75 - ERGONOMIC ANALYSIS OF TEACHERS IN SECONDARY EDUCATION OF CLASSROOMS OF A STATE SCHOOL IN SOUTHERN BRAZIL

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1. INTRODUCTION

Although it has experienced a major technological breakthrough in recent years, the Man has not yet been able to invent any machine capable of replacing teachers. However, despite the importance of these professionals in society, it is clear that the teacher's career is not properly recognized and valued.

For many years, teaching has been studied in various ways. The problems range from its origin to the social recognition of the profession. The workers of this area mobilize their physical, cognitive and affective capacities, generating a great effort and request their psychophysiological functions. The teacher broadened his professional practice beyond the classroom, rather than teach, care activities towards the student and the duty to ensure the relationship between community and school are among the roles developed by the teacher.

The International Labour Organization (OIT) described the profession as high risk, considering the second professional category worldwide to carry occupational character of diseases.

Education professionals are exposed to diseases such as mental fatigue, stress, mental overload, causing physical problems, such as irritations and allergies mainly in the skin and the respiratory tract caused by chalk dust, calluses on the vocal cords, muscle overload and the circulatory system caused by excessive holding in the awkward position (long standing or not ergonomic seats) and excessive hours. Another problem that becomes social is the high number of students per class and musculoskeletal problems related to profession (MSDs), plus numerous other related diseases. According to Gonçalves (2009), it is known that many work-related illnesses are linked to the need to meet targets and increase productivity, as a result of the market that does not consider the physical and psychosocial limits worker.

Thus this article is aimed at providing an ergonomic analysis of the work on high school teachers in a Brazilian public institution.

2. LITERATURE REVIEW

2.1 Ergonomic work analysis - AET

Ergonomics is the study of the relationship between man and his work, equipment and environment, and particularly the application of knowledge of anatomy, physiology and psychology in solving problems arising from the relationship (DUTRA, 1999; IIDA, 2005).

The practical goals of ergonomics are safety, satisfaction and well-being. Ergonomics focuses on the man, besides the machine, the environment, information, organization and consequences of work. The unsafe conditions, poor health, discomfort and inefficiency are eliminated when appropriate to the abilities and physical and psychological limitations of man (DUL; WEERDMEESTER, 1995; GRANDJEAN, 1998).

The ergonomic work analysis (AET) is to apply the knowledge of ergonomics to analyze, diagnose and fix a real work situation. Importantly, its applicability is not limited only to the man-machine system. The man-men system, which may involve little or no machine, is also studied. AET is the effective instrument also for discussing working conditions with the focus on analysis of this without bothering to discuss pertinence of the actions of workers with the strategies and objectives of production, but matter with respect to loading conditions, rhythm, penalties, suffering, etc. Can contribute greatly to improve the concrete conditions of work, from the real (LAVILLE, 1977; IIDA, 1997; 2005).

3. METHODOLOGY

This research it is a case study in classrooms of a state school in southern Brazil.

It was applied the methodology of ergonomic work analysis (AET), which aims to assess qualitatively and quantitatively the working conditions of the workplace under study.

Data collection for the research was carried out through the following procedures:

1 Interviews with medical professionals of the college; 2. Direct observation of work environment that teachers are submitted, as noise, light, temperature and ventilation. No measurement was made using apparatus, it was taken into account only the perception of the viewer; 3 Application of a questionnaire with questions seventeen to sixty teachers, corresponding to fourteen percent of total college professionals who directed the analysis of results; 4. Interview with eighteen teachers; 5 Interview with the director of the college; 6 Direct observation during a period of approximately fifty minutes over ten other day and at times also alternating of activities undertaken by teachers; Photographic record 7 desktop.

4. RESULTS AND DISCUSSION

4.1 Characteristics of the population of teachers

Through data analysis, it was concluded that the population of teachers is approximately forty-six percent of women and fifty-four percent of men.

In relation to age of these professionals, as shown in figure 1, 5% have aged 18 to 30 years old, 57% between 31 and 40 years old, 23% between 5 and 41 to 50% over 50 years.

