Physical pain and hopelessness in school teenagers

Dor física e desesperança em adolescentes escolares

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ABSTRACT

BACKGROUND AND OBJECTIVES: Physical pain and hopelessness can be risk factors for health and have a biopsychosocial impact on adolescence. Studies on such factors in adolescents are still scarce. This study aimed to evaluate aspects related to physical pain and hopelessness in a sample of school adolescents.
METHODS: Data was collected in two schools using the Multidimensional Pain Assessment Scale, and Beck Hopelessness Scale. Logistic regression was used to analyze factors associated with physical pain and hopelessness.
RESULTS: 270 adolescents were included. There was a significant prevalence of pain (mild 88.1% and intense 90.90%) and hopelessness (moderate 11.1% and severe 5.6%). In the multi-variate logistic regression model, the location of back pain and chronic pain were independently associated with severe hopelessness (defined as a Beck Hopelessness Scale score between 14 and 20). By multivariate logistic regression, adolescents who reported back pain and chronic pain presented, respectively, 2.07 (95% CI: 1.04-4.14) and 2.01 (95% CI: 1.03-3.93) times more chance to experience severe hopelessness. In the model of factors associated with the presence of pain, female adolescents were 3.87 times more likely to have pain (OR: 3.87; 95% CI: 1.74-8.60).
CONCLUSION: The greater occurrence of pain in female adolescents and the association between specific aspects of pain and the presence of hopelessness indicate the existence of priority groups for health care actions.

Keywords: Adolescent, Pain, Suicide attempt.

RESUMO

JUSTIFICATIVA E OBJETIVOS: A dor física e a desesperança podem ser fatores de risco para a saúde e gerar impacto biopsicossocial na adolescência. Pesquisas sobre tais fatores em adolescentes ainda são escassas. O objetivo deste estudo foi analisar aspectos relativos à dor física e à desesperança em uma amostra de adolescentes escolares.
MÉTODOS: Os dados foram coletados em duas escolas, com a aplicação de dois instrumentos: "*Multidimensional Pain Assessment Scale*", e "*Beck Hopelessness Scale*". Foi empregada a regressão logística para análise de fatores associados com a dor física e com a desesperança.
RESULTADOS: Foram incluídos 270 adolescentes. Houve prevalência relevante de dor leve 88,1% e intensa 90,90% e de desesperança moderada 11,1% e intensa 5,6%. No modelo de regressão logística multivariada, a localização da dor nas costas e a dor crônica estiveram independentemente associadas com a desesperança grave definida como uma pontuação entre 14 e 20 na "*Beck Hopelessness Scale*". Adolescentes que reportaram dor nas costas e dor crônica apresentaram respectivamente 2,07 (IC95%: 1,04-4,14) e 2,01 (IC95%: 1,03-3,93) vezes mais chance de apresentarem desesperança grave. Já no modelo dos fatores associados com a presença de dor, adolescentes do sexo feminino apresentaram 3,87 vezes mais chance de ter dor (OR: 3,87; IC 95%: 1,74-8,60).
CONCLUSÃO: A maior ocorrência de dor em adolescentes do sexo feminino e a associação entre aspectos específicos da dor e a presença de desesperança indicam a existência de grupos prioritários para as ações de cuidado em saúde.

Descritores: Adolescente, Dor, Tentativa de suicídio.

INTRODUCTION

Musculoskeletal physics pain is a relevant problem for public health due to its high prevalence, high cost and negative impact on the quality of life of those affected[1,2]. People in pain consume twice as much health care resources as the general population[2]. In addition, the presence of pain may be associated with increased risk of suicidal behavior[3]. The presence of pain in children and adolescents, in turn, can lead to sleep problems, inability to pursue hobbies, and absence from school[4].
Hopelessness may be understood as a pessimistic attitude or expectation about future events or thoughts. Someone who is hopeless tends to see the future with no expectations, loses motivation for life and can't find reasons for living[5]. Hopelessness constitutes a risk factor for the suicidal behavior[6,7].

