

# Prevalence and Profile of Pain and Catastrophic Thinking in Workers of a Health Care Provider

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## ABSTRACT

**Introduction:** Work-related musculoskeletal pain is a common health problem, which can be caused and/or aggravated by activities of daily living, environmental factors, working conditions, as well as by catastrophic thoughts.

**Objectives:** To identify the prevalence and profile of musculoskeletal pain, as well as catastrophic thoughts related to pain in workers in the administrative sector of a healthcare provider.

**Methods:** 95 workers from the administrative sectors of a health insurance company participated in the study. A questionnaire was used to know the profile of the sample, in addition to the Nordic Musculoskeletal Questionnaire, which aims to identify musculoskeletal complaints and the Brazilian version of Pain Catastrophizing Scale to identify the amplification of pain perception and the occurrence of distorted beliefs related to pain.

**Results:** Most participants were female. Concerning the prevalence of musculoskeletal pain, 86.3% of the total sample reported some complaint, the lower back being the most affected region (50.5%), followed by neck (49.5%) and shoulders (45.3%). Regarding catastrophizing, 92.6% of the participants have some negative thoughts regarding their pain, among which magnification and hopelessness were the most predominant (36.8% and 21.1%, respectively).

**Conclusion:** High rates of complaints of musculoskeletal pain were evidenced, where the lower back region was the most prevalent. More than 92% of the participants have some catastrophic event in relation to their pain, with a greater predominance of the magnification subscale.

**Keywords:** Cumulative Trauma Disorders; Musculoskeletal Pain; Catastrophization; Occupational Health

## Introduction

Work-related musculoskeletal pain is a common health problem, which can be caused and/or aggravated by activities of daily living, environmental factors and working conditions themselves [1]. This painful condition may be associated with the biomechanical demands of work as well as linked to poor posture; and these are aggravated by conditions such as load handling, use of force, repetitive movements and exposure to vibrations of some body segments or the whole body [2]. The presence of symptoms can act alone or together, presenting consequences at the muscular and articular level, as well as in ten-

dons, ligaments, cartilages, nerves, bones and vascular system [1]. Recently, Lima, et al. [3] pointed out that administrative work, due to their working conditions, such as inadequate postures in front of the workplace, activities said to be repetitive and long periods in section, can cause the worker to present pain and/or musculoskeletal disorders inherent to the position occupied. The presence of pain can influence aspects that go beyond the physical, being able to shake the psychological conditions of workers [4]. Catastrophic thoughts, or the act of "catastrophizing pain", refers to the negative and exaggerated interpretation of an unpleasant experience, whether it is painful, real

or expected [5]. It encompasses three factors, which are magnification (characterized by a tendency to increase pain and expectation for negative results), rumination (which refers to the repeated concern of inability to prevent or divert attention from thoughts related to pain) and hopelessness (belief that nothing can help resolve pain, feeling of inability to deal with painful situations) [5,6].

Knowing the prevalence, investigating and understanding the intervening factors to pain complaints in workers within a company, presence or not of this amplification of pain perception and the occurrence, or not, of distorted beliefs related to pain has great relevance. With regard to the costs related to disability, it is known that the annual amount is large, since workers with pain complaints show reduced productivity, greater absenteeism and frequent distant absences, for example [7]. This shows that in addition to the pain felt and/or perceived, individuals may also present alterations regarding quality of life, impaired productivity at work, need for sick leave and other complications that may injure different biopsychosocial aspects. Thus, the objective of this study was to identify the prevalence and profile of musculoskeletal pain, as well as catastrophic thoughts related to pain in workers in the administrative sector of a health care provider.

## Methods

This was a descriptive and quantitative correlational study based on an exploratory approach, which was conducted in the city of Taquara, Rio Grande do Sul, in the months of October and November 2022. The research project was approved by the Ethics and Research Committee of Faculdades Integradas de Taquara under opinion number 5.672.083. The population of this study was composed of employees of the administrative sectors of a health operator, totaling 130 workers, in which 95 participants were interviewed. Considering the total number of workers as the universe of the research, the participants were defined by means of sample calculation in which a confidence level of 95% and a margin of error of 5% were considered. Contact was made through e-mail, and the volunteers, after clarification of the research and signing of the Term of Free and Informed Consent (ICF), were invited to answer the questionnaires in the online format.

