Original article

Lack of knowledge about non-occupational low back pain risk factors among brazilian occupational health professionals: a cross-sectional observational study

Falta de conhecimento sobre os fatores de risco não ocupacionais da dor lombar entre profissionais de saúde ocupacional brasileiros: um estudo observacional transversal

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ABSTRACT | INTRODUCTION: Low back pain (LBP) is highly prevalent and is one of the main causes of disability in Brazil and around the world. LBP presents a multifactorial etiology, being extremely common in workers. **OBJECTIVE:** This study aimed to verify the knowledge about the LBP risk factors, beliefs and attitudes about the management of LBP among health professionals (physiotherapists and ergonomists) working in the occupational area. **MATERIALS AND METHODS:** A cross-sectional observational study was conducted with 81 Brazilian occupational health professionals. Participants completed an electronic questionnaire comprising professional data, sociodemographics, items about LBP risk factors, and the Brazilian version of the Pain Attitudes and Beliefs Scale for Physiotherapists. Knowledge, beliefs and attitudes were analyzed using the chi-square test for LBP risk factors and the linear regression model for health professionals' beliefs and attitudes. **RESULTS:** Obesity (7.4%), sitting for more than 2 hours (8.6%), physical activity (9.9%), lack of psychosocial support at work (11.1%) and consuming alcohol (37.0%) presented the lowest rate of knowledge about LBP risk factors by professionals. Items about general health showed the lowest knowledge. A balanced biomedical and psychosocial orientation of beliefs and attitudes about managing LBP was observed. **CONCLUSION:** Brazilian occupational health professionals lack knowledge about non-occupational LBP risk factors, especially general health status. These professionals also have balanced biomedical and psychosocial concepts in managing LBP.

KEYWORDS: Low Back Pain. Risk Factors. Pain Management. Health Personnel. Primary Prevention.

RESUMO | INTRODUÇÃO: A dor lombar possui alta prevalência, sendo uma das principais causas de incapacidade no Brasil e no mundo. A dor lombar apresenta etiologia multifatorial, sendo extremamente comum em trabalhadores. **OBJETIVOS:** Verificar o conhecimento sobre os fatores de risco para dor lombar, crenças e atitudes sobre o manejo da dor lombar entre profissionais de saúde (fisioterapeutas e ergonomistas) atuantes na área ocupacional. **MATERIAIS E MÉTODOS:** Foi realizado um estudo observacional transversal com 81 profissionais de saúde ocupacional brasileiros. Os participantes preencheram um questionário eletrônico composto por dados profissionais, sociodemográficos, itens sobre fatores de risco para dor lombar e a *Brazilian version of the Pain Attitudes and Beliefs Scale for Physiotherapists*. Conhecimentos, crenças e atitudes foram analisados por meio do teste do qui-quadrado para fatores de risco para dor lombar e um modelo de regressão linear para crenças e atitudes dos profissionais de saúde. **RESULTADOS:** Obesidade (7,4%), ficar sentado mais de 2 horas (8,6%), atividade física (9,9%), falta de apoio psicossocial no trabalho (11,1%) e consumo de álcool (37,0%), apresentaram os menores índices de conhecimento sobre fatores de risco da dor lombar pelos profissionais. Itens sobre saúde geral apresentaram o menor conhecimento. Uma orientação biomédica e psicossocial equilibrada de crenças e atitudes sobre o manejo da dor lombar foi observada. **CONCLUSÃO:** Profissionais de saúde ocupacional brasileiros carecem de conhecimento sobre os fatores de risco não ocupacionais da dor lombar, especialmente o estado geral de saúde. Esses profissionais também possuem conceitos biomédicos e psicossociais equilibrados no manejo da dor lombar.

PALAVRAS-CHAVE: Dor Lombar. Fatores de Risco. Manejo da Dor. Pessoal de Saúde. Prevenção Primária.

