SEATING POSTURE: A SELF-INSTRUCTIONAL PROGRAM FOR EDUCATORS

Patrícia de Paula Leite Raymundo[1]
Alberto De Vitta[2]
José Carlos Plácido da Silva[3]

[1]*Physical therapist, University of the Sacred Heart(USC), Bauru, São Paulo, Brazil*

[2]*Program of Physical Therapy. Graduated program in Collective Healt. University of the Sacred Heart, Bauru-SP*

[3]*Department of Industrial Design, FAAC, Universidade Estadual Paulista (UNESP), Bauru, São Paulo, Brasil*

Received on: August 7, 2003
Accepted on: March 17, 2004

RAYMUNDO, Patrícia de Paula Leite et al. Seatting posture: a self instructional program for educators. *Salusvita*, Bauru, v. 22, n. 3, p. 415-424, 2004.

ABSTRACT

This study has the objective to evaluate the effects of a self-educational program about knowledge related to the sitting posture for teachers who work with children in the first grade of primary schools, including state, municipal, and private schools in Bauru, São Paulo. To achieve the proposed objective the previous teachers´ knowledge concerning this subject was evaluated, next, the self-tutelage program about posture was applied, and afterwards, the examination of the effects of the manual enclosing identification and management of the critical aspects and another evaluation of teachers´ knowledge about the sitting posture were performed. Descriptive statistic analysis was made, and also some nonparametric tests (X^2 de McNemar and Qui-square for a sample) and correlation test (Spearman). The results showed that: 1. main problems identified by the teachers were referred to the furniture and to the posture habits; 2. actions taken were related to the posture habits and body movement; 3. a direct relationship between the number of read parts of the manual and the number of correct answers occurred; 4. meaningful statistical changes in the answers about the knowledge related to the seating posture have also occurred, in the previous and most tests, as the number of the correct answers increased. The self-tutelage program applied in

this project is an efficient instrument to raise awareness about the problem and it seems to represent a positive and investigative element for the searching and implementation of solutions.

KEY WORDS: sitting posture; educational program; teachers; prevention

RAYMUNDO, Patrícia de Paula Leite et al.Seatting posture: a self instructional program for educators. *Salusvita*, Bauru, v. 22, n. 3, p. 415-424, 2003.

INTRODUCTION

In Brazil, according to the year 2000 School Census, there are 345.527 schools being 221.852 for elementary, and high school and for young and adult education that are in a privileged age for the formation of positive values and habits regarding health. Out of the 181,504 elementary schools, 163,368 belong to the public education network. The same applies for the high school education – out of 19,456 schools, 13,227 are public ones – and for young and adult education – out of the 20,892 in this area, 18,983 are public. Therefore, an action directed towards the public education system will be stretched according to the geographical and populational point of view. In the year 2000, there were 35.717.948 enrolments in the elementary level, 8.192.948 in the high school and 3.140.830 in the young and adult education area. This population demands educative actions in health and deserves integrated and adhered actions in order to attain success and impact (MINISTÉRIO DA SAÚDE, 2002).

According to the Law for Directives and Basis for Education (MISKIER, 1997), all children should complete the elementary school, that is, all students should be using the seating posture for as average of 8 years. Besides that, presently most children use a considerable part of their time in sedentary tasks in seating posture during their daily life, such as watching TV, playing video games, home-work, language classes, computers, etc.

The seating posture, when wrongly done for long periods, generates several alterations in the muscle-skeletical structures in many body regions. The simple act of moving from standing to seating posture increases in 35% the internal pressure in the nucleus of the lumbar inter-vertebral disk and, furthermore, all the structures in the posterior aspect (ligaments, small joints and nerves) are stretched – this is the case of an individual that is seated in the best possible condition. Besides lumbar problems, long standing seated posture tends to reduce return circulation in the lower limbs leading to edema in feet and ankle and also promotes discomfort in the neck and upper limbs (RODGHER et al., 1996).

