Research Article

Epidemiological characterization of Cumulative Traumatic Disorders Syndrome among workers in Brazilian Amazon city between 2017-2022

Caracterización epidemiológica del síndrome de trastornos traumáticos acumulativos entre trabajadores de una ciudad de la Amazonía brasileña entre 2017-2022

Caracterização epidemiológica da Síndrome de Transtornos Traumáticos Cumulativos de trabalhadores de uma cidade da Amazônia brasileira entre 2017-2022

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ABSTRACT

In Brazil, 102,986 notifications of Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders were recorded between 2007 and 2021. The objective of this research was to characterize the epidemiology of Repetitive Strain Injuries, Work-Related Musculoskeletal Disorders (RSI/WMSD), and the sociodemographic profile of workers in a Brazilian Amazon city between 2017 and 2022. This is a descriptive, epidemiological, and cross-sectional study. Data collection was carried out online using the Disease Information System of the Information Technology Department of the Unified Health System. The selected variables were the frequency of RSI/WMSD notifications according to biological sex, race, age group, occupation, and total number of cases in the municipality of Tucuruí, in the State of Pará. Mixed race individuals and those in the 40-59 age group were the most prevalent. Additionally, it was observed that the unemployed in 2021 were the most affected. Therefore, the importance of this study to the community is emphasized, as there is a lack of data on this topic from other regions, such as Lake Tucuruí.

Keywords: Repetitive Strain Injuries; Work-Related Musculoskeletal Disorders; Epidemiological Profile; Amazon region.

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RESUMEN

En Brasil, se registraron 102.986 notificaciones de Lesiones por Esfuerzos Repetitivos y Trastornos Musculoesqueléticos Relacionados con el Trabajo en el período comprendido entre 2007 y 2021. El objetivo de esta investigación fue caracterizar la epidemiología de las Lesiones por Esfuerzos Repetitivos, los Trastornos Musculoesqueléticos Relacionados con el Trabajo (LER/TMET) y el perfil sociodemográfico de los trabajadores de una ciudad de la Amazonía brasileña en el período 2017-2022. Se trata de un estudio descriptivo, epidemiológico y transversal. El procedimiento de recolección de datos se realizó en línea a través del Sistema de Información de Agravos del Departamento de Tecnologías de la Información del Sistema Único de Salud. Las variables seleccionadas fueron la frecuencia de notificaciones de LER/TMET según sexo biológico, raza, grupo etario, ocupación y número total de casos en el municipio de Tucuruí, en el Estado de Pará. Los grupos más prevalentes fueron las personas mestizas y aquellas en el grupo de edad de 40 a 59 años. Además, se observó que los desempleados en el año 2021 fueron los más afectados. Por lo tanto, se destaca la importancia de este estudio para la comunidad, ya que faltan datos sobre este tema en otras regiones, como el Lago Tucuruí.

Palabras clave: Lesiones por esfuerzo repetitivo; Trastornos musculoesqueléticos relacionados con el trabajo; Perfil epidemiológico; Región amazónica.

RESUMO

Em um estudo epidemiológico, foram registradas 102.986 notificações de Lesões por Esforço Repetitivo e Distúrbios Osteomusculares Relacionados ao Trabalho (LER/DORT) no período entre 2007 e 2021 no Brasil. O objetivo deste estudo foi caracterizar a epidemiologia de Lesões por Esforço Repetitivo e Distúrbios Osteomusculares relacionados ao Trabalho (LER/DORT) e o perfil sociodemográfico dos trabalhadores de uma cidade da Amazônia brasileira entre 2017-2022. Trata-se de um estudo descritivo, epidemiológico e de corte transversal. A coleta de dados foi realizada online no Sistema de Informação de Agravos de Notificação do Departamento de Informática do Sistema Único de Saúde (DATASUS). As variáveis selecionadas foram a frequência de notificações de LER/DORT segundo sexo biológico, raça, faixa etária, ocupação e número total de casos no município de Tucuruí, no Estado do Pará. A cor parda e a faixa etária de 40 a 59 anos foram as mais prevalentes; além disso, observou-se que os desempregados no ano de 2021 foram os mais afetados. Assim, ressalta-se a importância deste estudo para a comunidade, uma vez que há carência de dados sobre este tema em outras regiões, como a do Lago de Tucuruí.

Palavras-chave: Lesões por Esforço Repetitivo; Distúrbios Osteomusculares Relacionados ao Trabalho; Perfil Epidemiológico; Região Amazônica.