The first questionnaire evaluated the profile of the sample (age, gender, time of hiring, level of education), then the Nordic Musculoskeletal Questionnaire (NMQ) [8] was applied, which is formed by the outline of a human figure divided into nine anatomical regions (neck, shoulders, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, ankles/feet) and aims to identify the presence of annual and weekly musculoskeletal disorders that precede the research. The translated and validated version for the Brazilian population of the Brazilian version of Pain Catastrophizing Scale (B-PCS) [9] was used to identify the amplification of pain perception and the occurrence of distorted beliefs related to pain. It is a self-administered scale, easy and quick to apply, composed of 13 questions that assess

the extent of catastrophic cognitions. The instrument is composed of three subscales: hopelessness, magnification and rumination, and the scale quotation is obtained from the sum of the responses to all items, ranging from 0 to 4 (0 = minimal, 1 = mild, 2 = moderate, 3 = intense and 4 = very intense). Quantitative variables were described as mean and standard deviation or median and interquartile range. Categorical variables were described by absolute and relative frequencies. To compare means, the student's t test or Analysis of Variance (ANOVA) were used. In case of asymmetry, the Mann-Whitney test was applied. To evaluate the association between numerical variables, the Spearman correlation test was used. The association between categorical variables was assessed by Pearson's chi-square test or Fisher's exact test. The level of significance adopted was 5% ( $p < 0.050$ ) and the analyses were performed using SPSS version 27.0.

## Results

The sample consisted of 95 workers from administrative sectors of a health operator in the State of Rio Grande do Sul; 78.9% were female, the mean age was 32.2 years ( $SD \pm 8.7$ ), most of them had completed higher education (49.5%), followed by incomplete higher education (36.8%), complete high school (9.5%), incomplete high school (3.2%) and complete elementary school (1.1%). Regarding the time in the company, most participants worked between 5 and 10 years (29.5%), 21.1% worked between 3 and 5 years and between 10 and 20 years, 14.7% worked between 1 and 3 years, less than one year 11.6% and 2.1% more than 20 years. Regarding the musculoskeletal symptoms evaluated by the NMQ, 82 of the 95 participants evaluated (86.3%) reported some complaint. Table 1 also shows the prevalence of musculoskeletal pain in certain regions of the body of the individuals participating in the research. The regions with the highest percentages of pain were the lower back, with 50.5%, followed by the neck (49.5%) and shoulders (45.3%), and these data refer to the last 12 months.

**Table 1:** Prevalence of pain in the last 12 months using the Nordic Musculoskeletal Questionnaire.

Regions	n	%
Neck	47	49,5
Shoulders	43	45,3
Upper back	40	42,1
Elbows	3	3,2
Cuffs/Hands	20	21,1
Lower back	48	50,5
Hip/thighs	12	12,6
Knees	17	17,9
Ankles/feet	16	16,8
General	82	86,3

Regarding the subscales of catastrophization, magnification and hopelessness were the most prevalent (36.8% and 21.1%, respectively) and for 15 participants it was rumination (15.8%). Those who had the same value in two or three subscales (18.9%) were classified as mixed. Only 07 participants did not score on the B-PCS scale, that is, 88 have some negative thoughts regarding their pain. This value corresponds to 92.6% of the total number of participants (Figure 1). There was no statistically significant difference between the groups (with and without pain) regarding the scores of the B-PCS subscales (Table 2). However, Figure 2 shows that the workers who did not score on the B-PCS had the lowest prevalence of pain ( $p < 0.001$ ). When pain regions were associated with the scores of the subscales of the Brazilian version of Pain Catastrophizing Scale (B-PCS), only the region corresponding to the lower back presented statistical significance. Figure 3 shows that workers with lower back pain had significantly

