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LOW BACK PAIN KINETOPROPHYLAXIS FOR PEOPLE WITH
PROFESSIONS IN AN OFFICE ENVIRONMENT

Radu Predescu (a), Corina Predescu (b)*, Mihaela Apostu (c)

*Corresponding author

(a) “Carol Davila” University of Medicine and Pharmacy, 37 Dionisie Lupu Street, Bucharest, Romania,
radu.predescu@yahoo.com

(b) National University of Physical Education and Sports, 140 Constantin Noica Street, Bucharest, Romania,
corina.predescu@yahoo.com

(c) National University of Physical Education and Sports, 140 Constantin Noica Street, Bucharest, Romania,
mihaelaapostu@yahoo.com

Abstract

Physical inactivity, modern technology and the significant extension of working hours, as well as the amount of people who work in an office environment, increase the incidence of low back pain (LBP). We started from the hypothesis that a modern complex prophylactic approach to LBP can reduce the high costs of medical treatment, the payment for the leaves of absence, the lack of long-term efficiency of the employees diagnosed with low back pain and increase the quality of the employees' lives. The study was conducted over a period of one year on 38 office workers diagnosed with LBP. The prophylactic approach to this pathology included the ergonomics of the daily workspace at one's jobsite, the rehabilitation or orthopaedics consultation. The intent was to develop a personalised management plan including chair massage, short kinetic programs performed at the workplace or, if needed, the Rolfing or Heller work. The results of our research can be added to numerous studies (Tveito, Hysing, & Eriksen, 2004; Waddell, Burton, & Main, 2004) that demonstrate the negative economic consequences of this pathology. Regarding the first occurrences of LBP in our subjects, this has dropped from 48% at the beginning of the study to 19% at the end. Furthermore, the number of the subjects who interrupt their work schedule to make a short program of personalized exercises has considerably increased from 21% to 63%. Most participants (82%) said they changed their lifestyle and significantly increased the time spent on various physical activities (swimming, basketball, fitness).

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1. Introduction

Low Back Pain (LBP) is the most common health problem among the active population. According to the latest statistics, in highly industrialised countries, LBP is a common condition that affects a large number of people: 85% of the population has a crisis of LBP throughout life. The therapeutic management of this pathology targets both the therapeutic and prophylactic approach.

Spending a long time in the office and in front of the monitor, as well as the lack of education regarding ergonomics, changing the workplace and the daily activities meant to increase the comfort and avoid the appearance of incidents are the causes of a slow onset of the musculoskeletal problems. This is why the ergonomics finds its place as a main means of primary prophylaxis of low back pain. The prophylactic measures applied to employees at work can avoid symptoms such as pain, the decrease in mobility or paraesthesia.

Through the awareness and control of posture at work, by organizing the space and working time, by choosing the right furniture and work equipment suitable for work ergonomics and working space, the personal comfort and health will improve.

2. Problem Statement

There are countless studies (Waddell & Burton, 2003; Tveito, Hysing, & Eriksen, 2004) carried out on a large number of employees attesting that office work causes musculoskeletal, nervous, articular and discal problems caused by the sedentary lifestyle, vicious or fixed prolonged postures, repetitive movements, the improper use of the workspace and the computer. Also, the manual materials handling is considered to be an important risk factor for developing of low back pain because it can lead to a spinal loading that exceeds tissue tolerance (Heymans, de Vet & Bongers, 2004; Norman, Wells & Neumann, 1998; Schenk, Doran & Stachura, 1996).

3. Research Questions

How much can the incidence of low back pain (LBP) increase due to physical inactivity, modern technology and the significant extension of working hours of people who work in an office environment? Is it important to analyse the environmental factors, the type of furniture and especially the posture at work as a step in preventing LBP? Can the examples of good practice for persons engaged in office work be developed in order to reduce the incidence of LBP?

4. Purpose of the Study

We carried out this study starting from the hypothesis that a modern complex prophylactic approach to LBP can reduce the high costs of medical treatment, the payment for the leaves of absence and the lack of long-term efficiency of the employees diagnosed with low back pain. This study aims to find solutions to increase the quality of the employees' lives.

5. Research Methods

The study was conducted over a period of one year, from March 2016 to February 2017, on a number of 38 people working in the office. According to the Helsinki Declaration, we had the agreement of all these patients to participate in the research. The subjects were between the ages of 27 and 45 and were diagnosed as suffering from low back pain at one point, but at the beginning of the study, they were at least 2 months after the last painful stroke.

This inclusion criterion was considered to be important because, in case of an acute painful stroke, the therapeutic approach would be different and the administration of medication could influence the obtained results. The prophylactic approach to this pathology included three stages:

1. the recovery-rehabilitation or orthopaedics consultation to exclude the associated pathologies that might influence our research;
2. the ergonomics of the workspace at the company where the subjects were working;
3. the development of a management plan for low back pain.

The anamnesis and clinical examination identified low back pain episodes in all subjects. In 38.2% of cases, this was associated with vertebral static disorders (scoliosis, kyphosis). The presentation of the ergonomics concept was done at the workplace and consisted in a general illustration of this concept, followed by the completion of a questionnaire by each participant. The presentation included information about the incidence, symptoms, diagnosis and treatment of LBP, as well as information related to the concept of ergonomics of the workspace.

For all participants in the study, it was the first presentation they attended regarding the concept of ergonomics of the workspace. Only 3 of them knew the concept of standard ergonomics. We chose to present the standards of the American National Standards Institute – Human Factors and Ergonomics Society (ANSI-HFES), an independent group that analyses and produces such standards.

