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FACTORS ASSOCIATED WITH LOW BACK PAIN IN WORKERS' HEALTH

INTEGRATIVE REVIEW

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ABSTRACT

Introduction: Low back pain or low back pain is described as a public health problem worldwide. The high incidence of low back pain is associated with work activities, since in this environment postural standards are adopted with permanence for long periods, causing damage to workers' health, which causes a reduction in productivity, absenteeism and significant interference in quality of life. This study aimed to identify the main factors responsible for the onset of low back pain in workers. Objective: The aim of this study was to investigate scientific publications that related the contributing factors for the emergence of the etiology of low back pain in the work environment. Methodology: A search was performed in the Google Scholar, SciELO and Lilacs databases, in the periods of July and August 2021, using the following keywords: Low back pain, low back pain, sedentary lifestyle, Functionality. Studies published in the last ten years were selected, and 2,890 results were found, where of these 18

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were selected for full reading and 5 contemplated in the present study, as included in the objectives of this research. Results: The studies reviewed in this research find some factors as being the most associated with the onset of low back pain in the worker, which are: sedentary lifestyle or physical inactivity, as well as the vicious posture, age and function developed by the worker. Considerations: The labor environment creates a favorable ambience for the appearance of low back pain, since this provides functional limitations and consequently a decrease in the quality of life of workers. It is emphasized the need for further research, with a greater number of articles researched or reviews, in order to explore in more detail these factors of relationship with low back pain in workers, as well as the main functional repercussions on their lives.

Keywords: Low back pain; Occupational low back pain; Sedentary lifestyle; Functionality.

1. INTRODUCTION

There are several factors associated with the onset of low back pain, where they have individual particularities, biomechanical causes and occupational factors (FREITAS *et al*, 2011). There are some risk factors more frequently for the onset of low back pain such as age, sex, obesity, lack of physical fitness, fragility of the abdominal and spinal muscles, poor posture, which arises during long stay in the sitting position and sedentary lifestyle (MANCIN *et al*., 2008). Low back pain is currently being described as one of the most recurrent complaints of the spine and is a significant causative agent with regard to the search for the health system, since this anatomical locality receives an expressive load of body weight (KLEINPAUL, 2008).

The high recurrent episode of low back pain generates direct actions in people's quality of life. Studies by the World Health Organization (OMS, 2007) indicate that pain in this region is described as a global public health problem, which causes worrying socioeconomic consequences to the population (ALVARES; FERRARETO, 2009). Studies describe that up to 80% of the general population will be affected by

episodes of low back pain at some point in their lives, and their episodes increase with age, having a greater reach during the sixth decade of life (KHOURI *et al*., 2008).

The signs of the appearance of painful signs are able to increase progressively and lead to the loss or reduction of some functions and this condition can remain over the years, and in certain cases may become intractable, therefore, it is necessary to affect their life habits in order to obtain control over these changes arising (COURY; MOREIRA; DIAS, 2009). The absence of physical activity has a high correlation with back pain and adjacent anatomical regions. The lack of physical activity, in other words the famous sedentary lifestyle is determined as an indispensable element in helping the absence of health, since the lack of healthy habits can play a harmful effect on the musculoskeletal system, besides damaging the patient's well-being (MANCIN, 2008).

The stress of modern life and the absence of physical activity when associated are factors that favor the increased incidence of musculoskeletal problems, especially the appearance of low back pain. The lack of physical exercises has a strong connection with pain in the anatomical structures of the spine, where sedentary lifestyle, associated with deficiency in the musculoskeletal system and spinal overload, leaves the individual predisposed to report low back pain (MANN *et al*., 2008).

Therefore, it was observed that the great existence of low back pain is related with regard to work activities, where many workers maintain postures for long periods improperly, which lead to the execution of body movements inadequately generating overload in the lumbar spine region. Therefore, given the fact mentioned this overload in addition to causing physical disorders to these workers cause losses for the company, since they generate absenteeism, decreased productivity among others (FRANÇA, 2009). The present study had the following question as a guide question: What are the main factors responsible for the appearance of low back pain in workers? Aiming to find in the literature evidence of the relationship between factors that have influence for the triggering of low back pain as well as to verify the impacts generated by it on the functionality and quality of life of workers in general.

