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Possible work-related musculoskeletal disorders in employees who act as cashiers at a local supermarket in nanuque city

Possíveis distúrbios musculoesqueléticos relacionados ao trabalho em funcionários que atuam como caixas em um supermercado local na cidade de nanuque

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RESUMO
Introduction: The tasks of the cashier may seem simple to the lay eyes and oblivious to the ergonomic working conditions, however, these functions in many cases culminate in repetitive, continuous and exhausting movements. These functions generate several problems related to the musculoskeletal system, such as RSI syndrome and WMSD - Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders. Objective: To identify possible work-related musculoskeletal disorders of employees who have been working as cashiers for at least 2 years in a supermarket in the city of Nanuque – MG. Methodology: This is a quantitative, exploratory and descriptive research, where the main musculoskeletal complaints were studied, using a validated and modified structured questionnaire, applied to 15 cashiers. Results: The operators reported having work-related pain, these injuries cause many problems for the worker, he loses his productive capacity, his autonomy and, in some cases, his income. It is noted that the pains mainly affect regions of the spine and upper part of the body, which indicates a lack of ergonomics in the workplace and a lack

of physical activities. Conclusion: Just like any activity that has repetitive movements and remains in the same position for a long period, the role of cashier generates several pains that are capable, if left untreated, to lead to the employee's absence. The information analyzed showed that the longer the working time and the lower the physical activities, the more WMSD increases, which makes the service provided painful and painful.

Keywords: Repetitive Motion, Ergonomics, Occupational Health.

1 INTRODUCTION

Supermarkets are vital establishments for the subsistence process of the contemporary individual, inserted in the Western capitalist context. These consumption centers are becoming the focus of the exclusive supply of food and other important products for consumers, above all, because of the convenience of finding what is desired in the same space, also because of the variety and quality of what is offered, etc. The fact is that supermarkets are fundamental in people's lives. This role causes an increase in customer demand and consequently in the need for a larger contingent of employees.

Within this reality, the tasks of the supermarket cashier have intensified, requiring greater effort and agility from the employee who works in this segment. The tasks of the cashier may seem simple to the lay eye and oblivious to the ergonomic working conditions, however, these functions in the vast majority of cases culminate in repetitive, continuous and exhausting movements. These factors, combined with poor posture and the inadequacy of the cashier's workstation can result in several problems related to the musculoskeletal system, such as RSI syndrome and WMSD - Repetitive Strain Injuries and Work-Related Musculoskeletal Disorders.

The most pronounced negative effects on cashiers usually appear through symptoms that affect the upper limbs, scapular region and neck, which are recognized by the Ministry of Social Security as RSI, through the Technical Standard for Disability Assessment of 1991, which was adjusted in 1997, with the term complemented to WMSD, (COSTA, 2017). Considered an endemic disease in Brazil, this disease is pronounced in the Supermarket Checkouts in an evident way, so its causes must be investigated so that they can be avoided and the disease treated, or rather, prevented.

The present study aimed to analyze a practical case in the city of Nanuque - MG, with the objective of investigating possible work-related musculoskeletal disorders of employees who have been working as cashiers for at least 2 years in a local supermarket in the city of Nanuque - MG.

2 THEORETICAL BACKGROUND

The area of Physical Therapy that works in workers' health is Ergonomics, responsible for developing actions or projects with the purpose of making work more attractive to the human being and not the other way around, that is, contributing to meet the capacities, needs and limitations of the worker, evaluating the tasks that will be performed by him, as well as the work environment. In this context, Ergonomics aims to improve health and awaken the importance of this study, as the workspace must ensure comfort and safety. A company that seeks to offer an ergonomically appropriate environment will consequently increase its productivity (SILVA *et al*, 2020).