The workplace ergonomics questionnaire included items related to office desk position, such as seat and monitor features and the work time spent on the computer. The questionnaire analysis revealed the aspects we needed to correct for each participant in the study – seat height, monitor position, forearm supports, posture improvement. Following this analysis, we developed an individualised low back pain management plan including chair massage, short kinetic programs that could be performed at the office or, as appropriate, the Rolfing or Heller work. We evaluated the efficiency of the plans developed with the questionnaire, which was initially applied before the ergonomic evaluation, and then one year after the implementation date. The questionnaire included 4 items related to the quality of life, the physical activity performed, the frequency of painful lumbar symptoms and the use of analgesic medication.

6. Findings

The distribution by gender showed a predominance of females, 25 (65.8%), compared to 13 (34.2%) males. The most affected age group in women was between 30-35 years (10), followed by the age groups 35-40 and 40-45, with the same number (6), and for the age group 27-30, the incidence was only 3%.

In men, the highest incidence was in the age group 35-40 (7), followed by the age group 30-35 (3), 27-30 (2) and 40-45 (1). 38.2% of patients had vertebral static disorders (scoliosis and kyphosis) and 89% did not have a correct position at the office desk, as interpreted by the questionnaire; following the questionnaire, they received suggestions regarding the proper arrangement of the workplace.

The responses to the questionnaire applied before and after implementing the individual management plan (workspace modification, chair massage, Rolfing or Heller work, a short kinetic program at work) were statistically interpreted by the Chi-Square Test. Thus, we notice an improvement in the quality of life after applying the individual management plan for one year (Table 01). It is found that the percentage of subjects who opted for the “very good” rating has increased from 30.8% to 69.2%, for the “good” rating, from 36.4% to 63.6%, and for the “medium” and “unsatisfactory” rating, the percentage has decreased from 71.4% to 28.6% and from 100% to 0%, respectively.

Table 01. The ratings for the quality of life

Quality of life		Individual management plan		Total
		Initially	At the end of the study	
Very good	Count	4	9	13
	Expected Count	6.5	6.5	13.0
	% within Quality of life	30.8%	69.2%	100.0%
Good	Count	12	21	31
	Expected Count	16.5	16.5	31.0
	% within Quality of life	36.4%	63.6%	100.0%
Medium	Count	20	8	26
	Expected Count	14.0	14.0	26.0
	% within Quality of life	71.4%	28.6%	100.0%
Unsatisfactory	Count	2	0	6
	Expected Count	1.0	1.0	6.0
	% within Quality of life	100.0%	0.0%	100.0%

The most promising result was about changing the lifestyle through a much more sustained practice of various sports activities: the percentage of subjects performing sports activities increased from 25% to 75% and, obviously, that of non-athlete subjects decreased from 77.8% to 22.2% (Table 02).

Table 02. The ratings of involvement in various sports activities

Do you practice physical activity?		Individual management plan		Total
		Initially	At the end of the study	
YES	Count	10	30	40
	Expected Count	20.0	20.0	40.0
	% within physical activity	25.0%	75.0%	100.0%
NO	Count	28	8	36
	Expected Count	18.0	18.0	36.0
	% within physical activity	77.8%	22.2%	100.0%

The analysis of the responses regarding the frequency of painful lumbar symptoms demonstrates the best the efficiency of the individual management plan for LBP (Table 03).

Table 03. The ratings of the frequency of painful lumbar phenomena

Frequency of painful lumbar phenomena		Individual management plan		Total
		Initially	At the end of the study	
At least one crisis every 2 weeks	Count	18	0	18
	Expected Count	9	9	18.0
	% within painful lumbar phenomena	100.0%	0.0%	100.0%
At least one crisis per month	Count	12	9	21
	Expected Count	10.5	10.5	21.0
	% within painful lumbar phenomena	57.1%	42.9%	100.0%
At least one crisis every 2 months	Count	8	29	37
	Expected Count	18.5	18.5	37.0
	% within painful lumbar phenomena	21.6%	78.4%	100.0%

We observe that the percentage of subjects who indicated at least one crisis every two weeks has decreased from 100% to 0%, the percentage of those who indicated at least one crisis per month has declined from 57.1% to 42.9%, and the percentage of those who reported at least one crisis every two months has increased from 21.6% to 78.4%.

Regarding the percentage of analgesics, we note that, after implementing the individual management plan, the percentage of subjects has dropped from 81.2% to 17.9%, and the percentage of people who do not use analgesics has increased from 16.2% to 83.8% (Table 04). This is also an argument in favour of the efficiency of both the workplace ergonomics and the development of an individualised LBP prevention program at the workplace.

Table 04. The ratings for item 4, “Do you use analgesics?”

Do you use analgesics?		Individual management plan		Total
		Initially	At the end of the study	
YES	Count	32	7	39
	Expected Count	19.5	19.5	39.0
	% within analgesic	82.1%	17.9%	100.0%
NO	Count	6	31	37
	Expected Count	18.5	18.5	37.0
	% within analgesic	16.2%	83.8%	100.0%

7. Conclusion

The results of our research are added to numerous studies (Tveito, Hysing, & Eriksen, 2004; Waddell, Burton, & Main, 2004) that demonstrate the negative economic consequences of this pathology. The National Centre for US Health Statistics shows that about 20% of low back pain is due to office desk positioning, resulting a decrease with 25% in productivity. The same centre mentions that low back pain accounts for about 40% of the total pathologies occurring in the workplace.

Regarding the emergence of low back pain in our subjects, it has dropped from 48% at the beginning of the study to 19% at the end. Also, the percentage of subjects who interrupted their work schedule to perform a short program of personalised exercises has considerably increased from 21% to 63%. Most participants (82%) said they changed their lifestyle and significantly increased the time spent on various physical activities (swimming, basketball, fitness).

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