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Assessment of musculoskeletal symptoms in academics in full-time and part-time courses

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ABSTRACT

Introduction: Musculoskeletal symptoms are affections, with or without degeneration of the tissues, and may present in various forms and be associated with multiple symptoms. At the moment its etiology is multifactorial and the pathological picture shows social relevance due to its scope and magnitude. **Objective:** The objective of this study was to evaluate and compare the prevalence of musculoskeletal symptoms in academics of full-time and part-time (nighttime) courses at UNICENTRO. **Methods:** The study counted on 120 students of both courses and for the selection of the individuals was used the stratified sampling method. The Nordic questionnaire for musculoskeletal symptoms (NMQ) and Visual Analogue Scale (VAS) questionnaire were used as a form of pain identification. **Results:** Observing the results obtained from the NMQ, it was observed a high prevalence of symptoms in the analyzed students, being 49% in Biological Sciences and 44.8% in Physiotherapy, highlighting the region of the vertebral column, being lumbar (9.42%) in academics of Physiotherapy and thoracic region (9.14%) in academics of Biological Sciences, also noted high involvement in multiple regions (53.9%). Furthermore, it was observed the presence of mild pain trough VAS (3.78 ± 2.38). **Conclusion:** It was concluded that the most affected region was the spine, specifically the lumbar and thoracic. Thus, it is assumed that biomechanical overload is responsible for this finding. Thus, preventive and ergonomic measures and health promotion should be stimulated among young students, but for this purpose further studies are needed.

Keywords: Musculoskeletal symptoms; Students; Prevalence.

INTRODUCTION

Musculoskeletal pain or symptom may be presented in different ways clinically, be associated with multiple symptoms and is based on the subjectivity and personality of the individual, being a personal phenomenon in function of the cultural and situational factors, and the psychological variables and the external variables.[1-2]

Chronic pain is self-reported as an uncomfortable sensation that lasts for at least three months and can affect the quality of life and efficiency of work, imposing an economic burden on the individual and society.[3,4,5]

According to Lourinho et al., (2011)[6], musculoskeletal symptoms are affections, with or without degeneration of the tissues that occur most commonly in the upper limbs, scapular region, neck and lumbar spine.

As reported by Alencar (2009)[7] the etiology of musculoskeletal disorders is multifactorial. And in the study of Carugno (2012)[8] was concluded that the somatization of factors is responsible for triggering musculoskeletal symptoms that arise from the environment and working conditions, repetitive movements, incorrectly applied muscular forces, inadequate postures and stress from the environment itself, as well as the magnitude of these affections is directly linked to the intensity, frequency and time of exposure to work.

The most appropriate posture is the one to which the individual, whether this student or not, can adopt with free will and can be varied over time because this maintenance avoids degenerations in the intervertebral discs, compensations of the spine and back pain, since the position assumed by individuals most of the time is the seated one and when this position lasts for long periods, the tendency is to decrease lumbar lordosis, statically overloading the musculoskeletal tissues. These factors result in poor work performance and productivity, leading to medical costs.[9,10,11]

According to estimates of Brazilian chapter of International Association for the Study of Pain (SBDE)[12], this condition affects at least 30% of individuals at some point in life and in 10 to 40% of cases it lasts more than one day (SBED, 2005). However, this prevalence may vary.[13]

The pathological picture is socially relevant because of its scope and magnitude. Even in the face of advances in pain

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control in Brazil, there is a lack of studies, especially among the younger ones, since pain is considered to be a complex problem or because these individuals are considered to be poorly affected by pain.[14,13] Due to the large number of individuals affected, the deleterious effects of these symptoms in their daily life activities and the scarcity of studies related to musculoskeletal symptoms, it is necessary to carry out new studies that approach the proposed theme.

The objective of the study was to estimate and compare the prevalence of self-reported musculoskeletal symptoms and to identify the location and subjective intensity of it, in academics enrolled in full-time/part-time courses in the "Universidade Estadual do Centro-Oeste" (UNICENTRO), Campus Cedeteg, in Guarapuava-PR.

METHODS

STUDY CHARACTERIZATION

The present study is cross-sectional observational. It was approved by the Research Ethics Committee of the "Universidade Estadual do Centro-Oeste do Paraná" (UNICENTRO), with the number 1.433.104, developed after the free and informed consent of the participants according to the National Health Council (Resolution number 196/96).