2. METHODOLOGY

This research had as method the integrative review of the literature, which is an analysis of studies that demonstrate relevance to synthesize important information that can provide basis for improvements in the practice of health professionals besides directing themes that need further studies. The authors Wittemore and Knafl (2005) conceptualize "integrative" as the interaction of opinions and concepts that came from research conducted.

This integrative literature review study had its data collection carried out in July and August 2021, obtaining as support articles found in databases such as Google Scholar, SciELO and Lilacs. The keywords used to find these articles were: low back pain, low back pain, sedentary lifestyle, functionality.

The filters applied to the research of articles were: articles published in recent years. Inclusion criteria: published between 2000 and 2021 available free of charge, in the Portuguese and English versions, which addressed low back pain in the work environment and factors related to the onset of its cause. Exclusion criteria were: blog articles, articles that did not include the theme proposed here.

In the construction of the integrative review, after the selection of the articles, a table was organized with the main information pertinent to the theme, with the variables: author/year, research title, study methodology, objectives and main results related to the theme, followed by discussion in front of the selected articles in the table, evidencing the results of the research with the hypothesis suggested in this review. The articles found in the databases totaled 2,890, where 18 were selected for full reading and, according to the inclusion and exclusion criteria, 5 were used in this review, 4 in Portuguese and 1 in English.

3. DEVELOPMENT

3.1 LOW BACK PAIN

Natour (2004) conceptualizes low back pain as a pain located between the lower part of the back and the gluteal fold, and may arise after excess forces on the structures or even adequate forces in injured structures. The lumbar spine makes up one of the regions of the spine being located in its lower portion, contains five vertebrae labeled from L1 to L5 where, due to the severity, it receives most of the body weight, thus justifying the vertebral bodies of this region being larger among the others. The lumbar spine supports the abdominal cavity making possible mobility between the trunk and the pelvis. Among the various attributions of the lumbar spine as well as its recruitment, it is common the appearance of low back pain or low back pain, popularly known as "back pain", this being a problem that involves the musculoskeletal system bringing a painful and sometimes disabling experience, is also seen as a major public health problem that brings injuries both in the clinical state of the patient, economic and social status.

The pandemic scenario experienced in recent months brought to individuals the need for adaptation, the implementation of the home-office was one of the measures adopted as an alternative to maintain work activities. However, the main posture adopted in this work model is the sitting position, which has been the cause of several diseases of the musculoskeletal system, such as low back pain. Prolonged permanence in this position causes muscle, tendon and nerve injuries. In the case of low back pain, this occurs due to muscle overload (SANTOS *et al*., 2020).

The etiology of low back pain has some classifications, it can be of mechanical origin - degenerative - caused by mechanical forces in the face of the structure triggering an imbalance, compressing nerve roots leading to pain. Of non-mechanical origin (inflammatory, metabolic or infectious), psychosomatic - originated from emotional factors or even, caused by repercussions of systemic diseases. To close the diagnosis of low back pain, the patient's clinical history is of paramount importance,

factors such as age, type of work, leisure activities and body weight help in this finding (NATOUR, 2004).

Low back pain also has subclassifications, these are discerned according to their duration, low back pain is classified as acute when it is less than six weeks, considered subacute when it lasts between six and twelve weeks and chronic when its duration reaches a period of more than three months. It can also be classified as specific and nonspecific, where the specific comes from herniated discs, tumors or inflammations in the region, that is, the cause is identifiable. The nonspecific, anatomical or neurophysiological cause does not provide the identification of the cause of pain (IMAMURA; KAZIYAMA; IMAMURA, 2011).

The use of drugs becomes an immediate option of patients, especially when it comes to chronic low back pain, however, it is important to emphasize that the drug intervenes in pain relief (immediate), but has no significant effects on improving function. Non-drug measures in the management of low back pain have shown evidence-based efficacy based on physical therapy intervention and can also reduce the costs of low back pain by 60% (BRASIL, 2020).

