

Musculoskeletal symptoms and presentism among professionals of public health management of Belém-PA, Brazil

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ABSTRACT

Introduction: Work-related musculoskeletal disorders affect the performance of workers and can increase presenteeism, a condition in which the employee comes to the workplace but does not produce satisfactory results because he is ill. **Objective:** To identify the prevalence of musculoskeletal symptoms and its association with presenteeism among public health management professionals of Belem-PA, Brazil. **Methods:** Cross-sectional study carried out with 88 professionals from the Municipal Health Department of Belem. A sociodemographic questionnaire was used to characterize the sample; the Nordic Musculoskeletal Questionnaire to identify the prevalence of pain, numbness, and tingling symptoms in the body; and the Stanford Presenteeism Scale to characterize presenteeism. Associations between variables were analyzed using a 5% significance level. **Results:** Musculoskeletal symptoms in the upper and lower back were the most prevalent. Presenteeism was significantly associated with daily workload, physical activity, and the presence of diagnosed musculoskeletal diseases or injuries. In the past 12 months, musculoskeletal symptoms in the neck, upper and lower back, wrists/hands, and hips/thighs have been associated with presenteeism. In the past 7 days, presenteeism has been associated with symptoms in the upper back and lower back. **Conclusion:** The most prevalent musculoskeletal disorders in health management professionals are associated with presenteeism.

Keywords: cumulative traumatic disorders; efficiency; presenteeism; occupational health; health services administration.

INTRODUCTION

Technological development, especially in the means of production, has provided great evolution in work processes in recent years, always aiming at greater productivity in the work environment¹. However, as a consequence of new work organizations, public or private, different forms of illness have emerged due to certain professional

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functions². In this context, the exposure of workers to occupational risk factors, such as repetitive movements, the invariability of tasks, static postures, and the high physical demands, are decisive for the emergence of musculoskeletal symptoms of a labor character^{2,3}.

Cumulative Trauma Disorders (CTDs) are the most prevalent health problem, and it is occupational disorders that cause the greatest consequences among the working population^{3,4}. In addition to affecting an individual's ability to work and perform their daily life functions, CTDs have an economic impact on the workplace, the health system, and the community⁴. Although there are no data that reveal national coverage in Brazil, Social Security records show that the groups of diagnoses with the highest prevalence of sickness benefits in the last 10 years were musculoskeletal disorders⁵.

From this perspective, it is clear that the problems associated with workers' health have a negative impact on the performance of the function and the quality of the service. Currently, presenteeism has been a cause for concern in the work process of organizations. Unlike absenteeism, which consists of the absence of the worker due to some intervening reason, presenteeism is characterized by the condition in which the employee comes to the workplace. Still, it does not produce satisfactorily for being ill, compromising the performance in the service^{6,7}. In addition to being one of the main causes of lost productivity, generating economic costs that exceed the costs of absenteeism⁸, presenteeism also interferes with the quality of life and health of the worker, which can make this condition chronic and incapacitating if health problems are not treated in time⁷.

In this context, knowing that musculoskeletal disorders have a direct impact on the drop in performance⁹, in this physical health condition, the present worker may present himself in the less productive work environment to perform tasks, which may compromise the quality of the service provided.

Therefore, this study aimed to identify the prevalence of musculoskeletal symptoms and its association with presenteeism among public health management professionals in the city of Belém, Pará, Brazil.

METHODS

Cross-sectional analytical study, developed with public health management professionals working at the central level of the Municipal Health Secretariat of Belém (SESMA), in Belém, capital of the state of Pará, Brazil. The sample population was provided by the human resources sector of SESMA, which has 675 employees. A non-probabilistic sample, for convenience, was obtained following a sample calculation that considered a 95% confidence level and a sampling error of 10%, whose resulting minimum sample size was 85 servers. In order to make up for any losses, 30% of the

stipulated minimum amount was added. All participants signed the Free and Informed Consent Form (ICF).

Professionals at the central level of SESMA who worked in the service for at least one year participated in the study. On the other hand, professionals who had been on sick leave or medical leave for more than 30 days in the past 12 months were excluded. Questionnaires with insufficient data for the research were excluded.

Data collection was carried out from September to December 2019. It was based on the use of a sociodemographic and occupational questionnaire, the Nordic Musculoskeletal Questionnaire (NMQ), and the Stanford Presenteeism Scale (SPS-6).