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During the adolescence years a vast number of biopsychosocial alterations occur[8], and physical pain and hopelessness makes the teenager more vulnerable.

Since the Brazilian studies that evaluate the relation between physical pain and hopelessness are scarce, especially regarding the teenage population, the present study analyzed the prevalence and the factors associated with physical pain and hopelessness in school teenagers.

METHODS

Cross-sectional, quantitative, and exploratory study, with a convenience defined sample, conducted from April to November 2018, in two state schools in the city of Divinópolis/MG. The inclusion criteria were adolescents from 15 to 19 years old, enrolled and regularly attending the schools, present in the classroom on the day and time of data collection, after the signing of the Free and Informed Consent Terms (FICT) by those responsible. After an orientation about the implications of the study, those who consented were instructed to take the FICT home and request that parents and/or guardians read and sign it. After collecting the FICT, students were instructed to read and sign the Informed Consent Term.

The population was composed of 489 teenage students, of which 119 decided not to participate in the study and 100 were excluded due to non-conformity to the adopted inclusion criteria. Thus, the sample consisted of 270 teenagers. The quantity studied was higher than the minimum sample size initially calculated through Open Epi, version 3.01, for a 95% confidence level, with a sample error of 5% and statistical power of 80%.

The Multidimensional Assessment Pain Scale (MAPS) and the Beck Hopelessness Scale (BHS) were used for data collection. The MAPS, validated for the Portuguese language[9], makes it possible to evaluate several descriptors of pain, from its absence or presence, to the presence of acute and chronic pain in different experiences, identifying sensitive, affective and evaluative components of the pain phenomenon. In this scale, the higher the score the higher the pain and its descriptors[9].

MAPS is a self-applicable instrument composed of 10 fixed questions in which the level of pain is quantified considering a numerical scale from zero to 10, in which zero indicates "no pain" and 10 "intense pain", being also possible to identify descriptors that characterize perceived pain. This scale is widely used in scientific studies and aims to identify and validate pain descriptors[9].

BHS is a self-administration structured instrument, composed of statements that evaluate the degree of hopelessness by measuring negative attitudes towards the future and its degree of pessimism, and presents satisfactory results of reliability and validity[10]. BHS has been used in national and international studies as an indicator of suicide risk.

BHS was translated and adapted to the Portuguese language by Cunha[10]. The instrument is characterized as a right and wrong type dichotomous scale, and its items are scored at zero or 1, with a score range from zero to 20, in which the sum of its individual items results in a total score, which ranks: minimal hopelessness (zero-4 points), mild hopelessness (5-8 points), moderate hopelessness (9-13 points) and severe hopelessness (14-20 points).

This study is in conformity with the Resolution 466 on human beings research[11]. The research project was approved on September 22, 2017 by the Comitê de Ética em Pesquisa (CEPES – Research Ethics Committee) of the Universidade Federal de São João del-Rei (CAAE 70602917.8.0000.5545 and Opinion No. 2.291.115).

Statistical analysis

The data was analyzed in the Statistical Package for the Social Sciences (version 20.0, SPSS, Chicago, Illinois) through double typing, which allowed consistency analysis and validation of the data. Firstly, the descriptive analysis was performed including the calculation of absolute and relative frequency distribution and measures of central tendency and dispersion. Then, the Shapiro Wilk normality test was performed for the age variable; as it didn't present normal distribution, it was presented in median and interquartile amplitude (p25-p75). Next, the Cronbach Alpha was calculated for the BHS components.

The BHS classification was grouped into two categories: mild and severe hopelessness, in order to increase the statistical power of the analyses. The mild and minimal groups were determined for mild hopelessness when the sum of the scale was less than 9, and the moderate and severe groups for severe hopelessness were determined when the sum was equal to or greater than 9.

