

Prevalence of low back pain and associated factors among physiotherapy students

Prevalência e fatores associados a dor lombar em estudantes de fisioterapia

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ABSTRACT

BACKGROUND AND OBJECTIVES: Precise estimates about the prevalence of low back pain in college students, especially in physiotherapy students, are necessary to evaluate their development landscape, producing global health indicators for the investigated group and preventing habits that can accelerate the generation of the pain incapacitation process. Therefore, this study aimed to analyze the factors associated with low back pain in physiotherapy students.

METHODS: A total of 410 undergraduate students were surveyed, answering questionnaires relating to socio-demographic data, health aspects, lifestyle and the Nordic Questionnaire for Musculoskeletal Symptoms to determine the presence of low back pain.

RESULTS: The prevalence of low back pain reported in the last year was 56.3% (95% CI: 51.5-61.2) and was associated with social class A and B, having an occupation, visited the doctor in the last 12 months, self-report of low back pain and to the year in course.

CONCLUSION: There was a high prevalence of low back pain in university students, so it is suggested that some measures are incorporated to understand the magnitude of the effects caused by this pain, and consequently find the best preventive and intervention strategies.

Keywords: Low back pain, Musculoskeletal pain, Prevalence, Risk factors, Students.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Estimativas precisas de prevalência de dor lombar em universitários, especialmente em estudantes de fisioterapia, são necessárias para avaliar o seu panorama de desenvolvimento, produzindo indicadores globais de saúde para o grupo investigado e prevenindo hábitos que possam acelerar a geração do processo de incapacitação pela dor. Portanto, este estudo teve como objetivo analisar os fatores associados à dor lombar em estudantes de fisioterapia.

MÉTODOS: Foram pesquisados 410 universitários, sendo aplicados questionários referentes a dados sociodemográficos, aspectos de saúde, estilo de vida e o Questionário Nórdico para Sintomas Osteomuscular para determinar a presença de dor lombar.

RESULTADOS: A prevalência de dor lombar relatada no último ano foi de 56,3% (IC95%: 51,5-61,2) e associou-se estatisticamente com classe social A e B, possuir ocupação, visitar o médico nos últimos 12 meses, autorrelato de dor lombar e ao ano do curso.

CONCLUSÃO: Houve alta prevalência de dor lombar nos universitários. Assim, sugere-se que sejam tomadas algumas medidas com intuito de compreender a dimensão dos efeitos que essa dor provoca, e consequentemente encontrar meios para melhores estratégias preventivas e de intervenção.

Descritores: Dor lombar, Dor musculoesquelética, Estudantes, Fatores de risco, Prevalência.

INTRODUCTION

Low back pain (LBP) is characterized as a referred pain below the margin of the last ribs and above the inferior gluteal lines, with or without pain in the lower limbs^{1,2} and only 10% of back pain are related to a specific cause of a particular disease³.

LBP is one of the most widespread public health problems faced by the industrialized world. It is a heavy burden for the national health systems and social security regarding diagnosis, treatment, absenteeism and premature retirement^{4,5}. Further, the psychosocial impact caused by the premature cocooning of active people under other aspects, from their everyday activities⁶.

Meucci, Fassa and Faria⁷, and Nascimento and Costa⁸ demonstrated that the prevalence of back pain in young adults ranges from 13.0 to 30%, and it is estimated that this condition can reach up to 65% of the general population, annually, and up to 84% of the people in some moment of their life. Furtado et al.⁵ reported a prevalence of 29.3% LBP in college students aged from 18 to 29 years.

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Despite these numbers, a specific diagnosis on the possible causes of the LBP is not determined in 90 and 95% of the cases since the LBP has a multifactorial character. However, some authors relate the presence of LBP to a set of causes, such as sociodemographic factors, health status, lifestyle and occupational factors^{5,9-11}.

