206 - POSTURAL EVALUATION: CHANGES IN THE SPINE OF HIGH SCHOOL STUDENTS.

ODÉLIO JOAQUIM DA COSTA
Instituto Federal de Ciência e Tecnologia do Tocantins
Campus Araguatins-TO.
E-mail delioneuro@hotmail.com

INTRODUCTION

According Magee (2002), posture is one composed of positions of the different joints of the human body in that moment, with the correct posture to a position where a minimum of stress is applied to each joint. Ascher (1976) corroborates with the previous definition, describing that attitude is the position of the body in space, with special reference to its parts, that requires the least effort, avoiding unnecessary fatigue. The American Academy of Orthopedic cited in Adams et al. (1985) adds that posture is the state of balance between muscle and bone with the capacity to protect the other structures of the body of trauma, either while standing, sitting or lying.

Barbanti (2003) adds that the posture can be defined as the position that our body takes in space, with respect to its segments to the center of gravity that can be influenced by factors such as obesity, unhealthy diet, physical activity without guidance, muscle atrophy or hypertrophy.

When we conduct a study on the posture of adolescents who attend high school, we must consider the influence that the environment exerts on the activities and habits developed and adopted by individuals.

The classrooms of the schools evaluated following the same patterns of organization from the beginning of the twentieth century, chairs are lined, forming three or four rows in the room, the table of teacher ahead, around the table.

The posture of the spine is influenced by the routine in the classroom. The biomechanical model of the spine of man was not made to stay for long periods in the sitting position, maintaining fixed postures and repetitive movements (SEYMOUR, 1995).

One of the body segments most influenced by incorrect positioning of the human body is the backbone, which consists of vertebrae, ligaments, muscles and intervertebral discs. Sandwiched between the vertebral bodies is the discs, structures that are related to the functions of damping pressure and weight bearing. The structural architecture consists of four skews that are presented as follows: vertebral column (concave at the time C6 e C7), thoracic column (convex at the time T5 e T6), lumbar column (concave at the time L3 L4), Sacred column (convex at the time S3 e S4). Changes to any misuse of such anatomical curvatures of accidents in relation to the line of gravity characterizing the postural deviation (RASCH, 1991).

Whereas a teenager remains more than four hours a day in school, sitting in chairs that are ergonomically designed to meet specific needs of each student, but in general can serve all, it is important to perform a postural assessment in this population.

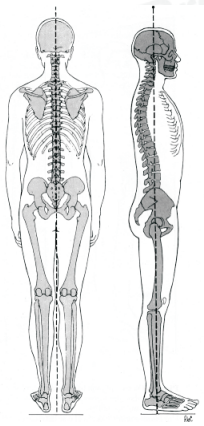
OBJECTIVES:

To evaluate the attitude of high school students, identify and describe the main changes in the alignment of the vertebral column.

METHODOLOGY

This is a study of diagnostic, descriptive and exploratory. The selected population for the study were students who were regularly enrolled in school, in four schools, two public and two private city of Palmas - TO. The sample of this study was composed of 300 pupils, between thirteen and seventeen. Being 150 male and 150 female study participants were randomly selected. The protocol for data collection was based on studies of Kendall et al .(1987) e Kanoplich (2003), where we follow the following criteria to assess the posture of the vertebral column:

Following the proposal of Kendall et al. (1987), believe that the optimal alignment the posterior-anterior plane, correspond to crossing the line of gravity or the plumb line, the spinous processes of the vertebrae, corresponding to the line passing espondileia also the medial part of the buttocks and medial thighs and legs. On the anteroposterior, the median sagittal line passes medially on the jugular notch, manúbio and sternum, umbilicus, pubic symphysis and medial thighs and legs.



OPTIMAL ALIGNMENT

In the position of the line profile should match the line of the frontal plane, passing over the acromion, then the cervical and lumbar lordosis and thoracic kyphosis above on the greater trochanter of the femur together with the lateral line of the lower limb.

