

# Prevalence of musculoskeletal complaints and quality of life among administrative technicians

Prevalência de sintomas osteomusculares e qualidade de vida de trabalhadores técnicos administrativos

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**ABSTRACT | Background:** Work-related musculoskeletal disorders comprise muscle, tendon, synovial, nerve, fascial and ligament injuries alone or combined, with a proven or not relationship with work. They manifest as pain, paresthesia, feeling of heaviness and fatigue, and may cause temporary or permanent incapacity for work. **Objective:** To establish the prevalence of musculoskeletal symptoms and quality of life of administrative technicians at a public institution who used computers at work for 5 years. **Methods:** The sample comprised 70 administrative technicians aged 20 to 69 who used computers at work for 5 years. We analyzed the prevalence of musculoskeletal complaints by means of the Nordic Musculoskeletal Questionnaire and quality of life with SF-36. Interviews were performed in the workplace. The data were analyzed with SPSS 20.0 and the significance level was set to 5%. **Results:** SF-36 domain scores were considered satisfactory for all the participants. Prevalence of pain in the past 7 days (70%) and past 12 months (77.1%) was high. The lower back was the body site most frequently involved (38.6%). **Conclusion:** The prevalence of pain in several body sites was high among the analyzed administrative technicians. Pain might interfere with their work and lead to sick leave spells. Clinical assessments and interventions are needed to minimize this problem.

**Keywords |** occupational health; cumulative trauma disorders; musculoskeletal pain.

**RESUMO | Introdução:** Os distúrbios osteomusculares relacionados ao trabalho (DORT) são afecções de músculos, tendões, sinóvias, nervos, fâscias e ligamentos isoladas ou combinadas associados, comprovadamente ou não, ao trabalho. Caracterizam-se pela ocorrência de sintomas como dor, parestesia, sensação de peso e fadiga e são causa de incapacidades laborais temporárias ou permanentes. **Objetivo:** Investigar a prevalência de sintomas osteomusculares em técnicos administrativos de uma instituição federal que desempenharam atividade informatizada nos últimos cinco anos, bem como a qualidade de vida. **Metodologia:** Participaram do estudo 70 técnicos administrativos que desempenhavam trabalho informatizado havia pelo menos cinco anos, com idade entre 20 e 69 anos. Buscou-se avaliar a prevalência de sintomas osteomioarticulares, por meio do Questionário Nórdico de Sintomas Osteomusculares, e a qualidade de vida, pelo Short Form Health Survey 36 (SF-36). As entrevistas foram realizadas no local de trabalho, e os dados, analisados no Statistical Package for the Social Sciences (20.0), com nível de significância de 5%. **Resultados:** Os resultados obtidos mostraram que os sujeitos apresentaram valores conforme o considerado normal para todos os domínios do SF-36 e alta prevalência de dor nos últimos sete dias (70%) e nos últimos 12 meses (77,1%), sendo a coluna lombar a região mais afetada, com 38,6%. **Conclusão:** Trabalhadores técnicos administrativos desempenhando trabalho informatizado apresentam altos índices de presença do episódio dor em diferentes regiões corporais, podendo interferir na produção do trabalho e levar ao afastamento da atividade. Logo, faz-se necessário que se realizem avaliações clínicas e futuras intervenções para minimizar essas alterações.

**Palavras-chave |** saúde do trabalhador; transtornos traumáticos cumulativos; dor musculoesquelética.

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DOI: 10.5327/Z1679443520200445

## INTRODUCTION

Work-related musculoskeletal disorders (MSD) comprise muscle, tendon, synovial, nerve, fascial and ligament injuries alone or combined, with a proven or not relationship to work. They manifest as pain, paresthesia, feeling of heaviness and fatigue, and may cause temporary or permanent incapacity for work<sup>1-3</sup>. These disorders are not caused by eventual actions, but by chronic inflammation associated with job tasks, repeated movements, awkward posture, lack of rest breaks, the organization of work, and intrinsic individual biological/physiological and mental factors<sup>4,5</sup>. Thus they have negative impact for both organizations and workers, including the latter's quality of life (QoL)<sup>6,7</sup>.

Work-related MSD represent one of the major public health problems in Brazil and worldwide—with an already high and increasing incidence—which is difficult to approach, prevent and rehabilitate. Cases began to be identified in Brazil starting in the 1980s. About 20,000 cases were reported in 2006 and 117,500 two years later<sup>8,9</sup>. They are the second leading reason for social security benefits, and some of the most prevalent causes of sick pay in the past decade<sup>10</sup>.

