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TEACHERS' PERCEPTION OF THE INFLUENCE OF FURNITURE ON LEARNING IN MUNICIPAL ELEMENTARY SCHOOLS IN SANTOS

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Summary

This article presents the results of an initial study on ergonomics and health carried out with teaching professionals at a municipal elementary school in Santos. The research shows that the teachers and principal of the evaluated school are aware of the importance of adopting healthy postures in the classroom for the success of the learning process of children and adolescents. Furthermore, research participants cited school furniture as the main factor causing discomfort in the classroom.

Keywords: perception, teaching, teacher, ergonomics.

1. Introduction and objective

Ergonomics in the school environment contributes to ensuring that pedagogical activities do not adversely affect the health and well-being of students (MOTTA; FERNDANDES; CORTEZ, 2011). One of the main points of attention in the school environment is the furniture, as this is where the student spends most of their time. The appearance of body pain in children and adolescents raises the hypothesis that they may be related to inadequate postures and furniture in the school environment. Studies show that school furniture has an influence on performance, safety, comfort, prevention of postural changes, pain and possible onset of pathologies, presenting a direct relationship with student productivity and learning (MOTTA; FERNDANDES; CORTEZ, 2011).

Many children and adolescents are unaware of the impact of poor posture in the classroom on their health, making them susceptible to the creation of postural defects, especially when the school infrastructure does not favor adequate use of its facilities. In this way, educators have a fundamental role not only in teaching good posture habits to students, but also in alerting the school about opportunities for improvements that can be adopted to guarantee a healthy environment for its children and adolescents.

In order to evaluate the suitability of school furniture from the point of view of ergonomics in municipal elementary schools in Santos, a research project called “Ergonomics and health in municipal elementary schools in Santos” was proposed. This article presents part of this research and aims to evaluate the perception of education professionals from 1st to 9th grade regarding the ergonomic conditions of furniture and its influence on classroom learning in a municipal school in Santos.

2. Theoretical Reference

The occurrence of pain and postural problems manifests itself in large proportions in childhood and adolescence (CORREA; PEREIRA; SILVA, 2005; GUNZBURG et al., 1999). The appearance of body pain in children and adolescents who spend several hours a day sitting in a classroom raises the hypothesis that they may be related to inadequate postures and furniture in the school environment. When furniture does not adapt to users' measurements and task activities, it may generate the need for adaptation through a pathogenic posture (PARAIZO; MORAES, 2011).

According to Murphy et al. (2007), the characteristics of school furniture are strongly associated with back and neck pain in school-age children. According to Siivola et al. (2004), back pain and postural problems in young people can have a multifactorial cause, such as, for example, prolonged stay in an inadequate posture while sitting and the use of heavy backpacks and their asymmetrical transportation. Gonçalves (2012) suggests that the incompatibility between the dimensions of furniture and the anthropometric measurements of its users is strongly associated with back and neck pain reported by school-age children, as well as harmful effects at the cognitive level, such as hyperactivity, lack of interest and consequent low performance in learning.

According to Viel and Esnault (2000), it is at school age that children should acquire good posture habits because it is in this age group that they remain seated for long periods. Poor spinal postures when sitting cause back pain, especially in the cervical, gluteal and lumbar regions (PARAIZO; MORAES, 2011 apud CORLETT et al., 1986; MANDAL, 1981). The uninterrupted stay in the sitting position for more than 45 to 50 minutes, associated with reduced physical activity and aggravated by the adoption of inadequate postures, can cause imbalance in the muscles, causing changes in anatomical structures that, in children, are still in the development phase. development (PAULSEN; HENSEN, 1994). Furthermore, they may be subject to inadequate furniture, leading to discomfort and poor posture in an attempt to find relief.

The school environment and its furniture are determining factors for a satisfactory ergonomic environment and are also of great importance in the pedagogical process (MOTTA; FERNANDES; CORTEZ, 2011). Therefore, furniture influences performance, safety, comfort, prevention of postural changes, pain and possible onset of pathologies, presenting a direct relationship with student productivity and learning (MOTTA; FERNANDES; CORTEZ, 2011).

Research into the application of ergonomic concepts in school furniture began a generation of important proposals and contributions to the development of this topic (PASCHOARELLI, 1997). The Brazilian Association of Technical Standards is the entity responsible for standardizing school furniture, expressed in Brazilian Standard 14006 (ABNT, 2003). Among other aspects, NBR 14006 specifies the dimensions of chairs and tables for individual student use, defining eight sets divided by student height ranges.