2.1 HEALTH AND QUALITY OF LIFE AT WORK

It is common knowledge that health and quality of life are complementary concepts, since a better quality of life will not only be summarized in better financial and material conditions, but also in a pleasant environmental environment that provides the individual with autonomy and the possibility of personal and professional fulfillment. However, in the midst of the activities developed, the individual's body may react unexpectedly when exposed to a large workload. For this reason, there is a growing amount of research that seeks to establish the relationship between the activities performed and the establishment of musculoskeletal complications, especially in a work environment that requires repetitive movements (ZAVARIZZI *et al*, 2019).

The development of occupational activities can subject workers to agents capable of making their illness possible. Exposed individuals deal with a variety of situations on a daily basis that can lead to occupational injuries and work accidents (THEME FILHA *et al*, 2013). The losses caused to the worker's body and mind reduce the performance of activities of daily living, which can affect their quality of life.

2.2 WORK-RELATED MUSCULOSKELETAL DISORDER

According to Lucca (2017), in the past and in the present, many workers, when subjected to intense and long working hours, present, over time, diverse and distinct symptoms that imply labor actions. With each passing day there is a need to improve knowledge that can support each working class to overcome the difficulties that arise from such disturbances. Thus, this set of symptoms is given the acronym RSI - Repetitive Strain Injuries, and later, WMSD - Work-Related Musculoskeletal Disorder (FERRI and XAVIER, 2015).

According to Paula and Amaral (2017), WMSD overloads the nerves, joints, cartilage, intervertebral discs, tendons, and muscles, and often harms mainly the upper limbs and neck (ROCHA *et al*, 2017).

There is a high level of concern regarding WMSD, because it can lead to the inability of the worker to perform his/her activities, causing temporary or even permanent leave, consequently generating a high cost with treatments, substitutions or even indemnities (SOUSA *et al*, 2015).

Melo *et al* (2017), in their study, identified that WMSDs represent a disabling problem of great importance for public health within the framework of worker morbidity, representing in 2011 the second largest reason for granting accident benefits of the sickness benefit type in Brazil, according to Social Security. These conditions are directly linked to labor relations and associated with occupational factors that put workers' health at risk, which demands more and more attention to the implementation of practices that ensure the well-being of these individuals.

The factors that facilitate the appearance of these injuries can be specific (previous trauma, hormonal, psychological and congenital factors) or general: inadequate work project with muscle overload, type of task with rapid and repetitive movements of the forearm, wrist, hands and fingers, inadequate work instruments, improper work environment (poor lighting, excessive noise), work overload with lack of rest period, frequent overtime, and static muscle load (NUNES *et al*, 2020).

According to Melo *et al* (2013), there is an increasing number of musculoskeletal symptoms resulting from WMSD worldwide, and they are considered a public health problem, as they are responsible for almost 90% of sick leave and, in a large percentage, cause disabilities, which are often permanent.

2.3 WMSD IN CASHIERS

The predominance of WMSD in the upper limbs of supermarket cashiers is high, especially in the shoulders and hands, a contributing factor to workers suffering from pathologies such as tendinopathy, enthesitis and bursitis. These pathologies are related to physical, biomechanical, psychological, and social aspects acquired in the work environment that cause stress, microtrauma, and injuries. The observed consequences result from inflammation, to the interference of the biomechanics of the affected joints, leading to a variety of clinical manifestations (SOARES *et al*, 2019).

Among the injuries, rotator cuff tendinitis stands out as the third leading cause, second only to low back pain and neck pain. As for the characteristics of low back pain, it is described as pain manifested between the costal margins and the gluteal fold, followed by painful restriction in the

performance of movements. On the other hand, pain in the cervical segment of the spine is called cervicalgia, and is responsible for generating frequent biomechanical stresses that can manifest acute 3 and temporary symptoms, in addition to accelerating the degenerative process of the vertebral structure and joints (SIMAS *et al*, 2020).

According to Galvão (2012), many scientific studies demonstrate a high incidence of Work-Related Musculoskeletal Disorders (WMSD) in professionals who work in the area of commerce and services, such as supermarket cashiers. This is due to the continuous use of muscle groups, poor posture and repetitive, daily and constant strain.