3.2 SEDENTARY LIFESTYLE AND LOW BACK PAIN

Physical inactivity or simply sedentary lifestyle bring negative effects on the musculoskeletal system, leading to functional limitations compromising the psychological and social well-being of individuals. A caveat can be made considering that physical activities or kinesiotherapy are the means used to treat patients with low back pain. Thus, sedentary life can be related to the weakening of the muscles that cooperate for the extension of the trunk, being this factor of great risk to trigger low back pain, where physical inactivity is related proportionally to pain in the spine region. Sedentary lifestyle, therefore, has been pointed out as a factor that contributes significantly to the absence of health (MANCIN, 2008).

3.3 FUNCTIONAL DISABILITIES GENERATED BY LOW BACK PAIN

Low back pain presents pain as its main symptom, followed by reduced Range Of Motion (ROM) and spasms in the muscles involved. The consequences range from changes in posture to limitations in the development of Activities of Daily Living (ADLs), restricting the individual in several aspects. The functional disability generated by low back pain can be translated as the difficulty in developing activities that guide the daily life of the patient, minimizing the development of their essential activities, requiring assistance for the effectiveness of them (MASCARENHAS and SANTOS, 2011).

Nascimento (2020) points out that chronic pain has a relationship directly proportional to the fall in productivity, rates of absence/absence at work (absenteeism), changes in work routines, leisure, and may even provide disability. The complaint of pain due to musculoskeletal events is the most common among the world population, being the main reason for seeking physiotherapy professionals. According to ICD-10, low back pain is among the musculoskeletal conditions that most lead the patient to seek health services. The symptoms of fatigue and weakness present in the low back pain patient lead to loss of function and consequently to an absence from work, generating a decrease in family income. The patient with pain also has impairment of sleep quality, as well as psychological and psychosocial changes, which can lead the patient to depression, since he tends to move away from social life.

The Ministry of Health (MS)[3] states that within a period of one year its prevalence is on average 38%, and in the period of 3 months about 25% of adults presented symptoms of low back pain for at least 24 hours (BRASIL, 2016). In 2007, low back pain was the first cause of disability among social security and accidental resources, with a prevalence of about 50% in the period of 1 year. In 2017, back pain was the main cause of removal of workers from their jobs, leading the list of most frequent diseases that lead to the granting of sickness benefits granted by the Brazilian Social

Security Institute (INSS)[4], with 763 aid granted for this health problem (BRASIL, 2020).

3.4 LOW BACK PAIN AND QUALITY OF LIFE

The World Health Organization conceptualizes as quality of life the individual's perception of their insertion in life, relating spiritual, physical, mental, psychological and social well-being (BRASIL, 2013). In patients with low back pain, quality of life is largely compromised, often considering the restriction in performing work activities, limitations in movements and chronic pain. The patient, too, develops emotional problems. Thus, the rates of depression associated with low back pain have been increasingly significant, where the intensity of pain as well as its duration have a directly proportional relationship with depression levels. Depression alone already increases sensitivity to pain. Because patients feel pain when moving, they may develop kinesiophobia – excessive fear of movement, limiting the performance of physical activity that also impacts the patient's quality of life (ANTUNES *et al*., 2011).

Low back pain damages the quality of life of individuals in various aspects such as functional capacity, physical aspects, pain, general health status, vitality, social aspects, mental and emotional aspects. There is a questionnaire called Short-Form Health Survey (SF-36) that assesses in scores from 0 (very bad) to 100 (excellent) the quality of life of patients. There are 36 items subdivided into the aspects mentioned above. From this questionnaire it is possible to identify the levels of impairment that low back pain has generated, as well as their impacts on the quality of life of these patients, thus favoring the tracing of objectives and physical therapy interventions. (FERREIRA and NAVEGA, 2010)

4. RESULTS AND DISCUSSIONS

In the search for the databases for articles to be used in the formulation of the results to be discussed, research was obtained in Portuguese and English, where of the 2,890 results obtained, 18 were selected for full reading and 5 contemplated to carry out the research proposed by the theme.

