ORIGINAL ARTICLE

Acute and chronic back pain in adults and elderly in southern Brazil: a population-based study

Dor aguda e crônica nas costas em adultos e idosos no sul do Brasil: um estudo de base populacional

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Abstract

Aims: to determine the prevalence of acute and chronic back pain and associated factors and identify the consequences of this pain in adults and the elderly in southern Brazil.

Methods: cross-sectional study conducted in 2019, in Criciúma, Santa Catarina, in individuals aged 18 and over. Acute back pain was pain in the cervical, thoracic, or lumbar regions not exceeding 3 months and chronic pain as pain for 3 months or more. Bivariate analyzes and multinomial logistic regression were performed.

Results: among the 820 participants, the prevalence of back pain was 67.0%, acute pain 39.3% (95% CI: 35.5% to 43.3%) and chronic pain 27.4% (95% CI: 24.5% to 30.4%). Acute back pain was associated with women, overweight, obesity, and with WMSD/RSI, while chronic pain chronic pain was found mostly in women, being related to leisure inactivity ...were female, leisure inactivity, falls, Work-related musculoskeletal disorder/repetitive strain injury, and arthritis/rheumatism.

Conclusions: acute pain was greater among overweight/obese and chronic pain contribute to absenteeism and demand for health services.

Keywords: back pain, chronic pain, acute pain, epidemiology.

Resumo

Objetivos: determinar a prevalência de dores aguda e crônica nas costas e fatores associados e identificar as consequências dessas dores em adultos e idosos no Sul do Brasil.

Métodos: estudo transversal realizado em 2019, em Criciúma, Santa Catarina, em indivíduos com 18 anos ou mais. Dor aguda foi a dor nas regiões cervical, torácica ou lombar não superior a três meses e dor crônica como dor por três meses ou mais. Foram realizadas análises bivariadas e regressão logística multinomial.

Resultados: entre os 820 participantes, a prevalência de dor nas costas foi de 67,0%, dor aguda 39,3% (IC 95%: 35,5% a 43,3%) e dor crônica 27,4% (IC 95%: 24,5% a 30,4%). A dor aguda nas costas foi associada a mulheres, sobrepeso, obesidade e a distúrbio musculoesquelético relacionado ao trabalho/lesão por esforço repetitivo, enquanto a dor crônica, foi constatada majoritariamente em mulheres, tendo relação com sedentarismo, quedas, distúrbio musculoesquelético relacionado ao trabalho/lesão por esforço repetitivo e artrite/reumatismo.

Conclusões: a dor aguda mais associada a excesso de peso/obesidade e a dor crônica contribuiu para o absenteísmo e procura pelos serviços de saúde.

Palavras-chave: dor nas costas, dor crônica, dor aguda, epidemiologia.

Abbreviations: BCCE, Brazilian Criteria of Economic Classification; BMI, body mass index; deff, design effect; HDI, high Human Development Index; IASP, International Association for Study of Pain; IPAQ, International Physical Activity Questionnaire; WMSD/RSI, Work-related musculoskeletal disorder/repetitive strain injury.

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Introduction

Pain is a multifactorial phenomenon defined by the International Association for Study of Pain as an unpleasant sensory and emotional experience described as tissue, real, or potential lesions (1). Back pain is among the main musculoskeletal symptoms with potential physical and psychosocial consequences (2). It is always subjective and related to previous experiences and socio-cultural or environmental factors (1). Pain duration determines its type. Acute pain appears suddenly and remains, at most, days or weeks, while chronic pain exceeds the period of three months (1).

Back pain's consequences provide direct costs (health care) and indirect costs (work absenteeism, disability pensions) to the public health system (3). In the United States, only in 2016, approximately US$ 440 million were spent between direct and indirect costs in more than 31 billion people (4). In Brazil, direct costs related to spinal disorders have increased by about 170% in the last decade (5).

Worldwide, acute back pain can affect up to about 76.0% (6–8) of the population and chronic pain can reach 21.1% (6,7,9). In Brazil, acute pain has been reported with prevalence that reach around 34.0% (10) and chronic pain with up to 82.9% (10–13). Studies have shown that back pain has been associated with females (6–12), old age (6,7) and obesity (6,7), however, there is controversial or inconclusive information about physical inactivity(6,7,10), lower schooling level(6,7) and overweight(6,7). Also, other factors such as hours and quality of sleep, and some health-related variables should be analyzed and differentiated under acute and chronic pain. Therefore, we hypothesized that younger, overweight women are associated with acute pain, and older women, with a worse health condition and sleep quality, and depression are associated with chronic back pain.