higher scores in the subscales Hopelessness ( $p = 0.021$ ), Magnification ( $p = 0.010$ ), Rumination ( $p = 0.014$ ) and total score ( $p = 0.009$ ). Figure 4 shows that the workers who did not score on the B-PCS were those who had the lowest prevalence of pain in the lower back and those who had a mixed predominance those who had the highest prevalence of pain in this region ( $p = 0.004$ ). When age, sex, education and time working in the company were associated with pain and catastrophic thinking, it was observed that women presented significantly higher prevalence of shoulder pain in the last 12 months when compared to men (52% vs 20%;  $p = 0.021$ ). It was also observed that workers with complete elementary school or incomplete high school education had a significantly lower prevalence of general pain in the last 12 months, when compared to those with higher education (25% vs 89%;  $p = 0.008$ ).

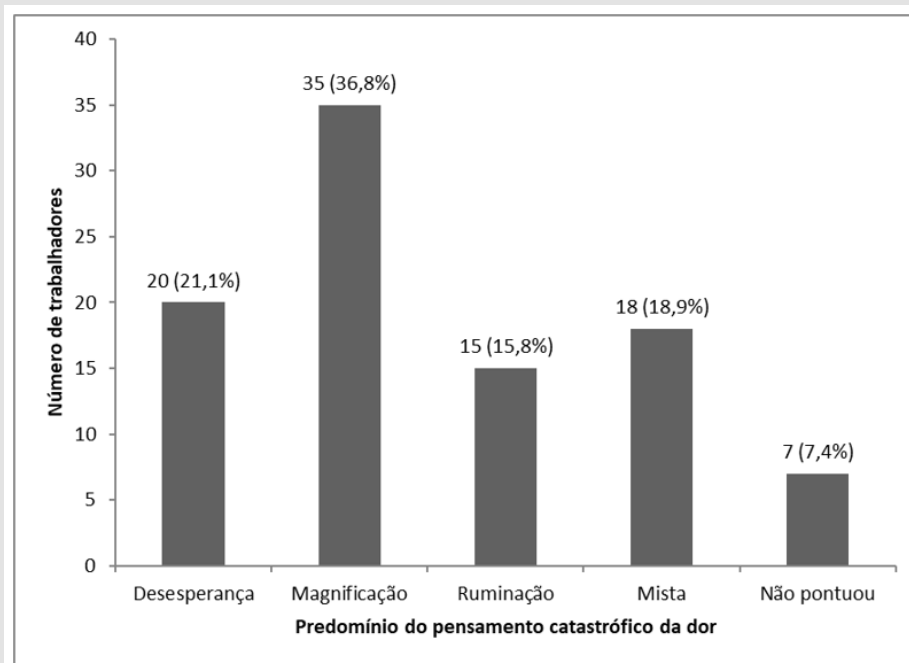


Figure 1: Predominance of the catastrophic thinking subscale of pain.

Table 2: Association of catastrophic thinking in pain through the Brazilian version of Pain Catastrophizing Scale (B-PCS) with pain by the Nordic questionnaire.

B-PCS subscales	Prevalence of general pain in the last 12 months			p
	Yes (n = 82)	No (n = 13)		
	Median	Median		
	(P25 - P75)	(P25 - P75)		
Magnification	3 (1 - 6)	2 (0 - 6)		0,263
Rumination	5 (2 - 8)	5 (0 - 8)		0,186
Hopelessness	5 (2 - 9)	3 (0 - 9,5)		0,148
Total score	13,5 (5,8 - 25)	10 (0 - 23)		0,138

