

Prevalence and associated factors of back pain in adults from southern Brazil: a population-based study

Prevalência de dor nas costas e fatores associados em adultos do Sul do Brasil: estudo de base populacional

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Abstract

Objectives: To identify the prevalence of spinal pain and possible prognostic factors in a representative sample of Pelotas, RS, Brazil.

Methods: Cross-sectional study evaluated 972 adults aged between 20 and 69 years, of both sexes, residents in a urban area. The questionnaire included socio-economic, demographics, behavioral and health-related questions. Spinal pain was defined as any pain or discomfort in the spine somewhere in the last 12 months, either in the cervical, thoracic or lumbar area. **Results:** The prevalence of spinal pain was 63.1% (95% CI 60.0 to 66.1) being lower back the most prevalent condition (40%). Female gender 1.24 (1.12 to 1.37) and poor health status ($p < 0.001$) were the variables that remained associated with the presence of spinal pain in the final model.

Conclusions: The prevalence of back pain is important as it is associated with activity limitation and with health care utilization.

Key words: Epidemiology; spine; low back pain; neck pain; back pain.

Resumo

Objetivos: Determinar a prevalência de dor nas costas e fatores associados em uma amostra representativa da cidade de Pelotas, RS, Brasil. **Métodos:** Estudo transversal que avaliou 972 adultos com idade entre 20 e 69 anos, de ambos os sexos, moradores da zona urbana do município. O questionário aplicado incluiu questões socioeconômicas, demográficas, comportamentais e de saúde. Dor nas costas foi definida como qualquer dor ou desconforto em algum local das costas nos últimos 12 meses, seja na região cervical, torácica ou lombar. **Resultados:** A prevalência de dor nas costas foi de 63,1% (IC_{95%} 60,0 a 66,1), sendo a região lombar a mais referenciada (40%). Sexo feminino 1,24 (1,12 a 1,37) e percepção ruim de saúde ($p < 0,001$) foram as variáveis que permaneceram associadas à presença de dor nas costas no modelo final. **Conclusões:** A prevalência de dor nas costas encontrada é importante e causa limitação e aumento na procura por serviços de saúde.

Palavras-chave: epidemiologia; coluna vertebral; dor lombar; dor cervical.

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Introduction

Back pain is a common health disorder that follows humans since the beginning of time; its prevalence is high and it affects the population indistinguishably. It is estimated that 70% to 85% of population will suffer from lower back pain in a given point in time^{1,2}. Body changes that happens with age as well as the occurrence of chronic diseases lead to the degeneration of important stability components of the spine, modifying the anatomy and physiology of the spine which may lead, to various morbidities, including spinal pain^{2,3}. Spinal pain is caused by inflammatory, degenerative diseases, tumours, congenital diseases, muscle weakness, rheumatic diseases predisposition, and signals of degeneration from the spine or intervertebral discs etc⁴. However, often, spinal pain does not come from specific diseases, but from a series of causes, such as socio-demographic factors (age, sex, income and education status), behaviors (smoking and low physical activity status), exposure during daily activities (strenuous physical work, vibration, vicious postures, repetitive movements) and others (obesity, psychological morbidities)^{5,6}.

The amount of time and resources spent with spinal pain patients is tremendous⁷, and the search for treatment increases each day. The request in hospitals and outpatient settings increases the costs with health care. The costs of such requests are additional charges for the public and private sectors, since government, industries and society must bear these expenses⁸.

Various epidemiological studies have described the theme of low back pain^{1,6-10}, but few refer to the pain in the upper dorsal region of the body, including thoracic¹¹ and cervical¹² areas. In addition, a great number of the articles are related to specific population groups, such as workers¹³⁻¹⁵. In Brazil, although there is a few population based studies about this topic^{11,16}, they are of difficult to generate comparisons due to different definition of the outcomes chosen¹⁷.

Therefore, this study aims to identify the prevalence of back pain in a population base sample of adults, living in the city of Pelotas, Brazil, and to verify the possible associations among demographic, socio-economic, behavioral, health variables and spinal pain.

Methods

This is a cross-sectional design study regarding certain aspects related to health in an urban area of the city of Pelotas, Brazil. Pelotas is a city with nearly 323000 people and is located in the South of Brazil. The sampling was developed in multiple stages. To define the clusters, it was used the division of the

grid of the census sectors of the city, according to the 2002 Brazilian demographic census from IBGE (Instituto Brasileiro de Geografia e Estatística/Brazilian Institute of Geography and Statistics). Forty census sectors were randomly selected, and 15 houses were visited in each of sectors. All subjects aging between 20-69 years-old who lived in the selected houses were interviewed. Institutionalized subjects (nursing homes, hospital, prisons etc.) and those without mental conditions to answer the questions were excluded from the study.