Darlan *et al* (2017) state that among the musculoskeletal pathologies of constant appearance in this class of workers, low back pain stands out, which is defined as a painful condition, located in the region of the lumbar spine; these pains can be from acute trauma or from cumulative trauma resulting from repeated or prolonged exposure to certain physical factors.

3 METHODOLOGICAL PROCEDURES

This is a quantitative, exploratory and descriptive study, where the main musculoskeletal complaints were studied, using a validated and modified structured questionnaire. The sample consisted of 15 employees who work as a cashier in a supermarket in the municipality of Nanuque, Minas Gerais. The questionnaire was applied in May 2023.

The Nordic Musculoskeletal Questionnaire (NMQ) was used as a research instrument to assess musculoskeletal symptoms. The general part of the Nordic questionnaire was used, culturally adapted to the Portuguese language by BARROS and ALEXANDRE (2003), consisting of two stages, the first addressing general information about the respondent containing 10 questions and the second stage consisting of a human figure divided into nine anatomical regions, containing 9 questions with alternatives in which the respondent reported the occurrence of symptoms in the last 12 months prior to the research. All respondents filled out the Free and Informed Consent Form, which contains the necessary information in relation to the research. The subjects are protected by the confidentiality of professional ethics required by COFFITO (Federal Council of Physical Therapy and Occupational Therapy).

In the questionnaire, the analysis of the answers was based on the region in which the cashier felt pain, the frequency and how long he was affected by it. This research was carried out with a sample of 15 cashiers, employees of a supermarket in the city of Nanuque – MG. All interviewees answered the printed questionnaire and then the data were tabulated and organized in graphs and tables for a better visualization.

4 RESULTS AND DISCUSSION

WMSD is a set of syndromes resulting from the overuse of the anatomical structures of the musculoskeletal system associated with lack of recovery time, characterized by the occurrence of several concomitant or non-concomitant symptoms, such as pain, paresthesia, feeling of heaviness, fatigue, causing temporary or non-temporary work incapacity (SANTOS *et al,* 2015).

The sample consisted of male (20%) and female (80%) operators, aged between 18 and over 40 years, 47% over 40 years old, 27% between 26 and 30 years old, 13% between 30 and 40 years old, 13% between 18 and 25 years old. These professionals work in this profession in the following time intervals: up to 3 years, 27%, from 4 to 7 years, 6%, from 8 to 12 years, 20%, from 13 to 16 years, 20%, over 16 years 27%.

The table below contains information regarding the physical type of each interviewee, there are 15 operators in which 99% have the right side as dominant and 1% the left side, with height between 1.50m and 1.84m and weight between 53kg and 90kg. As can be seen in the information in the table, the BMI of 60% of the interviewees is above the average established as healthy for an adult, which is between 18 and 24.9. According to the WHO reference values (World Health Organization, 2000), the BMI obtained indicated that 60% of the participants in the sample were classified as overweight.

Table 1: Information on the physical type of each interviewee

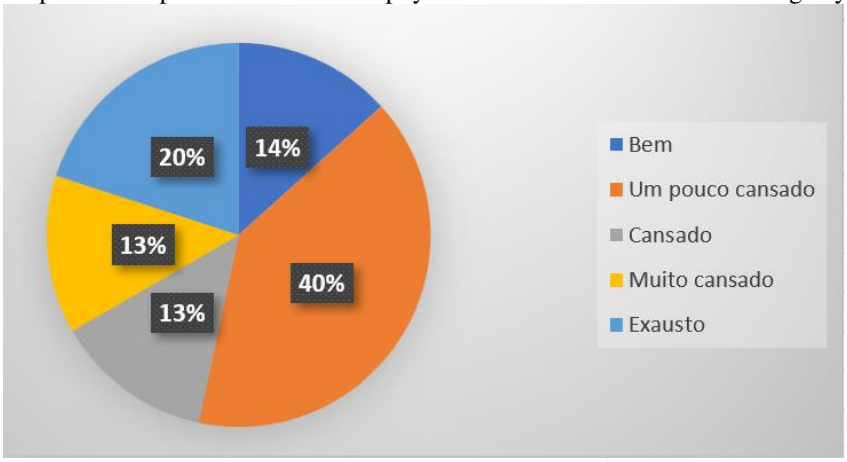
	Dominant Side	Height	Weight	BMI
Operator 01	D	1,55	64	26,6
Operator 02	D	1,6	57	22,3
Operator 03	D	1,5	53	23,6
Operator 04	D	1,84	85	25,1
Operator 05	D	1,75	89	29,1
Operator 06	D	1,5	61	27,1
Operator 07	D	1,49	57	25,7
Operator 08	D	1,7	87	30,1
Operator 09	D	1,66	62	22,5
Operator 10	D	1,65	65	23,9
Operator 11	D	1,68	59	20,9
Operator 12	D	1,6	69	27
Operator 13	D	1,65	65	23,9
Operator 14	And	1,72	90	30,4
Operator 15	D	1,6	64	25