Many types of jobs have been deeply influenced by novel computer-based technologies. However, working too long time on the computer, repeated movements, awkward posture, and the consequent sedentary lifestyle are associated with symptoms such as pain, mental fatigue, musculoskeletal complaints and in the most severe cases, sick leave spells<sup>10-12</sup>. For these reason, work-related MSD have high costs for society, insurance companies and health care services, in addition to their negative impact on the everyday life of affected individuals. This is how they became a serious public health concern<sup>10</sup>.

Administrative technicians at universities are charged of organizing, planning and executing definite tasks through available resources to ensure the efficiency and effectiveness of teaching, research and outreach. In addition, they are also responsible for the evaluation of these activities to thus benefit both institutions and users. As such, their role is highly relevant for the advancement and future of university students<sup>13</sup>. However, aspects of their job—such as remaining long

time sitting, repeated movements and awkward posture—may favor the occurrence of MSD. Therefore, detecting such symptoms and disorders is necessary to make adjustments in the workplace and formulate strategies aiming at much more than minimizing symptoms, but also to improve the performance of workers and reduce the costs of disease.

As a function of the aforementioned considerations, the aim of the present study was to investigate MSD among administrative technicians at Universidade Federal da Paraíba (UFPB), Brazil, whose job involved using computers for 5 years at least and their influence on QoL.

## METHODS

The present cross-sectional, qualitative and quantitative study was performed with administrative technicians at UFPB campus I, located in João Pessoa, hired through competitive examining. Approval was granted by the research ethics committee of the Center of Health Sciences, UFPB, Certificate of Presentation for Ethical Appraisal no. 55965516.3.0000.518.

The sample comprised employees who met the following criteria: age 20 to 70, having been hired as administrative technician through competitive examination, with jobs involving computer use for 5 years at least, and cognitive skills to respond the administered questionnaires. We excluded eligible subjects who refused consent.

Eligible subjects were contacted in the workplace to receive information on the study and sign an informed consent form as established in the Resolution no. 466/2012. Those who agreed to participate responded the Nordic Musculoskeletal Questionnaire (NMQ), Short Form Health Survey (SF-36) and a sociodemographic questionnaire to characterize the sample.

The aim of NMQ is to standardize self-reported musculoskeletal symptoms and thus facilitate comparisons of studies. While it cannot be used for clinical diagnosis, it is considered highly relevant to detect MSD. It provides multiple-choice responses for symptoms on different body sites. The Portuguese version was validated in 1999 by Pinheiro et al.<sup>14,15</sup>.

SF-36 comprises 11 questions and 36 items distributed across eight domains: physical functioning (10 items), physical role functioning (4 items), bodily pain (2 items), general health (5 items), vitality (4 items), social role functioning (2 items), emotional role functioning (3 items) and mental health (5 items); a final item, self-reported health transition, compares current state of health with that one year earlier. Responses are transformed into domain scores which range from 0 to 100, higher scores indicate better health status<sup>16</sup>. Each domain is assessed separately and there is no global score.

## STATISTICAL ANALYSIS

On descriptive analysis the data were expressed as relative frequencies, mean and standard deviation when normally distributed, otherwise as median and interquartile range. Normality was assessed by means of the Kolmogorov-Smirnov test. SF-36 scores were compared between sexes with the Mann-Whitney test. The significance level was set to 5% ( $p < 0.05$ ). All analyses were performed with software Statistical Package for the Social Sciences (SPSS) version 20.0 for Windows.

## RESULTS

The sample comprised 70 participants, with average age 50.7 years old; 34 (48.6%) were female and 36 (51.4%) male. Thirty-one participants (44.3%) had completed graduate studies, 20 (28.6%) undergraduate studies, eight (11.4%) secondary school and four (5.7%) elementary school, while two (2.9%) had partially attended graduate and five (7.1%) undergraduate studies. Anthropometric data, years in the job and weekly working hours are described in Table 1. These findings are relevant, because they may be related to MSD.

The highest scores (100) on SF-36 corresponded to domains physical role and emotional role functioning. The lowest scores corresponded to domains bodily pain (72) and vitality (72.5) as depicted in Figure 1. SF-36 scores did not significantly differ between men and women ( $p > 0.05$ ) (Table 2).

## MUSCULOSKELETAL COMPLAINTS

The results obtained with NMQ are described in Table 3. The prevalence of pain was high: 49 participants (70%) reported pain in the past seven days and 54 (77%) in the past 12 months. About 17.1% of the sample reported to

have missed workdays in the past 12 months. Among the participants who reported pain in the past seven days, 26/49 (53%) were female and 23/49 (47%) male. Among those who reported pain the past 12 months, 27 (50%) were female and 27 (50%) were male.