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1. Introduction

Low back pain (LBP) is a global health problem[1], with an increase of 54% between 1990 and 2015 in years lived with disability caused by LBP.[2] Globally, the prevalence of LBP exceeded 500 million cases in 2017.[3] In 2019, LBP was still among the top disorders that caused disability in adults.[4] Records from the Brazilian National Institute of Social Security point to LBP as the fifth most frequent disease in the list of labor benefits related to accidents at work in 2018, representing 3.79% of these benefits.[5] LBP has a multifactorial etiology, and conditions of exposure to physical exertion, lifestyle habits, physical and mental comorbidities represent some known risk factors.[2,6] LBP risk factors are classified into individual, general health, physical stress, and psychological stress. Because many of these risk factors are modifiable, it is possible to develop strategies for preventing LBP.[7]

LBP is common in workers. Occupational health specialists carry out actions whose main objective is to prevent occupational diseases, such as LBP. However, due to the LBP multifactorial etiology, preventive strategies that do not consider non-occupational factors might lead to limited benefits.[8] Accordingly, measuring the knowledge of these professionals about the risk factors of LBP is crucial to implementing proper preventive policies. Measurement instruments have been developed to verify the beliefs and attitudes of patients and health professionals in relation to LBP. For instance, in an analysis involving 5 measurement tools the Pain Attitudes and Beliefs Scale for Physiotherapists (PABS. PT) presented high validity and reliability.[9] Brazilian physiotherapists with experience treating LBP did not show predominance of an approach addressing biomedical or psychosocial factors for the treatment of LBP.[10] However, the study did not investigate the knowledge of the physiotherapists about specific LBP risk factors. In addition, no studies were found that verified knowledge related to LBP risk factors nor beliefs and attitudes in the management of LBP among occupational health professionals.

The main objective of this study was to verify the knowledge about the LBP risk factors and beliefs and attitudes about the management of LBP among health professionals working in the occupational area. Secondly, to compare the knowledge about LBP risk factors and beliefs and attitudes about the management of LBP among professionals according to sociodemographic conditions (sex, age), and different academic backgrounds and professional experience (i.e., physiotherapists and other professionals, time in the profession and time working in the occupational area). Our hypothesis for the main objective is that occupational health professionals have inadequate knowledge about LBP risk factors and beliefs and inadequate attitudes about the management of LBP, especially non-occupational factors. The hypothesis for the secondary objective is that sociodemographic conditions, different academic backgrounds (physiotherapists have less inadequate beliefs about LBP risk factors and management of LBP) and professional experience (longer time in the profession and longer working time in the occupational area determine less inadequate beliefs) interfere with the knowledge about LBP risk factors and beliefs and attitudes about the management of LBP.

2. Methods

2.1. Study design

This is a cross-sectional observational study with non-probability sampling conducted according to *Strengthening the Reporting of Observational Studies in Epidemiology* – STROBE.[11] The study was approved by the Institutional Research Ethics Committee (number: 55823922.1.0000.5235), following the Declaration of Helsinki for research in humans. All included participants read and signed electronically the Informed Consent Record before starting the participation.

2.2. Sample and Procedures

Participants were recruited organically in a virtual environment through social networks (Linkedin, Facebook, Twitter, and WhatsApp) and emails from occupational health professionals, between March 2022 and June 2022. Invitation announcements were posted on the researchers' social networks with links to access the questionnaires, invitation announcements were sent to groups of professionals in the field, as well as invitation announcements to the electronic message list of professionals. The invitation ads with links could be reposted and resent by other people who had access so that professionals who were interested in learning about and participating in the research could access the questionnaire. Brazilian occupational health professionals working in the prevention and treatment of musculoskeletal pain were eligible for inclusion in the study, including physiotherapists, occupational physiotherapists, ergonomists and other professionals with formal education in occupational health. After being invited to participate, interested parties accessed a Google Forms link to complete an electronic questionnaire composed of professional data, sociodemographic data, and items that identify the participant's knowledge about LBP risk factors, beliefs and attitudes about the management of LBP. Participants who did not respond to some item in the questionnaire and were therefore incomplete were excluded, following the listwise method.[12]