To facilitate the identification of these points, they were marked on the skin with the aid of external markers, and shaded with Dermatographic pencil addition we use a squared.

Knoplich (2003) suggests that a postural assessment should take note of the points described below:

Lateral deviation of the line espondiléia - Comprising the skin projection of the dorsal spinous processes of vertebrae with the aid of a plumb line, the evaluator places the free end of the bob on the spinous process of seventh cervical vertebra, the most prominent, leaving the other end falls freely through dorsal gluteal region. If there is a deviation from the perpendicular to one side of the same will happen to the side of convexity of the scoliotic curve.

Unevenness of the shoulders and scapulae - If it is not observed the same height to the acromial right and left shoulders, we find an imbalance, the shoulder is higher, will be on the convex side of scoliotic curve.

Asymmetry of the triangles formed by the middle and lateral edge of the arm and forearm with the pelvic girdle and lateral edge of the trunk. The triangle is the most concave part of the curve.

Asymmetry of relief after the ribs - It can be clearly observed when evaluating the student previously flexed trunk. This relief is called posterior gibbosity costal. When we notice an asymmetry one side is much higher than the other, we are faced with a spinal deformity costal indicating an advanced stage of deformity, the convex side of scoliotic curve coincides with the side of the spinal deformity margin.

PROCEEDINGS OF THE POSTURAL ASSESSMENT

The student was placed in the standing position in simetógrafo with heels slightly apart and feet abducted about 15 degrees, seeking to asymmetries in the frontal, sagittal and transversal. In the observation anteroposterior body symmetries were identified at the hip (quadril), triangle tales, shoulders and head, side or in the profile we look at the hip, vertebral column. In the analysis postero-anterior were observed gluteal line, column (lumbar, thoracic and neck), shoulder and head position.

To observe the costal spinal deformity, we ask the student to stand to make a bending of the trunk and upper limbs leave pending without the support of the knees, then observe the subsequent coastal relief. Data were recorded on a questionnaire. The referees were on the same line of students, maintaining a distance of three meters, which was observed at each angle deviation presented by each child. Postural assessment was carried out in schools and in laboratory studies of human movement from a particular University Center in the city of Palmas. Based on the evaluation sheets, developed by researchers who recorded the ages and sexes.

DISCUSSION

Table 01. Distribution of postural changes made by school students of both genders and their respective percentage for the whole sample (N = 300).

Postural changes	N	%
Cervical curvature increased (hyper lordosis)	14	4,7
Thoracic Curvature increased(hyper kyphosis)	33	11,0
Lumbar curvature increased (hyper lordosis)	54	18,0
Probable Thoracic Scoliosis	63	21,0
Probable lumbar scoliosis	12	4,0

The data from the table above indicate that there is an incidence of postural changes in the spine of the sample investigated, high school students of both sexes.

Adolescence is a stage where significant changes occur in the development of the individual allowing the appearance or emphasizing postural problems, making changes in chronic diseases.

In Brazil, the disorders of the spine are considered a major cause of worker absenteeism of service and retirement, much of the population suffers from some type of change in the locomotor period increased productivity (KANOPLICH, 2003).

Table 02. Distribution of the postural changes observed in the physiological curvature of the spine in adolescent male (n = 150) and female (n = 150).

Body Segment	**MALE**		FEMALE	
	N	%	N	%
Cervical curvature increased	8	2,7	6	2,0
Thoracic Curvature increased	15	5,0	18	6,0
Lumbar curvature increased	21	7,0	33	11,0

By observing the results of Table 02, after the evaluation of profile or side, we observed changes in physiological curves.

One of the most neglected deformities in the treatment of spinal kyphosis are labeled postural adolescence, but can be signs of a pathology more complex (KANOPLICH, 2003 p. 470). The most common type of kyphosis is postural, also known by the name of Kyphosis. Kyphosis is not considered a disease of the spine when the musical scale is increased through the classification of hyper kyphosis. The curvature can be altered by the posture adopted by the individual, one of the examples cited by Kanoplich (2003) is the posture adopted by the girls which to hide her breasts, as they see the big old bow the shoulders, increasing the angle of curvature.