Given the above, this study aims to: (i) determine the prevalence of acute and chronic pain and associated factors in adults and older adults in a municipality in the south of Santa Catarina; (ii) identify the consequences of back pain in this population.

Methods

Study design and location

This is a cross-sectional population-based study carried out in the municipality of Criciúma, located in the extreme south of the state of Santa Catarina, in Brazil, at about 206 km from the capital Florianópolis, with approximately 192 thousand inhabitants (98.6% living in the urban area), and a high Human Development Index of 0.788(14). This study is nested in a more extensive survey entitled "Health of Criciúma's population", conducted in 2019, which aimed to assess this population's health aspects.

Target population

The target population was individuals aged 18 years or over, living in the urban area of the municipality of Criciúma. Institutionalized individuals in nursing homes, hospitals, and prisons, and those with physical or cognitive disabilities to answer the questionnaire were excluded from this study.

Sample size calculation and sampling

The sample size was calculated considering the lowest prevalence of back pain found at 15.4% (6), proportion of 20% in the exposed group, prevalence ratio of at least 1.8, minimum power of 80%, 95% confidence level, a margin of error of 3.5 percentage points, and sample design effect of 30%, which requires working with a sample of 520 individuals. Adding 15% to the sample size to estimate the multiple relationships in the adjusted analysis, where we find the independent variable, the dependent variable, and some intervening variables, which are the potential confounding factors, and 10% for losses and refusals, we estimated a sample of at least 650 people.

The sampling process was carried out in two stages, based on data from the 2010 Demographic Census (14), where the primary units were the census tracts, and the secondary units were the households. Initially, all urban census tracts with private properties in Criciúma were listed sequentially, according to each tract's code. Subsequently, 77 of the census tracts were selected randomly, for a total of 15,218

households. The number of households was sampled proportionally to the tract's size, and visits were made to 618 households systematically selected in the census tracts.

Data were collected from March to December 2019. Previously trained interviewers used a pre-coded questionnaire with printed closed-ended questions. Double-entry was used in EpiData.

Variables

The dependent variables investigated were acute and chronic back pain, defined as persistent pain in the three cervical, thoracic, or lumbar regions in the last year. The following questions were asked: 1) "Did you have back pain in the last 12 months, that is, since <MONTH> last year?"; and 2) "Did this pain last more than 12 weeks, that is, three consecutive months?" Respondents had two options for answering "no" and "yes" to both questions. The outcomes were operationalized as follows: those who reported having experienced back pain in the last year, and who answered negatively to the question about the duration greater than or equal to three months, were considered to have acute pain. Those who answered affirmatively were considered to have chronic pain (1). Thus, the variable back pain was left with three categories: no pain, acute pain, and chronic pain.

The independent variables investigated were: gender (male/female), age group in years (18-39; 40-59; ≥60), skin color (white; black/yellow/brown/indigenous), marital status (single; married or common-law marriage; separated/divorced/widowed), schooling in full years (0-8; 9-11; ≥ 12), economic classes (A/B; C; D/E), tobacco use (no/yes), alcoholic beverages (no; yes), mean daily sleep time (<8.0; ≥ 8.0), leisure physical activity (no/yes), body mass index (underweight/normal; overweight; obese), falls in the last year (no/yes),Work-related musculoskeletal disorder/repetitive strain injury (WMSD/RSI) (no/yes), arthritis or rheumatism (no/yes). Moreover, the following variables were also investigated: depression (no/yes), self-perceived health (poor/very poor), sleep quality (poor/very poor); search for medical care (no/yes) and missing work (no/

yes) as possible consequences of back pain. All variables were obtained by self-report.

The variables WMSD/RSI, depression and arthritis/rheumatism were collected through the following questions, respectively: "Has any doctor ever told you that you have work-related musculoskeletal disease (WMSD) or repetitive strain injury (RSI)?"; "At some point in your life, has a doctor or psychologist ever told you that you had depression?"; "Has any doctor ever told you that you have arthritis or rheumatism?".