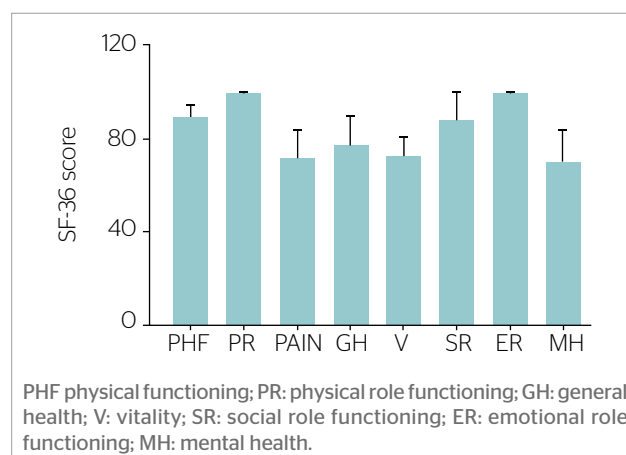
## INVOLVED BODY SITES

Figure 2 depicts the relative frequency of musculoskeletal pain in different body areas. The highest rates corresponded to the lower back (38.6%) and neck (34.3%) among the participants who reported pain in the past

**Table 1.** Sample characterization: anthropometric data, years in the job and working hours; data expressed as mean±standard deviation, João Pessoa, Paraíba, Brazil, 2018 (n=70).

|                          |            |
|--------------------------|------------|
| Participants             | 70         |
| Sex-Male (%)             | 51.4       |
| Female (%)               | 48.6       |
| Age (years)              | 50.7±13.2  |
| Weight (kg)              | 70.88±13.7 |
| BMI (kg/m <sup>2</sup> ) | 25.90±4.02 |
| Height (m)               | 1.65±0.95  |
| Years in the job         | 24.4±13.8  |
| Weekly working hours     | 33.31±4.7  |

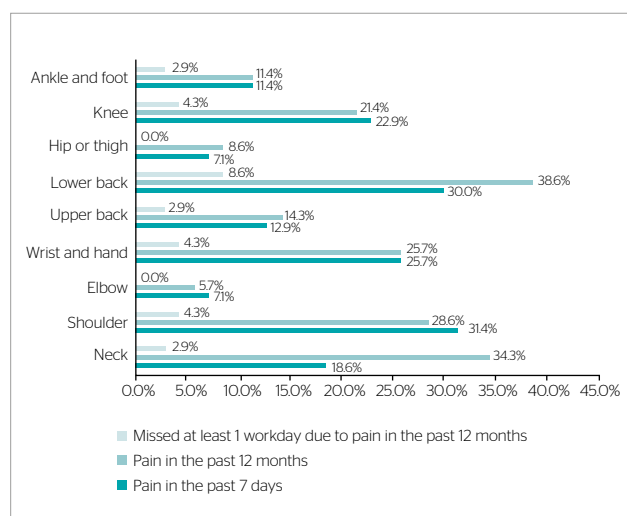
BMI: body mass index.



**Figure 1.** Short Form Health Survey 36 domain scores; data expressed as median (25-75% interquartile range), João Pessoa, Paraíba, Brazil, 2018 (n=70).

**Table 2.** Short Form Health Survey 36 domain scores according to sex; data expressed as median (25-75% interquartile range), João Pessoa, Paraíba, Brazil, 2018 (n=70).

|                            | Men              | Women           | P     |
|----------------------------|------------------|-----------------|-------|
| Physical functioning       | 90 (80-100)      | 82.5 (63.7-95)  | 0.311 |
| Bodily pain                | 73 (62-97.5)     | 72 (51-84)      | 0.441 |
| Physical role functioning  | 100 (75-100)     | 100 (75-100)    | 0.755 |
| General health             | 73.5 (60.5-89.2) | 77 (60.7-92)    | 0.781 |
| Vitality                   | 72.5 (51.2-85)   | 72.5 (53.7-80)  | 0.715 |
| Social role functioning    | 87.5 (68.7-100)  | 87.5 (71.8-100) | 0.100 |
| Emotional role functioning | 100 (66.6-100)   | 100 (100-100)   | 0.244 |
| Mental health              | 68 (60-83)       | 76 (60-89)      | 0.142 |

**Figure 2.** Prevalence of musculoskeletal pain according to body site among administrative technicians at Universidade Federal da Paraíba, João Pessoa, Paraíba, Brazil, 2018 (n=70).**Table 3.** Frequency of pain among administrative technicians at Federal University of Paraíba, João Pessoa, Paraíba, Brazil, 2018 (n=70).

|       | Pain in the past 7 days |       | Pain in the past 12 months |       | Missed at least 1 workday due to pain in the past 12 months |       |
|-------|-------------------------|-------|----------------------------|-------|---|-------|
|       | n                       | %     | n                          | %     | n   | %     |
| No    | 21                      | 30.0  | 16                         | 22.9  | 58  | 82.9  |
| Yes   | 49                      | 70.0  | 54                         | 77.1  | 12  | 17.1  |
| Total | 70                      | 100.0 | 70                         | 100.0 | 70  | 100.0 |

12 months, and the shoulders (31.4%) and lower back (30%) in the past seven days. Low back pain was the main reason for requiring sick leave (8.6%) followed by pain in the knees, wrists, hands and shoulders (4.3% each).