Sample size calculations were performed to establish the prevalence of spinal pain as well as for the identification of possible association between independent variables and presence of spinal pain. The largest sampling estimation (n=896) was found to detect the prevalence of spinal pain, and its calculation considered a confidence level of 95%, frequency expected of the outcome of 70% and an acceptable error of three percent.

The interviews were administered by 20 interviewers, who had, at least, 18 years-old and have completed the high school certificate. All of them performed a 40 hours training that included the aspects related to the interview technique, home approach and training related to the questions of interest from the research instrument. A pilot study was developed to verify the comprehension of the questions and to train the interviewers. The field work was supervised by the researchers involved in the study, being each supervisor responsible for accompanying two interviewers.

The demographic characteristics (age, gender, color of the skin), socio-economic (economic and marital status), behaviors (smoking status and physical activity levels), nutritional (body mass index (BMI) measured by the self-reported weight and height) and self-perceived health were evaluated through a coded questionnaire, with closed questions. The variable color of skin was observed by the interviewers and the economic status, identified by the Brazilian Criteria for Economic Classification (ABEP)¹⁸. The level of physical activity was assessed through the International Physical Activity Questionnaire (IPAQ)¹⁹. A cutoff point of 150 minutes by week was used to classify the subjects as active (150 min/week or more) or insufficiently active (below 150 min/week). The nutritional status was determined by the BMI, calculated through the self-reported weight and height, and the variable smoking status was categorized as "never smoked", "have already smoked" and "current smoker" (one or more cigarettes/day for more than a month). The question used to define the outcome spinal pain was: "In the last year, have you had any pain or discomfort in the spine somewhere?" In case of a positive answer, the subject should indicate the site in a human picture which differentiated colors, the anatomic sites of cervical, thoracic and lumbosacral²⁰. It was also verified the presence of chronic pain (the

presence of pain for seven weeks or more)²¹ and acute (pain in the last week) in the subjects whom reported positivity for pain in the last 12 months. For the subjects with pain in any site, it was questioned the indication and use of physical therapy services.

The control of quality was made through new visits to 25% of the sample. All the questionnaires, after reviewed and coded, were double-entered in the software EPI-INFO, version 6.04, with automatic checking for the amplitude and consistency, and the analysis were conducted in STATA version 10.0.

A descriptive analysis was performed to characterize the sample and, posteriorly, bivariate and multivariable analyses for the test of the initial hypothesis of the study were also calculated. For all the tests, it was adopted a level of significance of 5%.

In the descriptive analysis, the prevalence of all the variables included in the study was calculated, with their respective 95% confidence intervals. In the raw analysis, there were verified the prevalence of spinal pain in relation to the groups of the independent variables, with the respective relative risks, 95% confidence intervals and p values. The multivariable analysis was performed through Poisson regression²², with a robust variance, respecting a hierarchical model of relations between the variables²³ (Figure 1). The linear effect was considered using the STATA *svy* command.

The project was approved by the Ethics Committee of Research of the School of Physical Education from the Universidade Federal de Pelotas (UFPel), Pelotas, RS, Brazil, under the protocol number 005-2008, and the data were collected after an informed consent was obtained from the subjects. The confidentiality of the information and the right to refuse to participate were completely granted.

Results

From 600 homes selected, there were found 972 subjects from 20 to 69 years-old that were eligible for the study. Approximately 36% of the subjects from the sample aged ranging from 35 to 49 years, with a mean of 41 years (SD=13.4 years). More than half of the interviewed subjects (57%) were female, 82.4% were caucasian and 41.5% pertained to the C socioeconomic level. In relation to marital status, nearly 63% of the subjects were married or lived with a partner. Almost half of the sample had never smoked, 93.7% were insufficiently active in leisure time, and 48% perceived their health status as good (Table 1).

A total of 63.1% (95%CI 59.9 to 66.1) of subjects reported the presence of back pain at least once in the 12 months previous to the interview. Low back pain was the most prevalent (40%; 95%CI 36.9 a 43,2), followed by thoracic and cervical pain (Figure 2).

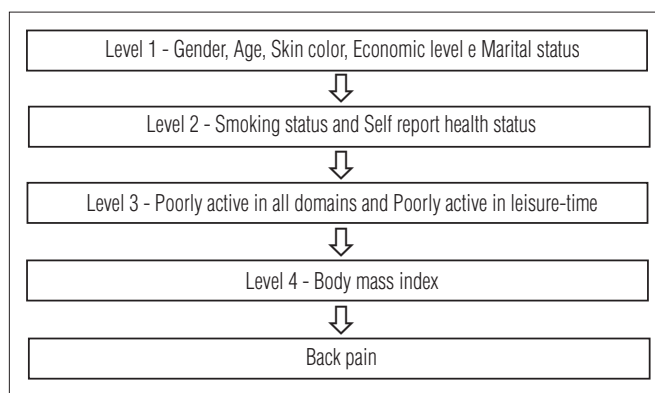


Figure 1. Statistic modeling for spinal pain prevalence.