Source: Survey data

According to the author, obesity and overweight represent a constant threat to health, as they can cause several diseases such as stroke, among others related to the heart and, to reverse them, methods for the treatment of obesity are necessary, such as diet, activity and physical exercise.

Graph 1 presents information on how the cashier feels after his daily workday, 40% feel a little tired, 20% exhausted, 14% fine, 13% tired and 13% very tired.

Graph 1: Perception of the cashier's physical state at the end of his working day



Source: Survey data

The movement of cashiers in supermarkets involves handling products with great frequency, and varying weights. The work takes place in an orthostatic and static position, associated with rotation movements, lateral and anterior inclination of the trunk to reach and pack goods, to activate the control panel and to withdraw the proof of purchase, among other functions. These positions also happen repeatedly throughout the day. The worker has a break period, for 6-hour workdays, or a lunch break, when working 8 hours a day. Such conditions contribute to the emergence of muscle fatigue, the emergence and aggravation of pre-existing injuries (DUTTON, 2010). This fact corroborates the information in the graph on the incidence of fatigue and exhaustion among the interviewees.

According to Table 2, there is a frequency and persistence of pain caused by the work performed. Table 2 shows how often cashiers feel pain in the following regions: 9% of participants report rarely feeling pain in the cervical region and 4% reported feeling pain always, 12% report feeling pain frequently in the shoulders, arms, elbows, forearms, wrists, 25% report feeling pain rarely, and 12% reported feeling pain always, 24% report feeling pain rarely in the dorsal, lumbar and hip region, 8% report feeling pain frequently, and 6% reported feeling pain always.

Table 2: Frequency of pain in the body regions of each operator

	Cervical	Ombros	Braços	Cotovelos	Antebraços	Punhos	Dorsal	Lombar	Qadril
Operador 1							Raramente	Raramente	Raramente
Operador 2	Raramente	Com frequencia	Com frequencia			Com frequencia	Raramente	Com frequencia	
Operador 3	Raramente	Com frequencia	Com frequencia	Com frequencia	Raramente	Com frequencia	Raramente	Com frequencia	Com frequencia
Operador 4	Raramente	Raramente	Sempre	Com frequencia	Sempre	Com frequencia	Com frequencia	Com frequencia	
Operador 5	Sempre	Sempre	Sempre	Sempre	Sempre	Sempre	Sempre	Sempre	Sempre
Operador 6	Raramente	Raramente	Com frequencia			Raramente	Raramente	Raramente	Raramente
Operador 7									
Operador 8	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente
Operador 9	Raramente	Raramente				Com frequencia	Com frequencia	Raramente	Raramente
Operador 10	Sempre	Sempre	Sempre	Sempre	Sempre	Sempre	Raramente	Raramente	Raramente
Operador 11	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente	Raramente
Operador 12	Raramente	Com frequencia	Raramente	Raramente	Raramente	Raramente	Raramente	Com frequencia	Raramente
Operador 13		Raramente		Raramente	Raramente	Raramente	Com frequencia	Raramente	Raramente
Operador 14							Sempre	Sempre	Sempre
Operador 15	Raramente					Raramente			Raramente

Source: Survey data

Some studies have shown that supermarket employees have a high predisposition to develop musculoskeletal disorders, These work-related disorders impair the worker's productivity, participation, and financial situation. In addition to being responsible for a large part of the absences from work, representing indemnities, treatments, and reintegration processes for the occupation for the entrepreneurs (BRASIL, 2019).