## DISCUSSION

The present study detected musculoskeletal pain in the past seven days among 70% of the participants and among 77.1% in the past 12 months, while 17.1% required sick leave. These findings—which agree with those of other studies<sup>17-19</sup>—indicate that musculoskeletal pain is a considerable source of distress for this population of workers and may lead to more severe disorders. In turn, the reported

QoL may be categorized as good, since scores were close to the maximum possible (100).

Repeated movements, awkward posture and lack of breaks are causal factors for pain in several body sites and are part of the everyday work routine of administrative technicians. Thus they contribute to illness and consequent sick leave spells<sup>20</sup>. Also age, sex and body mass index are associated with occurrence of symptoms<sup>21</sup>. The highest prevalence in the present study corresponded to low back pain (38.6%) and 8.6% of the affected individuals had to request sick leave. According to several studies, the prevalence of low back pain in the overall population ranges from 50 to 80%, while occupational low back pain is the leading cause of disability among workers under age 45 and accounts for one fourth of premature disability cases<sup>20</sup>. Corroborating

these data, in their study with seamstresses Machado et al.<sup>1</sup> found that low back pain was the main cause of sick leave. Therefore, the lower back is one of the main body sites to be assessed and treated; remaining long time sitting at work might be the main associated causal factor.

Neck pain was the second most prevalent in the present study (34.6%) and indeed represents a considerable health problem among office workers. According to Kaliniene et al.<sup>21</sup> and Paksaichol et al.<sup>22</sup>, neck pain is a cause of distress and disability and reduces the amount of work an individual may perform, with consequent socioeconomic impacts for themselves and society at large<sup>23</sup>. Some studies performed with administrative assistants found that the neck was one of the most frequently affected body sites. Appropriate placement of computers and adequate body posture are highly relevant to minimize musculoskeletal pain, since imbalance might interfere with spine rotation movements and thus lead to injury mainly of the neck and chest muscles. Elbows should be at a right angle relative to the desk, and the trunk in regard to the hips<sup>24,25</sup>.

Also other studies which administered NMQ to different populations of workers found high prevalence of pain in the past seven days and 12 months<sup>26,27</sup>. In a study performed with employees of Universidade Estadual do Sudoeste da Bahia, Brazil<sup>26</sup>, the prevalence of pain in the past 12 months was the highest, as also in the present study. These findings point to the chronic nature of symptoms. The data in the literature and our results stress the relevance of occupational health assessments and interventions to ensure better care in the workplace and during the performance of job tasks.

Functional capacity—considered indispensable for satisfactory QoL—was defined in several studies as the ability of people to perform activities of daily living with no aid or intervention whatsoever. According to Abreu<sup>28</sup> pain intensity is a factor with considerable influence on functional

capacity, and consequently also on QoL. In the present study, the score on SF-36 physical functioning score was high.

While the participants reported pain in several body sites, their overall QoL was good as per the scores on SF-36. There is not yet a consensus on what QoL is. A definition was attempted, encompassing several aspects, such as length in the job, economic resources, relationships, and leisure, among others<sup>29</sup>. According to Auquier et al., as cited by Minayo et al.<sup>30</sup>, health-related aspects associated with QoL are essentially self-perceived health, social, psychological and physical functioning and the corresponding impairments. In the present study, all SF-36 domain scores were high, which points to satisfactory QoL in general among the participants, without any difference between men and women.

Nevertheless, since the participants reported musculoskeletal complaints, such as pain, in several body sites, interventions are needed to provide relief and prevent them from impairing their performance at work. Regular physical activity and workplace fitness are highly relevant strategies in this regard. Several studies found that workplace fitness and physical activity at least 30 minutes five times per week reduce MSD and maximize the physical and mental well-being of workers<sup>31</sup>.

## CONCLUSION

Based on the results obtained we conclude that the rate of musculoskeletal pain was high among administrative technicians who use computers at work, involving several body sites. In turn, the scores on QoL were satisfactory.

We expect that our findings will contribute to the development of interventions at and outside the workplace to minimize MSD among this population of workers. Experimental studies are needed to achieve a more accurate clinical assessment.

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