The Brazilian Criteria of Economic Classification questionnaire proposed by the Brazilian Association of Research Companies (15), was used to identify the economic class, which allows stratifying the population into classes A, B, C, D, and E, based on information regarding the accumulation of material goods, housing conditions, number of domestic employees and education level of the head of the family. The leisure physical activity variable was created from the leisure section of the International Physical Activity Questionnaire (16), long version, and defined as those individuals who performed any level of intensity of physical activity during leisure. Concerning body mass index, self-reported weight and height were used and categorized as underweight and normal weight (up to 24.9 kg/m2); overweight (25.0 to 29.9 kg/m2), and obese (≥30.0 kg/m2) (17).

Statistical analysis

Statistical procedures were performed using STATA software version 14.0. The univariate analysis was performed using absolute and relative frequency to describe the sample according to each variable of interest. Bivariate analysis was used to calculate the prevalence of outcomes according to the independent variables using Fisher's exact test. The multivariate analysis was performed according to a hierarchical model (18) to determine the variables' order of entry in the analysis. This hierarchical model was built on three levels: the first level comprised demographic and socioeconomic variables (gender, age group, skin color, marital status, schooling, and economic

class); the second, contained behavioral variables (tobacco use, alcohol consumption, sleep hours, leisure physical activity); and the third consisted of health variables (body mass index, falls in the last year, WMSD/RSI, and arthritis/rheumatism). Variables with p-value ≤0.20 were maintained in the adjusted model to control confounding factors. Multinomial logistic regression was used to calculate the crude and adjusted odds ratio (OR) and its corresponding 95% confidence intervals (95% CI) and p-values. Wald's ratio test was used. The level of significance was set at 5% for two-tailed tests It is noteworthy that the interaction of all variables with gender and age group was tested. Those with statistical significance (p<0.10) were reported in the results. The variables related to the consequences of back pain were analyzed using Fisher's Exact Test, and charts were built using Microsoft Office Excel® software.

Ethical aspects

The Human Research Ethics Committee of the University of the Extreme South of Santa Catarina approved this research under Opinion N° 3.084.521. All ethical principles established by the National Health Council's Resolution N° 466/12 were respected. Participants were informed about their right to refuse participation and confidentiality procedures, and those who agreed to participate in the study signed the Informed Consent Form.

Results

A total of 820 people among the 618 eligible households participated in the survey, with a response rate of 86.1%. Of these, most are female with a mean age of 54±17. Sociodemographic, behavioral and health aspects are described in **Table 1**.

TABLE 1 – Characteristics of participants from Criciúma, Santa Catarina, Brazil, 2019 (n=820).

Variable	n	%
Gender Female	523	63.8
Age group		
18-39	193	23.5
40-59	259	31.6
60 and over	368	44.9
Skin color		
Black/yellow/brown/indigenous	158	19.3
Marital status		
Single	147	17.9
Married, common-law marriage	495	60.4
Separated/divorced/widower	178	21.7
Schooling (years)		
0-8	440	53.7
9-11	266	32.4
≥ 12	114	13.9
ABEP economic classes		
A-B	318	38.8
C	430	52.4
D-E	72	8.8
Smokers	118	14.4
Alcohol use (last 30 days)	66	8.0
Sleep < 8.0 daily hours	306	37.4
Absence of leisure physical activity	486	59.6
Body mass index		
Underweight/normal	324	39.5
Overweight	285	34.8
Obese	211	25.7
Sleep quality		
Very good/good	425	51.8
Fair	232	28.3
Poor/very poor	163	19.9
Falls since last year	160	19.5
Self-perceived health		
Very good/good	406	49.5
Fair	300	36.6
Poor/very poor	114	13.9
WMSD/RSI	178	21.7
Arthritis/rheumatism	214	26.1
Depression	224	27.3
Back pain		
No pain	274	33.4
Acute pain	322	39.3
Chronic pain	224	27.3

ABEP: Brazilian Association of Research Companies; WMSD/RSI: Work-related musculoskeletal disorder / repetitive strain injury.