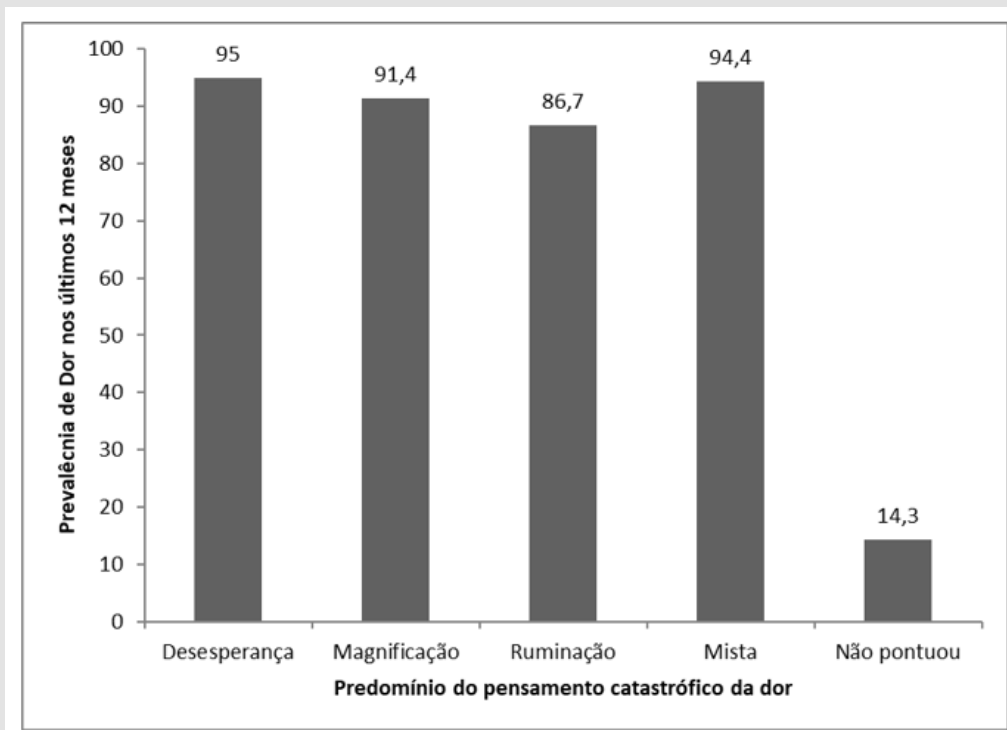


Figure 2: Prevalence of pain in the last 12 months and its relationship with the predominance of the catastrophic thinking subscale of pain.

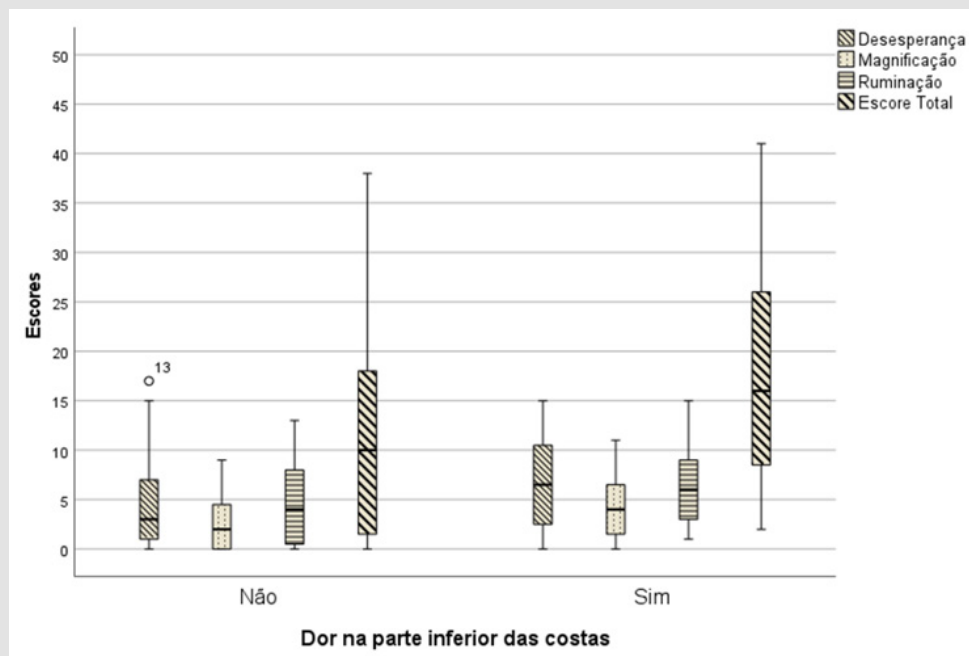


Figure 3: Catastrophic thinking in pain through the subscales of the Brazilian version of Pain Catastrophizing Scale (B-PCS) according to pain in the lower back by the Nordic questionnaire.