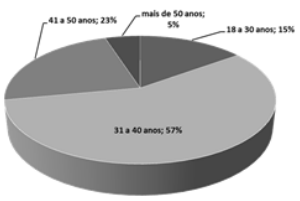

Figure 1 - Distribution of teachers in age

Therefore it can be concluded that the population is basically teachers with a mean age generally between 31 and 40 years. In relation to the physical characteristics of the average height is 1.62m and weight 67 kg.

As shown in Figure 2, the division of teachers' professional time are segmented into three groups, as follows: 20% of teachers are 1-10 years old, 53% are between 10-20 years and 27% have more than 20 years.

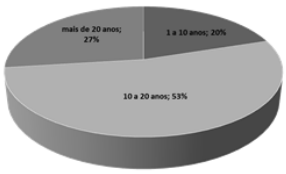

Figure 2 - Distribution of teachers as to length of service

Was noted that 80% of teachers have over ten years of work. Featuring a low turnover rate. When asked about the degree of satisfaction with the service provided, 90% reported to be satisfied.

4.2 Organizational conditions

The teachers' workday was 20 hours per week and can be a maximum of 40 hours per week, and 33% of that time is for planning and correction assessments. Working hours are Monday to Friday during the periods morning, noon and night.

Working hours were 7 am to noon, from 13 am to 17.30 minutes and in the evening of 19 hours to 22.30 minutes.

4.3 Environmental conditions

With regard to the environmental conditions of the school, referring to lighting, temperature, ventilation and sanitation, information was obtained through informal conversations with pedagogues, direction of the college, and interviews with teachers.

Through direct observation, it was found:

Artificial lighting: fluorescent lamps scaled to provide teachers with good visibility.

Noise was found outside noises, since the school is in the center of a big city.

Temperature and ventilation: the college has large windows on the sides in classrooms and through ventilation fans for air circulation in hot weather.

Hygiene: is performed by employees of building maintenance, which performs daily cleaning in the hallways and bathrooms of the school.

4.4 Equipment and furniture

The equipment that makes up the classroom are, blackboard located on the wall of the classroom, TV and some rooms projector. The use of this equipment is part of, day by day, teacher. Therefore the improvement of equipment and an ergonomic design, the job is extremely important, providing more comfort to the teacher in the classroom.

Listed below are the equipment and furniture which are part of the job:

1. Slate 90 cm above the floor, 7 meters long and 1.20 meters high and with a sideboard to put chalk dust and secure.
2. metal chair with seat in wood.
3. rectangular table with 70 cm high from the floor, 1.5 meters long and 40 cm wide.
4. TV of 29 inches for video presentations about 2 meters high.
5. projector placed on the living room ceiling for slideshows, videos and presentations of works. It is positioned approximately 5 meters from the wall where the blackboard.

4.5 Conditions and postural pain

Analyzing the responses of professionals, it concludes that the body part that was most cited the pain was back, as pointed out in Figure 3, with 22 teachers, followed by 15 teachers who reported having headaches. Muscle pain separately ranked third.

First leg, with 12 teachers, arms, with 6 teachers and shoulders, with 4 teachers. But when combined, muscle pain were mentioned by 25 of respondents, amounting to 43% of complaints.

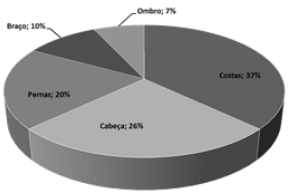

Figure 3 - Percentage of Complaint pains by Professors.

With regard to job stress, 18 teachers denied feel stress. The other 42, which account for almost 70% of respondents said they felt stress for a variety of reasons. Among the most frequently cited reasons are:

students talk in class (cited 2 times);
personal problems (cited 1 time);
tiredness (mentioned 19 times);
frequent charges of direction and teaching staff (mentioned 15 times);
involvement with students' problem (mentioned 2 times);
lack of integration of the parents (cited 1 time);
and feel insignificant (low self-esteem) (cited 1 time).