In case the seated individual adopts incorrect postures for a long period the alterations become potentialized and the intra-disk pressure increases beyond 70%. This fact may predispose the individual to greater risks of overall discomfort such as pain, weight sensation and formication in many parts of the body and, mainly, degenerative processes such as disk hernia (COURY, 1994).

Incorrect postural habits – anterior flexion of the trunk, lack of lumbar and forearm support – adopted since the elementary school are situations of concern since they are children and not adults, that is, the skeleton is still in formation and more prone to deformation and, furthermore, the muscle-skeletical structure is more sensible to loads. Therefore, the alterations (biomechanically incorrect postures) is a factor that can create potential conditions of significant hazard to the muscle-skeletical system in school children, particularly in what refers the structures that constitute the vertebral backbone.

To minimize the adverse effect of seating posture on the muscle-skeletical structures it is important to plan and/or to re-plan the physical environment with use of adjustable furniture for the intended task according to individual antropometric measures and the stimulate programs for preventive training.

According to Stamers and Patrick (1975) training is the systematic development of a model of behavior abilities – attitudes and knowledge – necessary to promote modifications in the knowledge and behavior of individuals towards their habits and their health.

There are many educational resources available to those that aim to actuate in the promotion of health and in the global aspect of individual's quality life. Among them there are the auto-instructional programs. There is no need for constant tutoring of a teacher since they are applied by the person itself, who has the opportunity to keeep track of the progress in his/her own rhythm and interest. They can do this starting from a material programmed by specialists and presented aiming to promote modifications in his/her behavior. Depending on the way this material is organized and presented, such programs can contribute to a comprehensive and detailed knowledge on the targeted problems and may act as a positive promoter in the search and implementation of solutions.

In what concerns the school environment, mainly in the initial series, it is quite clear the role of teachers in transmitting ideas and values. For that reason, it represents a significant role in the life of children, including those related to health. In this connection, teachers should have a deep understanding about health and need to have access to information on difference field of knowledge in order

to develop contents related to the study of human growth and development in the different stages of life, body function, nutrition, general notions of hygiene and they should also be able to identify and to control the critical aspects of the school ambient such as postural habits, furniture and movements (OLIVEIRA, 1996; BRASIL, 1997).

An important point regarding the educational aspect is that the first years of school life is the best moment to start prevention of muscle-skeletical problems, while children are still in the stage of growth, which makes the preventive work more efficient.

Taking into consideration the above, the aim of this study is to evaluate the effects of an auto-instructional program on knowledge related to seating posture among teacher of the 1st series of the 1st grade in public (state and municipal) and private schools in Bauru, São Paulo.

MATERIALS AND METHODS

The sample included 43 teachers selected by convenience process from the 1st series of the elementery level in state (22 teachers), municipal (12 teachers) and private (9) schools in Bauru, São Paulo. They were informed about the purpose and the stages of the study and accepted to participate signing an agreement term. The participation criteria included teachers of the 1st series of the elementery level that have not participate in similar programs and that have no duties, cumulatively, for orientation of school assistance actions (that includes multiplication of health orientation).

Initially, data was collected, by means of a questionnaire, referring to the characterization of the population (age, gender, marital status and level of formal education) and knowledge on seating posture. The questionnaire was applied at the beginning to the education program in separated session in the schools, in days and hours scheduled not to interfere with the school activities. Deadline for sending back questionnaires was one week.

On the day the completed questionnaires arrived it was applied an auto-instructional educational program composed by a "Auto-instructional Manual on Seating Posture" as proposed by Coury (1994). This material provided information and procedures regarding the following aspects: mechanical constitution of the backbone; risk situation present at school and in daily; how to evaluate postural habits, furniture and movements of school children; how to implement modification in the habits and in the environment aiming to avert theses consequences.