INTRODUCTION

The Brazilian Ministry of Health describes Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders (RSI/WMSD) as a clinical syndrome characterized by chronic pain, accompanied or not by objective changes, present mainly in the neck, shoulder girdle and upper limbs, associated with the dynamics of work and which can affect tendons, muscles and peripheral nerves (Silva & Silva, 2010). RSI/WMSD encompasses several diseases, among the best known are tendonitis, tenosynovitis and epicondylitis, responsible for compromising thousands of workers (Fernandes & Fernandes, 2011). Several factors can influence absence from work, the main ones being related to physical or emotional causes. With regard to occupational diseases, RSI/WMSD are the main cause of absence from work in Brazil (Brazilian Ministry of Health, 2019). Biomechanical and psychosocial overloads, together with the specific dynamics of work, are determining factors for future health-related problems for workers (Azambuja et al., 2004).

In view of this, in 2002, the National Network for Comprehensive Care for Workers' Health (RENAST) was created, focused on assistance, surveillance and care for the health of professionals. This network required the mandatory reporting of injuries through the National System for Notifiable Injuries (SINAN), intended to receive notifications regarding diseases monitored in the country (Ministry of Health of Brazil, 2006).

In an epidemiological study, 102,986 notifications of RSI/WMSDs were recorded in Brazil between 2007 and 2021. The most affected workers were women (52.1%), and the predominant age group was the productive age of 30 to 39 years, with 30,204 notifications; 40 to 49 years old, with 33,955; and 50 to 59 years old, with 20,299 cases, totaling more than 80% of the records. Approximately 40% of the affected workers were white. Regarding occupation, 43% of the notifications involved workers in the production of industrial goods and services, while self-employed workers totaled 7.8% (Pinto, 2022).

According to the Ministry of Health, to prevent injuries such as those mentioned, employers and companies are recommended to follow Regulatory Standard 17 (NR17), which determines adaptations of working, psychophysiological and furniture conditions, to provide greater comfort, safety and performance in the work environment (Ministry of Health of Brazil, 2006).

From this perspective, a study carried out in Belém/PA, with professionals who work sitting down using a computer, can help to better understand these problems, since approximately 87% of those interviewed reported feeling some type of pain after their workday, which highlights the need for more actions aimed at workers in the North region of Brazil (Silva et al., 2020). However, there is a lack of research and epidemiological data to fill the gaps on RSI/WMSDs in the North region, especially in the municipality of Tucuruí-PA, which justifies the need to carry out this research.

Therefore, it is important that companies promote health education actions for workers, together with the Occupational Health Reference Centers (CEREST) in each region (Alencar & Ota, 2011). Thus, the guiding question of this study was: what is the prevalence of Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders in the city of Tucuruí-PA?

Therefore, the present study aimed to characterize the epidemiology of RSI/WMSD and the sociodemographic profile of workers in a city in the Brazilian Amazon between 2017-2022.

METHODS

This is a descriptive, epidemiological study with a retrospective, quantitative, longitudinal approach (Zangirolami-Raimundo et al., 2018). The collection procedure was carried out online using secondary data collected from DataSus/SINAN on Tabnet. DATASUS seeks to provide tools for activities related to the concentration, selection, coding, classification and storage of large databases (Ferraz, 2009). In addition, the Notifiable Diseases Information System (SINAN) is used to collect, transmit and disseminate data generated by the Epidemiological Surveillance System in the three spheres of government. To select the variables, we used DATASUS/SINAN access on Tabnet and selected the item on epidemiological diseases and morbidity, followed by the topic "Notifiable Diseases and Injuries - 2017 onwards SINAN", in which the RSI/WMSD option in the state of Pará was selected. After that, the system directed the selection of variables, following the steps: 1 - line: municipality, sex, race, age group, occupation; 2 - column: year of notification; 3 - content: notifications; 4 - available periods: 2017-2022, with the selection of the municipality of notification referring to the city of Tucuruí.

This research is in accordance with the guidelines and regulatory standards for research involving human beings, according to Resolution 466/12 of the National Health Council (CNS) (Ministry of Health of Brazil, 2012). In compliance with the aforementioned resolution, it was not necessary to submit the project to a Research Ethics Committee (REC), since the study was conducted with secondary data from an open-access database.

The statistical analysis was performed using BioStat 5.1 software for Windows, establishing a significance level of $p < 0.01$, with an α error of 1% for all variables. Descriptive statistics with frequency and percentage values were used. Inferential statistics used the Chi-square test for adherence for equal expected proportions, with the percentage difference calculated as follows: $\Delta\% = \{\text{test 1} - \text{test 2}\}$.