The prevalence among individuals who reported not feeling pain was 33.0% (95% CI: 30.1% to 36.7%), ranging from 17.8% for arthritis/rheumatism to 42.6% for men. Back pain in the last year was reported in about 67.0% of the investigated population. Among these, acute pain covered 39.3% (95% CI: 35.5% to 43.3%), ranging between 33.6% for people with arthritis/rheumatism and 54.6% for those with alcohol abuse in the last 30 days. Chronic pain reached just over a quarter of the population 27.4% (95% CI: 24.5% to 30.4%), which covered a prevalence of 13.6% for those with alcohol abuse in the last 30 days to 48.6% for arthritis/rheumatism (**Table 2**). The sample design effect for no back pain was 1.00 (ICC=0.005), 1.32 (ICC=0.041) for acute pain, and 0.90 (ICC=0.001) for chronic pain.

TABLE 2 – Prevalence of acute and chronic back pain in adults and older adults in the urban population of Criciúma, SC, Brazil, 2019 (n=820).

Variable	No pain n (%)	Acute back pain n (%)	Chronic back pain n (%)	P-value*
Total	274 (33.4)	322 (39.3)	224 (27.3)	
Gender Female	147 (28.1)	213 (40.7)	163 (31.2)	<0.001
Age group				0.030
18-39	58 (30.1)	94 (48.7)	41 (21.2)	
40-59	86 (33.2)	100 (38.6)	73 (28.2)	
60 and over	130 (35.3)	128 (34.8)	110 (29.9)	
Skin color: Black/yellow/brown/indigenous	57 (36.1)	63 (39.9)	38 (24.0)	0.594
Marital status				0.799
Single	50 (34.0)	59 (40.1)	38 (25.9)	
Married, common-law marriage	161 (32.5)	200 (40.4)	134 (27.1)	
Separated/divorced/widower	63 (35.4)	63 (35.4)	52 (29.2)	
Schooling (years)				0.009
0-8	147 (33.4)	154 (35.0)	139 (31.6)	
9-11	93 (35.0)	110 (41.3)	63 (23.7)	
≥ 12	34 (29.8)	58 (50.9)	22 (19.3)	
ABEP economic classes				0.090
A-B	107 (33.6)	138 (43.4)	73 (23.0)	
C	137 (31.8)	165 (38.4)	128 (29.8)	
D-E	30 (41.7)	19 (26.4)	23 (31.9)	
Smokers	46 (39.0)	42 (35.6)	30 (25.4)	0.379
Alcohol use (last 30 days)	21 (31.8)	36 (54.6)	9 (13.6)	0.009
Sleep < 8.0 daily hours	92 (30.1)	129 (42.1)	85 (27.8)	0.272
Absence of leisure physical activity No	148 (30.4)	186 (38.3)	152 (31.3)	0.006
Underweight/normal	120 (37.1)	118 (36.4)	86 (26.5)	
Overweight	98 (34.4)	117 (41.0)	70 (24.6)	
Obese	56 (26.6)	87 (41.2)	68 (32.2)	
Falls since last year	36 (22.5)	59 (36.9)	65 (40.6)	<0.001
WMSD/RSI	33 (18.5)	72 (40.5)	73 (41.0)	<0.001
Arthritis/rheumatism	38 (17.8)	72 (33.6)	104 (48.6)	<0.001

ABEP, Brazilian Association of Research Companies; WMSD/RSI, Work-related musculoskeletal disorder/repetitive strain injury. *Fisher's exact test.

In the crude analysis of the multinomial logistic regression, we observed that the factors most likely to have acute pain were female, obesity, WMSD/RSI, and arthritis/rheumatism. Female, obesity, and WMSD/RSI remained in the model after adjustment. The variable overweight gained association, and arthritis/rheumatism lost association (**Table 3**). The results of the crude analysis for those who reported having chronic back pain showed that the likelihood increases in the poorest females, with leisure inactivity, obese, those who suffered a fall in the last year, and affected by morbidity (WMSD/RSI, arthritis/ rheumatism, and depression). Economic class and obesity lost association after adjustment.

TABLE 3 – Multinomial crude and adjusted logistical analysis of acute and chronic back pain in adults and older adults in the urban population of Criciúma, SC, Brazil, 2019 (n=820).