Considering the presence of LBP as a cause that limits the physical, emotional and cognitive skills of an individual, especially college students¹², it is necessary to study the precise estimates of prevalence university students, especially in students of physical therapy, to assess the development situation of the LBP, to produce global health indicators for the investigated group, and to prevent habits that can speed up the disabling process of pain.

The objective of this study was to analyze the factors associated with the LBP in university students.

METHODS

This is an exploratory, descriptive, cross-sectional field research. The sampling was of the simple random probabilistic type, considering a total of 445 students enrolled in the surveyed period. The calculation of the sample was estimated assuming a prevalence of 45.2%¹³, maximum error of 5% to a significance interval of 95% and using a correction factor of 1.5 for the outcome of the design. The sample was increased in 30% assuming the non-response rate and to control confusion factors, resulting in a total of 400 college students.

The inclusion criteria of this research were to be a physiotherapy student, of both genders, aged between 18 and 44 years who agreed to participate in the study and signed the Free and Informed Consent Form (FICT).

The exclusion criteria were pregnant women, students with musculoskeletal pain or lesions due to recent infectious, onco-hematological, genetic and traumatic diseases, and those who did not agree to participate in the study. Data collection was from May to June 2017.

The Nordic Musculoskeletal Questionnaire (NMQ)¹⁴, validated and adapted to the Portuguese language¹⁵ was used to assess the LBP and the outcome. For the study, LBP was defined as pain or discomfort in the last 12 months, not related to trauma or menstrual pain, with a minimum duration of one day, associated or not with irradiation to one or both lower limbs^{6,11}.

Other independent variables were also investigated in the following.

- Sociodemographic and economic variables: gender, age, marital status, race/color, religion, family income, social class (ABEP - Brazilian Association of Research Companies - 2016 - www.abep.org), place of residence, number of people living in the domicile, with/without children, occupation, school, course and year of the course;
- Lifestyle: the practice of physical activity, alcohol consumption, illicit drug use, nutritional status;
- Self-reported health aspects: healthcare plan, visit the doctor in the last 12 months, morbidities, sleep satisfaction, health and stress self-perception.

The research project was approved by the Research Ethics Committee of the School of Science and Technology

of Maranhão (FACEMA) with register number at CAAE 61597016.0.0000.8007 and opinion number 1.947.138. The study followed the resolution No. 466/12 of the National Health Council and Declaration of Helsinki of the World Medical Association.

Statistical analysis

The data were organized and tabulated using the SPSS version 18.0 for Windows (SPSS Inc., Chicago, IL 60606, USA).

The descriptive statistical procedures were applied in the univariate analysis. Pearson's χ^2 Chi-square test was applied in the bivariate analysis.

The Poisson regression was used for the multivariate analysis with a robust variance of standard errors¹⁶ with all covariates of interest that presented $p < 0.20$ in the bivariate analysis.

Three multivariate models were created, adopting a hierarchic entry¹⁷ of variables, in which the significant correlations (LBP and independent variables) were adjusted by confusion factors. The first entry, sociodemographic, economic and occupational variables (gender, social class, and occupation). The second entry, model adjusted by sociodemographic, economic, occupational and lifestyle variables (physical activity). The third entry, model adjusted by sociodemographic, economic, occupational, lifestyle and year of the course variables.

The gross and adjusted prevalence ratios were calculated with their respective confidence intervals of 95% (CI95%), and significance obtained by the Wald test.

A significance level of 5% was used in all the analyses.

RESULTS

The final number of students surveyed was 410. The prevalence of LBP in the last year was 56.3% (CI95%:51.5-61.2); and in the last week, 27.1% (CI95%:22.8-31.4). The LBP that led to an appointment with a professional was 8.0% (CI95%:5.4-10.7), while 14.9% (CI95%:11.4-18.3) of the respondents were not able to perform their normal activities in the last year because of the pain.

Of the total number of interviewees, 72.9% were female, 43.2% were in the 21-24 years age group, with an average age of 22.8 ± 5.0 years, 81.2% were single/divorced, and 51.2% were attending the 3rd and 4th school year (Table 1).