2.3. Instruments

A questionnaire was elaborated to verify the professional knowledge about LBP risk factors, as well as beliefs and attitudes about the management of LBP. The questionnaire encompasses sociodemographic characteristics and 46 items divided into 6 main domains. Two domains were composed of the cross-culturally validated version of the Brazilian's Pain Attitudes and Beliefs Scale for Physiotherapists – PABS.PT[13], being related to biomedical management and psychosocial management of low back pain, with six similar response options to each item (totally disagree, disagree, partially disagree, partially agree, agree, and totally agree). The items of the PABS.PT was used to verify if professionals have a biomedical or a biopsychosocial treatment orientation. The PABS.PT was initially developed in English[14] and adapted for the Brazilian context containing 19 items, being considered a reproducible instrument for measuring attitudes and beliefs related to chronic LBP in health professionals in Brazil. Items regarding risk factors for LBP were added to the questionnaire based on a recent umbrella review[7], comprising four other domains: individual factors, general health factors, physical stress factors, psychological stress factors. The items related to LBP risk factors initially had the same response options as PABS.PT, but were subsequently dichotomized into adequate or inadequate knowledge using the umbrella review as standard reference (Table 1).

Table 1. LBP Risk Factor

Survey Item	Appropriate response Direction
LBP Risk Factors	
Personal factors	
The risk of LBP is higher for males than for females.	**Disagree**
Previous LBP is a risk factor for a new onset of LBP.	**Agree**
The risk of LBP is independent of the person's height.	**Agree**
General health factors	
The risk of having LBP is higher in smokers than in non-smokers.	**Agree**
Obese people are more likely to develop LBP.	**Disagree**
Daily alcohol drinkers are more likely to have LBP.	**Disagree**
People who perform physical activity are less likely to have LBP.	**Disagree**
Having chronic diseases increases a person's chance of having LBP.	**Agree**
There is a higher risk of LBP in people with sleep problems.	**Agree**
People who are often tired are more likely to experience LBP.	**Agree**
Feeling pain in other parts of the body increases the risk of LBP.	**Agree**
Physical stress factors	
Whole body vibration causes LBP.	**Agree**
Handling a load above 25 kg increases the risk of LBP.	**Agree**
The greater frequency of handling loads increases the risk of LBP.	**Agree**
Sitting for more than 2 hours is a risk factor for LBP.	**Disagree**
Driving for more than 2 hours is a risk for LBP.	**Agree**
Kneeling for more than 15 minutes increases the risk of LBP.	**Agree**
Squatting for more than 15 minutes increases the risk of LBP.	**Agree**
People who bend forward (trunk flexion) or backward (trunk extension) are often at greater risk of LBP.	**Agree**
Standing or walking for more than 2 hours poses a risk for LBP.	**Agree**
Occupations with high physical workloads increase risk of LBP.	**Agree**
Psychological stress factors	
People exposed to monotonous work have a higher risk of LBP.	**Agree**
The lack of psychosocial support to the worker increases the probability of developing LBP.	**Disagree**
Mental distress (being stressed, nervous or tense) increases the risk of LBP.	**Agree**
People who are dissatisfied with life have a higher risk of LBP.	**Agree**
There is a higher risk of LBP in people with depression.	**Agree**
Psychosomatic factors are risk factors for LBP.	**Agree**

Note: Totally disagree, disagree, partially disagree were considered as disagree direction, and partially agree, agree, and totally agree were considered as agree direction.
Source: the authors (2024).