Variables	Acute OR (95% CI)		Chronic OR (95% CI)	
	Crude Analysis[‡]	Adjusted Analysis [‡]	Crude Analysis [‡]	Adjusted Analysis[‡]
Gender Female	1.67 (1.21;2.32)	1.70 (1.22; 2.37)	2.29 (1.61;3.26)	2.27 (1.60; 3.23)
Age group				
40-59	0.72 (0.45;1.15)	0.73 (0.44; 1.21)	1.20 (0.70;2.06)	0.99 (0.54; 1.81)
60 and over	0.61 (0.38;0.98)	0.65 (0.39; 1.09)	1.21 (0.74;1.95)	1.00 (0.55; 1.84)
Skin color: Black/yellow/brown/indigenous	0.95 (0.59; 1.53)	0.96 (0.60; 1.55)	0.79 (0.51; 1.23)	0.78 (0.50; 1.21)
Marital status				
Married/ common-law marriage	1.06 (0.65; 1.73)	1.49 (0.91; 2.45)	1.10 (0.69; 1.77)	0.96 (0.51; 1.80)
Separated/divorced/widower	0.85 (0.46; 1.56)	1.17 (0.60; 2.29)	1.09 (0.62; 1.90)	0.75 (0.37; 1.54)
Schooling (years)				
0-8	0.62 (0.38; 0.99)	0.61 (0.37; 0.99)	1.47 (0.80; 2.72)	1.44 (0.76; 2.72)
9-11	0.70 (0.42; 1.18)	0.71 (0.43; 1.19)	1.06 (0.51; 2.19)	1.08 (0.51; 2.29)
ABEP economic classes				
C	0.93 (0.66; 1.29)	1.09 (0.75; 1.59)	1.36 (0.94; 1.96)	1.24 (0.82; 1.87)
D-E	0.82 (0.33; 2.05)	0.99 (0.36; 2.69)	1.97 (1.02; 3.82)	1.56 (0.77; 3.15)
Smokers	0.74 (0.48; 1.15)	0.69 (0.43; 1.11)	0.76 (0.46; 1.27)	0.79 (0.49; 1.29)
Alcohol use (last 30 days)	1.51 (0.87; 2.63)	1.64 (0.93; 2.89)	0.50 (0.19; 1.35)	0.66 (0.23; 1.89)
Sleep < 8 daily hours	1.31 (0.90; 1.92)	1.30 (0.87; 1.93)	1.21 (0.84; 1.72)	1.28 (0.88; 1.87)
Absence of l eisure physical activity	1.15 (0.81; 1.62)	1.17 (0.82; 1.67)	1.78 (1.25; 2.53)	1.60 (1.10; 2.34)
Body mass index				
Overweight	1.37 (0.96; 1.94)	1.45 (1.02; 2.07)	1.04 (0.71;1.54)	1.03 (0.68; 1.55)
Obese	1.76 (1.20; 2.58)	1.78 (1.19; 2.66)	1.76 (1.24; 2.49)	1.45 (0.94; 2.22)
Falls since last year	1.48 (0.96; 2.27)	1.41 (0.89; 2.25)	2.69 (1.81; 4.01)	2.00 (1.33; 2.99)
WMSD/RSI	2.11 (1.30; 3.42)	1.84 (1.07; 3.18)	3.53 (2.30; 5.43)	2.45 (1.42; 4.23)
Arthritis/rheumatism	1.79 (1.18; 2.72)	1.47 (0.91; 2.39)	5.43 (3.48; 8.47)	3.45 (2.05; 5.80)

ABEP, Brazilian Association of Research Companies; OR, Odds Ratio; WMSD/RSI, Work-related musculoskeletal disorder/repetitive strain injury.

† Crude Analysis OR were calculated using multivariate multinomial logistic analysis.

‡ The adjusted OR were calculated using multivariate multinomial logistic analysis. The estimates considered three levels: 1st level: gender, age, skin color, marital status, education, economic class; 2nd Level: smoker, alcohol use, sleep, physical activity; 3rd level: body mass index, falls, WMSD, arthritis. P-value <0.20 was maintained in the model. The reference groups were the individuals without pain.