Table 2 shows the data related to lifestyle and health aspects.

Regarding LBP, the following variables were associated with their occurrence in the bivariate analysis: social class ($p=0.017$), course year ($p=0.011$), practice of physical activity ($p=0.022$) visited the doctor in the last 12 months ($p<0.001$) and self-reported LBP ($p<0.001$) (Tables 1 and 2).

In the multivariate analysis, through the Poisson regression (Table 3), it was observed an increase in the prevalence of LBP in students of classes A and B ($PR_{aj}=1.25$), who went to the doctor in the past 12 months ($PR_{aj}=1.40$), self-reported LBP as infrequent ($PR_{aj}=2.29$), frequently ($PR_{aj}=2.80$) and always ($PR_{aj}=3.13$), and on those who were in the third year ($PR_{aj}=1.52$), fourth year ($PR_{aj}=1.52$) and fifth year ($PR_{aj}=1.66$) of the course.

Table 1. Prevalence of low back pain in the last 12 months according to the socioeconomic and demographic characteristics of the students participating in the study. Caxias-MA, 2017

Variables	Total		Low back pain (%)	PR	CI95%	p value*
	n	%				
Gender						0.214
Male	111	27.1	51.4	1.0		
Female	299	72.9	58.2	1.13	0.92-1.39	
Age group (years)						0.658
17-20	139	33.9	53.2	1.0		
21-24	177	43.2	58.2	1.06	0.89-1.26	
25 or +	94	22.9	57.4	1.03	0.84-1.25	
Marital status						0.680
Single/divorced	333	81.2	55.9	1.0		
Married/domestic partnership	77	18.8	58.4	1.05	0.85-1.29	
Race/color						0.442
White	76	18.5	50.0	1.0		
Black	74	18.0	59.5	1.07	0.87-1.32	
Brown	260	63.4	57.3	1.05	0.88-1.25	
Practice of a religion						0.239
No	105	25.6	51.4	1.0		
Yes	305	74.4	58.0	1.13	0.92-1.39	
Family Income (MW)						0.277
Less than 1	49	12.0	44.9	1.0		
1-2	243	59.3	56.4	1.01	0.84-1.19	
3-5	95	23.2	60.0	1.09	0.90-1.32	
More than 5	23	5.6	65.2	1.17	0.86-1.60	
Social class						0.017
C and D	170	41.5	49.4	1.0		
A and B	240	58.5	61.3	1.24	1.03-1.49	
Place of residence						0.394
Parents or relatives	268	65.4	59.0	1.0		
Rooming house or friends	69	16.8	47.8	0.82	0.63-1.07	
Alone	12	2.9	50.0	0.88	0.50-1.57	
Others	61	14.19	55.7	1.04	0.81-1.32	
Number of residents in the domicile						0.776
Up to 3	196	47.8	55.6	1.0	1.0	
4 or +	214	52.2	57.0	1.03	0.86-1.22	
Has children						
No	338	82.4	55.6	1.0		
Yes	72	17.6	59.7	1.07	0.87-1.33	
Has an occupation						0.113
No	222	54.1	59.9	1.0		
Yes	188	45.9	52.1	0.87	0.73-1.04	
Course year						0.011
1 st	67	16.3	37.3	1.0		
2 nd	67	16.3	55.2	0.98	0.77-1.23	
3 rd	100	24.4	60.0	1.09	0.90-1.31	
4 th	110	26.8	60.0	1.09	0.91-1.31	
5 th	66	16.1	65.2	1.19	0.98-1.46	
Total	410	100.0				

MW = minimum wage (R\$937,00), *Pearson's Chi-square test; PR = prevalence ratio; CI95% = confidence interval of 95%.