Lordosis is a curve that is observed in the profile of a spine, the convexity of the cervical and lumbar region. Farfan apud Kanoplich (2003 p. 474) showed that lumbar lordosis is directly related to pelvic obliquity, which should be around 20 degrees. If it is higher there will be an increase in lordosis and therefore all curves for compensation.

Table 03. Distribution of lateral deviation of the spine (scoliosis), the students of both genders and their respective percentage.

Lateral deviations	MALE		**FEMALE**	
	N	%	N	%
Probable thoracic scoliosis	27	9,0	36	12,0
Probable scoliosis lumbar	5	1,7	7	2,3

The declaration postural analysis section later in the level of the spine, there was a characteristic of a probable Thoracic Scoliosis (9%) for males and (12%) for females. Bienfait (1995) states that the scoliosis at this age do not have accents so serious, then there is the possibility of treatment, with the goal of trying to correction.

Mechanically scoliosis is defined as a twisting of the basic elements of the spine around the vertical axis.

Scoliosis located in the thoracic spine cause deformities in the chest, also affects respiratory deformities in severe cases. In lumbar cause imbalance orgânico and often even pain. The diagnosis of scoliosis must be completed by radiologic examination.

Noting that the field of non-physiological deviations of the spine, is a large increase in numbers of students with such an effect, it is precisely at this stage of human life that the body undergoes its sudden changes.

CONSIDERATIONS

The diagnosis and treatment of diseases of the vertebral column provide better results in the sense of minimizing the effects of postural deviations (MURAHOVSCHI, 1998).

Given the results obtained by evaluation of posture, it is concluded that the changes that have greater impact on the vertebral column (lumbar curve marked, Probable Thoracic Scoliosis).

To Knoplich (2003) one of the better ways to reduce the large numbers of adult sufferers of chronic pain of the vertebral column, is trying to do a preventive orientation in children and adolescents.

The great advantage of conducting analysis of body posture in school system is exactly because of the large number of teenagers who meet in one place, getting the interest of the physical education teacher to identify the postural imbalances by making half of postural analysis of the students.

This study goes to show the importance of the postural evaluation in Brazilian schools. The literature is extremely broad, showing that several researches carried out in Brazilian schools, obtained results that demonstrate, through the diagnoses made, that students in schools kindergarten, elementary, middle and top, are suffering from postural changes in all body segments, especially in the vertebral column.

We believe that one of the means considered effective in reducing the number of adults with postural changes and chronic pain in the spine is the realization of an early diagnosis and preventive work on education.

REFERENCES

ADAMS, R. C. et al. **Jogos, esportes e exercícios para o deficiente físico.** São Paulo: Manole, 1985.

ASCHER, Cécile. **Variações de Postura na Criança.** São Paulo: Manole, 1976.

BARBANTI, Valdir J; **Dicionário de Educação Física e Esporte**. São Paulo: Atual, 2003.

BIENFAIT, Marcel. **Os Desequilíbrios Estáticos** - São Paulo: Summus, 1995.

BLACK, Arno. **Escola Postural - uma Alternativa para a Saúde da Coluna Vertebral**. Porto Alegre: Rígel, 1993.

KENDALL, H. O. et al. P**osture and pain.** Krieger. N. York, 1997.

KNOPLICH J. **Enfermidades da Coluna Vertebral uma Visão Clínica e Fisioterápica**. 3ª edição, Robe, 2003.

KNOPLICH, J**. A Coluna Vertebral da Criança e do Adolescente**. São Paulo: Panamed, 1985.

MAGEE, D.J. **Avaliação Postural In: Disfunção Musculoesquelética.** 3ª edição, São Paulo: Manole, 2002, p.105-157.

MIRANDA, Adalton**. Bases de Anatomia e Cinesiologia**. 4ª ed. Rio de Janeiro: Sprint, 2003.

