

Musculoskeletal symptoms and stress do not alter the quality of life of basic education teachers

Sintomas osteomusculares e estresse não alteram a qualidade de vida de professores da educação básica

Síntomas osteomusculares y estrés no alteran la calidad de vida de los profesores de la educación básica

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ABSTRACT | This study assessed the prevalence of musculoskeletal symptoms, level of stress and quality of life of basic education teachers. The sample was composed of 298 teachers (265 women and 33 men) of early childhood and elementary education from Caçador, Santa Catarina, Brazil. Musculoskeletal symptoms (Nordic Musculoskeletal Questionnaire), level of stress (Lipp's Stress Symptoms Inventory) and quality of life (WHOQOL-bref Questionnaire) were evaluated. Forty-eight percent (48%) of the teachers presented musculoskeletal symptoms and 65% were absent from daily activities. Forty-two percent (42%) of the teachers presented some level of stress, mainly at the stage of resistance (73%) and near exhaustion (19%). Psychological symptoms predominated over physical symptoms ($p < 0.05$). The average scores of the Physical (57.1) and Environmental (58.2) domains were significantly lower ($p < 0.001$) than Psychological (63.8) and Social Relations domains (71.2). The score of 62.6 regarding the general quality of life qualified teachers as satisfied with their quality of life. In conclusion, the high prevalence of musculoskeletal symptoms and stress does not alter the quality of life of basic education teachers.

Keywords | Teachers; Basic Education; Musculoskeletal Symptoms; Stress; Quality of life.

RESUMO | Este estudo avaliou a prevalência de sintomas osteomusculares, nível de estresse e qualidade de vida de professores do ensino básico. A amostra foi composta de 298 professores (265 mulheres e 33 homens) da educação infantil e fundamental do município de Caçador, Santa Catarina. Foram avaliados sintomas osteomusculares (Questionário Nórdico de Sintomas Osteomusculares), nível de estresse (Questionário dos Sintomas de Estresse de Lipp) e a qualidade de vida (Questionário WHOQOL-bref). Apresentaram sintomas osteomusculares 48% dos professores e 65% se afastaram das atividades diárias. Manifestaram algum nível de estresse 42% dos professores, principalmente na fase de resistência (73%) e quase-exaustão (19%). Os sintomas psicológicos predominaram sobre os físicos ($p < 0,05$). Os escores médios dos domínios Físico (57,1) e Meio Ambiente (58,2) foram significativamente menores ($p < 0,001$) que os domínios Psicológico (63,8) e Relações Sociais (71,2). O escore da qualidade de vida geral de 62,6 pontos classificou os professores como satisfeitos com a sua qualidade de vida. Em conclusão, a alta prevalência de sintomas osteomusculares e de estresse não altera a qualidade de vida de professores do ensino básico.

Descritores | Docentes; Ensino Fundamental e Médio; Transtornos Traumáticos Cumulativos; Qualidade de Vida.

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RESUMEN | Este estudio evaluó la prevalencia de los síntomas osteomusculares, el nivel de estrés y la calidad de vida de profesores de la enseñanza básica. La muestra fue compuesta de 298 profesores (265 mujeres y 33 hombres) de la educación infantil y primaria del municipio de Caçador, Santa Catarina. Fueron evaluados los síntomas osteomusculares (Cuestionario Nórdico de Síntomas Osteomusculares), el nivel de estrés (Cuestionario de los Síntomas de Estrese de Lipp) y la calidad de vida (Cuestionario WHOQOL-bref). Presentaron síntomas osteomusculares el 48% de los profesores y el 65% se alejaron de las actividades diarias. Manifestaron algún nivel de estrés el 42% de los profesores, principalmente en la etapa

de resistencia (el 73%) y casi-agotamiento (el 19%). Los síntomas psicológicos predominaron sobre los físicos ($p < 0,05$). Los puntajes promedios de los dominios Físico (57,1) y Medioambiente (58,2) fueron significativamente menores ($p < 0,001$) que los dominios Psicológico (63,8) y Relaciones Sociales (71,2). El puntaje de la calidad de vida general de 62,6 puntos clasificó a los profesores como satisfechos con su calidad de vida. En conclusión, la alta prevalencia de los síntomas osteomusculares y de estrés no altera la calidad de vida de los profesores de la enseñanza básica.