Table 2. Lifestyle, use of healthcare services and health conditions of college students participating in the research. Caxias-MA, 2017

	n	Total %*	Low back pain (%)	PR	CI95%	p value*
Practice of physical activity						0.022
Yes	162	39.5	49.4	1.0		
No	248	60.5	60.9	1.23	1.02-1.48	
Alcohol consumption						0.262
No	203	49.5	59.1	1.0		
Yes	207	50.5	53.6	0.91	0.77-1.08	
Smoking						0.798
No	357	87.1	56.6	1.0		
Yes	53	12.9	54.7	0.97	0.74-1.26	
Nutritional status						0.861
Low weight	43	10.5	55.8	0.99	0.75-1.32	
Eutrophic	274	66.8	55.1	1.0		
Overweight	80	19.5	60.0	1.08	0.88-1.33	
Obesity	13	3.2	61.5	1.10	0.71-1.70	
Use of illicit drugs						0.519
No	386	94.1	56.7	1.0		
Yes	24	5.9	50.0	0.88	0.58-1.33	
Healthcare insurance						0.821
No	337	82.2	56.1	1.0		
Yes	73	17.8	57.5	1.03	0.82-1.28	
Went to the doctor in the past 12 months						<0.001
No	102	24.9	41.2	1.0		
Yes	308	75.1	61.4	1.49	1.16-1.91	
Morbidities						0.157
None	339	82.7	54.3	1.0		
1	35	8.5	62.9	1.18	0.92-1.53	
2 or +	36	8.8	69.4	1.26	1.00-1.60	
Satisfaction with the sleep						0.941
Very satisfied	34	8.3	50.0	1.0		
Satisfied	121	29.5	56.2	1.01	0.83-1.20	
Neither satisfied nor dissatisfied	112	27.3	58.0	1.04	0.86-1.26	
Dissatisfied	101	24.6	57.4	1.03	0.84-1.25	
Very dissatisfied	42	10.2	54.8	0.97	0.73-1.29	
Self-perceived health						0.513
Excellent	47	11.5	59.6	1.0		
Very good	64	15.6	59.4	1.06	0.85-1.33	
Good	166	40.5	53.6	0.92	0.77-1.10	
Regular	64	15.6	55.3	0.97	0.81-1.18	
Bad	47	11.5	80.0	1.43	1.04-1.98	
Feel stressed						0.254
Never	13	3.2	53.8	1.0		
Rarely	61	14.9	52.6	0.73	0.54-0.98	
Sometimes	196	47.8	55.6	0.98	0.82-1.16	
Often	75	18.3	62.7	1.14	0.93-1.39	
Always	65	15.9	64.6	1.18	0.96-1.45	
Self-reported low back pain						<0.001
Never	41	10.0	22.0	1.0		
Rarely	65	15.9	40.0	0.67	0.49-0.92	
Infrequently	98	23.9	53.1	0.92	0.75-1.14	
Frequently	125	30.5	69.6	1.38	1.17-1.62	
Always	81	18.9	70.4	1.33	1.12-1.58	

*Pearson's Chi-square test; PR = prevalence ratio; CI95% = confidence interval of 95%.

Table 3. Multivariate analysis using Poisson regression for the independent factors associated with low back pain in the past 12 months

Variables	Model 1 PR (CI95%)	Model 2 PR (CI95%)	Model 3 PR (CI95%)
Gender			
Male	1,0	1,0	1,0
Female	1.13 (0.92-1.38)	0.97 (0.80-1.17)	0.95 (0.79-1.15)
Social class			
C and D	1,0	1,0	1,0
A and B	1.25 (1.05-1.50)	1.26 (1.06-1.50)	1.25 (1.05-1.47)
Has an occupation			
No	1,0	1,0	1,0
Yes	0.86 (0.72-1.02)	0.83 (0.70-0.98)	0.80 (0.67-0.95)
Practice physical activity			
Yes		1,0	1,0
No		1.09 (0.91-1.31)	1.08 (0.90-1.30)
Went to the doctor in the past 12 months			
No		1,0	1,0
Yes		1.42 (1.13-1.80)	1.40 (1.11-1.76)
Morbidities			
None		1,0	1,0
1		1.06 (0.82-1.39)	1.01 (0.78-1.31)
2 or +		1.13 (0.91-1.41)	1.09 (0.87-1.37)
Self-reported low back pain			
Never		1,0	1,0
Rarely		1.77 (0.94-3.32)	1.71 (0.92-3.21)
Infrequently		2.33 (1.28-4.22)	2.29 (1.27-4.12)
Frequently		2.89 (1.61-5.17)	2.80 (1.57-4.99)
Always		3.14 (1.75-5.63)	3.13 (1.75-5.61)
Course year			
1 st			1,0
2 nd			1.35 (0.95-1.91)
3 rd			1.39 (1.02-1.89)
4 th			1.52 (1.11-2.09)
5 th			1.66 (1.20-2.28)