To motivate teachers to read the manual it was furnished, preferably in individual sessions, information on the objectives of the manual, its format, the content and how to read it; statistics on diseases related to children's backbone and the importance of educators to identify and control critical aspects of the school ambient. There was also in the manual an explanatory text and how to use it.

Following that, they were informed that they would have 45 days to read the manual. After that, following the same pre-test protocol, teachers were visited for application of questionnaire 2. This one aimed to evaluate the utilization of the manual through questions connected to the read parts (question 1), intelligibility and size of the text (question 2), the type of support the manual could offer (questions 3, 4, and 5), identification of critical aspects in the school environment (questions 6 and 7), adoption or not (and reason) of the measures suggested in the manual and type of measures adopted and not adopted (questions 8, 9 and 10), besides the re-evaluation of knowledge related to sitting posture after the use of the manual (questions 11 through 25), identical to the pre-test.

To analyze data related to the knowledge on sitting posture it was considered, for each question, the answers in the pre and pos test aiming to show the modification in relation to the previous knowledge on the subject. For that it was used the McNemar X^2 test in the evaluation of the concordances (SIEGEL; CASTELLAN JR., 1988). The questions related to the reading, type of support the individuals believed the manual offered, identification of critical aspects of the school ambient, adoption or not (and why) of measures were analyzed by descriptive statistics of the percentage of answers of individuals of each pertinent question (BEIGUELMAN, 1988).

The measures of association between number of correct answers on the knowledge related to seating posture to the number of read parts of the manual were analyzed by the coefficient of correlation of Spearman (SIEGEM; CASTELLAN JR., 1988) and the frequencies of modification in the report of problems found and the measures adopted were analyzed by the Chi-square test for one sample (SIEGEL; CASTELLAN JR., 1988).

RESULTS

Regarding the main support the manual could offer, 93% answered that it was related to the knowledge that could intervene in the postural habits. On the identification of problems in the school ambient, it was reported that the main problems regarded the furniture (97.7%) and postural habits (88.4%).

It was also observed that 39 teachers (90.7%) had taken some sort of measure suggested by the manual, most of them related to postural habits (83.7%) and movement (60.5%).

TABLE 1 - Distribution of frequencies of modification in the reported problems and measures adopted and the result of Chi-square test for one sample.

Report problems	Measures adopted			
	Yes	No	X^2	p
Furniture	14	24	2.63	p > 0.05
Postural habits	35	7	18.67	p < 0.001*
Body movement	20	5	9.00	p < 0.01*

* Significant

In TABLE 1, it is possible to see that results with statistical significance were found in the answers related to the postural habits and body movement.

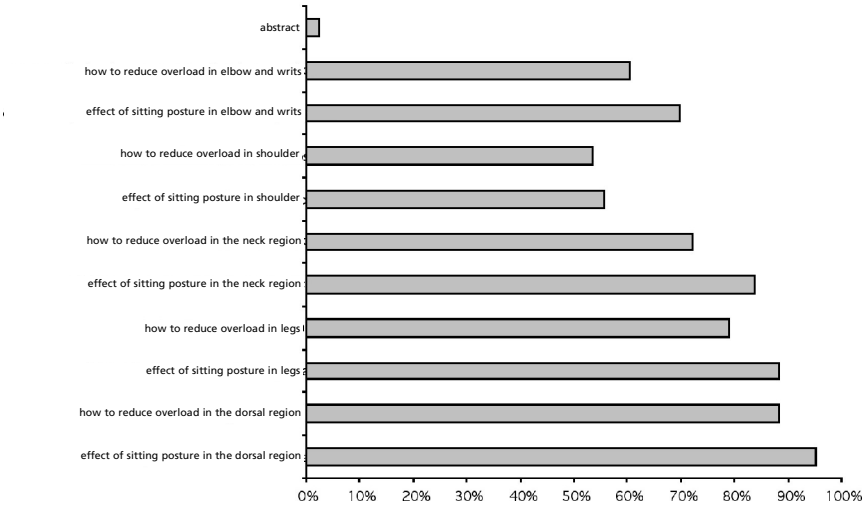

FIGURE 1 - Percentage of individuals that read each part of the manual

FIGURE 1 shows that teachers have read most of the parts of the manual.