One of the great challenges of ergonomics is to design or adapt the furniture and school environment to the great morphological diversity of students (Motta, Fernandes, Cortez; 2011). According to the Brazilian Society of Pediatrics, children and adolescents grow an average of 5 to 7 cm per year, which can lead to a difference in height of almost 50 cm between students aged 6 to 14, ages corresponding to elementary school (SBP, 2009).

Studies show that the adoption of a single model of furniture for elementary school students does not meet ergonomic specifications, as the anthropometric standards of these individuals are not compatible with the dimensions of the furniture (MOTTA, FERNANDES, CORTEZ; 2011). Although there are standards in Brazil that regulate the construction and dimensions of school furniture according to anthropometric characteristics, the laws are not complied with and children continue to be exposed to inadequate school environments (REIS, REIS, MORO, 2005). This factor can be observed in several works, where students of different heights and body masses share the same furniture at different times of the day, not receiving the necessary comfort for the time required during activities (MOTTA, FERNANDES, CORTEZ; 2011).

3. Methodology

The study was carried out in the city of Santos (SP) after approval of the research project by the Ethics Committee of the Department of Health, the Department of Education and the Ethics Committee on Research with Human Beings of the Centro Universitário Lusíada (CAAE: 49616015.1.0000.5436).

The procedure used in the research was the distribution of questionnaires to teachers and the director of a municipal elementary school chosen by the Department of Education of the municipality of Santos. The questionnaire for teachers contained 10 questions, 3 questions about the educator and 7 questions related to the research topic (5 multiple choice questions and 2 open questions). The questionnaire for the director contained 14 questions, 2 questions about the director and 12 questions about the research topic (9 multiple-choice questions and 5 open questions).

During the break between classes, the project team visited the teachers' room at the selected school to give a brief explanation of the research and how to complete the questionnaire. Afterwards, the questionnaire was delivered to the teachers and the director along with the Free and Informed Consent Form (TCLE). Upon completion, the documents were delivered to the project team, which stored the questionnaire responses in a database and filed the TCLE.

4. Results

4.1 Characterization of participants

27 teachers from the 1st to 9th grade classes and 1 director of the chosen municipal elementary school participated in the research. Regarding the gender of the teachers, 22 were women, with only 5 men. The length of service of the teachers interviewed ranged from 1 to 36 years, with an average of 18 years of experience. The school director has served in this

position for four years. The majority of teachers interviewed (17) divide their time in the classroom between different grades and only 10 respondents said they were responsible for teaching just one grade.

4.2 Answers to the questionnaire applied to the director

Influence of furniture on student concentration and academic achievement

According to the principal's perception, concentration and academic achievement are greater when students are seated comfortably in the classroom. In general, the director finds the furniture (chair and table) comfortable.

Differentiation of furniture

When asked about classification criteria and/or differentiation of furniture by age, the director stated that there is only one type of table and chair set available at the school and that this furniture is used by students from 1st to 9th grade regardless of their height or age. . The director also mentioned that the school adopts differentiation in furniture only when the student has some type of disability.

Criteria for purchasing and maintaining school furniture

According to the director, the school is not involved in the process of choosing and purchasing school furniture. Tables and chairs are provided by the Department of Education when the school requests the replacement of damaged furniture or when new students enroll. Regarding the maintenance of school furniture, the director mentioned that the school has a specific department to carry out maintenance on school furniture whenever necessary.

Knowledge of standards for school furniture

The director reported that she did not know and did not receive information from the Department of Education about the rules that regulate school furniture.

Suggestions for improving school furniture

When asked about possible improvements to school furniture, the director suggested that there be dimensional differentiation of furniture by age, in order to accommodate the anthropometric differences of students.

4.3 Answers to questionnaires administered to teachers

Influence of furniture and discomfort on student concentration and academic achievement

When asked about the influence of discomfort on student learning, 21 teachers responded that discomfort harms learning.

When asked about school furniture, 21 respondents said that furniture affects students' concentration and achievement. The main reasons they gave to justify their response were:

- The dimensions of the furniture are inadequate for students (9)
- School furniture is uncomfortable (8)
- Furniture is old and/or damaged (2)

According to teachers, the lack of suitability of the furniture for the student leads to the adoption of inappropriate postures, generating discomfort. Discomfort causes a reduction in

the student's concentration, reducing their performance in carrying out activities in the classroom.

School furniture and the discomfort perceived by the student

According to 18 teachers, school furniture is a reason for some discomfort perceived by students. Of this number, 12 believe that both the table and the chair can cause discomfort to the student and 6 said only the chair. The other respondents said that neither the chair nor the table cause discomfort to the student.

