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LOW BACK PAIN IN MEDICAL STUDENTS: PREVALENCE AND RELATED FACTORS

LOMBALGIA EM ESTUDANTES DE MEDICINA: PREVALÊNCIA E FATORES RELACIONADOS

LUMBALGIA EN ESTUDIANTES DE MEDICINA: PREVALENCIA Y FACTORES RELACIONADOS

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ABSTRACT

Objective: To identify the prevalence of low back pain and related factors among graduate medical students, and to measure the level of disability that this pain can cause in these students. Methods: Data were collected virtually, through Google Forms. After signing an Informed Consent Form (ICF), the participants responded to a sociodemographic survey, and those who reported having low back pain responded to the Oswestry Disability Index. The data analysis was conducted in three stages, through the R Core Team 2020 statistic program, open-source and free software. The Chi-square Test and Fisher's Exact Test were used in the second and third stages. Results: The study was composed of 200 participants, of whom 58% reported lumbar pain. Of those with pain, 94% had minimum scores on the disability scale. None of the variables showed a relevant connection, though BMI, sex, and use of Alcohol were notable for achieving p-values of around 0.05 or higher. Conclusion: The prevalence of lumbar pain among the medical students was 58%, and no specific risk factors were identified. Furthermore, 94% of the students who reported lumbar pain had a minimum disability score and 6% a moderate score. None of the participants presented severe or greater disability. ***Level of evidence II; A descriptive cross-sectional study with a quantitative approach.***

Keywords: Low Back Pain; Medical Schools; Medical Students; Pain.

RESUMO

Objetivo: Identificar a prevalência de lombalgia e os fatores associados em acadêmicos de medicina e medir o grau de incapacidade que a dor pode causar nesses estudantes. Métodos: Os dados foram coletados virtualmente, por meio do Google Forms. Depois da assinatura do Termo de Consentimento Livre e Esclarecido (TCLE), os participantes responderam a um questionário sociodemográfico e os que relataram dor lombar também preencheram o Índice de Incapacidade de Oswestry. A análise dos dados foi feita em três etapas, com o programa estatístico R Core Team 2020, software livre e de código aberto. Nas segunda e terceira etapas, foram aplicados o Teste do Qui-Quadrado e o Teste Exato de Fisher. Resultados: O estudo constou de 200 participantes, dos quais 58% relataram dor lombar. Dentre as pessoas com dor, 94% tinham escore de incapacidade em escala mínima. Nenhuma das variáveis apresentou relação significativa, embora IMC, sexo e etilismo tenham demonstrado valor de p próximo de 0,05 ou superior. Conclusões: A prevalência de dor lombar nos estudantes de medicina foi de 58%, e nenhum fator de risco específico foi identificado. Além disso, 94% dos acadêmicos que relataram dor lombar tiveram escore de incapacidade na escala mínima e 6% em escala moderada. Nenhum participante apresentou incapacidade grave ou maior. ***Nível de evidência II; Estudo descritivo transversal com abordagem quantitativa.***

Descritores: *Dor Lombar; Faculdades de Medicina; Estudantes de Medicina; Dor.*

RESUMEN

Objetivo: Identificar la prevalencia de lumbalgia y factores asociados en estudiantes de medicina y medir el grado de discapacidad que el dolor puede causar en estos estudiantes. Métodos: Los datos se recopilaron virtualmente a través de Google Forms. Después de firmar el Formulario de consentimiento informado (FCI), los participantes completaron un cuestionario sociodemográfico y aquellos que informaron dolor lumbar también completaron el Índice de Discapacidad de Oswestry. El análisis de los datos se realizó en tres etapas, con el programa estadístico R Core Team 2020, software libre y de código abierto. En la segunda y tercera etapa se aplicó la Prueba de Chi-Cuadrado y la Prueba Exacta de Fisher. Resultados: El estudio consistió en 200 participantes, de los cuales, el 58% mencionó dolor lumbar. Entre las personas con dolor, el 94% tenía una puntuación de discapacidad en escala mínima. Ninguna de las variables mostró relación significativa, sin embargo se destacan IMC, sexo y consumo de alcohol que presentaron valor de p cercano a 0,05 o superior. Conclusiones: La prevalencia de lumbalgia entre los estudiantes de medicina fue del 58% y no se identificó ningún factor de riesgo específico. Además, el 94% de los estudiantes que informaron dolor lumbar tenían puntuación de discapacidad en una escala mínima y el 6% en una escala moderada. Ningún participante tenía discapacidad grave o mayor. ***Nivel de evidencia II; Estudio descriptivo transversal con abordaje cuantitativo.***