TABLE 1 Publications selected for the study, distributed as well as: author, year, study method, objective and results.(continues)

AUTHOR/YEAR	SEARCH TITLE	TYPE OF STUDY	GOALS	Results
MAIA, 2013.	Força muscular lombar: uma análise comparativa entre indivíduos sadios, sedentários e indivíduos com lombalgia inespecífica.	Cross-sectional cohort study	Perform a comparative analysis with the muscle strength of lumbar paravertebral scans in patients with nonspecific low back pain.	It is emphasized that sedentary patients have increasingly lower rates of health and quality of life, patients with low back pain have significant levels of functional disability, and as for the decrease in strength there was evidence through dynamometry.
BARROS; ÂNGELO, 2011.	Lombalgia ocupacional e a postura sentada.	Cross-sectional analytical	To investigate the relationship between low back pain and sitting posture in the scope of work.	The studies suggest a significant relationship between sitting posture and low back pain, and the picture

				among those surveyed was more aggravating in sedentary patients over 40 years of age.
CARGNIN *et al*, 2019.	Deficiência funcional e intensidade da dor lombar crônica não específica em trabalhadores de enfermagem.	Cross-sectional study	To verify pain intensity and functional disability in patients with nonspecific chronic low back pain.	The researches reported limitations in activities of daily living and decrease in productivity at work by the pain factor, in the research the disability generated by the pain factor was considerably low, but other factors associated with pain are responsible for major functional disabilities.
ROCHA; ALENCAR, 2018.	Desafios nas orientações posturais para trabalhadores	Exploratory, descriptive and qualitative	Investigate challenges in postural orientations of	They evidenced difficulties in daily life activities,

	afastados do trabalho com lombalgia.		workers away from chronic low back pain.	physical restrictions at work as well as fear of returning to work after absence from low back pain.
FREITAS ET AL, 2011.	Lombalgia ocupacional e a postura sentada: efeitos da cinesioterapia laboral	Cross-sectional analytical	Check the efficacy of kinesiotherapy in patients with low back pain.	A large percentage of the employees analyzed did not practice physical activities, and sedentary lifestyle was a contributing factor for muscle weakness (paravertebral and abdominal) and may justify low back pain. Work kinesiotherapy improved several aspects such as: decreased pain and improved functionality.

Source: Prepared by the authors of the research, 2021.

The results table shows a study conducted in a university with 60 sedentary individuals, 30 healthy and 30 with nonspecific chronic low back pain. When using the dynamometer to verify the muscle strength of the lumbar region, the healthy individuals presented a strength of 51.76 Kgf and those with low back pain had a strength of 30.90 Kgf. The study suggests a reduction in the muscular strength of the lumbar region in patients with low back pain, but further studies are needed to prove it. This can be related to the indices of functional disability, verified by the Roland-Morris questionnaire, where 26, 67% of the surveyed, were characterized with some level of limitation of their functionalities (MAIA *et al*., 2013). This result corroborates the findings of Nascimento (2020), when it relates low back pain with reduced productivity, increased levels of absenteeism, interferences in leisure activities and may lead to disability when greatly exacerbated, that is, compromising its ability to perform essential basic functions.

A study containing a sample of 239 employees, with the objective of identifying the factors that related low back pain with sitting posture, suggested that low back pain is largely related to wrong (vicious) postures of work for prolonged periods, generating fatigue and deficits in muscle groups providing favorable ambience for the development of low back pain. The research consisted of interviews and evaluations in the workplace, where of the 146 employees with symptomatic low back pain, 95.2% had it in chronic state, being higher in employees who had more age and sedentary lifestyle habits, that is, both sedentary lifestyle and sitting posture for long periods are associated with low back pain in the work environment (BARROS; ÂNGELO; UCHÔA, 2011).

When investigating low back pain and its relationship with functional disability in a specific group of nursing professionals, a study with 90 workers pointed out that pain generates limitations to activities of daily living and work, but functional disability related only to pain obtained a low rate of relationship, since this relationship involves factors other than pain, however, it is stated that pain generates limitations and functional disabilities, and may interfere in the employee and work relationship (CARGNIN *et al*., 2019).

At the reference center for workers' health in the city of Santos - SP, a research was conducted linked to an existing project created in 2012, the study was conducted through interviews, where physical therapists and patients were evaluated. The study involved 14 patients and 3 physiotherapists. Of the patients, the majority (79%) were away due to low back pain, where there was a great fear of the patient returning to the work environment because they returned to the same functions (and postures) that led to the condition that generated the removal, without a possible relevance regarding their restrictions, and may also aggravate the patient's clinical condition. Regarding the orientations, we identified the need for more time for them, as well as stimulating the practice of the orientations, favoring teaching and learning so that it had greater relevance to physical therapy intervention (ROCHA; ALENCAR, 2018). The findings of the above research corroborate the data released by the INSS, when it stated that, in 2017, back pain was the main cause of absence in the workplace, as well as the granting of aid, and in 2007 low back pain was the leading cause of disability (BRASIL, 2020).