2.4. Statistical analysis

Descriptive data analysis was performed to summarize sociodemographic data, LBP risk factors, and PABS.PT$_{biomedical}$ score, and PABS.PT$_{psychosocial}$ score. Continuous variables were presented as mean and standard deviation (SD), and categorical variables in absolute values and proportions (%). The primary outcome measure was the measurement of knowledge about LBP risk factors and beliefs and attitudes about the management of LBP in Brazilian professionals working with occupational health. The secondary outcome was the relationship between knowledge about LBP risk factors and beliefs and attitudes about the management of LBP among professionals according to sociodemographic conditions and different academic backgrounds. The following independent variables were considered: age; sex (male or female), licensed health professional (general physiotherapists, occupational health physiotherapists, and physiotherapists with another occupational health education, ergonomists, and other occupational health professionals), time of profession and time working in the occupational area. The chi-square test was used to compare categorical variables (knowledge about LBP risk factors) between groups. A linear regression model was constructed to verify possible sociodemographic and professional characteristics that may be associated with the professionals' attitudes and beliefs about LBP management. A significance level of less than 5% ($p < 0.05$) was considered for all analyzes. The statistical analysis was performed using JASP version 0.15.0.0.

3. Results

A total of 97 professionals answered the questionnaire. Sixteen records were excluded due to the missing responses in one or more items, and 81 participants were included in the study. Among the study participants, 48 (59.3%) were female. The sample had a mean (SD) age of 42.1 (9.1) years, and a working time in occupational health of 11.6 (7.4) years. The main characteristics of the participants are presented in Table 2.

Table 2. Characteristics of the participants (n=81)

Characteristic	*Value*
Personal Information	
Age, years, mean (SD)	42.1 (9.1)
Sex, female, n (%)	48 (59.3)
Occupational Education	
Licensed health professionals	
Physiotherapist, n (%)	22 (27.2)
Occupational Health Physiotherapist n (%)	31 (38.3)
Physiotherapist with another health education n (%)	4 (4.9)
Ergonomist n (%)	24 (29.6)
Time of profession, years, mean (SD)	16.9 (8.6)
Time working in occupational health, years, mean (SD)	11.6 (7.4)

Note: mean (SD) or frequency (%)
Source: the authors (2024).

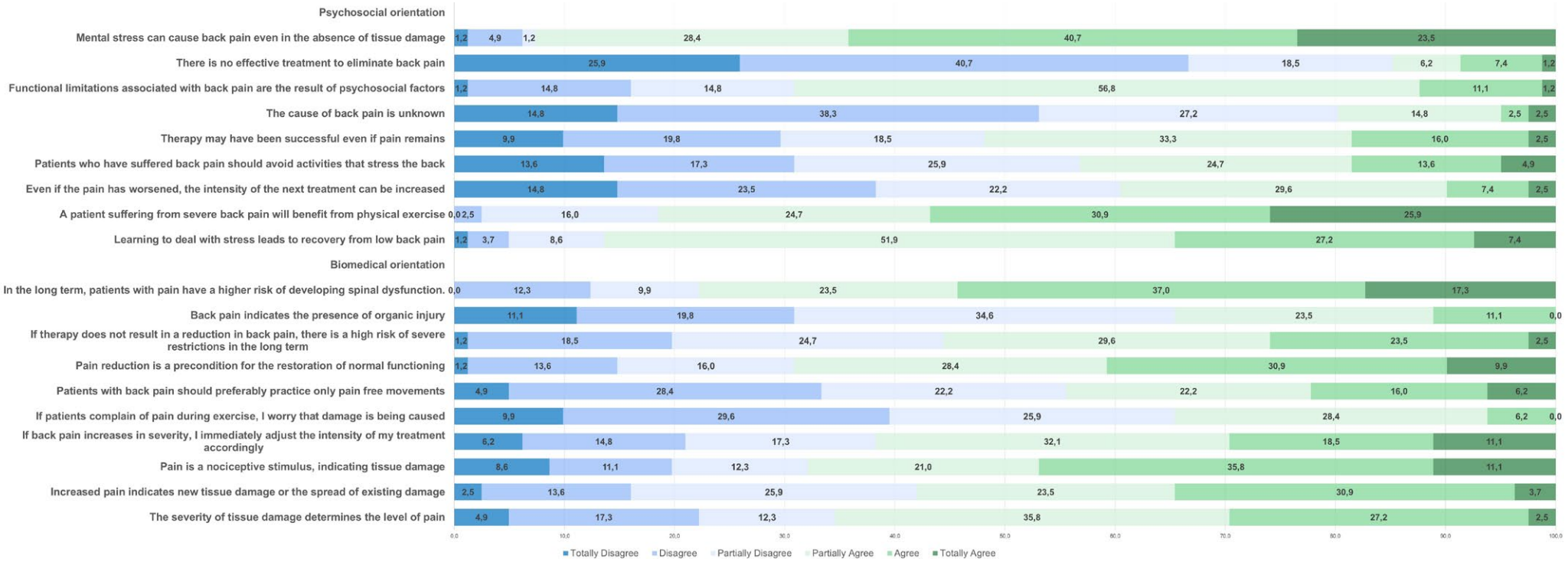
Analyzing the knowledge about LBP risk factors, the lowest knowledge rates were about obesity (7.4%), sitting for more than 2 hours (8.6%), physical activity (9.9%), lack of psychosocial support at work (11.1%) and consuming alcohol daily (37.0%). Among physiotherapists, the lowest knowledge rate was about obesity (5.3%) and among ergonomists it was about physical activity (0.0%). Considering the average of correct answers in the main domains, the values obtained were 54.8% for general health, 76.1% for personal, 76.3% for psychological stress, and 76.6% for the physical stress risk factor. There was no statistically significant difference ($p>0.05$) when comparing the groups (professional formation) in any item about LBP risk factors (Table 3).