To verify the factors independently associated with severe hopelessness and the presence of pain, multi-variate logistic regression models were constructed. Thus, two multi-variate models were presented. In one model the dependent variable was severe hopelessness and, in the other, the dependent variable was the presence of pain.

The sociodemographic data, the degree of hopelessness in the case of the model of factors associated with pain, the presence of chronic and acute pain variables and location of back, head and neck pain in the case of the model of factors associated with hopelessness, were considered as explanatory variables of the multi-variate regression models.

The explanatory variables that obtained a p value of less than 20% ($p<0.20$) in the bivariate analysis were inserted by the backward method in the multi-variate resente multiple logistic regression, and those with less significance (higher p value) were removed one by one from the model. The procedure was repeated until all variables resente in the model had statistical significance ($p<0.05$). The odds Ratio (OR) and their respective confidence intervals (95% CI) were calculated in the bivariate and multi-variate models.

RESULTS

The study showed a high incidence of physical pain in the teenagers, more frequent in the anterior part of the body, more located in the head, followed by the trunk and limbs. In the posterior part the pain was more frequent in the lumbar region, followed by head and neck and limbs.

Most students presented minimal hopelessness, although there was a high proportion of individuals with moderate or severe hopelessness. As for pain, 62.20% reported moderate pain and 21.10% intense pain. Acute pain (52.20%) was more frequent than chronic pain (35.60%) (Table 1).

Table 1. Profiling of the study's sample

Variables	n	%
Hopelessness classification		
Minimal	147	54.40
Mild	78	28.90
Moderate	30	11.10
Severe	15	5.60
Pain classification		
No pain	31	11.50
Mild	14	5.20
Moderate	168	62.20
Intense	57	21.10
Pain in the anterior part of the body		
No	46	17.00
Yes	224	83.00
Pain in the posterior part of the body		
No	100	37.00
Yes	170	63.00
Location of pain		
Anterior part of the body	224	83.00
Head	184	68.10
Upper limb	49	18.10
Lower limb	90	33.30
Trunk	92	34.10
Genital	40	14.80
Posterior part of the body	170	63.00
Head and neck	74	27.40
Back	131	48.50
Upper limb	21	7.80
Lower limb	47	17.40
Buttocks	07	2.60

Table 2. Models of simple (raw odds ratio) and multiple (adjusted odds ratio) binary logistic regression for the explanatory variables associated with severe hopelessness

Variables	Hopelessness (%)		Raw OD (CI 95%/p-value)	Adjusted OD of the final model variables (CI 95%/ p-value)*
	Mild	Severe		
Acute pain				
No pain	79.1	20.9	1	
Pain	87.9	12.1	0.51 (0.26-1.00. p=0.051)	
Chronic pain				
No pain	87.9	12.1	1	1
Pain	76.0	24.0	2.29 (1.19-4.41. p=0.013)	2.01 (1.03-3.93. p=0.040)
Presence of back pain				
No pain	89.2	10.8	1	1
Pain	77.9	22.1	2.35 (1.19-4.62. p=0.013)	2.07 (1.04-4.14. p=0.038)

*Multiple logistic regression. OR = odds ratio; CI: confidence interval.

Table 3. Models of simple (raw odds ratio) and multiple (adjusted odds ratio) binary logistic regression for the explanatory variables associated with pain

Variables	Pain (%)		Raw OD (CI 95%)	p-value	Adjusted OD of the final model variables (CI 95%/ p-value)*
	No pain	Pain			
Sex					
Male	20.0	80.0	1		1
Female	6.1	93.9	3.87 (1.74-8.6)	0.001	3.65 (1.61-8.25. p=0.002)

*Multiple logistic regression. OR = odds ratio; CI: confidence interval.

The value of the Cronbach alpha coefficient of the components of the BHS was 0.823, considered satisfactory and of good internal consistency.