Table 1. Frequency and prevalence of spinal pain, Pelotas, RS, Brazil, (n=972).

Variables	Sample	Prevalence (%)
Gender	971	
Mele		43.0
Female		57.0
Age	972	
20 to 34 years old		35.7
35 to 49 years old		35.9
50 to 69 years old		28.4
Skin color	969	
White		82.4
Black		12.0
Mixed		5.6
Economic status	952	
A		8.8
B		31.3
C		41.5
D/E		18.4
Marital status	971	
Married or live with a partner		63.2
Single		23.6
Divorced		7.6
Widow		5.6
Smoking status	970	
Never		49.5
Current		28.5
Former		22.0
Self report health status	966	
Excellent		9.8
Very good		15.9
Good		47.7
Average		23.4
Poor		3.2
Poorly active in all domains	930	
No		6.3
Yes		93.7
Poorly active in leisure-time	972	
No		31.6
Yes		68.4
Body mass index (BMI)*	893	
Normal		48.7
Overweight		36.3
Obese		15.0

* Variable with higher level of missing data.

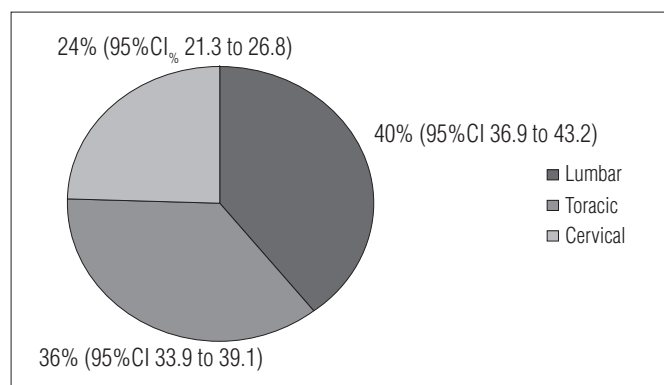


Figure 2. Spinal pain prevalence according to spine region among people reporting at least one episode in the previous twelve months, Pelotas, RS, Brazil, (n=972).

The prevalence of chronic pain (for at least seven consecutive weeks) was of 18.9%, while the prevalence of acute pain (any event in the week previous to the interview) was of 34.1%.

Among the subjects with spinal pain in the 12 months prior to the interview (N=613), 39.1% reported that the problem prevented them to perform their activities of daily living any time during the period, and 22% were advised to have physical therapy as treatment. Among those, 74.5% actually received the treatment.

In the raw analysis, spinal pain was associated to the female gender, with a health perception from regular to poor and with the fact to be insufficiently active during leisure time. In the adjusted analysis, the female gender had shown a chance 1,24 higher of risk to suffer from back pain than from male, and as the health perception worsened, there was a higher risk for pain. The variable insufficiently active during leisure time lost its significance after the adjustment for the further variables (Table 2).

Discussion

One aspect to be highlighted in this study is that the sample is considered representative of adults from 20 to 69 years of age, living in Pelotas, Brazil, with a high percentage of subjects interviewed and low level withdrawals from the study (9.3%). Some limitations also need to be considered. Difficult of comparisons with other studies due to variations in the sampling process and in the diverse cutoff points for the establishment of pain are two of these factors. In addition, it shall be considered the possibility of recall bias, since the recall length was of 12 months from the moment of the interview.

Of the interviewed subjects, 63.1% reported spinal pain for at least once in this period of 12 months. Although the present prevalence agreement with those described in the literature²⁴⁻²⁶, which varied from 41.1% to 90.1%, the comparison between the data should be considered cautiously since

the studies cited were developed with workers, who do not represent general population.

Low back pain was the most frequent (40.0%; 95%CI 36.9 to 43.2) of those who referred pain. This prevalence is considered high and similar to those found in other studies²⁷⁻³⁰. A review study from the period of 1966 to 1988 describes the one-year prevalence of low back pain, ranging from 22% to 65%³¹. A recent research developed in the South of Brazil presented an one year prevalence of low back pain of 52.8%³⁰, which is higher than the estimates observed in the present study. A study conducted in Germany, with workers, found an one-year prevalence of 60% of low back pain²⁹. The disability associated with pain and the limitation to perform domestic, professional and leisure activities, make this morbidity an important concern.