Table 3. Knowledge about LBP risk factors among occupational health professionals

Risk factors	Sample (n=81)	Physical Therapists (n=57)	Ergonomists (n=24)	p-value
Personal factors				
The risk of LBP is higher for males than for females. %	82.7	84.2	79.2	0.584
Previous LBP is a risk factor for a new onset of LBP. %	70.4	75.4	58.3	0.124
The risk of LBP is independent of the person's height. %	75.3	73.7	79.2	0.601
General health factors				
The risk of having LBP is higher in smokers than in non-smokers. %	54.3	56.1	50.0	0.612
Obese people are more likely to develop LBP. %	7.4	5.3	12.5	0.256
Daily alcohol drinkers are more likely to have LBP. %	37.0	38.6	33.3	0.654
People who perform physical activity are less likely to have LBP. %	9.9	14.0	0.0	0.053
Having chronic diseases increases a person's chance of having LBP. %	76.5	78.9	70.8	0.431
There is a higher risk of LBP in people with sleep problems. %	93.8	94.7	91.7	0.600
People who are often tired are more likely to experience LBP. %	91.4	91.2	91.7	0.949
Feeling pain in other parts of the body increases the risk of LBP. %	67.9	71.9	58.3	0.231
Physical stress factors				
Whole body vibration causes LBP. %	86.4	84.2	91.7	0.371
Handling a load above 25 kg increases the risk of LBP. %	97.5	98.2	95.8	0.523
The greater frequency of handling loads increases the risk of LBP. %	98.8	98.2	100	0.514
Sitting for more than 2 hours is a risk factor for LBP. %	8.6	5.3	16.6	0.095
Driving for more than 2 hours is a risk for LBP. %	91.4	94.7	83.3	0.095
Kneeling for more than 15 minutes increases the risk of LBP. %	59.3	61.4	54.2	0.545
Squatting for more than 15 minutes increases the risk of LBP. %	69.1	71.9	62.5	0.402
People who bend forward (trunk flexion) or backward (trunk extension) are often at greater risk of LBP. %	86.4	87.7	83.3	0.599
Standing or walking for more than 2 hours poses a risk for LBP. %	75.3	77.2	70.8	0.544
Occupations with high physical workloads increase risk of LBP. %	93.8	94.7	91.7	0.600
Psychological stress factors				
People exposed to monotonous work have a higher risk of LBP. %	75.3	73.7	79.2	0.601
The lack of psychosocial support to the worker increases the probability of developing LBP. %	11.1	10.5	12.5	0.796
Mental distress (being stressed, nervous or tense) increases the risk of LBP. %	95.0	96.5	91.7	0.360
People who are dissatisfied with life have a higher risk of LBP. %	90.1	89.5	91.7	0.763
There is a higher risk of LBP in people with depression. %	91.4	91.2	91.7	0.949
Psychosomatic factors are risk factors for LBP. %	95.1	96.5	91.7	0.360

Note: The results represent the appropriate response to the item. Significant differences between groups were tested by the Chi-square test. Statistically significant difference ($p<0.05$).
Source: the authors (2024).