In FIGURE 2 it can be seen that there was a direct relation between the number of parts read and the number of correct answers, that is, the individuals that read most of the parts of the manual had the great number of correct answers.

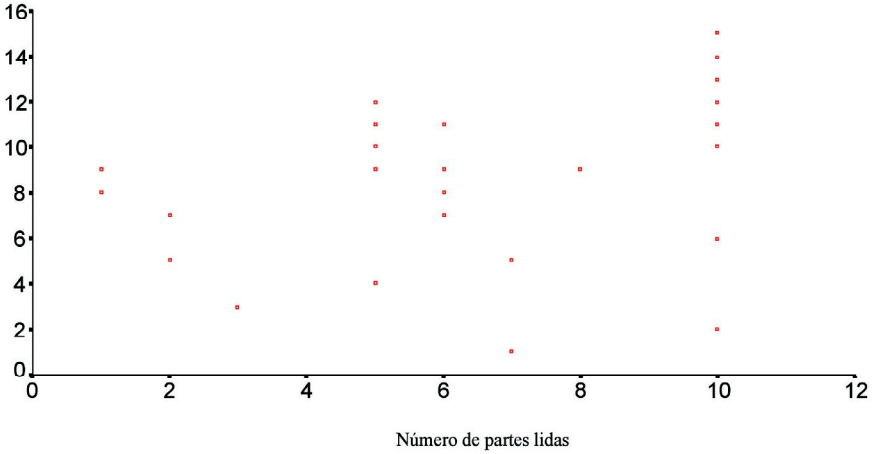

FIGURE 2 - Result of the test of point (o) correlation between the number of read parts and the number of connect answers on posture seatting

In TABLE 2, it can be observed that in questions 6, 7, 8, 9 and 13, there were modification with statistical significance in the answers obtained in the pre and in the post test in terms of an increase in correct answers.

TABLE 2 - Relative frequencies for modification of answers in the pre and post test according to the teachers and the result of the McNemar Chi-square test.

Question	Pre and post test answers				p
	C/C	C/W	W/C	W/W	
Q1	30	2	6	5	p> 0.05
Q2	31	4	5	3	p> 0.05
Q3	20	4	5	3	p> 0.05
Q4	18	4	10	11	p> 0.05
Q5	28	1	5	9	p> 0.05
Q6	11	4	13	15	p< 0.05*
Q7	5	1	21	16	p< 0.05*
Q8	9	1	22	11	p< 0.05*
Q9	4	0	21	18	p< 0.05*
Q10	23	6	9	5	p> 0.05
Q11	11	3	6	23	p> 0.05
Q12	28	3	8	4	p> 0.05
Q13	5	4	13	21	p< 0.05*
Q14	6	3	8	26	p> 0.05
Q15	11	5	10	17	p> 0.05

* Significant C = correct answer W = wrong answer

DISCUSSION

By analyzing the results regarding the type of problems and the measures adopted it was observed that teachers had intervened in the aspects related to the postural habits and body movement whereas in those related to furniture there were no significant alterations. The late can be due to practical and structural causes, that is, public schools do not have adjustable furniture (tables and chairs). Thus, these are initiatives that do not rely only on teacher's will.

Basso et al. (2000) report that the main constraints that influence individuals in not adopting modification in the physical condition of the ambient (furniture, equipments, etc) are economical, lack of structural conditions (non adjustable furniture and equipments) and the non participative managers.

The presence of significant results regarding postural habits and body movement may be explained by the fact that these interventions depend solely on the interest, competence and decision of teachers into put them in practice.

In brief, the results of the present study confirm those of the literature, showing that a program of this sort should be necessarily conducted with effective material and functional support from the various levels of organization, otherwise the results may be partial.