Descriptores: *Dolor de la Región Lumbar; Facultades de Medicina; Estudiantes de Medicina; Dolor.*

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INTRODUCTION

Low back pain is a generic term that refers to pain located below the rib margin and above the gluteal lower lines.[1] In most cases, the anatomopathological source of low back pain cannot be determined, therefore, it is classified as idiopathic. The etiology is usually related to multifactorial and sociodemographic variables (age, sex, income, level of education), behavior (smoking, use of alcohol, poor diet, sedentary lifestyle), day-to-day activities (strenuous daily activities, harmful postures, repetitive movements), obesity, and psychological morbidities, all of which can all play a part in the genesis of the symptoms.[2]

Studies have shown that approximately 60% to 80% of the adult population suffer, or have suffered from a clinically relevant episode of back pain, especially in the lumbar region, varying in duration and intensity.[3] Relevant data call attention to the prevalence of low back pain in 29.3% of college students aged 18 to 29 years old.[4] Medical students have busy lifestyles, juggling their daily and academic activities, with alternating postural biomechanics, which causes pain in various joints.[5]

Considering that low back pain is an important factor in limiting physical and cognitive abilities, especially among college students, and that it is costly for the health services, a study of the prevalence, associated factors, and disability rate produced by low back pain among medical students is important, as this will produce health indicators for this population, enabling the prevention of related factors and reducing the impacts of low back pain.[6]

METHODS

This is a descriptive, cross-sectional study, with a quantitative approach. This paper was approved by the Research Ethics Committee at the institution where it was developed, under protocol 26287319.4.0000.5580.

The study sample comprised 200 students (n) enrolled in one public and four private medical schools in the city of Curitiba. All the medical schools are located in easily accessible regions and close to hospital centers. This study included students of both sexes, aged 18 or over, in their first to sixth years of the medicine, and who agreed to sign an Informed Consent Form (ICF), drawn up in accordance with the recommendations of the National Health Council 196/96 resolution. Pregnant women, those with a surgical procedure to correct lumbar spine problems and those who did not agree to be part of the study, refusing to sign the ICF, were excluded.

The data collection was performed virtually, in the period January to April 2020, through the online platform Google Forms. The study group consisted of 200 participants, who responded to a general survey with questions about: age, height, weight, sex, current year of medical school, extracurricular activities, physical activities, smoking, use of alcohol, main means of transport, most common posture assumed during the day, and the presence or absence of low back pain. The students who reported having low back pain then responded to the Oswestry Disability Index (ODI).

The responses to the questionnaires were organized in Excel sheets, which were generated automatically by the Google Forms platform. The data analysis was performed in three stages, through the R Core Team 2020 statistic program, which is open-source and free. The first stage was the descriptive analysis, to determine the quantities and percentages for the categorical variables and the descriptive measures (minimum, maximum, average and standard deviation) for the continuous variables. For the subsequent stages, the research participants were divided in two groups (those with and those without lumbar pain), as per the proposed methodology. The purpose of the second stage was to evaluate variables such as BMI, sex, practice of physical activities, extracurricular activities, smoking, use of alcohol, main means of transportation and prevalent posture assumed during the day, comparing these variables for the groups with, and without low back pain. In the third stage of analysis, the same variables as those used in the second stage were again analyzed, in relation to the disability scores obtained from the Oswestry Disability Index of the participants with lumbar pain. In the second and the third stages, the Chi-square Test and Fisher's Exact Test were used. Both tests can be used to compare categorical variables, as in cases where $p < 15$, it is understood that the variables concerned have a dependency relation. The selection between the tests was determined by the amount in each cross-table cell. In cases where a cell presented a number of 5 or below, Fisher's Exact Test was used, due to the preference of lower quantities. Otherwise, the Chi-square Test was applied.

RESULTS

This study included 200 participants, aged between 18 and 33, with an average age of 22.15 years and standard deviation of 2.72.

The study involved students from all the years of medical school, with 40 (20%) in the first year, 13 (6.5%) in the second, 41 (20.5%) in the third, 76 (38%) in the fourth, 25 (12.5%) in the fifth and 5 (2.5%) in the sixth year of the medicine course.