PR = prevalence ratio; CI95% = confidence interval of 95%; Model-1 = model adjusted by socioeconomic variables (gender, social class and occupation); Model-2 = model adjusted by socioeconomic variables, lifestyle and health; Model-3 = model adjusted by socioeconomic variables, lifestyle, health and course year.

Note: Data in bold represent a prevalence ratio and a confidence interval statistically significant by the Wald test.

In the study, the fact that the student had an occupation presented as a protective factor, decreasing by 20% the prevalence of LBP.

DISCUSSION

Since LBP is be defined as a symptom, and not a disease, investigative studies heavily rely on the subject's information and memory. The frequency of the outcomes may present different results depending on the accepted definitions since the data collection varied in different studies^{11,18-21}.

The recent interest in studying the prevalence of LBP in the Brazilian population may be due to the financial cost generated by

this condition, in the last years, to the healthcare system and social security^{20,22}.

In this study, the prevalence of LBP in the last year was 56.3%, showing similarity when compared to other research. In a study conducted by Matos et al.²⁰ the prevalence of reported back pain by the population last year was 71.5%, and the most affected region was the lumbar spine, accounting for a prevalence of 52.8% in the year. In another study conducted by Bejia et al.²³ with workers showed a variation in the annual prevalence equivalent to this latter study (52.1%).

In Andrusaitis, Oliveira and Barros Filho²⁴ study with truck drivers from the state of São Paulo, the observed prevalence was 59%. A study conducted by Falavigna et al.²⁵ with students of physical therapy and medicine course of the University of Caxias do Sul

(Rio Grande do Sul) reached a prevalence of 66.8% annually, showing a slight change compared to those already described.

Cavalcante Filho et al.²⁶ conducted a study with adolescents (ages from 11 to 18 years) of a private school in a city in the State of Piauí where it was observed a high prevalence of LBP (78%). In a study populational study conducted by Noll et al.²⁷ with children and teenagers from 11 to 16 years, it was found a prevalence of back pain in the past three months of 55.7%. Silva et al.²⁸ studied 395 students from all years of the course of medicine of the University of Taubaté and observed a 35.69% prevalence of chronic pain that they defined as persistent lasting for more than 6 months.

In a systematic review carried by Nascimento and Costa⁸ in Brazil, it was evidenced, in the different analyzed studies, an LBP prevalence higher than 50%, disagreeing with the Almeida et al.²⁹ study developed with adults over 20 years of age, residents in the city of Salvador (Bahia), that showed a prevalence of 14.7%. In a study conducted by Fernandes et al.³⁰ with workers of the plastic industry in the city of Salvador (Bahia), the annual prevalence of LBP was 28.9%.

In the bivariate analysis, among the statistically significant elements related to LBP, it was evidenced that the significant variables were the social class, year of the course, the practice of physical activity, visited the doctor in the past 12 months and self-reported LBP. However, the variable practice of physical activity lost its significance in the multivariate analysis.

Also, regarding the risk factors, no statistically significant association was found with the gender variable. However, in a study conducted by Ferreira et al.³¹ they concluded that the females had a greater prevalence since women are increasingly combining household activities with their work outside, becoming more prone to ergonomic loads, mainly repeatability, vicious posture and work at great speed.