POPULATION AND SAMPLE

The sample consisted of 120 students from a population of 239 and of these, were included a portion of the students previously selected from the two courses, Physiotherapy (daytime) and Biological Sciences (nighttime) of the "Universidade Estadual do Centro-Oeste", regularly enrolled and who were made available at the time of data collection to complete the questionnaires to be applied, without the obligation to participate in the study. All the students enrolled in the third year of Physical Therapy were excluded, as they developed the present study, there was also a sample loss for those who did not return the questionnaire, students refusing to participate in the study and to those who were absent on the day of the questionnaires.

For the calculation of the sample size, were used the available sample calculation: http://www.calculoamostral.vai.la>, accessed in: [08/26/2015]. A population of 239 individuals (N=239), a 95% confidence interval, a maximum tolerable error of 5 percentage points with a maximum percentage of 76.5% were used.[13]

There was a difference in the total population, counting with 100 academics of Biological Sciences and 139 of Physiotherapy. Based on these values, the sample size was estimated in 43 academics, the sample number was estimated in 56 individuals of Biological Sciences and 49 of Physiotherapy academics and, with an addition of 30%, the sample increased to 64 individuals. However, only 97 participated, 47 and 50 respectively, of the courses previously mentioned.

For the selection of the individuals who participated in the study, the stratified sampling method was used, with a sample fraction of two individuals for the Biological Sciences course and three individuals for the Physiotherapy course, through simple random sampling by the table of random numbers.

INSTRUMENT

The Nordic questionnaire for musculoskeletal symptoms (NMQ) and Visual Analogue Scale (VAS) questionnaire were used in the study.

The NMQ was applied as an instrument to measure musculoskeletal symptoms, which presents a human body figure divided into anatomical regions: neck, shoulders, upper and lower back, wrists, hands, hip, thigh, knees, ankles and feet. This questionnaire evaluates the presence of pain, tingling or numbness in these regions, the presence of inability to perform usual activities and the search for a health professional to treat musculoskeletal symptoms, being it related to the last 12 months and only the last question related to the last 7 days, referring to the presence or absence of symptoms in the anatomical regions indicated in the questionnaire. From these, participants noted the "yes"/"no" option in each question in the questionnaire.

The VAS questionnaire is consisted of a 10 cm line that aims to assess the intensity of pain presented by the patient. In general, it has in its extremes the phrases "absence of pain" and "unbearable pain", in which it is marked zero when there is no pain, level five if the pain is moderate and intense pain is referred to a level ten.

Individuals were first selected in the classrooms, then the purpose of the study was clarified and the students were invited to identify themselves and to participate in the study; for those who accepted were given two terms of consent that should be signed, one term should remain with the individual and the other should be returned. After that, the questionnaires were delivered, completed and returned by the students on the same day and later the data were analyzed. In addition to the NMQ and VAS, personal information (name, date of birth and gender) was collected, as well as the information if the individual works and/or studies and the duration of both activities.

STATISTICAL ANALISIS

The categorical variables were presented with absolute numbers and percentages and to identify the relation between the studied variables was used the Fisher's exact test. For statistical analysis was used the Bioestat 5.0 software, with a significant level of $\alpha < 0.05$.

RESULTS

A total of 120 academics were selected. Of the 56 questionnaires applied to the Biological Sciences course, 6 were not retrieved, while in the Physiotherapy course of 64 questionnaires, there were 17 not returned, implying a

loss of 10.71% and 26.56% of the questionnaires, respectively, totaling 37.27% of sample loss.

As observed in Table 1 according to the NMQ results, the highest prevalence symptoms were in the spine region, in academics of both courses, especially the lumbar spine (9.42%)

Table 1. Distribution of pain in various body segments.

Variables	Period		Total
	Full-time	Part-time	
	n (%)	n (%)	n (%)
UL (n=88)			
Shoulder	23(6.37)	26(7.20)	49(13.57)
Elbow	4(1.11)	3(0.83)	7(1.94)
Fist and Hand	18(4.99)	14(3.88)	32(8.87)
Spine (n=170)			
Cervical	28(7.76)	22(6.09)	50(13.85)
Thoracic	24(6.65)	33(9.14)	57(15.79)
Lumbar	34(9.42)	29(8.03)	63(17.45)
LL (n=103)			
Hip	18(4.99)	20(5.54)	38(10.53)
Knee	22(6.09)	13(3.60)	35(9.69)
Ankle and Foot	11(3.05)	19(5.26)	30(8.31)
Total (n=361)	182(50.43)	179(49.57)	361(100)

UL: Uper Limbs
LL: Lower Limbs

in the students of Physiotherapy and the thoracic region (9.14%) in the students of Biological Sciences.