Palabras clave | Docentes; Educación Primaria y Secundaria; Transtornos de Traumas Acumulados; Calidad de Vida.

INTRODUCTION

Today, the role of the teacher exceeded the mediation of the student's knowledge process, expanding the mission of this professional beyond the classroom, with extracurricular and out-of-class activities, to ensure a link between school and community¹. In addition to teaching, the teacher must prepare lessons, evaluate students' assignments, attend the school planning and management, be a member of various committees of the school and of the community, which means more dedication and, consequently, physical wear and mental distress².

With these new demands, many teachers have to be absent from work activities due to health problems, causing high economic cost to institutions and social security, reorganization of institutions to replace teachers, and new hires³.

Musculoskeletal problems and stress are some of the many factors that affect teachers' health and quality of life. The disorders resulting from the musculoskeletal system can lead to the appearance of various signs, such as pain and functional incapacity, causing absence from work activities⁴. When excessive, stress can cause depression, psychological and physical exhaustion, and psychosomatic diseases⁵.

In basic education, the quality of teaching is related to a qualified and motivated faculty⁶, therefore, it is essential to improve working conditions and avoid risk factors that negatively influence teachers' quality of life. Most studies on musculoskeletal symptoms, stress and quality of life have focused on professors of higher education and health institutions; however, there is a lack of research on primary education teachers, mainly

in the State of Santa Catarina, located in the southern region of Brazil.

A study conducted by our group with physical education teachers working in basic education showed that high stress levels did not change the quality of life of these professionals⁷. However, it is not known if teachers with different backgrounds and working in basic education will reproduce the same findings.

For more information on the physical and mental conditions of basic education teachers and subsidies to elaborate policies of health promotion and quality of life in teaching, this study aimed to evaluate musculoskeletal symptoms, stress and quality of life of teachers of early-childhood and elementary education. Our hypothesis is that teachers present high levels of musculoskeletal symptoms and stress and that their perception on quality of life is satisfactory.

METHODOLOGY

Sample

Sample calculation was carried out from the proposal by Rodrigues⁸ and based on data provided by the Municipal Secretary of Education of Caçador, SC, Brazil, with 700 teachers, considering a 5% error and a 50% p . Through sample calculation, a value of 196 teachers was obtained; however, the availability of teachers has enabled a total sample of 298 volunteer teachers of early-childhood and elementary education. A total of 24 early-childhood and elementary schools of the city of Caçador were evaluated. All the volunteers signed an informed consent form, and the research

was approved by the Research Ethics Committee of Universidade Alto Vale do Rio Peixe (Uniarp).

Research design

An authorization was requested from the Secretary of Education of the city to the accomplishment of the research. Then, there was a meeting with all the principals of the 24 schools to inform about the research procedures and schedules for the researchers to move to the data collection sites.

In schools, teachers' assessments were carried out in a classroom reserved, determined by the principal of the school. First, teachers were informed about the research procedures. Only teachers who signed an informed consent form participated in the research, and those who did not participate (402 teachers) returned to the classrooms. All the assessments were performed in October, November and early December 2015, in morning and evening periods, during classes.

Prior to the application of questionnaires to the teachers, the researchers met and received training for the tools, to eliminate possible biases and confusion in the interpretation of the questions. The application of all questionnaires was made when the teachers were assembled in the evaluation room. The questionnaires were presented in the following order: (1) Socio-economic Survey; (2) Nordic Musculoskeletal Questionnaire (NMQ); (3) Lipp's Stress Symptoms Inventory (LSSI); and (4) Questionnaire of Quality of Life (WHOQOL-bref).

Socio-economic assessment

Socio-economic assessment was made with a questionnaire composed of six questions relating to sex, age, specific training, educational level and family total income (which encompassed only children and spouse who resided in the teacher's house), in accordance with the procedures described by Bjorner and Olsen⁹.

Evaluation of musculoskeletal symptoms

To evaluate the musculoskeletal symptoms, we used the Nordic Musculoskeletal Questionnaire (NMQ), adapted culturally to the Portuguese language by Barros and Alexandre¹⁰. It consists of a human figure divided into nine anatomical regions. The respondent must report the occurrence of symptoms considering the

twelve months and seven days preceding the interview, as well as the occurrence of absence from daily activities in the last year¹¹.