The sociodemographic and occupational questionnaire was used to identify the profile of the professionals included in the study. For this, this instrument collected information related to personal data: sex, age, marital status, education, Body Mass Index (BMI), occupational: daily workload, length of service, main work tool, main position in work, life habits: physical activity, smoking, alcohol consumption, and health conditions: chronic diseases, diagnosed musculoskeletal diseases/injuries, feeling of physical tiredness, self-perceived health status.

The NMQ was developed with the proposal to standardize the measurement of complaints of musculoskeletal symptoms among a population, allowing analysis of prevalence and comparisons between variables. Validated in Brazil¹⁰, the NMQ consists of objective questions with binary "yes" or "no" answers regarding the occurrence of musculoskeletal symptoms in nine regions of the body: neck, shoulders, upper back, elbows, lower back, wrists/hands, hips/thighs, knees, ankles/feet. The instrument considers musculoskeletal symptoms (pain, tingling, numbness) in the twelve months and seven days preceding their completion, in addition to identifying the withdrawal from daily activities and the search for health professionals due to the symptoms.

The SPS-6, which was adapted and validated for Brazilian Portuguese by Paschoalin et al.¹¹, is one of the main instruments to assess productivity at work through presenteeism. The instrument consists of six questions divided into two groups to assess two dimensions of presenteeism: dimension I (concentration of workers) and dimension II (difficulty in completing the work). Dimensions I and II present objective questions with answers ranging from 1 to 5, being 1) I totally disagree; 2) partially disagree; 3) do not agree or disagree; 4) partially agree; 5) I totally agree. To quantify the results, the SPS-6 assigns values from 1 to 5 points for each answer of the six questions, with groups I and II presenting these values inverted. The total score of the SPS-6 is obtained by the sum of the scores of the alternatives of the two groups, which can vary from 6 to 30. In this way, the lower scores (from 6 to 18) indicate a decrease in performance in their work activities due to presenteeism. On the other hand, higher scores (closer to 30) indicate a greater capacity for the worker

to concentrate and do all the work despite having some health problems.

Data were collected through interviews with each professional, respecting the participant's service and availability scales. The instruments were delivered in order of completion: sociodemographic questionnaire, NMQ, and SPS-6. Only professionals who would report one or more musculoskeletal symptoms in the NMQ were instructed to complete the SPS-6, as the latter requires the presence of a health condition as a reference for filling it out.

The study started after the approval of the Research Ethics Committee with human beings of the University Center of the State of Pará, under the opinion 3,533,977, and the authorization of the Center for Permanent Education of SESMA.

The collected data were stored in a database in Microsoft Excel version 2016. Then, the variables were characterized by means of descriptive statistics (absolute frequency, relative frequency, means, standard deviation). Subsequently, Fisher's Exact tests were applied to 2x2 and Chi-square tables to analyze the relationship between presenteeism and sociodemographic, occupational variables, and musculoskeletal symptoms. The statistical software R (version 3.5.2) was used, and a significance level of 5% was adopted.

RESULTS

One hundred thirteen professionals were analyzed using data collection instruments. Of these, 25 were excluded due to incomplete filling out of some questionnaire (14), due to withdrawal during filling out (6), or for not having reported musculoskeletal symptoms in the NMQ (5). Thus, 88 instruments were able to be included in the study.

There was a predominance of females (75%) and an average age of 39.1 ± 11.1 years, which varied between 23 and 68 years. Regarding the workday, 40.9% had a daily workload of 6 hours, and the same amount worked daily for 8 hours. Most worked in the service for a period of 1 to 5 years, with the sitting position being the most used for carrying out the work (95.4%), and the computer was the most referred work tool (78.4%). The other demographic, occupational, lifestyle, and general health characteristics are detailed in Table 1.

The NMQ results are presented, according to the anatomical region, in absolute value and relative to the total number of participants (Table 2). It was possible to observe that, in the last 12 months, the highest prevalence of musculoskeletal symptoms was located in the lower back (68.2%), followed by the upper back (64.8%) and wrists and hands (64.8%). In the last 7 days, the lower back remained the most prevalent region for musculoskeletal symptoms (43.2%), followed by the upper back (36.4%) and neck (31.8%). Symptoms in the lower back were the ones that most

Table 1: Characterization of the sample regarding demographic, occupational, lifestyle habits, and general health status.

