

Back pain in adolescents: prevalence and associated factors

Dor nas costas em adolescentes: prevalência e fatores associados

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ABSTRACT

BACKGROUND AND OBJECTIVES: Back pain is one of the most common pain in humans. It impacts the health and quality of life and can be disabling. Diseases detected in adolescence and poorly managed may get worse in adulthood. The objective of this study is to estimate the prevalence, the associated factors and the characteristics of back pain in adolescents living in the city of São Paulo.

METHODS: A cross-sectional population-based study – Health Survey in São Paulo (2015) with 539 adolescents of both genders between 15 and 19 years old was used. The information was collected through home interviews and the participants were selected by probabilistic sampling. Frequencies, Chi-square test, and logistic regression analysis were used in this analysis. The level of significance was 5%.

RESULTS: The estimated prevalence of back pain in adolescents in the city of São Paulo was 22.4%. Back pain in adolescents had the following associated factors: dizziness (OR 3.1), common mental disorder (OR 2.4), insomnia (OR 2.6) and perform household chores (OR 1.8). To relieve the pain, 46.6% of adolescents do nothing, 17.3% use self-medication and 8.9% use prescribed medication.

CONCLUSION: Acknowledging back pain as a public health problem requires strategies that allow us to learn the origins, associated factors and coping strategies that may influence new ways of prioritizing and organizing healthcare.

Keywords: Adolescent, Back pain, Cross-sectional studies, Low back pain, Prevalence.

RESUMO

JUSTIFICATIVA E OBJETIVOS: Dor nas costas é uma das dores mais comuns do ser humano. Afeta a saúde e a qualidade de vida, podendo ser incapacitante. Doenças detectadas na adolescência e mal manejadas podem se agravar na vida adulta. O objetivo deste estudo foi estimar a prevalência, fatores associados e características de dor nas costas em adolescentes da cidade de São Paulo.

MÉTODOS: Estudo transversal de base populacional – Inquérito de Saúde da Capital 2015, com 539 adolescentes de ambos os sexos e entre 15 e 19 anos. As informações foram coletadas por meio de entrevistas domiciliares e os participantes foram selecionados a partir de amostragem probabilística. Frequências, teste do Qui-quadrado e análise de regressão logística foram utilizados na análise. O nível de significância adotado foi 5%.

RESULTADOS: A prevalência estimada de dor nas costas em adolescentes da cidade de São Paulo foi de 22,4%. Dor nas costas em adolescentes apresentou fatores associados com: tontura (OR 3,1), transtorno mental comum (OR 2,4), insônia (OR 2,6) e realizar atividades físicas domésticas (OR 1,8). Na busca por alívio da dor, 46,6% dos adolescentes não fazem nada, 17,3% buscam automedicação e 8,9% usam fármaco prescrito.

CONCLUSÃO: Entender a dor nas costas como um problema de saúde pública obriga a pensar em estratégias que permitam compreender origens, fatores associados e estratégias de enfrentamento que podem influenciar novas formas de priorizar e organizar a atenção à saúde.

Descritores: Adolescente, Dor lombar, Dor nas costas, Estudos transversais, Prevalência.

INTRODUCTION

Back pain is known as a major cause of disability¹ in work and daily activities. Its origin, in part, refers to the use of the human body, which begins in childhood but starts to show its signs of use (or misuse) more intensely in adolescence. There is evidence that earlier intervention in this problem would bring more effective results in adulthood.

There are few studies on back pain, despite being a frequent health problem in the world population. Swain et al.², in a systematic review of adolescents (9 to 17 years old), estimated the worldwide prevalence of back pain at 37%. In local studies in Brazil, the prevalence found of back pain was in adults in the cities of Campinas-SP, 30.6%³ and Pelotas-RS, 63.1%⁴, and in adolescents (10 to 17 years old), in Uru-guaiana-RS, 16.1%⁵.

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“Back pain” is a broad term, used colloquially³. Its importance is based on its high worldwide prevalence, its impact on people’s quality of life, and its potential for disability to work. Given the breadth of the term, several studies prefer to treat only low back pain. In this study, the term “back pain” will be used, considering it as the grouping of the terms neck pain, upper back pain and low back pain.

This study aimed to estimate the prevalence, associated factors, and characteristics related to back pain in adolescents in the city of São Paulo in 2015.