Another factor favoring this prevalence is the fact that females have some functional anatomy characteristics (lower stature, lower muscle mass, lower bone mass, more fragile joints and less adapted to physical exertion, greater fat weight) and linked to the modulation of the nervous system, which may contribute to the onset and greater intensity of pain³²⁻³⁵.

A study conducted in Brazil by Malta et al.¹⁸ found a prevalence of chronic back pain of 15.5% (CI95% 14.7-16.4) in men and 21.1% (CI95% 20.2-22.0) in women.

In relation to social class, one can notice that the prevalence of LBP increased 25% in classes A and B when compared to classes C and D, contrary to Almeida et al.²⁹ that identified the social class as a protective factor for low back pain.

The variable occupation was considered a protective factor for LBP, reducing the prevalence by 20%. This result can be justified by the fact that during the execution of their tasks, individuals can be moving, even with a little effort, such as walking from home to work. Consequently, this will force them not to stay at home developing sedentary habits.

Contrary to the study by Andrusaitis, Oliveira and Barros Filho²⁴ in which they report that occupations, where the worker remains seated for a long period of time, would be a factor with a positive association with lower back pain. In their study,

Silva, Fassa and Valle³⁵ also showed that occupations in which individuals spend a lot of time lifting weight or performing repetitive movements increase the probability of developing LBP. In the present study, there was no association between the practice of physical activity and LBP. However, Oliveira, Salgueiro and Alfieri³⁶ state that this type of activity would be a preventive factor since it would strengthen the muscles in general, which contradicts the research conducted by Dijken et al.³⁷ that showed that the association of low back pain with practitioners of physical activity is more common in individuals who have physically demanding jobs.

To Malta et al.¹⁸ the variable practice of physical activity at work, intense or heavy, and also, the heavy physical activity at home, were associated with the prevalence of chronic back pain. Ferreira et al.³¹ even say that heavy physical activity is not considered beneficial to the health, because it causes fatigue, muscle and joint overload, leading to a series of musculoskeletal problems.

Having visited the doctor in last the 12 months increased by 40% the prevalence of LBP. This can be explained by the fact that the individuals who sought medical advice were those who have had some musculoskeletal dysfunction. This may have been the cause for the demand, while those who do not visit a doctor for years may have infrequent reporting.

In this study, the self-reported LBP increased the prevalence of LBP. Fonseca and Serranheira³⁸ stated that the prevalence of musculoskeletal symptoms in different anatomical areas over a period of 12 months is high (84%), reaching mostly the lumbar region (65%). Serranheira, Pereira and Santos³⁹ stated that the self-reported prevalence value for the lumbar region was 55.4%.

The present study showed that moving forward in the course had a direct relationship with the increase in the prevalence of LBP. Since this is a study with college students of the health area, the result may be a consequence of the task overload, which may prevent students from performing physical activities and lead to the adoption of inadequate postures^{27,28}.

Corroborating the study by Dominguez et al.⁴⁰ carried with students and employees of a university center that elaborates the idea that psychological factors such as stress, dissatisfaction, anguish, demotivation and psychological overloads in populations that are in a relentless search for professional improvement in a competitive society, can generate painful processes in the lumbar region⁴¹.

During the academic phase, LBP can directly affect the quality of life of college students, and consequently cause a poorer academic performance, since the year of the course contributes to the onset of problems that affect the lumbar spine²⁶⁻²⁸.

LBP is a cause that affects thousands of individuals. However, the findings considered risk factors for this population point to the need for the implementation of new services that promote health, aiming at complementary measures to minimize this painful picture.

As the present study was conducted only with college students, the result cannot be extrapolated; and due to its cross-sectional character, one cannot infer causality.

CONCLUSION

There was a high prevalence of LBP in the college students surveyed, showing a significant association with the social class, occupation, having visited the doctor in the last 12 months, self-reported LBP and year of the course.

Therefore, it is still necessary to have more information about the prevalence of LBP in order to understand the magnitude of the effects caused by this pain, and consequently find ways to develop a better preventive and intervention strategy.

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