A study in the same line sought to identify occupational low back pain also with the sitting position, verifying the effectiveness of work gymnastics as a form of intervention. This was performed with 38 employees of a higher education institution who had a diagnosis of occupational low back pain. It was found that a large percentage of employees did not practice physical activities, suggesting that sedentary lifestyle is related to lumbar discomfort. As for work gymnastics, it improved ranges of motion and functionality of stabilizing muscles of the spine, in addition to improving symptoms such as pain. The participants also reported improvement in the development of ADLs and work, since the symptoms of low back pain generate functional impairments in the patient's life influencing the labor environment (FREITAS *et al*., 2011). That is, physiotherapy through work gymnastics can intervene not only in the treatment of low back pain, but also in the prevention of it.

Physical activity has been presented as one of the contributing factors for public health. The population, characterized as sedentary, has been associated with a

greater possibility of early death compared to the active public, as well as the absence of health during life. There are several factors that predispose to low back pain, physical inactivity or sedentary lifestyle, either directly or indirectly. It is known that physical activities have been used in the prevention or treatment of low back pain, as in the case of kinesiotherapy, based on a principle defended by the author Hippocrates, when he already mentioned physical exercises with the objective of muscle strengthening (TOSCANO and EGYPTO, 2001). Considering the high rates of low back pain in the work environment due to the functional disabilities generated by it, it is valid to look at the causes, as well as the most appropriate interventions, suggesting the participation of the physiotherapist to stimulate the change of habits that may suggest the appearance of low back pain, thus reducing the rates of absence from work, since this factor is directly proportional to the decrease in the quality of life of patients with low back pain.

Sedentary lifestyle has been pointed out as one of the factors present in the profile of patients with low back pain where, in the work environment, employees who remain in ergonomically harmful postures for long periods and associate this with physical inactivity are more likely to develop the pain in question. The pain factor alone already generates limitations regarding the functions developed by low back pain patients. When this characteristic of the pathology is related to the employees and their resourcefulness regarding work functions, there is an injury that sometimes leads the patient to leave the work environment, generating impacts on the economy of the country, since it is necessary to grant sickness benefits. The psychological state of the worker away from the work environment is also compromised, where there is concern about the state of health and the financial losses resulting from the disease, social and leisure activities also suffer significant impacts, influencing proportionally the quality of life of the patient due to the functional limitations acquired with low back pain.

Physical exercises are the main forms of intervention adopted for patients with low back pain, where these performed sporadically bring benefits, but when practiced regularly, according to Mancin (2008), corroborate significant changes in

psychological status, generating greater resistance to stress, in addition to improving function and reducing the pain of patients with low back pain.

5. FINAL CONSIDERATIONS

The functional limitations and disabilities generated by low back pain have shown a negative impact on the patient's quality of life. The work environment has been a target of high incidence of low back pain, where the repercussions it generates, causes absences (absenteeism), having as main cause the functional limitations caused by the disease. From the research based here, we could find the answer to the question that led the present study, since sedentary lifestyle or physical inactivity has been pointed out as a negative habit adopted by a large part of the population evidenced by the studies reviewed here, constituting factors commonly present in the profile of workers suffering from low back pain, where associated with other factors such as age and inadequate posture in the work environment, favor the appearance of this pathology in the population mentioned. The studies reviewed here present low back pain as the main complaint and describe some factors that are directly correlated with the appearance of symptoms from mild to injuries to individuals, verifying common characteristics in this patient profile, taking into account functional deficits and decline in quality of life. However, more research involving this theme is necessary, obtaining a significantly larger sample in order to reaffirm the proof of the degree of correlation between several factors because they are high-risk agents, motivating the emergence of intense and recurrent pain in the lumbar region with injuries, as well as their influence on the worker's functionality and quality of life.

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APPENDIX - FOOTNOTE

3. Brazilian Ministry of Health.

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