal drawings in order to confirm some hypotheses raised. The self-report for the presence/absence of medical diagnosis for musculoskeletal disorders has brought limitations to the study; however, the data presented has demonstrated that the musculoskeletal conditions are associated with a decrease in the nursing professionals' ability to work. Sampling for convenience may contribute to the inclusion of selection bias, and the use of random sampling could better control this bias. However, due to the presence of outsourced companies, it was not possible to access the list of all hospital workers for randomization, and therefore, it was necessary to approach each worker in the sector.

CONCLUSIONS

This study has demonstrated that the nursing workers affected by musculoskeletal disorders are in a productive age group with a technical level function and they are female. The average WCI score, comparable to the age group over 60 years old, reinforces the importance of the development of interventions focused on the mitigation of the musculoskeletal disorders. The WCI's inversely proportional associations with stress and the WCI reduction in individuals with a medical diagnosis of musculoskeletal disorders have revealed that the relationships between capacity, stress and musculoskeletal disorders need to be taken into account when establishing intervention actions in these workers. Although the study did not present differences between individuals with and without a diagnosis for levels of stress and social support, the direct and inversely proportional relationship of social support to work capacity and stress level, respectively, emphasize the importance of humanization strategies of labor relations.

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