In total, 67% of respondents feel stressed in the frequency ranging from sometimes, often and always. On the other hand, 33% of respondents say they feel stressed with work, as pointed out in Figure 4.

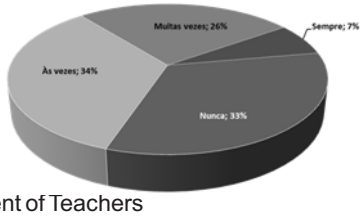

Figure 4 - Stress Frequency Percent of Teachers

Of respondents who said they had headaches, adding 8 teachers, only five said they felt stressed with work. And, according to Jack Barchas, neurochemical Stanford University in the United States, heads of pain may be related to stress (UNESP, 2012).

4.6 Suggestions for improvement

Regarding the ergonomic improvements to be worked, the recommendation in the classroom, is the exchange of the chairs of the teachers for a more comfortable and ergonomically correct model, preferably upholstered. The wooden chair does not favor the ideal posture for the spine, to have the support for the back 90 with respect to support to sit, besides being hard material and uncomfortable to the buttocks. The back support should also be longer, and can also support the neck when necessary. With the exchange of chairs, teachers' tables should be inspected so that the group provide comfort to the teacher. If it does not, the tables should also be replaced. Following the NR-17 recommendations (BRAZIL, 2014), item 17.3.3:

"17.3.3 The seats used in the workplace must meet the following minimum requirements of comfort:
a) height adjustable to workers' structure and the nature of the work performed;
b) characteristics of little or no conformation on the seat base;
c) rounded front edge;
d) back to form lightly tailored to the body to the lower back protection. "

The specific table for the teacher, perhaps because it was considered that the teacher is standing all the time, so the suggestion would be to insert a suitable mobile so he could sit when he felt the need.

In the written question on the blackboard, the best use of overhead decreases the activity with the arm to write on the board, significantly reducing pain in the arm and shoulder.

Another suggestion is to hold meetings which aim to value the teacher and also more meetings with parents to exchange ideas. These can be formal, within the school, as well as make use of dinners, lectures.

Another possibility is also feasible before the start of the activities run workplace exercises to improve your posture during your activity. Propose physical activities only to teachers after class period to improve the relationship because according to most of the answers to the questionnaire on physical activity, 78% responded that they do not practice sports or physical activity.

A motivated worker develops a better job. Charges of management and teaching staff should be made more relaxed forms, so let's look collections, and start to be seen as a common occurrence or need for teamwork.

Another possibility would be to implant assistant professors or assistants. In this case the breaks can be considered a possibility to avoid stress. Furthermore, increased activity hours, during which the teachers have more time to rest and prepare best classes

5. CONCLUSIONS

From the results, it can be said that teachers in the study are distributed homogeneously with respect to gender, average age 40, all with college degrees. The fast pace of activity added to repetitive movements and awkward postures, facilitate the onset of pain. By applying the questionnaire can be detected that the cervical region (neck and cervical spine) and upper limbs are the most affected as pain for the realization of the teaching activity. Followed by the lumbar spine and lower limbs. Environmental conditions, such as poor ventilation and noise conditions become sources of headaches and malaise.

Lack of training and guidance on postural re-education is another aggravating factor, because the application of a bad posture provides the acceleration of appearance of pain.

The study showed that physical activity and an ergonomically correct working environment are fundamental to the development not of pain complaints. Simple measures such as installing computers and projectors in the classroom would minimize the pain of teachers in upper limbs added the stretching practice before starting the workday.

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ERGONOMIC ANALYSIS OF TEACHERS IN SECONDARY EDUCATION OF CLASSROOMS OF A STATE SCHOOL IN SOUTHERN BRAZIL

ABSTRACT

This research presents a case study in a state school in southern Brazil, whose objective was to perform an ergonomic analysis in teachers of a high school. Through the questionnaire and analysis of the activity, it was found that most complaints regarding the pain was related to cervical region (neck and cervical spine) and upper body (shoulders, arms and hands) followed by lumbar spine. Teacher activity provides the appearance of these complaints due to repetitive work, power applications, trunk twisting motions and fast-paced work. The study concluded that the teaching activity, by its operational, organizational characteristics, contributes significantly to the development of musculoskeletal disorders and occupational health in these professionals.