In relation to the association between the outcomes with the independent variables investigated in the present study, the gender and the self-perceived health remained associated to the back pain in the final model. Women showed a higher risk of spinal pain than men (RR=1.24; 1.12 to 1.37). Some epidemiological studies attribute this finding to an information bias³², however, it is plausible, since women, more and more, combine the execution of domestic tasks and jobs done out of home, where they are exposed to ergonomic loads, especially the repeatability, vicious positions and high velocity tasks' performance³³. In addition, the female gender presents some anatomic functional characteristics (smaller stature, smaller muscle and bone masses, frail joints and less adapted to strenuous physical efforts as well as having a higher proportion of fat)^{1,34,35} and others related to the nervous system which can collaborate to the emergence and increase of pain intensity^{36,37}. The worst the health perception, the higher was the risk to have spinal pain (p<0.001). Several studies have shown that the worst is people health perception, the higher is the occurrence of morbidities³⁸. However, this association should be cautiously analyzed.

Siqueira, Facchini and Hallal³⁵ showed that spinal pain is responsible for one of the highest demands for health services and physical therapy outpatient settings. In spite of the clear indication for physical therapy care for this condition, in only 22.5% of the cases, a health professional recommended this approach, and from these patients only 74.5% received the treatment from a physical therapist.

It was concluded that the results obtained for the prevalence of spinal pain for the adult population of Pelotas is high, which can lead to high demand and costs for the care of these subjects.

It is important to highlight that primary care services must be prepared to diagnose and treat the problem, as well as identifying its causes and to establish strategies for its prevention.

Table 2. Prevalence and raw and adjusted association between independent variables and back pain, Pelotas, RS, Brazil, (n=972).

Variables (level)	Prevalence	Raw analysis		Adjusted analysis	
		RR (95%CI)	P	RR (95%CI)	P
Gender (1)			<0.001		<0.001
Male	55.6%	1		1	
Female	68.6%	1.23 (1.12 to 1.37)		1.24 (1.12 to 1.37)	
Age (1)			0.092 ^T		0.08 ^T
20 to 34 years old	64.7%	1		1	
35 to 49 years old	65.7%	1.02 (0.91 to 1.13)		1.00 (0.91 to 1.12)	
50 to 69 years old	57.7%	0.89 (0.78 to 1.01)		0.89 (0.78 to 1.01)	
Skin color (1)			0.34		0.29
White	63.5%	1		1	
Black	68.1%	1.07 (0.94 to 1.23)		1.04 (0.91 to 1.20)	
Mixed	50.9%	0.80 (0.61 to 1.04)		0.81 (0.62 to 1.05)	
Economic status (1)			0.31 ^T		0.81 ^T
A	56.6%	1		1	
B	62.7%	1.11 (0.90 to 1.36)		1.11 (0.90 to 1.37)	
C	65.8%	1.16 (0.95 to 1.42)		1.14 (0.93 to 1.40)	
D / E	59.3%	1.05 (0.84 to 1.31)		1.04 (0.83 to 1.32)	
Marital status (1)			0.69		0.86
Married or live with a partner	64.0%	1		1	
Single	57.0%	0.89 (0.78 to 1.01)		0.84 (0.73-0.95)	
Divorced	71.6%	1.12 (0.96 to 1.31)		1.10 (0.94-1.28)	
Widow	67.3%	1.05 (0.86 to 1.28)		1.05 (0.85-1.30)	
Smoking status (2)			0.94		0.52
Never	61.6%	1		1	
Current	68.2%	1.11 (0.99 to 1.23)		1.11 (0.99 to 1.23)	
Former	59.4%	0.96 (0.85 to 1.10)		1.01 (0.89 to 1.16)	
Self report health status (2)			<0.001 ^T		<0.001 ^T
Excellent	53.7%	1		1	
Very good	54.3%	1.01 (0.80 to 1.28)		1.02 (0.81 to 1.29)	
Good	59.5%	1.11 (0.91 to 1.36)		1.12 (0.92 to 1.38)	
Average	77.2%	1.44 (1.18 to 1.76)		1.47 (1.20 to 1.79)	
Poor	86.2%	1.61 (1.27 to 2.03)		1.62 (1.28 to 2.05)	
Poorly active in all domains (3)			0.51		0.61
No	63.5%	1		1	
Yes	58.9%	1.08 (0.86 to 1.35)		1.06 (0.84 to 1.34)	
Poorly active in leisure-time (3)			0.05		0.47
No	58.7%	1		1	
Yes	65.2%	1.11 (0.50 to 1.16)		0.96 (0.86 to 1.07)	
Body mass index (BMI) (4)			0.34 ^T		0.85 ^T
Normal	63.7%	1		1	
Over weight	59.9%	0.94 (0.84 to 1.05)		0.97 (0.87 to 1.09)	
Obese	66.7%	1.05 (0.91 to 1.20)		1.03 (0.90 to 1.19)	

^T –Wald test for linear trend.

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