MURAHOVSCHI, Jayme. **Pediatria: Diagnóstico + Tratamento.** 5. ed. São Paulo: Sarvier, 1998.

RASCH, Philip J. **Cinesiologiae Anatomia Aplicada**. 7. ed. Rio de Janeiro: Guanabara Koogan, 1991.

SANTOS, A. G & COSTA, O. J. **Análise da Postura Corporal nos Alunos do Ensino Fundamental: Comparações entre meninos e meninas**. Resumo Anais VIII Jornada de Iniciação Científica do CEULP/ULBRA, Palmas, 2008.

SEYMOUR, M. B. **The ergonomics of seating-posture and chair adjustment.** Nursing times, v. 91, n. 9, p 35-37, 1995

ODÉLIO JOAQUIM DA COSTA
Instituto Federal de Ciência e Tecnologia do Tocantins
Campus Araguatins-TO.
E-mail delioneuro@hotmail.com

POSTURAL EVALUATION: CHANGES IN THE SPINE OF HIGH SCHOOL STUDENTS.

INTRODUCTION

According Magee (2002), posture is one composed of positions of the different joints of the human body in that moment, with the correct posture to a position where a minimum of stress is applied to each joint. When we conduct a study on the posture of adolescents who attend high school, we must consider the influence that the environment exerts on the activities and habits developed and adopted by individuals. The classrooms of the schools evaluated following the same patterns of organization from the beginning of the twentieth century, chairs are lined, forming three or four rows in the room, the table of teacher ahead, around the table. The posture of the spine is influenced by the routine in the classroom. The biomechanical model of the spine of man was not made to stay for long periods in the sitting position, maintaining fixed postures and repetitive movements (SEYMOUR, 1995). Whereas a teenager remains more than four hours a day in school, sitting in chairs that are ergonomically designed to meet specific needs of each student, but in general can serve all, it is important to perform a postural assessment in this population. **OBJECTIVES** To evaluate the attitude of high school students, identify and describe the main changes in the alignment of the vertebral column. **METHODOLOGY** This is a study of diagnostic, descriptive and exploratory. The selected population for the study was students who were regularly enrolled in school, in four schools, two public and two private city of Palmas - TO. The sample of this study was composed of 300 pupils, between thirteen and seventeen. Being 150 male and 150 female study participants were randomly selected. The protocol for data collection was based on studies of Kendall et al .(1987) e Kanoplich (2003). The student was placed in the standing position in simetógrafo with heels slightly apart and feet abducted about 15 degrees, seeking to asymmetries in the frontal, sagittal and transversal. In the observation anteroposterior body symmetries were identified at the hip, triangle tales, shoulders and head, side or in the profile we look at the hip, vertebral column. In the analysis postero-anterior were observed gluteal line, column (lumbar, thoracic and neck), shoulder and head position. DISCUSSION The data indicate that there is an incidence of postural changes in the spine of the sample investigated. 4.7% in the cervical curvature (hyperlordosis), 11% in the thoracic curvature (hyperkyphosis), 18% lumbar curvature (hyperlordosis), 21% likely thoracic scoliosis, 4% likely lumbar scoliosis. **CONSIDERATIONS** Given the results obtained by evaluation of posture, it appears that there are changes of curvatures and lateral deviation of the vertebral column.

POSTURAL ÉVALUATION: CHANGEMENTS DANS LA COLONNE VERTÉBRALE DES ÉLÈVES DU SECONDAIRE.