METHODS

The data from the 2015 Health Survey of São Paulo were analyzed, a population-based cross-sectional study, with data collection conducted between September 2014 and December 2015.

The 2015 Health Survey of São Paulo is a study consisting of a sample composed of people aged as of 12 years old, living in permanent private housing units, in the urban area of the city of São Paulo, which is the largest city and makes up the largest and most complex metropolitan region in Brazil. In this study, the stratified probabilistic sampling was used, with a two-stage draw: (1) census sectors; and (2) households^{6,7}.

The prevalence refers to the population of the 2015 Health Survey of São Paulo study, which considered only the population living in urban areas, 9,349,890 inhabitants⁶.

The study domains consisted of: (a) regions and (b) respondents in the 12-19-year old age group, 60 years old or older, and gender and age range of 20-59 years by gender (male and female). For the purpose of statistical inference, each individual in the sample was associated with a sample weight. The final weight was calculated according to three components: (1) design weight, which takes into account the sampling fractions of the two-stage draw; (2) non-response fit; and (3) post-stratification, which adjusts the distribution of the sample by gender, age group and region of residence, according to the population distribution in the municipality and according to the population estimate⁶.

For this study, 539 (98.4%) respondents were selected, a sample composed of adolescents aged between 15 and 19 years, part of the age group of 12-19 years of the 2015 Health Survey of São Paulo. The 12-14-years old adolescents were removed from the sample because the questions related to the Self Report Questionnaire (SRQ), an integral part of 2015 Health Survey of São Paulo, were not applied to children under 15 years old.

The following dependent variable was considered:

1. back pain.

The following independent variables were considered:

2. Sociodemographic variables: gender, age, race/color, and education;

3. Variables related to health and lifestyle conditions: nutritional status⁸; smoking, alcohol use, and physical activity recommended by the World Health Organization (WHO). Physically active are those who have complied with the WHO recommendation to engage in light or moderate physical activity for at least 150 minutes per week or vigorous activity for at least 75 minutes per week⁹.

4. Variables related to chronic diseases and symptoms: all self-reported were considered and tested.

5. Emotional variables, those who answered ‘yes’ to eight or more questions from the 2015 Health Survey of São Paulo Block E, composed of questions from the Self Report Questionnaire 20 (SRQ20), an instrument with 20 questions for Common Mental Disorder (CMD) and can be used in primary care, validated by Gonçalves, Stein and Kapczinski¹⁰.

6. Characteristics of back pain: location, frequency, intensity, and attitudes for pain relief.

For the analysis of surveys based on complex designs, the survey module of the STATA14 program was used, which allowed the incorporation of the different weights.

The analysis was constructed by a logistic regression model to test the isolated association among the dependent variables (back pain) and each independent one, besides analyzing those that entered the final model.

All participants, or their guardians, signed Free Informed Consent Form (FICF) in which the research objectives and the information that would be requested were explained, ensuring the confidentiality of the information obtained. The research protocol was approved by the Ethics Committee of the Department of Epidemiology, School of Public Health, University of São Paulo - Opinion 1.420.473 (2015).

Statistical analysis

The prevalence between categorical variables was quantified by Pearson’s chi-square test (p); those selected for the model were those with $p < 0.20$. In the final model, after selection tests, only variables with $p < 0.05$ remained in the model. Associations among variables were measured by the Odds Ratio (OR). The adjustment of the regression model was evaluated by the Archer and Lemeshow test¹¹.

RESULTS

Of the 554 adolescents (aged 15-19 years) interviewed at the 2015 Health Survey of São Paulo, 539 (98.4%), who responded to all the variables in this study, were identified as the studied population.

Of the 539 adolescents interviewed, 50.5% were male and 49.5% female, so the proportion was quite approximate. The age distribution of this sample showed differences between 17.0 and 22.1%, here also with approximate proportions. All other characterization variables of this population were homogeneous (Table 1).