Variables	n=88
Age, mean (SD)	39.1 (11.1)
Sex, n (%)	
Female	66 (75)
Male	22 (25)
BMI, mean (SD)	26.4 (5.3)
Marital status, n (%)	
Single/Divorced	46 (52.3)
Married/Stable union	42 (47.7)
Education, n (%)	
Complete higher education	66 (75)
Incomplete higher education	11 (12.5)
High school	11 (12.5)
Workload/Day, n (%)	
6	36 (40.9)
8	36 (40.9)
>8	16 (18.2)
Time working in the service, n (%)	
1 to 10 years	70 (79.6)
>10 years	18 (20.4)
Main working tool, n (%)	
Computer	69 (78.4)
Phone/mobile	9 (10.2)
Paper and pen	10 (11.4)
Main position at work, n (%)	
Sitting down	84 (95.4)
Standing	2 (2.8)
Walking	2 (2.8)
Practices physical activity at least 3 times a week, n (%)	43 (48.9)
Consume alcoholic beverages, n (%)	
No	46 (52.2)
Eventually	25 (28.4)
Once a week	12 (13.6)
More than once a week	5 (5.7)
Smoking, n (%)	7 (7.9)
Chronic diseases, n (%)	15 (17.1)
Musculoskeletal injuries, n (%)	26 (29.6)
Frequency of physical tiredness after work, n (%)	
Never	3 (3.4)
Rarely	5 (5.7)
Sometimes	36 (40.9)
Frequently	29 (32.9)
Always	15 (17)
Self-assessment of health status in relation to people of the same age, n (%)	
Bad	1 (1.1)
Reasonable	30 (34.1)
Good	54 (61.4)
Excellent	3 (3.4)

MI: Body mass index; SD: standard deviation

impeded the performance of daily activities (19.3%), in addition to being the region of the body that most motivated the search for a health professional (18.2%).

When analyzing the SPS-6 score, an average score of 17.7 ± 4.6 was obtained, ranging from 6 to 30 points. The presenteeism

Table 2: Prevalence of musculoskeletal symptoms according to NMQ (n=88).

Body region	Symptoms in the last 12 months	Prevented from carrying out activities	Sought for health professional	Symptoms in the last 7 days
	n (%)	n (%)	n (%)	n (%)
Neck	55 (62.5)	09 (10.2)	11 (12.5)	28 (31.8)
Shoulders	44 (50.0)	08 (9.1)	06 (6.8)	20 (22.7)
Upper back	57 (64.8)	12 (13.6)	12 (13.6)	32 (36.4)
Elbows	09 (10.2)	04 (4.5)	03 (3.4)	03 (3.4)
Fists/Hands	57 (64.8)	11 (12.5)	09 (10.2)	26 (29.5)
Lower Back	60 (68.2)	17 (19.3)	16 (18.2)	38 (43.2)
Hips/Thighs	30 (34.1)	10 (11.4)	05 (5.7)	14 (15.9)
Knees	42 (47.7)	15 (17.0)	10 (11.4)	25 (28.4)
Ankles/Feet	38 (43.2)	07 (8.0)	08 (9.1)	21 (23.9)

Values expressed in absolute frequency and relative to the total number of participants. The participant could select more than one region of the body.

was found in 48 (54.5%) of the professionals who composed the sample. From this, the proportions of presenteeism and non-presenteeism were related to the sociodemographic, occupational, lifestyle, and general health status variables, as described in Table 3. In this sense, a significant association can be observed between presenteeism and the number of hours worked per day (p=0.02), physical activity (p<0.01), and the presence of diagnosed musculoskeletal disease/injuries (p=0.03).

The presenteeism has been related to each region of the body referred to in the NMQ in the last 12 months and the last 7 days. In this sense, in the last 12 months, a significant association was observed between presenteeism and the symptoms of pain, tingling, or numbness in the neck (p=0.04), in the upper back (p=0.01), in the wrists, and hands (p=0.04), in the lower back (p=0.02) and hips/thighs (p=0.04). With regard to the last 7 days, a significant association occurred between presenteeism and symptoms in the upper back (p=0.02) and lower back (p=0.03). The data are presented in Table 4.

DISCUSSION

This cross-sectional study identified the most prevalent musculoskeletal symptoms in employees of a public agency in Belém, Pará, Brazil, and related them to presenteeism in the workplace. In this sense, it was possible to observe that the symptoms (pain, numbness, or tingling) located in the neck, in the upper and lower back, and the region of the fists and hands were the most prevalent and presented a significant relationship with the presenteeism of the professionals who composed the sample. In addition, we found significant results in the relationship between presenteeism and daily workload, physical activity, and the presence of musculoskeletal diseases or injuries.