RESULTS

Table 1 presents the results for the race and age group variables of the notifications of Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders in the period 2017-2022, showing statistical differences $p < 0.01$, where it was found that the brown color and the age group of 40 to 59 years were the most prevalent.

Table 1.
Sociodemographic variables for RSI/WMSD notifications between 2017-2022.

Variable Race/color 2017-2022	Result 1 Frequency	Result 2 %
Unknown	4	5
White	3	4
Black	7	8
Brown	68	82
Indigenous	1	1
Total	83	100
p	< 0,0001	
Age Range 2017-2022	**Frequency**	**%**
< 1 year	3	4
20 to 39 years old	9	11
40 to 59 years old	59	71
60 and over	12	14
Total	83	100
p	< 0,0001	

Figure 1 shows the results for the total number of reported cases, where statistical differences were found ($p < 0.0001$), with a total sum of 83 cases in the municipality of Tucuruí between the years 2017 and 2022, with the highest prevalence being in the year 2019, followed by the year 2021.

Figure 1.
Reported cases of RSI/WMSD in the period 2017-2022 in the municipality of Tucuruí-PA.

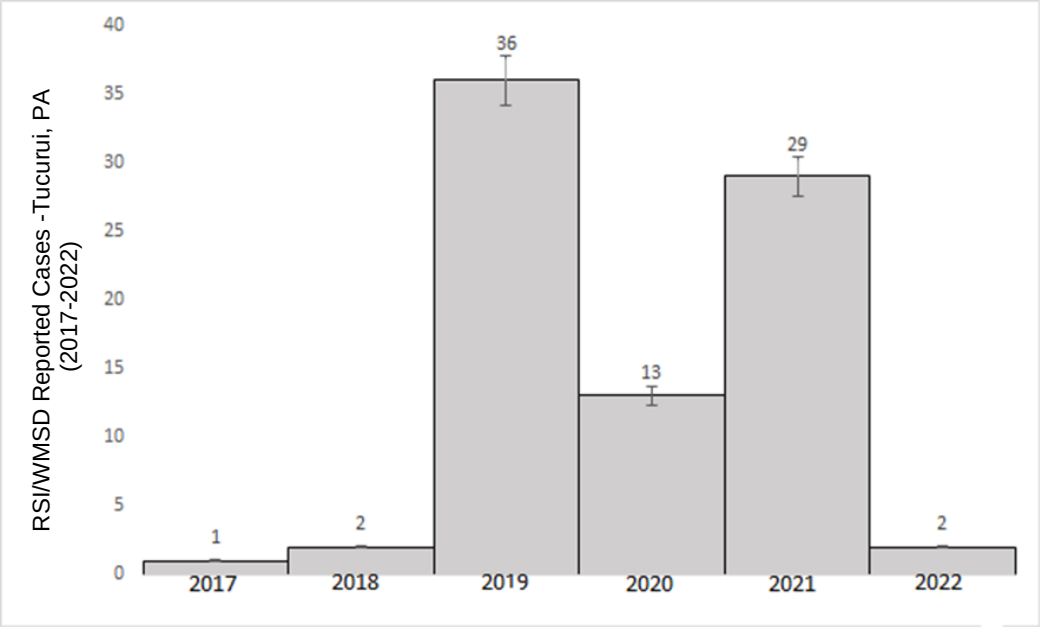


Figure 2 presents the results by biological sex, where a statistically significant difference in favor of the female sex was observed (Δ % + 59 %; p < 0.0001).

Figure 2.
Reported cases by biological sex of RSI/WMSD in the period 2017-2022.

