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**ORIGINAL ARTICLE**

# Lifestyle Habits, Physical Disability, and the Relationship with Non-Specific Chronic Low Back Pain

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**Highlights:**
(1) The intensity of low back pain is associated with greater physical disability.
(2) Smoking increases the risk of low back pain and physical disability.
(3) Lack of leisure activities is linked to greater low back pain and physical disability.

## ABSTRACT

Objective: This study examined the relationship between lifestyle habits, physical disability, and non-specific chronic low back pain. Methods: This cross-sectional, exploratory, and analytical study included a convenience sample of 50 individuals aged ≥ 18 years of both sexes. Participants were assessed on socioeconomic, demographic, and lifestyle factors, as well as the level of physical disability, using the Roland-Morris questionnaire and pain intensity using the visual analog scale. Results: The participants had an average age of 56.9 (SD = 8.87), ranging from 34 to 72 years. Among them, 90% (n = 45) were female. Pain perception was divided between moderate (30%, n = 15) and severe (70%, n = 35). There was a statistically significant association between pain and physical disability (prevalence ratio [PR] 9.86, confidence interval [CI] = 1.46–66.47). Individuals who did not engage in leisure activities also reported a higher subjective feeling of low back pain (PR 0.60, CI = 0.37–0.95) and physical disability (PR 0.39, CI = 0.18–0.88). Additionally, there was a statistically significant association between smoking and LBP (PR 1.60, CI = 1.25–1.99), as well as between physical disability and low back pain (PR 1.88, CI = 1.13–3.11). No significant associations were found between physical exercise, alcohol consumption, and diet with levels of pain and physical disability. Conclusion: A strong relationship was found between pain and physical disability, as well as smoking habits and interference with leisure activities.

**Keywords:** low back pain; chronic pain; physical disability; lifestyle habits.

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## INTRODUCTION

Low back pain (LBP) is a musculoskeletal disorder that significantly affects the quality of life, independence, and social participation of individuals[1]. This condition also imposes a high burden on public services, with epidemic levels in the general population[2]. The prevalence of LBP is higher in industrialized countries, affecting approximately 37% of the global adult population[3]. Data from the Brazilian National Health Survey conducted in 2019[4] revealed that around 21.6% of the Brazilian population experiences some form of chronic back problem, most commonly in the lumbar region. Moreover, it is estimated that 80% of adults will experience LBP at some point in their lives[5].

According to Hartvigsen et al.[3], it is not possible to identify a specific nociceptive cause for chronic low back pain (CLBP). There is strong evidence that sociodemographic factors, lifestyle choices, educational level, psychosocial or work-related factors, and their interactions influence the onset and persistence of this condition. Evidence indicates that the physical disability caused by CLBP is not solely attributed to biological factors. Despite its high prevalence rate, approximately 90–95% of CLBP cases have no identifiable etiology and are multifactorial[6].

Understanding the factors contributing to CLBP and their impact on individuals is crucial for healthcare professionals to effectively manage this issue. It is important to consider not only the factors directly associated with CLBP but also the subjective aspects associated with this condition. This knowledge enables the design of appropriate multidimensional interventions. Therefore, this study aims to examine the relationship between lifestyle habits, physical disability, and CLBP.

## METHODOLOGY

This exploratory cross-sectional study was conducted in three Family Health Units (FHUs) in the Santo Amaro neighborhood in the central area of Recife (Pernambuco State, northeastern Brazil). The study took place between April 5 and December 20, 2022. Participants were included based on convenience, without a sample calculation. Participants were recruited from professionals of the family health strategy, informed about the study's objective, and tasked with identifying individuals in the area who met the criteria. These individuals were then invited to the unit to participate in the study at a designated day and time. Additionally, participants were attracted through health education sessions conducted by the researcher in the waiting rooms of the FHUs.

The inclusion criteria were as follows: being 18 years or older, experiencing CLBP for at least three months, and being registered at one of the FHUs involved in the study. Exclusion criteria included cognitive and/or neurological impairments, previous neuromusculoskeletal dysfunctions (e.g., trauma sequelae, amputations, and deformities), and pregnancy.

Participants received both verbal and written explanations about the study and were asked to sign the informed consent form in duplicate; one copy was retained by the participant, while the other remained with the researcher. Data collection occurred in a private area, specifically the reception room of the FHU, to maintain confidentiality and respect the participants' privacy.