The first stage consisted of the descriptive analysis of the data. The prevalence of low back pain in the study population was 58% (116). Of the students with low back pain, 94% (109) presented the minimum disability in the ODI, while 6% (7) presented moderate disability.

Table 1 gives a summary of time with low back pain. It is observed that 54.3% of the study participants had had the pain for over a year. Meanwhile, 15.5% were not able to provide this information.

In the second stage, comparisons were made between the categorical variables and the group with low back pain in the same way as for the group without pain. The statistical tests results are shown in Table 2. None of the variables showed a relevant connection, nevertheless, BMI, Sex and Alcohol stood out for reaching (or even exceeding) a rate of around 0.05. Here, the presence of pain is proportionally predominant in the lowest BMI, as 73.3% of the participants with BMI < 18.5 presented low back pain, around 58% of those with moderate BMI presented pain, and no participants with BMI > 30 presented pain.

It was found that those who consumed alcohol were more likely to report having pain (75.9%) compared to those who did not. The group of females were more likely to present pain (62.4%) than the male group (47.5%), albeit without statistical significance.

In the stage 3, the categorical variables were compared in relation to the disability score. The results are shown in Table 3. Despite the non-statistical difference, this does not necessarily prove equality, as the lack of evidence may be due to the sample size or to the actual absence of difference. In this case, the low number of participants who reported moderate pain prejudices the statistical test, and this may be the reason for the lack of $p < 0.05$.

DISCUSSION

Medical students lead busy lives, having to balance a lot of daily, academic and extracurricular activities which, added to psychosocial factors such as stress, can lead to low back pain.[7] Some studies indicate that low back pain can be an important factor for personal limitation and disability, as well as being a relevant symptom in the public health system.

This study showed a strong prevalence of low back pain among medical students (58%). This result is similar to that obtained in a survey[8] in which 53.4% of 103 medical students sampled presented low back pain, and to that of the paper of, in which 59.5% of students

Table 1. Time with low back pain.

Time with low back pain	Number (%)
Can't tell	18 (15.5)
Less than a month	12 (10.3)
1 to 3 months	8 (6.9)
3 to 6 months	6 (5.2)
6 months to a year.	9 (7.2)
Over a year	63 (54.3)

Table 2. Comparison of those with and without low back pain in relation to the categorical characteristics.

	No	Yes	p-value
BMI			**0.08**
< 18.5	4 (26.7)	11 (73.3)	
18.5 – 24.9	60 (42.3)	82 (57.7)	
25 – 29.9	16 (42.1)	22 (57.)	
> 30	4 (100)	0 (0)	
Sex			**0.072**
Female	53 (37.6)	88 (62.4)	
Male	31 (52.5)	28 (47.5)	
Extracurricular activities			**0.334**
no	14 (34.1)	27 (65.9)	
Yes	70 (44)	89 (56)	
Practice of physical activities			**0.084**
no	18 (31.6)	39 (68.4)	
Yes	66 (46.2)	77 (53.8)	
Smoking			**0.404**
no	83 (42.8)	111 (57.2)	
Yes	1 (16.7)	5 (83.3)	
Use of alcohol			**0.054**
no	77 (45.3)	93 (54.7)	
Yes	7 (24.1)	22 (75.9)	
Main means of transport			
On foot	19 (42.2)	26 (57.8)	
Car	48 (39.3)	74 (60.7)	
Public transportation	17 (51.5)	16 (48.5)	
Prevalent posture			**1**
Standing	7 (43.8)	9 (56.2)	
Sitting	76 (41.5)	107 (58.5)	

Table 3. Comparison of disability scores in relation to the categorical characteristics.