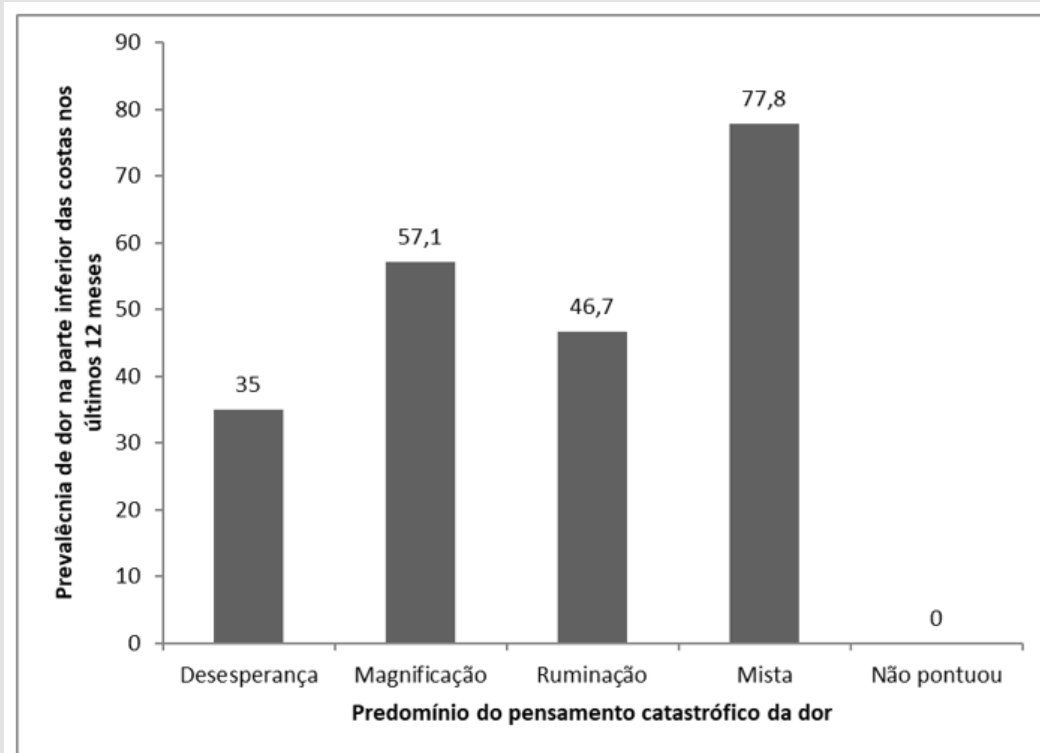


Figure 4: Prevalence of lower back pain in the last 12 months and its relationship with the predominance of catastrophic pain thinking subscale.

## Discussion

Administrative work is characterized by being performed predominantly in the sitting position, which has stimulated researchers to evaluate the different impacts on workers' physical health [10]. In the present study, it was seen that, regarding the presence of pain related to the musculoskeletal system, 86.3% of the interviewees reported complaints of pain in some region of the body in the last twelve months, and the region with the highest prevalence was in the lower back, corresponding to more than half of the sample (50.5%). These findings corroborate studies by Celik, et al. [11], Lima, et al. [3] and Natali and Barbalho-Moulim [12], which also aimed to assess the prevalence of pain in administrative workers. In the study by Brakenridge, et al. [13], it was suggested that low back pain may be associated with prolonged time in the sitting position, considering that there was a decrease in complaints when one hour of daily sitting time at work was reduced. However, the results of a systematic review reached a conflicting conclusion, as they suggest that working in the bipedal position for a prolonged time, in front of a desk position, did not reflect in lower rates of perceived low back pain when compared with the sitting position [14].