KEYWORDS: Ergonomic Analysis of Work, Teacher, LER, WMSD.

ANALYSE ERGONOMIQUE DU ENSEIGNANTS DANS L'ENSEIGNEMENT SECONDAIRE DE SALLES DE CLASSE DE L'ÉCOLE PUBLIQUE AU SUD DU BRÉSIL

RÉSUMÉ

Cette recherche porte sur une étude de cas dans une école de l'État dans le sud du Brésil, dont l'objectif était d'effectuer une instituteurs ergonomique et haute de travail analyse des conditions. Grâce au questionnaire et l'analyse de l'activité, il a été constaté que la plupart des plaintes concernant la douleur était liée à la région cervicale (cou et du rachis cervical) et le haut du corps (épaules, les bras et les mains), suivie de la colonne lombaire. L'activité de l'enseignant donne l'apparence de ces plaintes en raison de travaux répétitifs, des applications de puissance, les mouvements de torsion du tronc et du travail en évolution rapide. L'étude conclut que l'activité d'enseignement, par ses caractéristiques organisationnelles, opérationnelles, contribue de manière significative au développement de troubles musculo-squelettiques et la santé au travail dans ces professionnels.

MOTS-CLÉS: Analyse ergonomique du travail, Des enseignants, LER, Troubles musculo-squelettiques.

ANÁLISIS ERGONÓMICO DE MAESTROS EN EDUCACIÓN SECUNDARIA DE AULAS DE UNA ESCUELA DEL ESTADO EN EL SUR DE BRASIL

RESUMEN

Esta investigación trata de un estudio de caso en una escuela pública en el sur de Brasil, cuyo objetivo era realizar un maestros de escuela ergonómico y alta condiciones de trabajo de análisis. A través del cuestionario y el análisis de la actividad, se encontró que la mayoría de las quejas relacionadas con el dolor que está relacionada con la región cervical (cuello y la columna cervical) y la parte superior del cuerpo (hombros, brazos y manos), seguido de la columna lumbar. La actividad del profesor ofrece la aparición de estas quejas debido al trabajo repetitivo, aplicaciones de potencia, movimientos de torsión del tronco y el trabajo de ritmo rápido. El estudio concluyó que la actividad docente, por sus características organizativas, operativas, contribuye de manera significativa al desarrollo de trastornos músculo-esqueléticos y la salud ocupacional en estos profesionales.

PALABRAS CLAVE: Análisis Ergonómico del Trabajo, Maestro, LER, DORT.

ANÁLISE ERGONÔMICA DE PROFESSORES EM SALAS DE AULA DO ENSINO MÉDIO DE UM COLÉGIO ESTADUAL NO SUL DO BRASIL

RESUMO

Esta pesquisa aborda um estudo de caso realizado em um colégio estadual no sul do Brasil, cujo objetivo foi realizar uma análise ergonômica e das condições de trabalho de professores do ensino médio. Por meio da aplicação do questionário e análise da atividade, detectou-se que as maiores queixas com relação às dores são referentes à região cervical (pescoço e coluna cervical) e membros superiores (ombros, braços e mãos) seguido da coluna lombar. A atividade de professor propicia a aparição destas queixas devido ao trabalho repetitivo, aplicações de força, movimentos de torção de tronco e ritmo acelerado de trabalho. O estudo concluiu que a atividade de professor, por suas características operacionais, organizacionais, contribui significativamente para o desenvolvimento de distúrbios osteomusculares e de saúde ocupacional nestes profissionais.

PALAVRAS-CHAVE: Análise Ergonômica do Trabalho, Professores, LER, DORT.