	Minimum	Moderate	p-value
BMI			**0.34**
< 18.5	11 (100)	0 (0)	
18.5 – 24.9	75 (91.5)	7 (8.5)	
25 – 29.9	22 (100)	0 (0)	
> 30	0 (-)	0 (-)	
Sex			**0.675**
Female	83 (94.3)	5 (5.7)	
Male	26 (92.9)	2 (7.1)	
Extracurricular activities			**0.664**
no	25 (92.6)	2 (7.4)	
Yes	84 (94.4)	5 (5.6)	
Practice of physical activities			**1**
no	37 (94.9)	2 (5.1)	
Yes	72 (93.5)	5 (6.5)	
Smoking			**1**
no	104 (93.7)	7 (6.3)	
Yes	5 (100)	0 (0)	
Use of alcohol			**0.617**
no	88 (94.6)	5 (5.4)	
Yes	20 (90.9)	2 (9.1)	
Main means of transport			**0.196**
On foot	26 (100)	0 (0)	
Car	69 (93.2)	5 (6.8)	
Public transportation	14 (87.5)	2 (12.5)	
Prevalent posture			**0.441**
Standing	8 (88.9)	1 (11.1)	
Sitting	101 (94.4)	6 (5.6)	

in the fourth year of the University of Belgrade Faculty of Medicine reported having had low back pain in the last twelve months.[9] A study that evaluated the presence of chronic pain in 395 medicine students of the Universidade de Taubaté indicated low back pain, along with sacrococcygeal pain, as the main cause of chronic pain (23.1%), with the complaint of pain being more significant among the students in the research. Although the literature indicates a high prevalence of low back pain, there have been few studies specifically on medical students, especially in Brazil.[10]

The data obtained in a statistical comparison between the participants with low back pain and some of the categorical variables, such as BMI, sex, extracurricular activities, practice of physical activities, smoking, main means of transport, use of alcohol and prevalent posture assumed during the day showed no significant correlations between them. Nevertheless, p was closer to 0.05, albeit sometimes higher, for the following factors: BMI ($p = 0.08$), sex ($p = 0.072$) and use of alcohol ($p = 0.054$).

Linking the reports of low back pain to the participant's sex, the study presented similar results to the literature, indicating a higher prevalence among females (62.4%).[11] Involving 7 studies in which it was observed that pain is more frequent in women. Some anatomic and functional aspects in females, such as smaller stature, less muscle mass, less bone mass, more fragile joints and greater proportion of fats, may be related to a predisposition to the emergence of lumbar spine pain.[1]

A connection was found between low back pain and lower BMI in the current sample: 73.3% of the participants with low weight presented pain. Similar results were found in a study by Furtado et al.,[4] but this data is not corroborated by most of the literature, which indicates a higher risk of pain in people with obesity. Even without being overweight, the bones, ligamental and discal structure of the lumbar spine can be overwhelmed due to the probable lack of lean body mass. Further studies are needed to relate these two factors.

The current study also found a higher proportion of low back pain in participants who used alcohol (75.0%); however, some studies, like the one lead[12] showed no relationship between BMI and pain. Studies with larger samples are needed to demonstrate this connection.

Even with the significant prevalence of low back pain in the sample population and the chronicity of the case (54.3% of the participants had had the pain for over a year), the functional disability of this study is low: of those who presented pain, 94% had a minimum disability score and, the others, a moderate score. These data corroborate other studies in the literature. In a survey that investigated low back pain in 186 college students through the Oswestry Disability Index (ODI), the authors found that 81.2% of the participants had a minimum disability score, 18.3% moderate disability and only 0.5% severe disability.[13] In terms of the pain evolution, the studies almost always indicate significant chronicity, quoting the paper, in which 87% of the participants had had low back pain for over 12 months.[14]

The risk factors linked to greater disability and chronicity of low back pain are: history of low back pain, low back pain that radiates to the legs, decreased leg lifting range, signs of neurologic deterioration, decreased strength and endurance in the muscles of the trunk region, and physical deconditioning.[15] It is important that students are able to identify these factors and to take investigation and early intervention measures, to reduce damage caused by more chronic and disabling back pain.

The major strength of this study is the assessment of biopsychosocial factors and their contribution to low back pain in medical students. However, despite achieving its objectives, this study has some limitations. First, the sample of undergraduate students were all recruited from colleges in the same city; therefore, generalization of the results of this study to other student populations should be done with caution.

In view of the above, further studies are needed to elucidate the possible risk factors for low back pain among medical students, in order to implement forms of prevention and reduce the incidence, chronicity and impact on the individual's functionality.

CONCLUSION

The prevalence of low back pain among the medical students was 58%. The statistical tests did not indicate related factors in the participants of this study. Furthermore, 94% of the students who reported lumbar pain showed a minimum disability score and 6% a moderate score. None of the participants showed severe or a superior disability.

All authors declare no potential conflict of interest related to this article.

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