Evaluation of stress level

Stress level was assessed by Lipp's Stress Symptoms Inventory (LSSI)¹². LSSQ is an instrument that aims to objectively identify the stress symptoms presented by the patient by evaluating the type of symptoms (somatic or psychological) and stress phase in which the patient lies. It consists of three charts, with a total of 37 items on stress symptoms of somatic nature, and 19 items of psychological nature. The instrument is answered from the report of the symptoms presented in the last 24 hours, in the last week, and in the last month.

Evaluation of quality of life

To assess the quality of life, the WHOQOL-bref Questionnaire (World Health Organization Quality of Life) proposed by Fleck et al¹³. was used, consisting of 26 questions, two of general satisfaction with health and quality of life and other 24 corresponding to four domains (physical, psychological, social relations, and environmental). Physical domain refers to information about pain and discomfort, fatigue and energy, mobility, need for medical assistance etc. Psychological domain concerns affection, memory, concentration, self-esteem, body image and appearance. Social domain investigates interpersonal relationships and social support networks. Environmental domain deals with issues related to physical security and protection, financial resources, transportation, housing, among others.

The results of the raw scores for each facet were transformed into a score ranging from zero to 100. This transformation of a raw score to a transformed one made it possible to express the scale score in percentage between the lowest possible value (0) and the highest possible value (100) of classification of quality of life according to the WHOQOL-bref manual. Values from zero to 20 were classified as very unsatisfied, 21 to 40, unsatisfied, 41 to 60, neither unsatisfied nor satisfied, 61 to 80, satisfied, and 81 to 100 very satisfied. In addition, in the scale used from zero to 100, the closer the teachers' average score is to 100, the more satisfied or positive is the perception of the general quality of life (general QOL).

Statistical analysis

Initially, the descriptive analysis of the data was held and the results were presented with mean, standard deviation (SD) and percentage. To determine the parametric or non-parametric statistics, the normality of the data was verified with the Shapiro-Wilk test and the Levene test to analyze the homogeneity of the variables.

For comparisons between two variables we used the Mann-Whitney test for unpaired samples and analysis of variance (Anova) for multiple comparisons. When a significant effect was detected, *post hoc* analysis was performed using Tukey's test. The significance level adopted was $p < 0.05$.

The statistical model adopted by WHOQOL-bref was used to analyze the results of the quality of life of teachers according to the method and results of focus groups in Brazil¹⁴. All analyses were performed with GraphPad Prism[®] statistical package, version 6.0.

RESULTS

The socioeconomic characteristic (Table 1) of basic education teachers showed that 89% of the faculty were women, and in the variable age, the highest percentage in the female sex varied from 30 to 39 years old, and in the male, from 40 to 49 years old. Most of the teachers had undergraduate degree in Pedagogy, 44% had specialization, and only 2% had a master's degree. The total family income was above five minimum wages in 55% of the teachers.

Regarding musculoskeletal symptoms (Table 2), 48% of the teachers presented musculoskeletal problems in the last 12 months. The most prevalent regions were knees (67%), ankle/feet (61%), and neck (57%). Sixty-five percent (65%) of the teachers were absent in the last 12 months from daily activities due to musculoskeletal problems. In the 7 days preceding the questionnaire, 66% of the teachers presented some type of musculoskeletal symptom.

Forty-two percent (42%) of the teachers presented some level of stress (Table 3). Regarding intensity of problem manifestation, most teachers were in the resistance (73%) and near exhaustion (19%) phases, with predominance of psychological symptoms over physical symptoms (52% vs. 44%, respectively, $p < 0.05$).

The scores for each domain and the general quality of life (QOL) of teachers (Table 4) showed the highest

scores were in the Social Relationships (71.2) and Psychological (63.8) domains, and the lowest scores were in the Physical (57.1) and Environmental (58.2) domains. When comparing the domains with the best score and the lowest score (Social Relations/Psychological vs. Physical/Environmental), there was a significant difference ($p < 0.001$). On the other hand, when domains of lower scores (Physical vs. Environmental) and domains of higher scores (Social vs. Psychological) were compared, only the domains with the highest score showed significant difference ($p < 0.001$).

The general score of the perception of teachers' quality of life was 62.6, classifying them as satisfied with their quality of life.