Figure 1. Prevalence of responses by professionals to PABS.PT domains (%)



Source: the authors (2024).

Professional beliefs and attitudes about the LBP management using PABS.PT scored 26.5 out of 50.0 (6.9) for biomedical orientation and 22.7 out of 45.0 (5.7) for psychosocial orientation. For the psychosocial items in the LBP management, most participants agreed with the following items: "mental stress can cause back pain even in the absence of tissue damage", "functional limitations associated with back pain are the result of psychosocial factors", "a patient suffering from severe back pain will benefit from physical exercise", and "learning to deal with stress leads to recovery from low back pain". In the biomedical items of LBP management, there was a high percentage of "agree" option with the following items: "in the long term, patients with pain have a higher risk of developing spinal dysfunction", "pain reduction is a precondition for the restoration of normal functioning", "pain is a nociceptive stimulus, indicating tissue damage", and "the severity of tissue damage determines the level of pain". The graphic (Figure 1) shows the results for each item in each PABS.PT domain with the prevalence of responses by professionals. Linear regression in PABS.PT considering sex, age, time of profession, time working in occupational health and academic background professional obtained a non-significant statistical result for these variables. Summarizing, no sociodemographic or professional characteristics variables were significantly associated with the score on $PABS.PT_{biomedical}$ (p=0.503) or with the score on $PABS.PT_{psychosocial}$ (p=0.575).

4. Discussion

The present study aimed to verify the knowledge about LBP risk factors and beliefs and attitudes about the LBP management among health professionals working in the occupational area. We observed a low level of knowledge about non-occupational LBP risk factors, specifically about general health conditions. Occupational health professionals presented a high proportion of illiteracy on issues like obesity, sitting for more than 2 hours, physical activity, lack of psychosocial support at work and consuming alcohol daily. Besides, the knowledge about the LBP risk factors was similar between physiotherapists and ergonomists. Participants showed a balanced orientation of beliefs and attitudes about managing LBP. Finally, no sociodemographic or academic background professional characteristics were linked to beliefs and attitudes about LBP management. These findings highlight the importance of improve the knowledge about LBP risk factors among occupational health professionals, especially non-occupational risk factors.

The general health-related LBP risk factors were poorly understood by about 50% of professionals, and emotional, psychological, and physical stress factors were poorly understood by about 25% of participants. The mismatch between professional knowledge and scientific research may be related to the misinterpreting of association measures from cross-sectional studies. For instance, in a recent meta-analysis involving only cross-sectional studies, prolonged sitting time, being overweight and smoking were associated with LBP[15], but the study design cannot infer a cause-effect relationship. To overcome this limitation, we used LBP risk factors established by an umbrella review which examined systematic reviews of cohort studies to assess the knowledge of occupational health professionals. Moreover, these specialized professionals usually work with preventive strategies focused on occupational risk factors, which may explain this deficient knowledge of non-occupational risk factors for LBP. Ergonomic interventions were generally ineffective in preventing or reducing LBP among healthy workers.[16] On the other hand, specific exercise programs to strengthen spinal muscles combined with aerobic exercise or stretching, education about back disorders, and ergonomic principles can prevent LBP.[17] Exercise improves individual health and mood and consequently the ability to submit to physical efforts but does not eliminate or minimize physical and psychological risk factors at work. Therefore, improving evidence-based knowledge about occupational or non-occupational risk factors may be essential for preventing LBP in worker health.