When studying the population that identified as having problems related to back pain – which in this study includes low back, neck and upper back pain – it was possible to verify significant prevalence differences between females 28.1% (95% CI 22.6 – 34.2) and males 16.8% (95% CI 12.2 – 22.7), meaning that girls have almost twice as much back pain as boys. (Table 2) It was also possible to verify the existence of significant differences between self-perception of health. Those with ‘not good’ self-perception health were found to have a prevalence of 36.4% (95% CI 28.6 – 45.0), while 19.0% (95% CI 14.9 – 23.9) had

Table 1. Demographic profile of adolescents living in São Paulo city in 2015

Demographic characterization	% total (95% CI)	n
Gender		
Male	50.5 (46.3 – 54.7)	269
Female	49.5 (45.3 – 53.7)	270
Age (years)		
15	21.2 (18.1 – 24.6)	116
16	17.0 (13.6 – 21.0)	91
17	21.0 (17.3 – 25.3)	112
18	18.7 (15.4 – 22.6)	104
19	22.1 (18.4 – 26.5)	116
Race/color		
White	44.8 (39.7 – 50.1)	230
Black	14.2 (11.1 – 18.0)	78
Brown	37.0 (32.3 – 41.8)	206
Others	4.0 (2.4 – 6.4)	22
Education		
Complete elementary school II	33.3 (29.4 – 37.3)	180
Complete elementary school I	54.1 (49.3 – 58.8)	287
Incomplete elementary school	12.6 (9.6 – 16.4)	72

CI = Confidence Interval.

Table 2. Adolescents with back pain: prevalence of demographic and lifestyle characterizations of residents in the city of São Paulo, 2015

Variables	% Adolescents with back pain (95% CI)	P-value
Demographic Characterization		
Gender		0,0028
Male	16.8 (12.2 – 22.7)	
Female	28.1 (22.6 – 34.2)	
Age (years)		0.3329
15	25.3 (18.1 – 34.1)	
16	14.1 (8.2 – 23.3)	
17	24.0 (17.2 – 32.4)	
18	24.2 (16.4 – 34.1)	
19	22.8 (15.5 – 32.4)	
Race/color		0.2178
White	19.5 (14.3 – 25.9)	
Black	28.0 (19.0 – 39.2)	
Brown	24.7 (19.1 – 31.2)	
Others	13.3 (4.6 – 32.7)	
Education		0.5989
Complete elementary school II	22.8 (16.4 – 30.8)	
Complete elementary school I	21.0 (15.9 – 27.2)	
Incomplete elementary school I	27.3 (18.4 – 40.3)	
Lifestyle Characterization		
Smoking		0.7368
Do not smoke	22.7 (18.6 – 27.2)	
Currently smokes	17.5 (8.0 – 34.3)	
Alcohol use		0.6195
Do not drink	26.3 (20.5 – 33.1)	
Currently drinks	33.1 (20.0 – 49.4)	

CI = Confidence Interval

self-perception ‘good’ health, as might be expected. What has drawn our attention was precisely 19.0% of adolescents who identified themselves with back pain problems, but with self-perception of ‘good’ health (Table 3).

Regarding the symptoms, diseases and other health problems, adolescents with back pain problems have a higher prevalence of associated factors such as headache 33.3% (95% CI 27.0 – 40.3), anxiety 34.1% (95% CI 21.9 – 49.1), sinusitis 34.7% (95% CI 24.2 – 46.8), insomnia 46.4% (95% CI 36.0 – 57.1), CMD 49.0% (95% CI 38.6 – 59.4) and dizziness 49.9% (95% CI 37.3 – 62.4). It meant that of the total of adolescents interviewed, at least one third reported comorbidities (Table 3).

The estimated prevalence of back pain among adolescents in the city of São Paulo aged 15-19 years old was 22.4% (95% CI 18.4 – 26.9) (Table 4).

The characteristics of back pain for adolescents were related to greater identification with the location of pain in the lower back 42.9% (95% CI 34.5 – 51.8). As for the frequency of pain, it was found that 58.2% reported having back pain at least twice a week (41.0% have pain some days of the week, and 17.2% have every day). Regarding the intensity of the pain felt, 21.8%

Table 3. Adolescents with back pain: prevalence of characterizations lifestyle and self-reported health problems in residents of the city of São Paulo, 2015