Table 3 below shows the time in which employees reported being affected by pain in the following regions of the body: 4% of the participants reported feeling pain for years in the cervical region, 5% reported feeling pain for months and 6% reported feeling pain for days, 21% reported feeling pain for years in the shoulder region, arms, elbows, forearms, and wrists, 12% reported feeling pain for months, 13% reported feeling pain for days, 7% reported feeling pain for years in the dorsal, lumbar and hip region, 21% reported feeling pain for months, and 11% reported feeling pain for days.

Table 3: Time that employees report pain from exertion at work.

	Cervical	Ombros	Braços	Cotovelos	Antebraços	Punhos	Dorsal	Lombar	Quadril
Operador 1							Dias	Meses	Dias
Operador 2	Anos	Anos	Anos			Anos	Meses	Meses	
Operador 3	Dias	Dias	Meses		Dias	Dias		Meses	Meses
Operador 4	Dias	Dias	Anos	Anos	Anos	Anos	Dias	Dias	Dias
Operador 5	Anos	Anos	Anos	Anos	Anos	Anos	Anos	Anos	Anos
Operador 6	Dias	Meses	Meses			Meses	Meses	Meses	Meses
Operador 7									
Operador 8	Dias	Dias	Dias	Dias	Dias	Dias	Dias	Dias	Dias
Operador 9	Anos	Anos				Anos	Anos	Meses	Meses
Operador 10	Meses	Anos	Anos	Anos	Anos	Anos	Meses	Meses	Meses
Operador 11	Meses	Meses	Meses	Meses	Meses	Anos	Anos	Anos	Anos
Operador 12	Dias	Dias	Dias	Dias	Dias	Dias	Dias	Dias	Dias
Operador 13		Meses		Meses	Meses	Anos	Meses	Meses	Meses
Operador 14							Meses	Meses	Meses
Operador 15	Meses					Meses		Meses	Meses

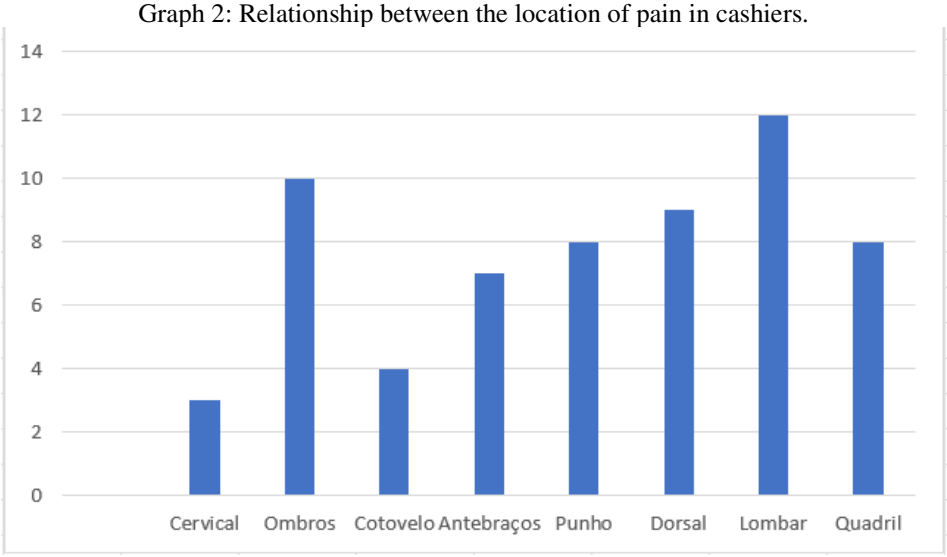
Source: Survey data

According to Scopel *et al*, (2012), there are studies that demonstrate the high incidence of pathological symptoms related to musculoskeletal factors in cashiers. Most of these researches were carried out through the use of questionnaires, which were applied to operators who performed the most diverse functions, whether they were active workers or those who were no longer working. The sites of pain and the period of incidence, based on the time of work of the operators involved in this research, demonstrate this relationship.