The research project was approved by the Research Ethics Committee (protocol no. 5.384.447). It adhered to the ethical guidelines recommended by Resolution no. 466/2012 of the National Health Council of the Brazilian Ministry of Health pertaining to research involving human subjects.

### Procedures

Initially, participants completed a questionnaire prepared by the researchers. The questionnaire included questions about socioeconomic and demographic factors, such as race (white, black, brown), sex, age, education level (illiterate, elementary school, high school), occupation, marital status (with or

without a partner), and family income (up to one Brazilian minimum wage or more than one minimum wage). Additionally, the questionnaire included questions about lifestyle habits, such as regular physical exercise, alcohol use, smoking, and consumption of processed foods, fruits, and vegetables.

Next, the researchers administered the Roland-Morris questionnaire, which measures the impact of LBP on activities of daily living (ADLs) and instrumental activities of daily living (IADLs). The questionnaire has been validated for Brazilian Portuguese and consists of 24 questions. It is a quick and easy assessment that takes about five minutes to complete. Scores are calculated by adding up the responses, ranging from zero (no disability) to 24 (severe disability). Scores above 14 indicate physical disability[7].

Finally, the subjective sensation of pain was assessed using the Visual Analog Scale, which quantifies pain intensity based on an individual's perception. The scale consists of different levels of pain intensity, and participants are asked to verbally indicate their pain level using corresponding phrases[8]. Pereira et al.[9] suggested a pain score classification, with 0 representing no pain, mild pain ranging from 1 to 2, moderate pain ranging from 3 to 7, and severe pain ranging from 8 to 10.

### Statistical Analysis

The instruments were converted into an online form using Google Forms. For data analysis, numerical variables were reported as means and standard deviations, while categorical variables were presented as frequencies and percentages. Since this study was cross-sectional, the prevalence ratio (PR) was calculated to determine the association between pain sensation and degree of disability, as well as the relationship between lifestyle habits and pain sensation and disability. A 95% confidence interval (CI) was considered. The data was analyzed using the Statistical Package for the Social Sciences (SPSS) software, version 22.0.

## RESULTS

A total of 50 individuals were assessed, of whom 90% (n = 45) were female with an average age of 56.9 (SD = 8.87) years, ranging from 34 to 72 years. Among the respondents, 62% (n = 31) identified themselves as brown and 50% (n = 25) reported having partners. In terms of education, 52% (n = 26) had not completed elementary school. Regarding family income, 76% (n = 38) received less than one minimum monthly wage. In terms of occupation, 56% (n = 28) identified themselves as "housewives." None of the individuals reported feeling mild pain, with the perception of pain being divided between moderate (30%) and severe (70%) (n = 35) (Table 1).

Table 1 – Sociodemographic and pain intensity variables of individuals with chronic low back pain from three family health units in Recife (Pernambuco, northeastern Brazil), 2022

| Variable | Moderate pain | Severe pain | n (%) |
|---|---|---|---|
| **Sex** | | | |
| Female | 14 | 31 | 45 (90) |
| Male | 1 | 4 | 5 (10) |
| **Race/color** | | | |
| White | 4 | 7 | 10 (22) |
| Black | 3 | 5 | 8 (16) |
| Brown | 8 | 23 | 31 (62) |
| **Marital status** | | | |
| With a partner | 8 | 17 | 25 (50) |
| Without a partner | 7 | 18 | 25 (50) |

| | | | |
|---|---|---|---|
| **Education** | | | |
| Illiterate | 0 | 3 | 3 (6) |
| Elementary education | 9 | 17 | 26 (52) |
| High school education | 6 | 15 | 21 (42) |
| **Occupation** | | | |
| Health worker | 0 | 4 | 4 (8) |
| Retired | 2 | 1 | 3 (6) |
| Businessman | 0 | 1 | 1 (2) |
| Seamstress | 1 | 0 | 1 (2) |
| Housewife | 8 | 20 | 28 (56) |
| Student | 0 | 1 | 1 (2) |
| Mechanic | 1 | 0 | 1 (2) |
| Driver | 0 | 1 | 1 (2) |
| Stonemason | 0 | 1 | 1 (2) |
| Service provider | 2 | 5 | 10 (14) |
| Security guard | 1 | 0 | 1 (2) |
| Unemployed | 0 | 1 | 1 (2) |
| **Household income** | | | |
| ≤1 minimum wage | 10 | 28 | 38 (76) |
| >1 minimum wage | 5 | 7 | 12 (24) |