Table 2 presents the simple logistic regression models and the multiple logistic regression model of factors associated with severe hopelessness. In the simple logistic regression model, the existence of occupation, the presence of chronic pain and back pain were associated with severe hopelessness. In the multi-variate logistic regression model, the location of back pain and chronic pain were independently associated with severe hopelessness. Regarding the bi and multi-variate logistic regression models of the factor related to presence of pain, the only variable with significant association with both was the presence of pain in females (Table 3).

DISCUSSION

The study revealed high prevalence of pain and hopelessness in the teenagers. The presence of pain in adolescence has not been much studied in Brazil. A systematic review observed that, in the United States, the prevalence of pain in teenagers was between 11 and 38%, generating an estimated yearly cost of 19.500 billion dollars[12,13]. In regard to the presence of hopelessness in Brazilian teenagers, the study[6] done in the city of Porto Alegre with individuals from 15 to 19 years old obtained results similar to the identified in the present study.

The high occurrence of pain and hopelessness in teenagers, mainly regarding a non-clinical population, may indicate the important biopsychosocial suffering that many times is unknown or ignored.

Moreover, headaches are becoming more common in children and school teenagers, and a number of studies have confirmed the higher prevalence of headache in adolescents[14-17].

As headaches are often accompanied by other physical and/or emotional manifestations, the recognition and repercussion of headaches in teenagers, as well as the effects on psychological development, school performance and social interaction are relevant, and the importance of being adequately treated to avoid potential long-term consequences and minimize the impacts on adult life is substantial[16].

The present study verified a higher occurrence of pain in the posterior region, the dorsal region being the most frequent location, which has also been identified in other studies with teenagers[18-20].

A population-based Brazilian study[21] conducted with 1.597

school adolescents found that the high intensity of back pain was associated with the impediment of doing day-to-day activities. The possible health problems associated with the presence of back pain and the identified association between it and hopelessness demonstrate the relevance that this type of pain can have in the lives of adolescents and its biopsychosocial repercussions.

Besides back pain, occupation and chronic pain were associated with severe hopelessness. These results are in conformity with the information from the WHO and other studies[22-24] regarding the association between vulnerability factors and suicidal behavior, such as the presence of stress and stress events throughout life.

Although the studies on the association between the presence of chronic pain and back pain with the occurrence of hopelessness in adolescents are still scarce, it's possible to hypothesize that constant pain is a major factor for the occurrence of hopelessness. Therefore, interventions directed at teenagers with chronic pain may be relevant at the Public Health level.

A cross-sectional[25] population-based study of 5.504 German school-age teenagers showed that those who reported pain were almost twice as likely to die from suicide. The presence of pain was also significantly associated with increased odds of suicide ideation, suicide attempts, and multiple attempts. The same was observed in a study[26] with 250 adult patients hospitalized with chronic pain, which identified that suicide ideation was common in people with chronic pain.

Regarding the analysis of factors associated with the presence of pain, the female sex was the only significant associated factor. Previous studies[19,21,27,28] have shown similar results. The higher prevalence of musculoskeletal pain in the spine in female adolescents can be explained by the existence of multifactorial alterations, such as those of the endogenous system of pain modulation, which contribute to greater sensitivity and higher prevalence of several painful conditions in females.

Furthermore, anatomofunctional characteristics, hormonal changes induced by puberty and/or social characteristics may also play a relevant role[20].

Although no association has been identified between hopelessness and the sex of the teenagers, a greater presence of suicide ideation has been reported in females[7]. Therefore, it's an issue that should be better investigated in the literature.

CONCLUSION

The present study identified high prevalence of pain and hopelessness in school teenagers, as well as higher occurrence of pain in female teenagers and the association between chronic and back pain and the presence of hopelessness.

AUTHORS CONTRIBUTIONS

Vinicius Silva Belo
Statistical analysis, Methodology, Writing – Original preparation, Writing – Review and Editing, Software, Supervision, Visualization

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Financing acquisition, Conceptualization, Resource Management, Project Management, Research, Methodology, Writing – Original preparation, Writing – Review and Editing, Supervision, Validation, Visualization

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