INTRODUCTION

Selon Magee (2002), l'attitude est un composite de différentes positions des articulations du corps humain en ce moment, avec la posture correcte à une situation où un minimum de contrainte est appliquée à chaque joint. Lorsque nous réalisons une étude sur l'attitude des adolescents qui fréquentent l'école secondaire, il faut considérer l'influence que le milieu exerce sur les activités et les habitudes développées et adoptées par les individus. Les salles de classe des écoles évaluées selon les mêmes modèles d'organisation à partir du début du XXe siècle, les chaises sont alignés pour former trois à quatre rangées dans la chambre avec le bureau du professeur, à l'avant, à côté de l'image. La posture de la colonne vertébrale est influencée par la routine dans la salle de classe. Le modèle biomécanique de la colonne vertébrale de l'homme n'était pas fait pour rester pour de

longues périodes en position assise, le maintien de postures fixes et les mouvements répétitifs (Seymour, 1995). Considérant qu'un adolescent reste plus que quatre heures par jour à l'école, assis dans des fauteuils qui sont conçus de façon ergonomique pour répondre aux besoins spécifiques de chaque élève, mais en général, peuvent servir à tous, il est important de procéder à une évaluation posturale dans cette population . **OBJECTIFS**: Pour évaluer l'attitude des élèves du secondaire, identifier et décrire les principaux changements dans l'alignement de la colonne vertébrale. **MÉTHODES:** Il s'agit d'une étude de diagnostic, descriptive et exploratoire. La population sélectionnée pour l'étude était les élèves qui étaient régulièrement inscrits à l'école secondaire dans quatre écoles, deux publiques et deux privées ville de Palmas. L'échantillon de cette étude était composée de 300 élèves, entre treize et dix-sept. Étant de 150 mâles et 150 femelles participants à l'étude ont été choisis au hasard. Le protocole utilisé pour la collecte des données est basée sur des études de Kendall et al. (1987) et Kanoplich (2003). L'étudiant a été placé dans la position debout dans simetógrafo avec des talons légèrement écartées et les pieds ont enlevé environ 15 degrés, la recherche d'asymétries dans le frontal, sagittal et transversal. DISCUSSION: Les données indiquent qu'il ya une incidence de changements de posture de la colonne vertébrale de l'échantillon. 4,7% dans la courbure cervicale (concavité), 11% dans la courbure du thorax (cyphose), 18% courbure lombaire (concavité), 21% probable scoliose thoracique, probable 4% 4% **CONCLUSION** scoliose lombaire Compte tenu des résultats obtenus en évaluant le position, il apparaît qu'il ya des changements de courbures et de déviation latérale de la colonne vertébrale.

LA POSTURA DE EVALUACIÓN: LOS CAMBIOS EN LA COLUMNA VERTEBRAL DE LOS ESTUDIANTES DE SECUNDARIA.

INTRODUCCIÓN

Según Magee (2002), la actitud es una combinación de las diferentes posiciones de las articulaciones del cuerpo humano en ese momento, con la postura correcta a una situación en la que un mínimo de tensión se aplica en cada junta. Cuando llevamos a cabo un estudio sobre la postura de los adolescentes que asisten a la escuela secundaria, debemos considerar la influencia que el entorno ejerce sobre las actividades y hábitos desarrollados y adoptados por los individuos. Las aulas de las escuelas evaluadas siguiendo los mismos modelos de organización desde el comienzo del siglo XX, las sillas se alinean para formar tres o cuatro filas en la sala con escritorio de la maestra en la parte delantera, junto a la imagen. La postura de la columna está influenciada por la rutina en el aula. El modelo biomecánico de la columna vertebral del hombre no fue hecho para permanecer durante largos períodos en posición sentada, mantener posturas fijas y movimientos repetitivos (Seymour, 1995). Considerando que un adolescente sigue siendo más de cuatro horas al día en la escuela, sentado en las sillas que están diseñados ergonómicamente para satisfacer las necesidades específicas de cada estudiante, pero en general pueden servir para todo, es importante realizar una evaluación postural en esta población . **OBJETIVOS:** Evaluar la actitud de los estudiantes de secundaria, identificar y describir los principales cambios en la alineación de la columna vertebral**. MÉTODOS:** Se trata de un estudio de diagnóstico, descriptivo y exploratorio. La población seleccionada para el estudio fueron los estudiantes que estaban regularmente matriculados en la escuela secundaria en cuatro escuelas, dos públicas y dos privadas de la ciudad de Palmas. La muestra de este estudio fue compuesta por 300 alumnos, entre trece y diecisiete años. Siendo 150 hombres y 150 participantes en el estudio mujeres fueron seleccionadas al azar. El protocolo utilizado para la recolección de datos se basó en estudios de Kendall et al. (1987) y Kanoplich (2003). El estudiante fue colocado en la posición de pie en simetógrafo con los talones ligeramente separadas y los pies secuestraron a unos 15 grados, en busca de las asimetrías en el frontal, sagital y transversal. DISCUSIÓN: Los datos indican que hay una incidencia de los cambios posturales en la columna vertebral de la muestra. 4,7% de la curvatura cervical (concavidad), el 11% de la curvatura dorsal (cifosis), el 18% curvatura lumbar (concavidad), el 21% probable escoliosis torácica, probable 4% 4% **CONCLUSIÓN** escoliosis lumbar vista de los resultados obtenidos mediante la evaluación de posición, parece que hay cambios de curvatura y la desviación lateral de la columna vertebral.