Still on the complaint of pain in the lower back, which comprises the lumbar spine area, this was the only one that presented a significant correlation with catastrophic thinking. That is, participants complaining of pain in the lumbar region had significantly higher scores in the catastrophization subscales. This behavior was also observed in a prospective cohort study by Ranger, et al. [15], where it was evidenced that catastrophization was positively associated with chronic low back pain; They also mention that this psychological factor is associated with a worse prognosis of low back pain and disability. In addition, pain catastrophization has been associated with various degrees of functional disability and high pain intensity, where, for example, the findings of the study by Lins, et al. [5] demonstrated that the magnitude of catastrophization and its subscales have a direct and proportional relationship to the functional impairment resulting from pain. Similarly, pain tolerance is worse in individuals with exaggerated negative orientation about pain, because psychological predictors are preponderant and contribute to increased sensitivity to pain [16].

Following in the field of catastrophization, magnification was the subscale with the highest predominance. This finding was also evidenced in the study by Lins, et al. [5] who state that higher scores on the catastrophic thinking scale were significantly associated with

pain-related functional disability, with magnification and rumination being the main subcomponents of catastrophization predictive of disability. Magnification is the component of catastrophic thinking that is characterized by a tendency to increase pain and expectation for negative results<sup>5,6</sup>, that is, the individual amplifies the negative perception about pain. In a study involving 844 participants with chronic pain, aiming to examine the relationship between pain catastrophization, pain, quality of life and depression, found that magnification was significantly related to physical and mental health, quality of life and depressive mood [17]. Even if workers have access to health services and all the therapeutic resources at their disposal, distortions of thoughts resulting from the perception of pain can lead to catastrophic feelings that reduce the effectiveness of any treatment intervention [18]. Still on this, Mankovsky, et al. [19] reported that high scores in measures of pain catastrophization predict a worse response to treatment. That is, the distortion of thought resulting from the perception of pain can lead to feelings of catastrophization that can reduce the effectiveness of other interventions.

In our study, it was also found that women have a significantly higher prevalence of shoulder pain compared to males. A possible justification for this finding is that women generally perform more activities that involve raising the upper limbs above the head, where in many cases domestic chores and home care are added to their daily workload [20]. Another hypothesis referring to the finding that women felt more pain than men is the hormonal relationship. Therefore, the perception of increased pain may be caused by the action of the hormone 17 $\beta$ -estradiol, for example, which acts by inhibiting neural activity in a specific area of the brain, which is responsible for modulating the analgesic effect in the body [21]. Low educational level was identified as one of the strongest predictors in the prevalence of musculoskeletal pain when compared to those with higher education [22,23]. Possible explanations for the fact that less educated people feel more pain, may be because they have less understanding about the importance of properly assessing and treating pain, in addition to having worse financial conditions, frequent self-medication and less access to health services [24]. However, our research showed that workers with a lower level of education had a significantly lower prevalence of pain when compared to those with higher education. Because this is a study with a homogeneous population with regard to exposure to occupational risk agents and that low education may be associated with lower age, we can infer that this finding is related to the chronobiological aspects of the participants. In order for the problems mentioned in this study to be prevented, it is very important to conduct health education for employees.

Providing an ergonomic environment, providing comfortable instruments and equipment and avoiding prolonged postures are good options to reduce musculoskeletal disorders [25]. Psychotherapeutic follow-up is also an excellent option, in addition to making employ-

ees reflect more on their negative and exaggerated thoughts about unpleasant experiences, it also helps the individual to develop their potential, through positive psychology [26]. Therefore, providing a favorable environment for the well-being of the worker can avoid absences, and consequently minimize the costs associated with health and high turnover as well as increase productivity and, in view of this, directly impact the quality of services and products [27]. In the present study, we pointed out limitations related to the methodological restriction regarding the n sample size in which we suggest studies with a larger population, preferably designed in a multicenter way to better understand the aspects related to the prevalence of musculoskeletal pain and catastrophic thinking related to pain.

## Conclusion

The prevalence of musculoskeletal pain among employees of the administrative sectors of a health operator is 86.3%, and the lower back was the region of greatest complaint. With regard to the results of catastrophization, 92.6% of the participants have some catastrophic thought in relation to their pain, with a greater predominance of the magnification subscale.

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