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ORIGINAL ARTICLE

Risk factors associated with structural postural changes in the spinal column of children and adolescents

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Received 15 April 2014; accepted 30 July 2014

KEYWORDS

Risk factors;
Posture;
Spine/abnormalities;
Child;
Adolescent;
Epidemiology

Abstract

Objective: To investigate the association between behavioral risk factors, specifically postural habits, with the presence of structural changes in the spinal column of children and adolescents.

Methods: 59 students were evaluated through the self-reporting Back Pain and Body Posture Evaluation Instrument and spinal panoramic radiographic examination. Spine curvatures were classified based on Cobb angles, as normal or altered in the sagittal plane and as normal or scoliotic in the frontal plane. Data were analyzed using SPSS 18.0, based on descriptive statistics and chi-square association test ($\alpha=0,05$).

Results: The prevalence of postural changes was 79.7% ($n=47$), of which 47.5% ($n=28$) showed frontal plane changes and 61% ($n=36$) sagittal plane changes. Significant association was found between the presence of thoracic kyphosis and female gender, practice of physical exercises only once or twice a week, sleep time greater than 10 hours, inadequate postures when sitting on a seat and sitting down to write, and how school supplies are carried. Lumbar lordosis was associated with the inadequate way of carrying the school backpack (asymmetric); and scoliosis was associated with the practice of competitive sports and sleep time greater than 10 hours.

Conclusions: Lifestyle may be associated with postural changes. It is important to develop health policies in order to reduce the prevalence of postural changes, by decreasing the associated risk factors.

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PALAVRAS-CHAVE

Fatores de risco;
Postura;
Coluna vertebral/
anormalidades;
Criança;
Adolescente;
Epidemiologia

Fatores de risco associados a alterações posturais estruturais da coluna vertebral em crianças e adolescentes

Resumo

Objetivo: Verificar se existe associação entre fatores de risco comportamentais, especificamente hábitos posturais, com a presença de alteração postural estrutural na coluna vertebral de crianças e adolescentes.

Métodos: Foram avaliados 59 crianças e adolescentes, que responderam ao questionário auto-aplicável *Back Pain and Body Posture Evaluation Instrument* e realizaram o exame radiográfico panorâmico da coluna vertebral. De acordo com o ângulo de Cobb, as curvaturas sagitais da coluna vertebral foram classificadas como normal ou alterada e, no plano frontal, como escoliose ou normal. Os dados foram analisados no SPSS 18.0, a partir de estatística descritiva e do teste de associação qui-quadrado ($\alpha=0,05$).

Resultados: A prevalência de alterações posturais foi de 79,7% ($n=47$), sendo que 47,5% ($n=28$) apresentavam alteração no plano frontal e 61% ($n=36$) no plano sagital. Foi encontrada associação entre cifose torácica e sexo feminino, prática de exercício físico de apenas uma ou duas vezes na semana, tempo de sono superior a 10 horas, posturas inadequadas para sentar no banco e sentar para escrever e o meio de transporte do material escolar. Para lordose lombar, observou-se associação com o transporte da mochila escolar de modo inadequado (assimétrico). Houve associação significativa entre a presença de escoliose com a prática de esporte competitivo e o tempo de sono superior a 10 horas.

Conclusões: Hábitos de vida podem estar associados a alterações posturais, sendo importante o desenvolvimento políticas de saúde a fim de reduzir a prevalência de alterações posturais por meio da redução dos fatores de risco associados.

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Introduction

Static postural changes are considered a public health problem, especially those that affect the spinal column, as they may be a predisposing factor for degenerative conditions of the spine in adulthood;^{1,3} additionally, depending on their magnitude, they are capable of causing impairment to some daily activities.

The phases of childhood and adolescence correspond to those during which young individuals attend the school environment, where they remain for long periods in the seated position, usually assuming an inadequate posture, most often on inappropriate furniture,⁴ which in addition to the tendency to a sedentary lifestyle throughout school time⁵ can also favor the onset of static postural changes. Furthermore, there seems to be a trend that postural habits adopted in childhood and adolescence will continue into adulthood.⁶

Thus, investigations on the occurrence of static postural changes and the variables associated with this condition help to understand the risk factors for spinal problems, early detection of these changes being the first step towards prevention of conditions that predispose to the emergence of these disorders. Thus, early detection of static postural changes should be one of the goals of professionals working with child and adolescent health, as growth spurts occur at these age groups, and these are critical times for the onset of back problems⁷ caused by several adjustments, adaptations, and psychosocial and physical changes that are characteristic of this phase of development, in addition to intrinsic and extrinsic factors

such as genetic, environmental, physical, emotional and socioeconomic factors.⁸

In this context, some studies have sought to identify the postural pattern of young individuals at school age, and their results suggest a high prevalence of anteroposterior and lateral changes in the spinal column,^{9,10} using photogrammetry to assess posture. Nevertheless, many of these studies are limited due to the lack of real knowledge on spinal column posture, which is only possible through radiological assessment. Thus, it is important to carry out studies that aim not only to assess static posture, but also to provide evidence of the actual positioning of the spinal column, in addition to knowledge of behavioral risk factors, such as postural habits.

Thus, we assessed the hypothesis that inadequate postural habits in the seated position and when carrying the school backpack might be associated with the presence of static postural changes in the sagittal and frontal planes, respectively. Therefore, the aim of this study was to investigate if there is an association between behavioral risk factors, specifically postural habits, and the presence of structural postural changes in the spinal column of young individuals.

Method

This is a cross-sectional study, and sample size was determined through data of mean and standard deviation of the spinal column lateral asymmetry angles (58.1 ± 11.15), from the study of Bettany et al,¹¹ thus requiring 58 indi-

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