Variables	% Adolescents with back pain (95% CI)	P-value
Lifestyle Characterization		
Nutritional status		0.0862
Normal and underweight	20.3 (15.8 – 25.6)	
Overweight	26.0 (17.3 – 37.0)	
Obese	36.1 (21.5 – 53.8)	
Physical activity with leisure and transportation		0.7389
Does not comply with the recommendation	22.8 (18.3 – 28.1)	
Complies with recommendation	21.7 (16.2 – 28.4)	
Physical activity work		0.812
Does not comply with the recommendation	22.5 (18.2 – 27.4)	
Complies with recommendation	21.4 (14.0 – 31.1)	
Physical activity household chore		0.0019*
Does not comply with the recommendation	19.0 (15.1 – 23.7)	
Complies with recommendation	32.9 (24.6 – 42.3)	
Health perception		0.0001*
‘Good’	19.0 (14.9 – 23.9)	
‘Not good’	36.4 (28.6 – 45.0)	
Characterization of health problems		
Reported disease: rhinitis	23.4 (16.7 – 31.8)	0.6200
Reported disease: sinusitis	34.7 (24.2 – 46.8)	0.0107*
Reported disease: anxiety	34.1 (21.9 – 49.1)	0.0374*
Reported problem: headache	33.3 (27.0 – 40.3)	<0.0001*
Insomnia	46.4 (36.0 – 57.1)	<0.0001*
Dizziness	49.9 (37.3 – 62.4)	<0.0001*
Common Metal Disorder	49.0 (38.6 – 59.4)	<0.0001*

CI = Confidence Interval; P-value = Pearson's correlation coefficient;

* Selected variables for the logistic regression model.

reported having severe or unbearable pain, and 62.3% reported that this pain did not prevent them from performing their daily activities. Attitudes toward seeking back pain relief: drug use was reported by 26.5% (8.9% prescription drug and 17.6% self-medication). Other reported non-pharmacological practices were: 11.2% do rest, 9.6% do physical activities, and 46.6% say they do nothing (Table 4).

From the univariate analysis, the following variables were selected: gender (Table 2), nutritional status and physical activities

Table 4. Prevalence and distribution of reported back pain characteristics of adolescents living in São Paulo city, 2015

Prevalence	% (95% CI)
Back pain	22.4 (18.4 – 26.9)
Distribution by location	
Neck	16.7 (11.6 – 23.3)
Upper back	23.2 (16.1 – 20.4)
Low back	42.9 (34.5 – 51.8)
Diffuse (1 or more locations)	17.2 (11.6 – 24.8)
Frequency of back pain	
Less than once a month	14.7 (8.5 – 24.2)
A few times a month	27.2 (20.4 – 35.3)
Some days of the week	41.0 (31.8 – 50.8)
Every day	17.2 (11.7 – 24.4)
Pain intensity	
Weak	38.6 (30.0 – 48.0)
Moderate	39.6 (30.7 – 49.2)
Intense	11.9 (7.6 – 18.2)
Unbearable	9.9 (5.4 – 17.5)
Limits daily activities	
Does not limit	62.3 (51.9 – 71.7)
Little bit	30.6 (21.7 – 41.1)
Very limited	7.2 (3.9 – 12.8)
Attitudes for back pain relief	
Does nothing	46.6 (35.9 – 57.6)
Self-medication	17.6 (11.7 – 25.6)
Prescription drug	8.9 (4.8 – 16.1)
Rest	11.2 (6.6 – 18.4)
Physical activity	9.6 (4.6 – 18.7)
Massage	4.0 (1.8 – 9.0)
Others	2.1 (0.5 – 8.1)

CI = Confidence Interval.

Table 5. Logistic regression analysis for adolescents with back pain living in the city of São Paulo in 2015

Variables	Gross OR	Adjusted OR (95% CI)*	P-value
Dizziness	4.5 (2.5 – 8.1)	3.1 (1.6 – 5.9)	0.001
Common Metal Disorder	4.3 (2.7 – 7.1)	2.4 (1.4 – 4.4)	0.002
Insomnia	3.7 (2.3 – 6.1)	2.6 (1.6 – 4.3)	<0.001
Physical activity at home	2.1 (1.3 – 3.3)	1.8 (1.1 – 2.9)	0.027

* Fit variables; OR = Odds Ratio; CI = Confidence Interval.

related to household chore (Table 3), and characterization of health status: sinusitis, anxiety, headache, insomnia, dizziness and CMD (Table 3).

For the logistic regression model, the independent variables associated with back pain were: dizziness (OR 3.1), CMD (OR 2.4), insomnia (OR 2.6) and doing household chore-related physical activities (OR 1.8) (Table 5).

To check the predictive capacity of the logistic regression model, the Archer and Lemeshow test¹¹ was applied, which indicated a 96.4% chance of an adolescent presenting back pain in the presence of these factors.

DISCUSSION

The study by O'Sullivan et al.¹² recognized that back pain – low back, neck, and upper back pain – in adolescents is multifactorial and may be due to biological, psychological, physical, anatomical, lifestyle, and comorbidities.