The reference groups used for the crude and adjusted analyzes were:: gender (male), age (18 to 39 years old), skin color (white), marital status (single), Schooling (≥ 12), economic class (A-B), smoker (no), Alcohol use (no), sleep (≥ 8 hours), Leisure physical activity (yes), Body mass index (Underweight / normal), falls since last year (no), WMSD / RSI (no) and Arthritis / rheumatism (no).

Interaction of gender with age, marital status, and education was identified. In other words, the association between females and back pain was higher for younger (18-39 years), single, and more educated women. Age group had interacted only with falls, showing that the association in those who suffered falls and back pain was more robust for the 40-59 years' age group (data not shown).

Individuals who reported having chronic back pain were more likely to have depression, to have a perception of poor/very poor health, and poor/very poor sleep quality. The prevalence of these variables did not differ for those who did not have pain, and those who had acute pain (**Figure 1**).
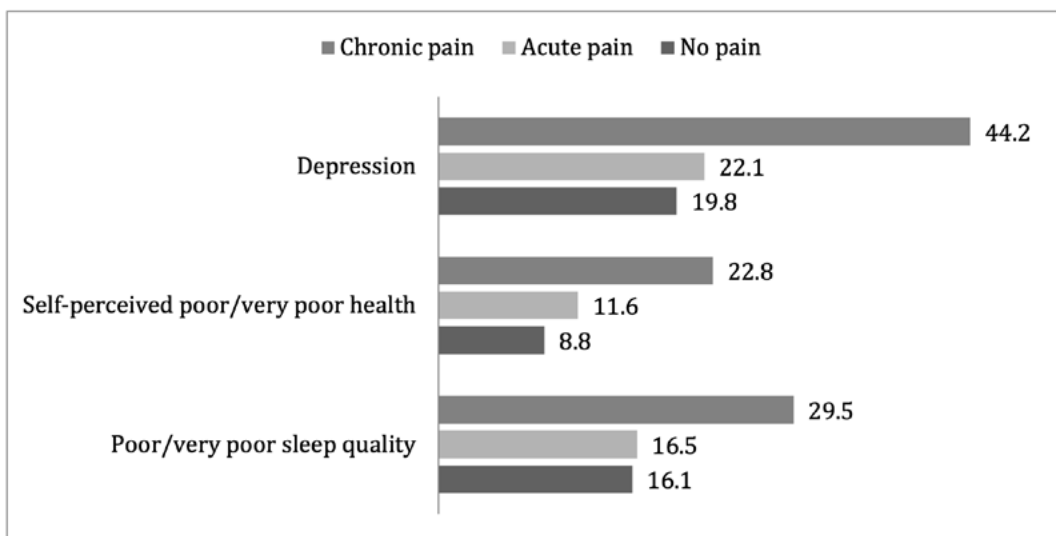

Figure 1 – Prevalence associated with acute and chronic back pain in adults and older adults in the municipality of Criciúma, Santa Catarina, Brazil (n=820).

Approximately 12.0% of those who had acute pain and 29.0% of those with chronic pain missed work because of back pain. About half (47.0%) of individuals with acute pain and 82.1% with chronic pain on the back sought medical care (**Figure 2**).
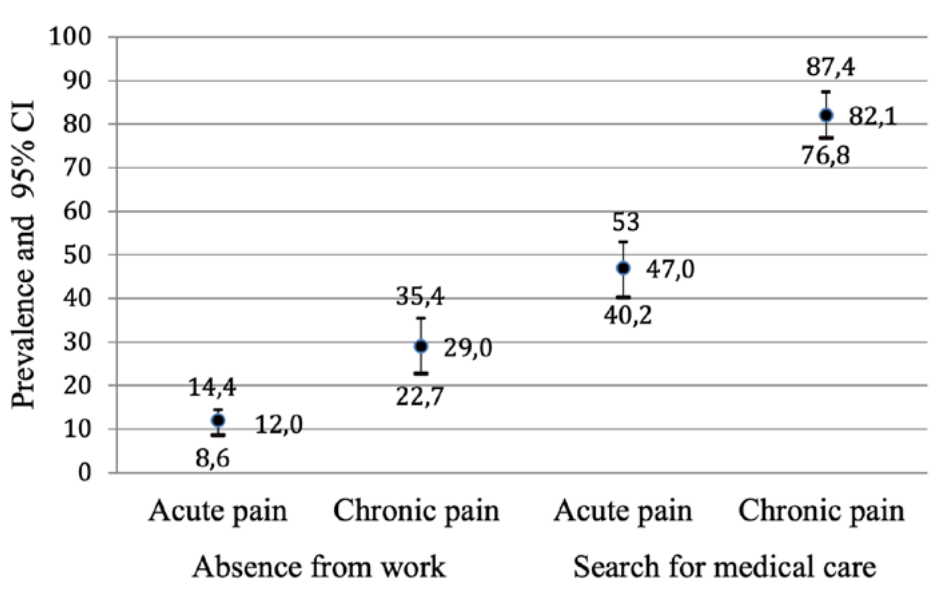