Adequacy of school furniture for students

The main reason for students' discomfort cited by teachers was the incompatibility of the dimensions of the school furniture with the students' anthropometry. Of the 27 teachers, 11 consider the dimensions of the table inadequate for the students and 14 consider the dimensions of the chair inadequate for the students. Despite this, 24 of the 27 respondents rated school furniture as good or fair overall.

Suggestions for improving school furniture

When asked about suggestions for improving school furniture, teachers suggested:

- School furniture suited to the student's anthropometry (10)
- More comfortable and upholstered chairs (6)
- More modern and comfortable furniture (1)

5. Discussion

The responses to the questionnaire distributed to the director of a municipal elementary school in Santos showed that the school does not participate in the process of choosing and purchasing school furniture and that it is provided by the Department of Education upon request. The director reported that there is only a single model of school furniture used in all classrooms, with no distinction in dimensions between the different educational grades and height of students from the 1st to the 9th grade of elementary school.

As seen in the theoretical framework, the fact that an elementary school has only one model of school furniture has already been observed in other works (MOTTA, FERNDANDES, CORTEZ; 2011). These studies found that the dimensions of these furniture do not meet the morphological diversity of students, which can vary between 1.10m and 1.63m among students aged 6 to 14 (SBP, 2009).

The school furniture found at the school has dimensions between the red (4) and green (5) ranges stipulated by Brazilian Standard 14006 (NBR 14006) and, therefore, should be used by students with a height between 1.48m and 1.80m.

It was also verified in the responses to the questionnaire that there is a lack of knowledge on the part of the school management about the standards that regulate school furniture. Offering only one model of school furniture contradicts the recommendation of Brazilian Standard 14006 (NBR 14006), which suggests different dimensions of furniture depending on the user's height (ABNT, 2003). Even though she is not familiar with the standards, the director believes that the dimensions of school furniture should be differentiated according to the student's age.

According to the perception of the teachers interviewed, the inadequacy of the dimensions of the tables and chairs for students leads to the adoption of inappropriate postures, causing discomfort to the student. The dimensions of the chair were the most cited in the study as being unsuitable for students.

The research also showed that, according to the teachers' perception, the discomfort generated by the inadequacy of the furniture to the students' morphology has an influence on concentration and learning in the classroom. This finding was also found in the literature, reinforcing that the adoption of incorrect postures and bodily discomfort can interfere with the educational process and also contribute to the emergence of musculoskeletal pathologies (MOTTA, FERNDANDES, CORTEZ; 2011; GONÇALVES; 2012).

Despite the perception of incompatibility between the dimensions of the tables and chairs and the morphology of the students, the majority of teachers classified the school furniture as good or reasonable. It is important to remember that the question about the classification of school furniture was open-ended and may have led respondents to think about aspects other than dimensions, such as the quality of the materials, the appearance of the furniture, the degree of conservation, among others.

6. Conclusion

This article presented the results of an initial study on ergonomics and health carried out with teaching professionals at a municipal elementary school in Santos.

The research showed that the teachers and principal of the evaluated school are aware of the importance of adopting healthy postures in the classroom for the success of the learning process of children and adolescents. Furthermore, research participants cited school furniture as the main factor causing discomfort in the classroom.

In general, according to the perception of teachers from 1st to 9th grade and the principal, the dimensions of the school furniture adopted at the school in question do not match the anthropometric characteristics of the students. This perception can be justified by the fact that the school only has one type of table and chair set for all its students, which contradicts the recommendation of Brazilian Standard 14006 (NBR 14006).

Study limitations

This study only presented the view of teaching professionals on the possible discomforts perceived by students, without evaluating the subject from the students' perspective. In a later phase of this research, we intend to investigate the same questions from the students' point of view.

Another limitation of the study is related to the research sample. Initially, the research group requested the Department of Education for access to at least 4 municipal elementary schools, but the request was denied on the grounds that the school in question had a large enough population to participate in all stages of the research. Therefore, it is not possible to state that the other municipal elementary schools in Santos:

- Have the same limitation of types of chair and table set.
- Do not participate in the process of choosing and purchasing school furniture.
- Have a maintenance department for damaged school furniture.
- Have the same knowledge of the standards that regulate school furniture.

Next steps

In the next stage of this research, measurements of the anthropometric characteristics of students, observation of the postures adopted by students in the classroom and investigation of the perception of discomfort in school furniture from the students' point of view will be carried out. With this, it will be possible to compare the dimensions of the school furniture adopted in this school with the anthropometric characteristics of the students, their constraints in the classroom and their perceptions of discomfort when using school furniture.

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