Our sample exhibited a proportional score between biomedical orientation and psychosocial orientation considering beliefs and attitudes about LBP management, in agreement with a previous study conducted with Brazilian physiotherapists.[10] The academic background of these professionals may explain this finding. Nonetheless, professional characteristics (time of profession and working in the occupational area) and sociodemographic conditions (sex and age) did not influence beliefs and attitudes about LBP management. Age and education did not interfere with physicians' beliefs and attitudes about LBP, while the specialty plays an opposite role.[18] Physiotherapists do not have adequate training to address and treat the multidimensional presentations of LBP, having a preference for dealing with mechanical aspects of LBP, which can induce cognitive, psychological and social maladaptive beliefs concerning LBP.[19] Due to the multidimensional nature of LBP, certain risk factors (e.g., depressive symptoms, body mass index, sex, psychological factors, pain level) predict poor outcomes in different stages of the LBP course.[20] The attitudes of health professionals in treating people with LBP are influenced by the beliefs of these professionals.[21] As a result, professionals' beliefs affect patients' beliefs about LBP.[22] Conversely, a brief educational intervention in medical students on beliefs and attitudes regarding LBP improved knowledge.[23] Therefore, educational interventions about LBP management focused on occupational health professionals may have favorable results for improving their attitudes and impact on LBP prevention outcomes in workers.

Certain strengths and limitations can be reported. This is a pioneering study to evaluate the knowledge of LBP risk factors and beliefs and attitudes in the treatment orientation of patients with LBP by Brazilian occupational health professionals. Another strength was that to evaluate beliefs and attitudes in the management of LBP a cross-culturally validated version of PABS.PT for Brazilian Portuguese was used. In the same way, we developed a questionnaire based on a recent umbrella review following the PABS.PT format as a form of standardization in the analysis, and the instrument developed allowed the assessment of several domains (i.e., occupational and non-occupational, physical and psychological personal factors, etc.). Also, professionals with different academic backgrounds were included in the study. The research was widely disseminated as a way to minimize selection bias. Finally, we excluded records with missing data to minimize the information bias, however there is no guarantee of complete elimination of bias. As a limitation, no sociodemographic data is available to guarantee that the sample is truly representative of all Brazilian occupational health professionals. Therefore, we suggest caution when extrapolating data to the population. Despite all the care taken in the development of the instrument to assess the domains regarding the knowledge about LBP risk factors, it did not undergo a validation process. A thorough questionnaire development process is required to assess knowledge about LBP risk factors, including validation. Furthermore, we must cite that although the PABS.PT has been cross-culturally validated in some languages[24,25] physiotherapists may have some difficulty completing the PABS.PT26 and an improvement in the instrument, especially in the psychosocial subscale, can bring more reliable results from the construct.[26,27]

This study highlighted the low knowledge of occupational health professionals about certain LBP risk factors. Consequently, preventive strategies planned in the work environment can be ineffective. The training of these professionals must encompass non-occupational LBP risk factors, which may impact the effectiveness of preventive actions against LBP in workers. For future surveys, a larger sample can bring more assertive results of inadequate knowledge about LBP among these professionals. Also, there is a lack in the literature of available questionnaires to assess knowledge on LBP risk factors and this study highlights the need for future studies to develop and validate high-quality specific questionnaires for this purpose. Finally, expanding the literature on risk factors about LBP in this investigation will increase knowledge on the topic.

5. Conclusion

Brazilian occupational health professionals, including physiotherapists and ergonomists, have little knowledge about non-occupational risk factors for low back pain, especially general health status. These professionals also have balanced biomedical and psychosocial concepts in managing LBP.

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Authors contributions

Leivas EG e Nogueira LAC participated in the conception of the research question, methodological design, research and statistical analysis of research data and interpretation of results. Corrêa LA contributed to the conception of the research question and the methodological design. Ferreira AS e Almeida RS participated in the research and statistical analysis of research data, interpretation of results. All authors worked on writing the scientific article, reviewed and approved the final version and are in agreement with its publication.

Conflicts of interest

No financial, legal, or political conflicts involving third parties (government, private companies and foundations, etc.) have been declared for any aspect of the submitted work (including, but not limited to, grants and financing, advisory board participation, study design, preparation manuscript, statistical analysis, etc.).

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