Results also indicate that teachers read the items related to possible effects of seated posture in the dorsum and how to reduce overload in the dorsum for the most part. Coury (1994) reports that all participants in the study read the item related to the effect of seated posture in the dorsum. This author presents two probable reasons for this. First, it could be due to the fact that this topic is the one that appears first in the manual, which could have contributed to a greater rate of reading. Secondly, the vast majority of population shows pain in this region and, also, the subject is frequently mentioned in midia and being more familiar could have enhanced the interest for further information.

In the analyzis of data related to the read parts and the number of correct answers it was seen that there was an association among the variables. It was also verified that the questions that mostly induced significant modification were those related to topic read by teachers.

Auto-instructional programs have been used in the areas of medicine and occupational health but there lack studies published in the area of school health (ARAÙZ et al., 2001;THERON, 1999; LOVATO; RYBAZ, 1995; COURY, 1994).

In conclusion, it can be said that the auto-instructional program used in the present study is an efficient instrument to increa-

se knowledge and awareness on the focused problem and it may represent a positive investigation element in the search and implementation of solutions.

The considerations made in the first part of this paper, regarding advantages of preventive actions in health, on the role of school and teachers as instruments of health promotion, on the need for new alternatives to reduce the adverse effects of sitting posture and on the importance of training monitors to optimize the transfer of information on the risk situation in the school environment indicate that the elementary school and mainly teachers of these school level are the right persons to promote preventive programs related to muscle-skeletic problems because their daily contact with students establishes an important link to implement a work of this nature.

In the area of health education the information provided by this study may offer some contribution to plan measures aiming the maintenance, improvement and promotion of physical welfare of students. In this connection it is identified the need for preventive programs with varied educational, organizational and ergonomic methodologies on various risk factors in the school and family daily-life.

Acknoledgement: to FAPESP (Fundação de Amparo à Pesquisa do Estado de São Paulo), for the support provided.

BIBLIOGRAPHIC REFERENCES

1. BASSO, A. C. et al. Análise de um programa de ensino de auto-cuidado postural para indivíduos que trabalham sentados. *Salusvita*, v. 19, n. 1, p. 19-29, 2000.

2. BEIGUELMAN, B. Curso prático de bioestatística. *Revista Brasileira de Genética*, 1988. 224p.

3. COURY, H. J. C. *Programa auto-instrucional para o controle de desconfortos posturais em indivíduos que trabalham sentados*. Campinas, 1994. Tese - Faculdade de Educação, Universidade Estadual de Campinas, 1994.

4. MINISTÉRIO DA SAÚDE. SECRETÁRIA DE POLÍTICOS DE SAÚDE. A promoção da saúde no contexto escolar. *Revista de Saúde Publica*, v. 36, n. 4, p. 533-53, agosto, 2002.

5. NISKIER, A. *LDB: a nova lei da educação*. Rio de Janeiro: Consultor, 1997.

6. OLIVEIRA, R. J. P. *Postura de crianças em sala de aula: um estudo diagnóstico*. São Carlos, 1996. Dissertação – Programa de Pós-Graduação em Educação, Universidade Federal de São Carlos, 1996.

7. RODGHER, S. et al. Controle de desconfortos posturais em indivíduos que trabalham sentados: avaliação da eficácia de um programa audio-visual. *Revista Brasileira de Fisioterapia,* v. 1, n. 1, p. 21-27, 1996.

8. SIEGEL, S., CASTELLAN JR, N. J. Nonparametric statistic for the behavioral sciences, 2. Ed. New York: Mc Graw – Hill, 1988. 312p.

9. STAMMERS, R., PATRICK, J. *The psychology of training*. Londres: Methuen, 1975.

RAYMUNDO, Patrícia de Paula Leite et al.Seatting posture: a self instructional program for educators. *Salusvita*, Bauru, v. 22, n. 3, p. 415-424, 2003.