Figure 2 – Prevalence of absence from work and seeking medical care associated with acute and chronic back pain in adults and older adults in the municipality of Criciúma, Santa Catarina, Brazil (n=820).

Discussion

This study carried out the first population-based survey on acute and chronic back pain in the municipality of Criciúma, southern Brazil, and is one of the few carried out in the country with a representative sample of adults and older adults on this topic. We found that 39.3% (95% CI: 35.5%-43.3%) of individuals reported having acute back pain and 27.4% (95% CI: 24.5%-30.4%) chronic back pain. Being female and having WMSD/RSI were factors independently associated with acute and chronic back pain. Also, associations between the two outcomes differed. Overweight and obesity were associated with acute back pain, while leisure physical inactivity, falls in the last year, and suffering from arthritis/rheumatism were associated with chronic back pain.

The prevalence of acute back pain found in this study was close to the study by Ferreira et al. (10), performed in Pelotas (RS), Brazil, (34.1%), and the study by Jonsdottir et al. (7), in Wales (31,5%). The assessment of this condition is vital as it can indicate possible preventive treatments that avoid chronicity. While the prevalence of chronic back pain reported in our study was similar to that verified by Depintor et al. (12), in São Paulo, Brazil (22.0%), and by Martinni et al. (9), in Germany (21.1%), this finding was superior to that reported in the study by Malta et al. (11), which used data from the 2013 National Health Survey, with a representative sample of Brazilian adults, who found a prevalence of 18.5%. However, the referred study did not present temporality for the definition of pain, and chronicity was self-reported.

Studies have consistently shown that women have more back pain than men. (6,7,10) Our results evidenced that women had more acute (40.7%) and chronic (31.2%) pain than men (36.8% and 20.6%, respectively). Acute pain was more frequent in younger, richer, and more educated females, and chronic pain in poorer women over 60 years and with low schooling. Women are influenced by their anatomy and hormonal factors that are different from men (10,11). For example, some hormones such as relaxin, estrogen, and progesterone are produced during pregnancy. They provide higher flexibility of the spinal and hip ligaments, leading to changes because of weight gain and fetus growth (11). Also, ergonomic and occupational factors can cause back pain and chronicity due to the load and working conditions (11).

It is well established in the literature that physical inactivity can harm musculoskeletal health (11). In our study, we observed that 69.5% of the individuals who reported having some back pain were physically inactive, and they were 60% more likely to have chronic back pain than those who reported not having pain. These findings are consistent with other evidence found in the literature (6,7). A cohort study conducted in Germany, which followed adult individuals for fourteen years, found that physical inactivity for a prolonged period showed a strong association with thoracic and lumbar spine disc degeneration (19).

Overweight and obesity were independently associated with acute back pain. This finding is consistent with the epidemiological research carried out by Jonsdottir and collaborators (7), in Wales. Body weight gain stresses the musculature, favoring the emergence of back pain and other diseases in the spine, which may evolve over time (11). This issue was confirmed by Fransen et al. (20), who found that obesity is a significant predictor of chronicity in individuals who receive compensation for lost workdays due to acute back pain.

Individuals who reported falls in the last year were twice as likely to have chronic back pain than those who did not report having pain. However, we observed some differences between genders; women seem to suffer more falls and tend to have more chronic back pain than men. Also, the older one is, the more chronic back pain is perceived. Fall is a health risk that meets all prevention criteria: high frequency, evidence of avoidability, and a high burden of morbidity (21). In middle-aged adults, this episode may be linked to a higher incidence of disease and medication use, and low levels of physical activity and physiological changes that begin to alter postural stability (21). With age, these factors worsen together with the deleterious effects of aging, favoring a higher incidence of falls (22).