Table 3: Prevalence and associations between presenteeism, sociodemographic, occupational, lifestyle and general health variables.

	Presenteeism		P value
	Yes (n=48)	No (n=40)	
	n (%)	n (%)	
Sex			
Male	13 (59.1)	9 (40.9)	0.80 ^a
Femae	35 (53)	31 (47)	
Age			
18 to 30	10 (40)	15 (60)	0.23 ^b
31 to 60	35 (59.3)	24 (40.7)	
> 60	3 (75)	1 (25)	
BMI			
Normal BMI (18.4 a 24.9)	21 (72.4)	17 (58.6)	0.81 ^b
Overweight (25 a 29.9)	18 (50)	18 (50)	
Obesity Grade I (30 a 34.9)	5 (55.6)	4 (44.4)	
Obesity Grade II (35 a 39.9)	2 (100)	0 (0)	
Obesity Grade III (> 40)	2 (66.7)	1 (33.3)	
Workload/day			
6	14 (41.2)	20 (58.8)	0.02 ^{b*}
8	27 (71.1)	11 (28.9)	
> 8	7 (43.8)	9 (56.3)	
Time in service			
1 to 10 years	37 (77.1)	33 (82.5)	0.60 ^a
> 10 years	11 (22.9)	7 (17.5)	
Physical activity			
Yes	17 (39.5)	26 (60.5)	<0.01 ^{a*}
No	31 (68.9)	14 (31.1)	
Smoking			
Yes	2 (28.6)	5 (71.4)	0.26 ^a
No	46 (56.8)	35 (43.2)	
Chronic diseases diagnosed			
Yes	7 (14.6)	8 (20)	0.57 ^a
No	41 (85.4)	32 (80)	
Musculoskeletal injuries diagnosed			
Yes	19 (73.1)	7 (26.9)	0.03 ^{a*}
No	29 (46.8)	33 (53.2)	

BMI: Body mass index; ^aFisher's Exact Test; ^bChi-square test; *p<0.05

The predominance of females observed in this research was also present in previous studies carried out in public agencies¹²⁻¹⁴. The prevalence of women in health services is widely reported in the literature¹⁵. In the work environment, the presence of CDTs in women may be associated with the combination of the service with diversified domestic tasks, in addition to childcare, which requires repetitive work, in a non-ergonomic position and at a high speed^{16,17}.

Although there was no statistical difference in BMI between present and non-present workers, the general average of this variable was 26.3, showing a sample with overweight. An above-average BMI is considered an independent risk factor for the onset of musculoskeletal disorders¹⁸. In addition, overweight and obesity

Table 4: Association between musculoskeletal symptoms referred to in the NMQ and presenteeism according to SPS-6.

	Last 12 months			Last 7 days		
	Presenteeism			Presenteeism		
	Yes n (%)	No n (%)	p value	Yes n (%)	No n (%)	p value
Neck	35 (63.6)	20 (36.4)	0.04*	19 (67.9)	9 (32.1)	0.10
Shoulders	28 (63.6)	16 (36.4)	0.23	14 (70.0)	6 (30.0)	0.13
Upper back	37 (64.9)	20 (35.1)	0.01*	23 (71.9)	9 (28.1)	0.01*
Elbows	7 (77.8)	2 (22.2)	0.17	2 (66.7)	1 (33.3)	>0.99
Fists/Hands	36 (63.2)	21 (36.8)	0.04*	18 (69.2)	8 (30.8)	0.10
Lower back	38 (63.3)	22 (36.7)	0.02*	26 (68.4)	12 (31.6)	0.03*
Hips/Thighs	21 (70.0)	9 (30.0)	0.04*	5 (35.7)	9 (64.3)	0.15
Knees	27 (64.3)	15 (35.7)	0.09	16 (64.0)	9 (36.0)	0.34
Ankles/Feet	24 (63.2)	14 (36.8)	0.19	14 (66.7)	7 (33.3)	0.22

Values expressed in absolute frequency and relative to the presence of musculoskeletal symptoms by the NMQ; *p<0.05 using Fisher's Exact Test.

were previously associated with lost productivity^{19,20}. According to Neovius et al.¹⁹, obesity is associated with almost twice as much productivity losses for society as for normal weight throughout life.