According to the classification of the disability instrument, 48% (n = 24) of the individuals fell into the disability group, while 52% (n = 26) did not have any disability. The prevalence ratio between severe pain and disability was 9.86 (CI = 1.46-66.47), as shown in Table 2. The mean score for pain sensation was 8.06 (SD = 1.43; min = 5, max = 10). In the questionnaire, the mean score was 12.92 (SD = 6.09; min = 2, max = 24).

Table 2 – Prevalence ratio between pain and physical disability in individuals with chronic low back pain from three family health units in Recife (Pernambuco, northeastern Brazil), 2022

| **Sensation of pain** | **Physical disability – n (%)** | | **PR (CI = 95%)** |
|---|---|---|---|
| | **Yes** | **No** | |
| Severe | 23 (46) | 12 (24) | 9.86 (1.46–66.47) |
| Moderate | 1 (2) | 14 (28) | |

PR: Prevalence ratio; CI: confidence interval.

After all 50 participants answered the questions on lifestyle habits, the results showed that 62% (n = 31) reported not consuming alcohol, 94% did not exercise (n = 47), 18% were smokers (n = 9), 40% participated in leisure activities (n = 20), and 72% ate processed foods (n = 36). As for the consumption of fruit and vegetables, 70% confirmed doing so (n = 35). Table 3 presents the relationship between LBP and lifestyle habits. The findings showed a statistically significant association between smoking and pain intensity as well as leisure activities, with a PR of 1.60 (CI = 1.46–66.47) for the former and PR of 0.60 (CI = 0.37–0.95) for the latter.

Table 3 – Prevalence ratio between lifestyle habits and pain in patients with chronic low back pain from three family health units in Recife (Pernambuco, northeastern Brazil), 2022

| Lifestyle habits | Sensation of pain – n (%) | | PR (CI = 95%) |
|---|---|---|---|
| | Moderate | Severe | |
| Alcohol consumption | 15 (30) | 4 (8) | 1.22 (0.86–1.73) |
| Smoking | 9 (18) | 0 (0) | 1.60 (1.25–1.99) |
| Physical exercise | 2 (4) | 1 (2) | 0.95 (0.42–2.16) |
| Leisure activities | 10 (20) | 10 (20) | 0.60 (0.37–0.95) |
| Industrialized food consumption | 26 (52) | 10 (20) | 1.12 (0.72–1.74) |
| Fruit and vegetable consumption | 12 (24) | 3 (6) | 1.21 (0.85–1.72) |

PR: Prevalence ratio; CI: confidence interval.

Table 4 lists the association between physical disability and lifestyle habits. It was possible to observe statistically significant associations between physical disability and smoking and leisure time activity, respectively PR = 1.88 (CI = 1.13–3.11) and PR = 0.39 (CI = 0.18–0.88).

Table 4 – Prevalence ratio between lifestyle habits and physical disability of patients with chronic low back pain from three family health units in Recife (Pernambuco, northeastern Brazil), 2022

| Lifestyle habits | Physical disability – n (%) | | PR (CI = 95%) |
|---|---|---|---|
| | Yes | No | |
| Alcohol consumption | 10 (20) | 9 (18) | 1.16 (0.65–2.07) |
| Smoking | 7 (14) | 2 (4) | 1.88 (1.13–3.11) |
| Physical exercise | 0 (0) | 3 (6) | — |
| Leisure activities | 5 (10) | 15 (30) | 0.39 (0.18– 0.88) |
| Industrialized food consumption | 16 (32) | 20 (40) | 0.79 (0.43–1.39) |
| Fruit and vegetable consumption | 7 (14) | 8 (16) | 0.96 (0.51–1.82) |

PR: Prevalence ratio; CI: confidence interval

## DISCUSSION

Most participants in this study were females with low levels of education and income up to one minimum wage. There was a higher prevalence of severe low back pain and disability among these participants. Smokers had a higher prevalence of disability, while there was an inverse relationship between leisure activity and disability. In the literature, socioeconomic factors are commonly cited as risk factors for the generation and maintenance of chronic pain[10,11]. According to a study by Malta et al.[12], based on 2019 data[4], back pain is highly prevalent and is associated with demographic factors and socioeconomic conditions.