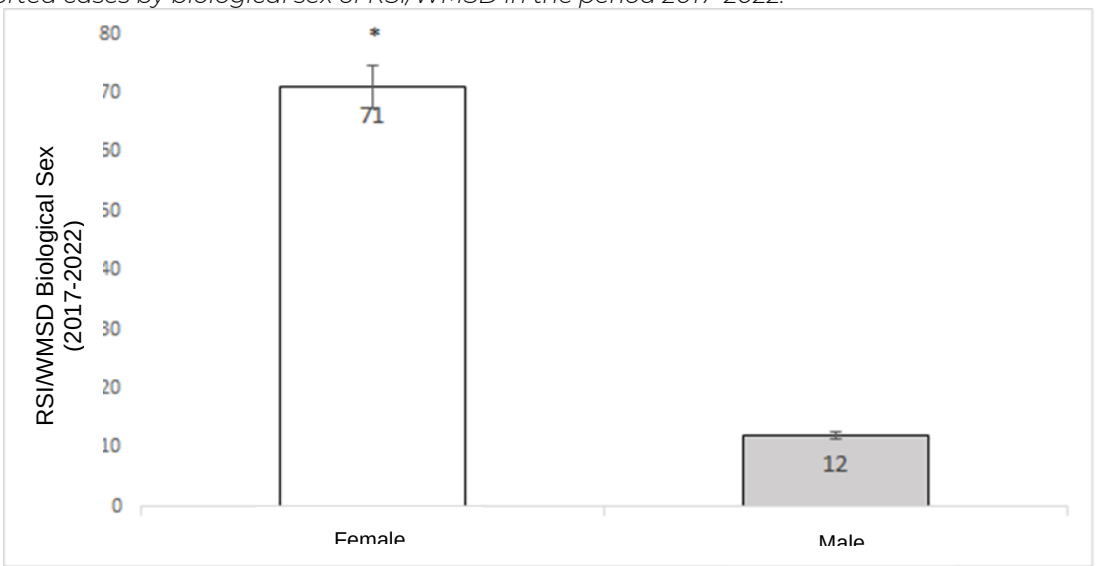
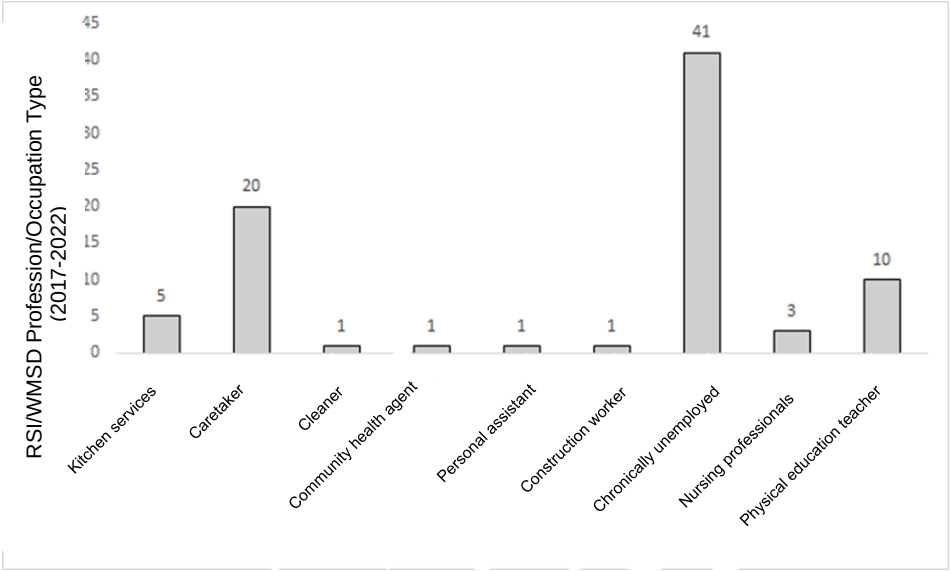


Figure 3 presents the results according to profession and occupation, showing statistical differences (p < 0.0001), with the highest prevalence among unemployed people, janitors and primary school teachers, respectively.

Figure 3.
Results for RSI/WMSD according to profession/occupation



DISCUSSION

This study showed that the sociodemographic level was more prevalent among people of mixed race, women (Figure 2), and those aged 40-49 (Table 1). The years with the highest incidence of RSI/WMSD were 2019 and 2021 (Figure 1), and the most affected professions were janitors and unemployed individuals (self-employed workers) (Figure 3).

In the contemporary world, RSI/WMSD have been frequent in men and women in the productive phase of work, causing various reasons for absence from the workplace. These conditions often evolve into partial or permanent disabilities, which can ultimately result in disability retirement. In this sense, absence from work due to injuries and disorders negatively impacts both work performance and the daily lives of workers (Alencar & Ota, 2011).

Souza et al. (2021) conducted a study on RSI/WMSD notifications in the state of Bahia, comprising 4,979 cases between 2014 and 2018. The study showed a prevalence of 37.5% among people of mixed race, in addition to affecting workers in the age group between 40-49 years, results similar to those presented in this research (Table 1).

In another study on the population of industrial workers affected by RSI/WMSD in Brazil between 2007 and 2013, Viegas & Almeida (2016) observed that the most affected were non-white individuals, between 36-59 years of age. Regarding race, Lima et al. (2020) observed that black or mixed race individuals were prevalent, with an average age of 43 years, which is also in agreement with the findings of this study (Table 1).

It was also found that the age group of 40-59 years has been more prevalent in the literature (Pinto, 2022; Lima et al., 2020; Sousa et al., 2020), which may be associated with the accumulation of activities over time and the physiological reduction of functional capacities due to aging (Moraes & Bastos, 2017). Even so, workers tend not to abandon their services, influenced by the need for subsistence in a capitalist society (Dale & Dias, 2018).