Swain et al.², in a study with data from 28 countries, estimated the worldwide prevalence of back pain in adolescents (9 to 17 years old) at 37%, with the lowest prevalence in Poland (27.7%) and the highest prevalence in the Czech Republic (50.5%). In this study, the estimated prevalence of back pain in adolescents (15 to 19 years) in the city of São Paulo, Brazil, is 22.4% (95% CI 18.4 - 26.9), a result below other countries.

The association between CMD and back pain has been found in different studies^{12,13}. This study also identified a significant association between CMD and back pain in adolescents from the city of São Paulo (OR 2.4, 95% CI 1.4 - 4.4). Viana et al.¹⁴ concluded in their study that individuals with CMD are at higher risk of developing back pain, which may mean that the experience of physical and emotional pain in adolescents may not be independent, emphasizing the importance of detecting such associations.

Dizziness as the primary association with back pain in adolescents from the city of São Paulo has not been presented as an associated factor when studying back pain, although it was found in this study. In a survey, Janssens et al.¹⁵ published on American and Dutch adolescents, in which they identified an association between pubertal delay and back pain, excessive tiredness and dizziness. In this study, the association appears simultaneously, but it is not possible to confirm the direct association.

Insomnia is an inability to sleep properly, therefore a symptom of poor sleep quality. Auvinen et al.¹⁶ and Dey, Jorm, and Mackinnon¹⁷ found an association between poor sleep quality and back pain. In these studies, there is a significant association between back pain and insomnia (OR 2.6 - 95% CI 1.6 - 4.3). It is difficult to identify the origin of this association; if back pain leads to poor sleep quality (insomnia), or if insomnia contributes to back pain.

The health problem related to back pain refers in part to the use and disuse of the human body. The association between back pain in adolescents from the city of São Paulo and the performance of domestic physical activity was identified (OR 1.8 - 95% CI 1.1 - 2.9). However, the classification related to the Physical Activity block of 2015 Health Survey of São Paulo presented only results related to compliance or not with WHO recommendations⁹, which became an important limitation of this study, since

such classification does not have a range that allows recognizing the excess of adolescents in relation to the performance of such physical activities.

As the study refers to adolescents, a contemporary factor of common knowledge related to intense physical activity in the household chores, identified with frequent and inappropriate body postures, is the excessive use of new technologies in this age group. Sjolie¹⁸ demonstrated an association between excessive leisure activity and back pain. Noll et al.¹⁹, in a study with adolescents, identified an association between different postures and body uses (computer use, daily time spent watching television, studying in bed, sitting posture to write and backpacking) with back pain. In this study, it was not possible to identify such associations since classifications related to the intense and/or inappropriate use of technologies are not part of the data available in 2015 Health Survey of São Paulo.

Finally, Hestbaek et al.²⁰ showed that there was a correlation between low back pain diagnosed in childhood/adolescence and the permanence of the problem in adulthood, and suggest that the focus of prevention, treatment, and research related to back pain problems should be in children and adolescents. The results of this study support this conclusion.

In addition, it has been found that back pain is usually treated with painkillers, but there are other treatments that include physical therapy, physical exercise, and spinal manipulation¹. Self-medication has been considered a significant public health problem. Pardo et al.²¹ relate self-medication as the primary search for relief to face pain-related issues. Arrais et al.²² estimate the prevalence of self-medication in Brazil at 16.1%. In this study, self-medication used to seek back pain relief was reported by 17.6% of adolescents.

Shipton²³ warns that non-pharmacological treatment to address back pain is important because it improves body function and decreases disability. In this study, approximately a quarter (24.8%) of adolescents in the city of São Paulo who reported having back pain reported using other non-pharmacological mechanisms to relieve it, such as massage (4.0%), activity physical (9.6%), and rest (11.2%).

CONCLUSION

Understanding back pain as a public health problem requires us to think of strategies that allow us to understand origins, associated factors, and coping strategies that may influence new ways of prioritizing and organizing health care in the Unified Health System (SUS) and in complementary health services in the country.

Thus, the four factors (dizziness, common mental disorder, insomnia, and domestic physical activity) associated with back pain should be considered for diagnosis, treatment, and proper clinical management.

Finally, it is important to highlight that diseases detected and managed improperly in adolescence can worsen in adulthood.

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