The diagnosis of WMSD often results from a complaint of intense pain in a person who works with repetitive movements, even if physical, clinical, and ultrasound examinations do not find lesions corresponding to this pathology (SANTOS *et al*, 2021). According to Costa (2015), the development of these occupational disorders is multicausal and the risk factors are biomechanical (ergonomic), psychosocial related to work organization, and organizational.

Graph 2 shows the relationship between the location of pain in cashiers, with the main complaints being pain in the lumbar region (38% of the participants), shoulders (32% of the participants) and dorsal region (30% of the participants).

Graph 2: Relationship between the location of pain in cashiers.



Source: Survey data

These injuries cause a series of problems for the worker. The worker loses his productive capacity, his autonomy and, in some cases, his income. It is noted that the pains mainly affect regions of the spine and upper part of the body, which indicates a lack of ergonomics in the workplace and a lack of physical activities in which a health professional can identify the cause of the pain and which physical activities can improve the quality of life of these professionals (RAMOS *et al*, 2010).

Graph 3 presents information on the working position of cashiers, with 80% remaining seated and 20% performing their work standing, no employee performing their function lying down.

Graph 3: Position in which work is performed

Source: Survey data

It can be seen through this graph that the work is performed mainly in a static way, either standing or sitting, and performing a function for a long time in a constant way and without variation of position can lead to health problems.

According to Vézina *et al* (1998), the consequences of static work while standing are as follows: appearance of varicose veins due to hydrostatic pressure in the veins of the legs; development of edema in the lower limbs due to decreased lymphatic circulation; symptoms of pain in the lower limbs and lumbar region; and pain in this region is related to a higher risk of injury during load maintenance. According to Assunção (2004), the sitting and immobile posture, according to the quality of the support, can cause lumbar muscle fatigue and compression of the muscle mass of the thighs, which generates pain in the lower limbs. Adjusting the height of the chair can influence venous return if there is compression on the back of the thighs.

These employees also unanimously reported that they did not need to ask for any type of leave from work due to their pain and also did not undergo surgery.

Studies with a large number of employees who have these conditions have concluded that work ergonomics, in addition to being very important, is essential for the prevention of musculoskeletal disorders that facilitate the adaptation of workstations according to the needs and limitations of employees, taking into account the equipment used and the way it is used (COSTA, 2017).

5 CONCLUSION

Supermarket cashiers have intensive activities, whose work requires physical and mental skills, so the technologies applied in the sector facilitate and speed up the processes of handling goods on the conveyor, but on the other hand, those who carry out the activities completely are the operators, that is, the employees who in turn need care, zeal and breaks in your workday.

In view of the above, it was possible to locate the main places where operators feel the most pain and discomfort, so it is possible to determine what they can do to alleviate symptoms in cashiers, and even if possible avoid employee leave, such as: carrying out an ergonomic employee monitoring program in order to raise awareness among all workers in the supermarket chain, Carrying out more training and, if possible, leaving posters exposed that help their movements, showing how essential a correct posture is for their health, doing work gymnastics before starting their activities.

Just like any activity that has repetitive movements and remains in the same position for a long period, the role of cashier generates several pains that are capable, if left untreated, to lead to the employee's absence.

It is concluded that there was a higher prevalence of musculoskeletal disorders in the upper and lower back regions in cashiers, which is compatible with the symptoms of musculoskeletal disorders in a large part of the population of studies that have already been carried out in professionals who perform the same function. For this reason, it is important to carry out more studies aimed at identifying the risk factors or origin of these pains so that preventive and rehabilitation programs can be developed.

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