Table 1. Socioeconomic characteristics of basic education teachers

	N	%
Gênero		
Male	33	11,1
Female	265	88,9
Age		
Male		
20-29 years	11	33,3
30-39 years	7	21,2
40-49 years	13	39,3
50 years or over	2	6,2
Female		
20-29 years	66	25,4
30-39 years	99	38,1
40-49 years	74	28,4
50 years or over	21	8,1
Academic background		
Pedagogy	200	67,0
Languages	17	7,0
Mathematics	12	4,0
Geography	10	3,4
Biological Sciences	13	4,4
History	9	3,1
Visual Arts	16	5,4
Physical Education	21	7,0
Education level		
Undergraduate education	161	54,0
Specialization	132	44,3
Master's degree	5	1,7
Household income (BRL)		
<2.640,00	18	6,0
2.640,00-4.400,00	117	39,4
4.400,00 or more	163	54,6

Table 2. Prevalence of musculoskeletal symptoms and functional impairment in basic education teachers

Anatomical Region	Symptoms in the last 12 months (%)	Unable to perform activities in the last 12 months (%)	Symptoms in the last 7 days (%)
Neck	57,0	86,9	72,5
Shoulders	53,3	81,5	70,8
Upper back	52,6	80,8	71,4
Elbows	12,7	2,6	4,70
Wrists/hands	54,3	81,5	73,1
Lower back	50,0	78,5	69,8
Hips/thighs	19,4	6,7	9,7
Knees	67,1	81,8	73,2
Ankle/Foot	65,1	86,2	78,8
Mean±SD	48,0±19,0	65,1±34,4	58,2±29,0

Table 3. Frequency, phase and symptoms of stress of the sample of basic education teachers

	N	%
Stress		
Yes	124	41,6
No	174	58,3
Phase		
Alert	8	6,0
Resistance	98	73,1
Near exhaustion	26	19,4
Exhaustion	2	1,5
Symptoms		
Physical	-	44,2
Psychological	-	52,0*

*p<0.05 compared with the physical symptoms

Table 4. Perception of the quality of life in every domain of the WHOQOL-bref and general quality of life (QOL) of basic education teachers

DOMAINS	MEAN	SD
Physical	57,1	9,5
Psychological	63,8*	12,3
Social relationships	71,2 ^{ab}	16,4
Environment	58,2 ^a	13,8
General QOL	62,6	10,6

*p<0.001 compared to Physical and Environment domains; ^ap<0.001 comparison between physical and environment domains; ^bp<0.001 comparison between psychological and social relationships domains.

DISCUSSION

The characteristics of the sample of this research showed that most teachers were women, had an undergraduate degree in Pedagogy and family total income over five minimum wages (Table 1). These results are in agreement with other studies that evaluated basic education teachers, confirming that the school is a workspace with female predominance¹⁵⁻¹⁸.

In the past 12 months, 48% of the teachers presented musculoskeletal symptoms (Table 2). Our findings corroborate with other research on basic education teachers, which showed high prevalence of musculoskeletal symptoms in teachers, ranging from 40% to 95%¹⁸⁻²³.

The parts of the body most affected by musculoskeletal symptoms were the knees, ankles and/or feet, neck, wrists/hands and back (Table 2). Our results present a similarity with previous research in which the main musculoskeletal problems found in teachers are located in regions such as the back, neck, shoulders, wrists/hands, ankles and/or feet^{17,20,21,24}. According to Shuai et al.⁴, the characteristics of the teaching work, such as long time sat on tables and standing to write, frequent and prolonged reading sessions, preparing lessons and typing on the computer, associated with the biomechanical factors present in the activity of repetitive requirements and developed in ergonomically inadequate designed environments, result in musculoskeletal changes. Individual characteristics, lifestyle and working conditions are also factors that can explain the appearance of the medical condition abovementioned in teachers²⁵.

The percentage of absents due to musculoskeletal problems, mainly in the neck, ankles and/or foot, knees, shoulders and upper back was high in the teachers evaluated in this study (Table 2). Other studies have also found a high prevalence of absences due to musculoskeletal symptoms located in the same regions highlighted in this survey in basic education teachers^{2,19,21}.