AVALIAÇÃO POSTURAL: ALTERAÇÕES NA COLUNA VERTEBRAL DE ALUNOS DO ENSINO MÉDIO.

INTRODUÇÃO

Segundo Magee (2002), a postura é um composto das posições das diferentes articulações do corpo humano num referido momento, sendo a postura correta à posição na qual um mínimo de estresse é aplicado em cada articulação. Ao realizarmos um estudo sobre a postura corporal dos adolescentes que cursam o ensino médio, temos que considerar a influência que o meio ambiente exerce nas atividades e hábitos desenvolvidos e adotados pelos indivíduos. As salas de aulas das escolas avaliadas seguem os mesmos padrões de organização do inicio do século XX, as cadeiras são enfileiradas, formando de três a quatro filas dentro da sala, com a mesa do professor à frente, próximo ao quadro. A postura da coluna vertebral é influenciada pela rotina dentro das salas de aula. O modelo biomecânico da coluna do homem não foi constituído para permanecer por longos períodos na posição sentada, mantendo posturas estáticas fixas e realizando movimentos repetitivos (SEYMOUR, 1995). Considerando que um adolescente permanece mais de quatro horas do dia dentro das escolas, sentados em cadeiras que ergonomicamente não são projetadas para atender especificidade de cada aluno, mas de uma forma geral possa atender a todos, torna-se importante realizar uma avaliação postural nesta população. **OBJETIVOS:** Avaliar a postura dos alunos do ensino médio, identificar e descrever as principais alterações no alinhamento da coluna vertebral. **METODOLOGIA:** Trata-se de um estudo de diagnostico, descritivo, exploratório. A população determinada para o estudo foi alunos que estavam regularmente matriculadas no ensino médio, em quatro escolas, duas públicas e duas privadas do município de Palmas-TO. A amostra deste trabalho foi composta por 300 alunos, entre treze e dezessete anos. Sendo 150 do sexo masculino e 150 do sexo feminino, os participantes da pesquisa foram escolhidos aleatoriamente. O protocolo utilizado para coleta de dados foi elaborado com base nos estudos de Kendall et al.(1987) e Kanoplich (2003). O aluno foi colocado em posição ortostática no simetógrafo com calcanhares levemente afastados e pés abduzidos cerca de 15 graus, buscando-se as assimetrias nos planos frontal, sagital e transversal. **DISCUSSÃO:** Os dados indicam que ocorre uma incidência de alterações posturais na coluna vertebral da amostra investigada. 4,7% na curvatura cervical (hiperlordose), 11% na curvatura torácica (hipercifose), 18% curvatura lombar (hiperlordose), 21% provável escoliose torácica, 4% provável escoliose lombar 4 % **CONSIDERAÇÕES FINAIS** Diante os resultados obtidos pela avaliação da postura, conclui-se que ocorrem alterações das curvaturas e desvios laterais da Coluna Vertebral.

PUBLICAÇÃO NO FIEP BULLETIN ON-LINE: http://www.fiepbulletin.net/80/a1/206