Although the mean age of the participants in this study was over 50, there were women who were not yet menopausal, and the different phases of the menstrual cycle can also affect the perception of low back pain. A study by Carvalho and Souza[13] showed a higher prevalence of chronic pain in women compared to men, which also affects pain intensity and ADLs. Souza, Häfele, and Siqueira[14] observed that chronic pain perception was higher among women, with the lumbar spine being one of the most affected regions.

This study found a high prevalence of individuals with low levels of education. According to Romero et al.[15], adults with lower levels of education (no education or incomplete elementary education) have a higher prevalence of chronic back problems compared to those with higher levels of education. The same finding was reported in a study by Rocha, Alfieri, and Silva[16], as most participants with chronic pain had a lower level of education.

Furthermore, this study found that individuals with CLBP had a higher prevalence of physical disabilities and limitations in ADLs and IADLs. Chronic pain significantly interferes with everyday activities and significantly impacts the quality of life[17]. The years lived with disability caused by low back pain have increased by over 50% since 1990, especially in low- and middle-income countries[18]. Trelha et al.[19] observed that chronic pain mainly affects the ability to get up (72%), perform household tasks (54%), and walk (47%), suggesting that severe pain interferes with an individual's level of functionality. Lemos et al.[20] also indicated a relationship between ADLs and pain intensity.

Notably, 94% of the participants in this study did not engage in exercise, and despite there being no apparent relationship between physical exercise, pain, and disability, research has demonstrated an important association between a sedentary lifestyle and CLBP[21]. Evidence shows that the level of physical activity influences pain intensity, indicating that sedentary or insufficiently active individuals report higher pain intensity compared to those who are active and very active[22]. More than half of the individuals reported frequent consumption of processed foods. Although no relationship was found, the literature suggests that industrialized and high-fat foods play a role in pain generation by inducing the formation of inflammatory substances in the body[12,23].

Another important finding in this study was the lower prevalence of severe pain and physical disability among individuals who reported engaging in leisure activities. This suggests that there may be a relationship between leisure activities and pain. Pereira et al.[9] conducted a study that showed that individuals with severe CLBP tended to experience more physical disability, which impaired their social interaction and, consequently, their ability to engage in leisure activities. Trelha et al.[19] found that pain mainly interfered with sleep (61.28%), mood (54.25%), and leisure activities (45.05%). Scudds and Ostbye[24] conducted a study on a population of elderly Canadians, revealing that pain interfered with mood in approximately 54% of the participants, with leisure activities in 44%, and with sleep in 40%.

Moreover, our findings showed a higher prevalence of severe pain among smokers compared to non-smokers. Malta et al.[12], using official government data[4], assessed the prevalence of back pain among smokers, ex-smokers, and non-smokers and noted that back pain was present in the majority of smokers; Caputo[25] also observed an association between back pain and smoking. CLBP affects all age groups and is generally associated with sedentary occupations, smoking, obesity, and low socioeconomic status[18]. Hence, these findings suggest a possible relationship between the intensity of CLBP and disability in smokers, emphasizing the need for further research on this topic.

## LIMITATIONS OF THE STUDY

The study has inherent limitations in its design. Age may have influenced the study results, as older individuals are more prone to musculoskeletal dysfunctions. In this study, the participants' ages varied. Additionally, there is a possibility of overestimating the prevalence rates since CLBP was self-reported, and the answers were based on the participants' perceptions of their lifestyle habits and physical disability. Another limitation is the lack of sample calculation, as the survey was conducted for convenience rather than representing the entire population. This convenience sampling may have resulted in the exclusion of mild cases of CLBP.

## CONCLUSION

It is evident from this and other findings in the literature that chronic low back pain cannot be approached and understood solely through the lens of nociception as it is also related to socioeconomic factors, demographic factors, and lifestyle habits. In this study, a strong correlation was observed between pain and physical disability, as well as smoking habits and interference with leisure

activities. Thus, primary healthcare professionals have tremendous potential to promote healthy habits through multidisciplinary and interdisciplinary approaches to develop effective strategies to reduce the comorbidities and disabilities caused by chronic low back pain.

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