Today, the teaching profession is regarded as one of the most stressful professions²⁶. In this study, basic education teachers showed high prevalence of stress (41.6%), mainly in the stages of resistance and near exhaustion, with predominance of psychological symptoms over physical symptoms (Table 3). Our results corroborate with most surveys conducted with teachers of basic education in various regions of Brazil. For example, a study by Goulart Junior and Lipp²⁷ with 175 teachers from first to fourth grade of elementary school, operating in state public schools of the city of São Paulo, revealed high percentage of stress (56.6%). According to Goulart Junior and Lipp, 98% of the teachers were in the stage of resistance and near exhaustion, with psychological symptoms predominating (60%) over physical symptoms, which corroborates our research.

In another survey, conducted with 21 teachers working in multigraded classes in the countryside, more than half of the sample (57% of the teachers) presented significant symptoms of physical and/or psychological stress²⁸. It is important to highlight that in the resistance phase teachers are trying to face the stressors factors in search of psychological and physical balance in work environments and situations. In near exhaustion phase, teachers start to give in to pressure of persistent stressors, losing the ability to deal with these conditions in a healthy way, tending to manifest pathological symptoms, which can lower productivity and contribute to the poor performance in the teaching and learning process of the students²⁹.

The general results of the domains of this research showed that the best scores of basic education teachers were the Social Relations and Psychological Domains, and the worst scores were the Physical and Environmental Domains (Table 5). Our results are similar to other studies that assessed the quality of life of primary school teachers with WHOQOL-bref³⁰⁻³⁴. Teachers of basic education were classified as satisfied in aspects related to personal relationships, social support, sexual activity, self-esteem, appearance, and body image, and in cognitive aspects, such as learning and

memory, and feelings. On the other hand, teachers are unsatisfied with aspects related to work capacity, fatigue, drug addiction, pain, mobility for the performance of activities of daily living, as well as security, health care, climate, transportation, opportunities to acquire new knowledge, leisure and financial resources. This dissatisfaction in the Physical domain can be related to the high prevalence of musculoskeletal symptoms found in our study (Table 2). Concerning the environment, the dissatisfaction with the payment may be the most influential factor in scoring. It is important to highlight that the two indicators of quality of life that showed greater dissatisfaction by basic education teachers indicate the need to look closely the health of teachers, preventing possible absences of their school activities.

The average score of the general quality of life was 62.6 points in this study (Table 5). In a survey of 349 teachers from state and municipal education networks in the city of Florianópolis, the average score of the general quality of life was 63.8 points³¹. In another study conducted with 517 basic education teachers (252 teachers of public schools and 265 of private schools) of 57 public and private schools of the city of Campina Grande, PR, Brazil, the average score of the general quality of life was 74.5 points³³. This difference may be related to the large number of teachers from private schools in relation to the ones from public schools in both studies. Public school teachers are subjected to greater amount of stressors and they are more favorable to the emergence of psychopathological indicators, influencing on quality of life^{34,35}.

Interestingly, despite the high prevalence of musculoskeletal symptoms and stress, the basic school teachers evaluated in this survey were satisfied with the general quality of life (Table 4). These results show the perception of health and quality of life is a subjective and multidimensional construction. It is influenced by several factors, such as longevity, job satisfaction and personal fulfillment, salary, leisure, family relationships, disposition, quality in relationships, leisure options, access to cultural events, spirituality, among others³⁶⁻³⁸.

This study presents limitations which must be mentioned. Regarding the workload of the participants, their work arrangement was not discriminated. As for the time of the survey (October, November and early December 2015), this is a moment of overload resulting from previous accumulations, aspects that may interfere with musculoskeletal symptoms, stress and quality of life of teachers.

We suggest that longitudinal studies be conducted with basic education teachers, investigating the time/context relationship and other factors that could influence musculoskeletal symptoms, stress and quality of life. Still, we propose to seek strategies to monitor and control possible environmental factors that may prevent exhaustion, avoiding the aggravation of the problem.

CONCLUSIONS

Our data show that teachers of early-childhood and elementary education of the city of Caçador, SC, Brazil, have a high prevalence of musculoskeletal symptoms and stress, with predominance of resistance and near exhaustion phases, prevailing the psychological symptoms over the physical symptoms. In different domains of the quality of life, teachers were unsatisfied with physical and environmental factors, but they are satisfied with their general quality of life. In conclusion, the high prevalence of musculoskeletal symptoms and stress does not alter the quality of life of basic education teachers.

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