Comparing the segments through NMQ, the regions most affected in the full-time course were shoulder (6.37%), lumbar (9.42%) and knee (6.09%), observing respectively the upper limbs (UL), the spine and the lower limbs (LL). In the part-time were shoulder (7.2%), thoracic (9.14%) and hip (5.54%).

In table 2 in the "pain" item, the results of the research indicate that the musculoskeletal symptoms (49%) prevail in academics of the course of Biological Sciences in comparison to those of Physiotherapy with 44.8%, and this finding can be attributed to the fact observed in the "activities" item that these individuals mostly work during the day and study at night (31.8%), whereas 46.6% of students only study. In the affected region, were analyzed the prevalence of musculoskeletal symptoms in the UL, spine, LL, 2 and 3 regions and there was a high level of involvement of 3 regions in both courses, being 23.6% of Physiotherapy and 30.3% of Biological Sciences.

The mean age of 20.66 ± 2.8 (17-34) was observed and the pain intensity mean of 3.78 ± 2.38 (0-8) was noticed by VAS.

DISCUSSION

In the present study, according to the results obtained through the application of the questionnaires, there was a high prevalence of musculoskeletal pain in the sample studied, 49% in the Biological Sciences and 44.8% in Physiotherapy course (table 2), being more common in the regions of the spine, especially the lumbar region (9.42%) in the Physiotherapy and

Table 2. Relation of musculoskeletal symptoms in students enrolled in full- and part-time courses.

Variables	Period		Total	Fisher's exact test	p
	Full-time	Part-time			
	n (%)	n (%)	n (%)		
Activities (n=88)					
Study	41(46.6)	18(20.5)	59(67)	33.992	0.001
Study and Work	1(1.1)	28(31.8)	29(33)		
Total	42(47.7)	46(52.3)	88(100)		
Pain (n=96)					
Yes	43(44.8)	47(49.0)	90(93.8)	0.011	0.91
No	3(3.1)	3(3.1)	6(6.2)		
Total	46(47.9)	50(52.1)	96(100)		
Affected Region (n=89)					
UL	0(0.0)	0(0.0)	0(0.0)		
Spine	3(3.4)	6(6.7)	9(10.1)	7.45	0.05
LL	0(0.0)	3(3.4)	3(3.4)		
Two affected regions	19(21.3)	10(11.2)	29(32.6)		
Three affected regions	21(23.6)	27(30.3)	48(53.9)		
Total	43(48.3)	46(51.7)	89(100)		

UL: Upper Limbs; LL: Lower Limbs

thoracic (9.14%) in the Biological Sciences course (table 1). Thus it was observed that the percentage of pain was higher in the regions of the spine when compared to the UL and LL and the pain prevailed in three regions (53.9%) (table 2).

Corroborating with the study carried out by Falavigna et al. (2011)[15], in which was verified the prevalence of lumbar pain in students of Physiotherapy in comparison to those who attended the Medicine course and when it was present, if this was more serious and incapacitating. It was observed that low back pain was more frequent in Physiotherapy than in Medicine students, but there was no difference in the intensity of pain and disability, and no increase in lumbar pain during the undergraduate course.

In contradiction to the present study, Kumar (2015)[16] verified the prevalence of idiopathic musculoskeletal pain (IMP) and its impact in the daily activities of 1,018 schoolchildren between 5 and 16 years old and observed, through the analysis of the results, the prevalence of 16.2% of IMP, being the LL (52.1%) the most affected region, followed by the UL (31.5%), neck (29.1%), lumbar (26.7%), thoracic (17.6%) and cervical (10.9%) and it was also noted that pain was present most commonly in multiple regions (54.5%) compared to an affected region (45.5%), and this finding was coincided with those of the present study.

It is assumed that the students presented an increased prevalence of musculoskeletal symptoms in the spinal regions due to the biomechanical overload, which can be generated from incorrect postures adopted for long periods or other factors.

According to Falavigna et al. (2011)[15] some activities practiced by physiotherapists may be considered risk factors for the development of back pain such as manual therapy, transfer of dependent patients and manual resistance provided by them.

There was an affection in both courses of pain in the UL prevailing on the shoulders (13.57%), and this same result was found in the study of Oksanen et al. (2014)[17], who in his research with Finnish academics found prevalence of pain in the neck and shoulder region (28%), standing out in relation to low back pain (14%).