The findings of this study showed a greater number of cases between 2019 and 2021, with a decrease in 2020 (Figure 1), possibly associated with the COVID-19 (SARS-CoV-2) pandemic, a period in which home office was adopted (Pinto, 2022). Sallas et al. (2022) highlight the strong impact that the pandemic had on notifications of diseases or injuries. However, an increase in RSI/WMSD notifications was observed in 2021 and a decrease in 2022 (Figure 1).

In the present study, females were the most frequent (Figure 2). Women have been more frequently involved in repetitive activities in the labor market, in addition to having lower muscle mass, which increases the risk factors for musculoskeletal disorders. Genetic and hormonal factors, as well as fluid retention, can also increase the chances of musculoskeletal disorders, both during and after work activities (Fortes et al., 2015).

A study conducted by Araujo-Fernandes et al. (2024) with obese and overweight women in the post-pandemic period found significant improvements in the mental health domain in a group that performed exercises with a multidisciplinary approach. However, no significant differences were observed in physical health between the experimental group and the control group. It was concluded that multidisciplinary rehabilitation is a fundamental component to improve the quality of life of women with symptoms of long COVID-19, especially in the mental health domain.

Regarding occupation, the present study highlighted a higher incidence of the syndrome in unemployed individuals (Figure 3), and according to Zavarizzi et al. (2022), the high number of injuries may be related to informal occupations, that is, self-employment. Despite this, increased access to health care in this population demonstrates a positive aspect (Haeffner et al., 2018).

The incidence was also high among janitors (Figure 3), as these occupations require physical overload during the workday, with repetition of movements and inadequate postures, as is the case with outsourced workers. According to Druck (2011), this condition makes it difficult to organize unions that could demand improvements in the work environment, such as the implementation of ergonomic standards (Lima et al., 2020; Zavarizzi et al., 2022; Almeida et al., 2021).

Sousa et al. (2020) observed that elementary school teachers are highly susceptible to RSI/WMSD, due to the exhausting work routine, associated with factors such as mental and cognitive health, memory, stress and anxiety, in addition to physical demands. These conditions, together with the high weekly workload and goals to be met, increase the possibilities of RSI/WMSD (Medeiros & Segatto, 2012).

According to the National Institute for Occupational Safety and Health (NIOSH), several factors in the workplace can affect workers, such as dissatisfaction, stress levels, high pressure for physical and mental performance, and interpersonal relationships. These factors can increase the incidence of RSI/WMSD, reinforcing the need for educational actions and occupational health policies (Santos et al.,

2019). In this context, Walsh et al. (2019) state that worker health is part of the universal right to health, guaranteed by the Federal Constitution (1986), and that it is the State's duty to ensure the health of workers (Ministry of Health of Brazil, 2019).

Finally, the recommendations of worker health protection entities highlight the need to comply with ergonomic standards (NR17) in the workplace. Workplace gymnastics planned by trained professionals is an efficient intervention, as it prevents injuries and occupational diseases (Vilela et al., 2012; Soares, 2022). Physical activities should be encouraged both during leisure and at work, due to their positive effects on the quality of life, attention, memory and physical health of workers (Maureira & Flores-Ferro, 2017; Poblete-Valderrama et al., 2015; Enriquez-del Castillo et al., 2022).

This combination of positive factors in the work environment can provide greater satisfaction to workers, generating better results for companies or public institutions. In addition, it can reduce absences due to musculoskeletal problems (Viegas & Almeida, 2016; Vilela et al., 2012).

This study had limitations related to underreporting of cases, possibly caused by a lack of information and training of health professionals, or by fear of dismissal of workers. Furthermore, the population studied was from a single city in the southeast of the state of Pará. The main strength of this study is that it fills a gap in knowledge on the subject in the scientific literature. Thus, this manuscript can serve as a reference for strategic proposals, both in public policies and in the private sector, in ergonomic planning and in the implementation of workplace gymnastics.

CONCLUSION

It is concluded that the epidemiological profile of RSI/WMSD in the analyzed period showed a higher prevalence in 2019, in females and in the mixed race, with the most affected population being those between 40 and 59 years of age.

In addition, the most affected professions were building caretakers and the unemployed. Thus, the importance of this study for the community is highlighted, since there is a lack of data on this topic in other regions, such as Lake Tucuruí.

Therefore, it reinforces the need for new research that covers more areas of the Amazon region and a longer period of time, in order to develop effective strategies to combat this problem that strongly impacts the health of the population and the economy of the region.

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