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These issues may explain this study's findings, which showed that approximately half of older individuals who suffered a fall had acute pain, and 60% had chronic back pain, and back pain may be a response to this episode.

Some aspects of morbidities were also analyzed in this study. Those who reported having WMSD/RSI were more likely to have both acute and chronic pain, but chronic pain was twice more likely than no pain. This chronic condition restricts usual activities, which is of concern. These limitations affect the adult population, which is in the economically active age group, reducing the functional capacity at work, and the performance of activities of daily living, overly impairing the quality of life (23).

Arthritis/rheumatism is another chronic inflammatory disease characterized by axial and peripheral joint involvement and shows pain, morning stiffness, functional failure, and can aggravate back pain (24). Our results showed that people with this type of impairment suffer more from chronic back pain, which refers to approximately 49% of this population. Back pain and arthritis/rheumatism can harm the population, either due to lack of work or the costs generated to the public health system (25).

Back pain can lead to work absenteeism, affecting productivity, reaching tens of billions of dollars in lost wages, and reduced work capacity each year (25). Our findings showed that approximately one in eight individuals with acute pain and about one in three with chronic back pain missed work because of such pain. Therefore, interventions that make small improvements in the onset and development of these chronically disabling diseases can result in significant general savings in health cost (25).

Those who reported having chronic back pain had approximately twice the prevalence of depression, perceived their health as poor or very poor and reported poor sleep quality than those who reported not having back pain. It can be inferred that individuals who suffer from chronic back pain are more likely to express their health as poor or very poor, and compromise their sleep quality and be more likely to have depression due to this condition. In the study

by Kopec et al. (26), it was found that worse self-rated health is a predictor for back pain in men. Therefore, it is assumed that those who do not take care of their health are more likely to have health problems, including chronic back pain, because self-rated health is associated with people's real state or health goal. As for sleep, Stubbs et al. (27) also found an association between back pain and sleep disorders. However, these authors hypothesized that there was a bidirectional relationship between these variables. Concerning depression, the study by Currie e Wang (28), evidenced that the highest level of depression increased linearly with the higher severity of back pain and that this association was a predictor for more significant disability. Pain symptoms involve a complex interaction of physical, emotional, cognitive, and behavioral components. The ability to deal with pain depends on emotional and psychological factors, and depression can affect the coping mechanism, leading to a higher perception or experience of painr (29). It is essential to mention that acute back pain was not associated with these outcomes.

The limitations of this study must be considered. Some variables may have been affected by the reverse causality bias. For example, individuals who experience back pain may have difficulty performing physical exercises and become insufficiently active or physically inactive. Recall bias may also be the case, especially for acute pain, because individuals do not remember a short episode of back pain, which may have underestimated acute pain prevalence. Also, information about the intensity or duration of the pain was not evaluated, and there was no clinical examination to prove whether individuals had any acute or chronic back pain problems.

In conclusion, this study's outcomes showed that two out of five individuals experienced acute pain, and approximately one out of four chronic back pain. Females and WMSD/RSI carriers were more likely to have both acute and chronic pain. Acute pain was higher among those who reported being overweight and obese, while chronic pain was identified in the physically inactive and people

with arthritis/rheumatism. It is also important to mention that chronic pain can affect the quality of life (more significant depression and worse sleep quality and health perception) and that back pain, especially the chronic condition, contributed to work absenteeism and demand for health services.

Therefore, it was observed that back pain seems to affect individuals differently (physically, socially, and psychologically), and the chronic condition is the most limiting, which can harm the quality of life, generating an adverse social and economic impact on the individual and society. Longitudinal cohort studies should be carried out to identify the progression from acute to chronic factors, and experimental studies should propose different interventions aimed at reducing the occurrence of back pain.

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Conflicts of interest disclosure

The authors declare no competing interests relevant to the content of this study.

Authors' contributions

All the authors declare to have made substantial contributions to the conception, or design, or acquisition, or analysis, or interpretation of data; and drafting the work or revising it critically for important intellectual content; and to approve the version to be published.

Availability of data and responsibility for the results

All the authors declare to have had full access to the available data and they assume full responsibility for the integrity of these results.

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