According to the data requested together with the questionnaires, there was a difference in the presence of pain between the genders, counting that in the course of Physiotherapy, of the 43 students, 40 (93.02%) related pain and all of them presented the same symptom. In the Biological Sciences course, of the 30 female students, 29 (96.7%) presented pain and of the 19 male students, 18 (94.74%) presented pain.

The study realized by Zhang et al. (2015)[18] aimed to investigate the prevalence of chronic pain and to verify its prevalence in relation to the self-reported academic pressure by high school students in Shanghai, China. The author verified that 30.3% (headache), 20.9% (abdominal pain), 41.1% (shoulder pain) and 32.8% (low back pain) Were the prevalence rates in the analyzed students, and the findings were elevated in female compared to male students.

In the study carried out by Hanvold et al. (2014)[19], from 2002 to 2009, the development of pain in the neck and shoulder of young adults was examined and was observed its increase in the transition from the technical school to the professional career, relating to individual and work factors. The high mechanical load was responsible for the presence of pain in the women, whereas the muscular resistance resulted in a lower rate of musculoskeletal symptoms in the neck and shoulder of the men. However, perceived muscular tension and ethnicity were considered predictors for the occurrence of these symptoms, being their prevalence of 56% in comparison with those who reported low levels of muscular tension.

Through the application of VAS, there were reports of pain in the majority of the students in the courses analyzed and the intensity was higher in the students of the last year in relation to the other students, and in the majority of these, a low intensity of these symptoms was found, which gives indications of the presence of chronic pain. Despite this, it was considered only the report of the main musculoskeletal symptom, but other pains of lower frequency may also negatively impact the productivity of academics.

In your study, da Silva (2011)[20] sought to estimate the prevalence of chronic pain in nursing students and to characterize it according to the occurrence, location, duration, intensity and quality. The study counted on the participation of 211 students, being the presence of 59.7% of chronic self-reported pain, being present in the head (38.1%), lumbar (11.9%), shoulder/UL (11.9%), LL (6.3%) and other areas (31.7%), and the intensity was characterized as strong (Median of the pain score= 7.0). It was concluded that the prevalence of chronic pain in the studied population is high.

In the study, there was no search for the identification of the possible causes of musculoskeletal pain, thus, it was not realized the analysis of the activities performed by the students and whether these were static or dynamic.

In the research of Ayanniyi, Mbada, Muolokwu (2011)[21] in which was investigated the prevalence, characteristics, predisposing factors and mode of treatment required for back pain among school adolescents in Nigeria, it was found that back pain is common among these adolescents, but 59% of respondents reported recurrent low back pain and a tendency to increase with age.

In contradiction, Oksanen et al. (2014)[17], observed a prevalence of low back pain (14%) and expected to observe the trend of increasing pain over the years, but its occurrence was lower in the year 2012 than in 2008, on the grounds that information on ergonomics and preventive care was provided with the health of the students.

In the research of Ayanniyi, Mbada, Muolokwu (2011)[21] has been found that the factors that are responsible for back

pain in adolescents include backpack weight, sitting position, bending, walking, emotional problems and standing position. The study also revealed that postural modification was responsible for relieving back pain, but self-medication was the most common intervention found in 20% of adolescents.

Likewise that the predisposing factors were not identified a long-term study would be necessary for this purpose, in order to establish an ergonomic intervention.

Da Silva (2011)[20] emphasizes the importance of implementing programs for the prevention of complications, as well as promoting the health of university students. According to Falavigna et al. (2011)[15] and Ayanniyi, Mbada, Muolokwu (2011)[21] further research is needed to identify the risk factors that lead to low back pain, as well as to promote health education, including ergonomic counseling and primary and secondary prevention.

In Brazil, studies on pain in academics are scarce, a fact that made it difficult to compare the results of the present study, but the majority of the studies with academics from other countries were used for this purpose. In addition, a pre-study was not carried out for the application of the research instruments to identify possible errors in the execution of the questionnaires or in the filling of the questionnaire, nor was there training for their applicators.

CONCLUSION

It was concluded that the most affected region of the three segments analyzed in the study was the spine, specifically the lumbar in Physiotherapy and thoracic in the Biological Sciences academics. Thus, it is assumed that the biomechanical overload is responsible for this finding. Thus, preventive and ergonomic measures and health promotion should be stimulated among young students, but for this purpose further studies are needed.

AUTHOR'S CONTRIBUTION

GA, JCG and MAK: participated in the methodological idealization, execution of the research project, writing and review of the manuscript; MPB: participated in the methodological idealization, orientation of the execution of data collection, analysis of results, and critical review of the manuscript.

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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