Symptoms in the lower back were the most prevalent in both periods recorded on the NMQ. The highest occurrence of low back pain was also reported in work environments similar to this research, whose functions are mostly administrative^{21,22}. The permanence in static positions and the intensive use of computers, as is the case of most of our sample, contribute to the appearance of low back pain in office workers²³. In this respect, lumbar spine pain is a common health problem that should affect most workers throughout their professional lives, impacting not only the life of the worker and his family but also the industry and the government²⁴.

We observed a significant association between presenteeism and the daily workload of professionals. 71.1% of the subjects with 8-hour working days have their performance affected by presenteeism. The workload is considered an interference factor in the worker's quality of life and health^{25,26}. It is not uncommon for many workers to take a double shift to compensate for insufficient wages²⁵. However, the increase in the workload generates damage to physical and mental health, directly impacting the quality of work due to greater illnesses resulting from tiredness²⁷.

The practice of physical activity was reported by the majority of non-present workers (60.5%). Similar results have been found in previous researches⁷. Professionals who practice physical activity are healthier and, therefore, less likely to fall ill. In these conditions, these professionals are less likely to have inferior performance at work when compared to sedentary colleagues, decreasing the chances of absence from the service²⁸.

In order to reduce health care costs and improve employee health and productivity, employers' organizations are increasingly investing in workplace wellness programs²⁹. The practice of physical exercise in the work environment has positive effects on

the worker's health. It has more effective results when performed in groups, as it generates motivation and favors adherence to the program³⁰. Studies that applied physical exercise protocols in the work environment have satisfactory results in reducing musculoskeletal pain in different anatomical regions³¹⁻³³. As of the time of this research, SESMA has not adopted physical exercise programs for professionals working at the central level. It may contribute to the prevalence of musculoskeletal disorders referred to in the NMQ, especially for workers with long daily working hours who may feel unwilling to practice any physical activity outside the work environment.

Among the health conditions investigated in this study, there was an association of present professionals that has musculoskeletal diseases/injuries. In fact, musculoskeletal injuries affect different parts of the body (joints, bones, muscles, and spine), triggering painful symptoms that can persist and manifest chronic conditions³⁴. The reduction in health status due to chronic rheumatic conditions, such as rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis, affects not only the loss of productivity at work but also affects daily functionality and causes early mortality³⁵. Thus, we consider the presence of musculoskeletal diseases or injuries as potential contributors to the emergence of the symptoms of pain, numbness, or tingling analyzed in this study.

We found that in the last 12 months, presenteeism was associated with musculoskeletal symptoms in the neck, upper and lower back, hip/thighs, and wrist/hand region. In the last 7 days, the associations were maintained in the upper and lower back. Such anatomical regions have also been associated with presenteeism previously^{6,36}, suggesting the drop in performance of employees who suffer from localized pain and discomfort.

The spine, along its length, is a constant target of pain symptoms among the working population. In this perspective, pain in the neck and lumbar region are often reasons for activity limitations, absence due to illness, or inability to work in the long term,

representing a significant socioeconomic burden for patients and society³⁷. In another study, neck pain was associated with greater chances of stress and distraction, compromising the ability to think and focus on tasks³⁶.

Some limitations need to be considered. First, because it is a cross-sectional study, it is not possible to affirm causal relationships between musculoskeletal symptoms and presenteeism. In addition, the absence of adjusted analysis, such as regression models, was also considered a limiting factor. Second, the non-probabilistic sampling obtained by convenience limits the results to be generalized to all servers. Still, the sample loss of 22.1% can be considered a limitation, although the study has achieved the minimum sample number calculated. No data were collected regarding occupations outside SESMA, such as a second job or professional training in parallel, which could reduce the time of rest, leisure activities, or physical exercises. A previous study showed that self-development activities outside of work

increased the risk of presenteeism³⁸. Another limitation concerns the period of 12 months to recover memory about musculoskeletal symptoms, which may result in inaccuracy in self-report due to memory difficulties.

In general, through this study, it was found that the most prevalent musculoskeletal symptoms (upper and lower back, neck, hips/thighs, and wrists/hands) among professionals were associated with presenteeism, a condition that affects productivity in Work. In addition, conditions such as daily workload, physical activity, and musculoskeletal diseases/injuries had a significant association in this study. In this perspective, the relationship between musculoskeletal symptoms and presenteeism found in this research underscores the need to seek strategies for coping with CTDs, such as the inclusion of physical exercise programs in the workplace and health education actions, in order to prevent health problems and musculoskeletal disorders resulting from work activity.

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