

THE EFFECTS OF TRADITIONAL PHYSIOTHERAPY TREATMENT AND EXERCISE PROGRAM IN REDUCING THE INTENSITY OF LOW BACK PAIN

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Abstract

It is generally accepted that lumbar pain represents one of the most common painful conditions of modern man, treated in the doctor's office, and is the leading cause of lost working days. The aim of the research was to determine the effects of traditional physiotherapy treatment and an exercise program in reducing the intensity of pain in the lower back. The research was carried out on a sample of 61 subjects diagnosed with lower back pain. The Oswestry Low Back Pain Disability Questionnaire was used to assess functional status and the degree of impairment. The physical therapy treatment lasted 15 days; 5 times a week (Monday to Friday) for 3 consecutive weeks. In addition to traditional physiotherapeutic treatment, a program of exercises to strengthen weakened muscle groups was also applied. Differences in the analyzed variables in the initial and final measurements were determined by t-tests for dependent samples. Based on the obtained results, it can be concluded that between the initial measurement (before starting the physiotherapy treatment and the exercise program) and the final measurement (after the 15-day physiotherapy program and the exercise program) we have significant differences in the decline of disability, where we have elimination of severe impairment and total disability.

Keywords : *physical therapy, exercise program, lumbar syndrome, back pain*

Introduction

It is generally accepted that lumbar pain represents one of the most common painful conditions of modern man, treated in the doctor's office, and is the leading cause of lost working days (Popovic 1989; Negovetić, 1993; Birkmeyer & Weinstein, 1999).

Lumbar syndrome refers to difficulties related to pain and impaired function in the lumbosacral region of the spine, while radiculopathy is characterized by pain along one or both legs and signs of neurological deficit. These symptoms occur as a result of irritation or compression of one or more lumbar or upper sacral roots of spinal nerves (Popovic 1989; Bendix et al., 1997; Ala-Kokko, 2002).

People have been suffering from back pain and sciatica since ancient times. It is a typical human condition, as a consequence of the upright posture of the person with the formation of the physiological curves of the spine and the inclination of the pelvis during the phylogenetic and ontogenetic development. Additionally, the static and dynamic loads of the lumbar region of the spine throughout life contribute to this condition (Birkmeyer & Weinstein, 1999; Ariyoshi et al., 1999).

The aim of the research is to determine the effects of a traditional physiotherapeutic treatment and an exercise program in reducing the intensity of pain in the lower back.

Methods

Sample of respondents

The research was carried out on a sample of 61 subjects diagnosed with lower back pain. The diagnosis of pain was made in collaboration with a rheumatologist, orthopedist, neurosurgeon, or neurologist, specifically in cases of lumbar disc herniation, using lumbar MRI or CT scans. The respondents were treated at the University Hospital of Kosovo, as well as A.H. Center for physiotherapy in Pristina. Inclusion criteria: diagnosis of lower back pain confirmed by a rheumatologist, orthopedic neurosurgeon, neurologist or radiologist, women and men aged 25-65, lumbago or lumbosciatica of at least 6 weeks, unilateral radiculopathy. Exclusion criteria: patients with a history of lumbar injection within the last 4 weeks, marked

osteoporosis, history of lumbar surgery, acute trauma, inflammatory pain, neurological disease, and lumbar instability.

Sample variables

The Oswestry Low Back Pain Disability Questionnaire was used to assess functional status and degree of impairment associated with disability. This questionnaire consists of questions from ten domains, each offering six answers. The responses are scaled based on intensity, ranging from 0 to 5. Each question was treated as an individual variable, and the sum of the ten questions was calculated to obtain a total disability index.. The final result (grade) is assessed in percentages, where a higher grade indicates a more negative assessment of the current situation and prognosis.

Treatment protocol

The physical therapy treatment lasted 15 days; 5 times a week (Monday to Friday) for 3 consecutive weeks. The session lasted from 1 hour to 1 hour and 30 minutes (60 to 90 minutes). In addition to traditional physiotherapeutic treatment, a program of exercises to strengthen weakened muscle groups was also applied. Exercise 1. lie down, stand for 5 minutes every two hours. Exercise 2. of inverted stretching in the elbows for 5 minutes every two hours. Exercise 3. Reverse the extension with outstretched arms. The patient is told to relax the back, not to use the muscles, the stretching activity should remain for a few seconds, repeating 10 times every two hours.

Statistical data processing

For all variables that are on the scale of interval and ratio (measurement), the following basic statistical parameters were calculated: arithmetic mean (X), standard deviation (SD), coefficient of variability (V), minimum score (MIN), maximum score (MAX); asymmetry (skewness) of the distribution of results; skewness or flatness (kurtosis) of the distribution of results; Kolmogorov-Smirnov method for testing the normality of the distribution of results (KS).

Univariate differences in the analyzed variables in the initial and final measurements were determined by t-tests for dependent samples. The data were processed with the statistical package SPSS for Windows version 22.0 and Statistics for Windows version 10.0.

Results

The basic descriptive parameters and normality of the distribution of the variables that were an integral part of the questionnaire "Oswestry questionnaire for assessment of back pain" in the initial and final measurement are shown in table 1 and 2.

Table 1 . Descriptive statistics and normality of the distribution of the variables that were an integral part of the questionnaire "Oswestry questionnaire for assessment of back pain" in the initial measurement

	Mean	Min	Max	SD	KV%	SE	Skew	Kurto	KS
Pain intensity	2.62	0.00	5.00	1.63	62,32	0.21	-0.14	-1.14	p < .15
Personal care	1.89	0.00	4.00	1.34	71.23	0.17	0.09	-1.26	p < .15
Lifting	2.21	0.00	5.00	1.44	65.02	0.18	0.41	-0.70	p < .15
Walking	1.39	0.00	4.00	1.37	98,29	0.18	0.77	-0.63	p < .15
Sitting	2.00	0.00	5.00	1.48	74,16	0.19	0.76	-0.19	p < .15
Standing	2.20	0.00	5.00	1.34	60.97	0.17	0.66	-0.47	p < .05
Sleeping	1.85	0.00	5.00	1.57	84.69	0.20	0.71	-0.47	p < .01
Social life	1.74	0.00	5.00	1.32	75.69	0.17	0.55	-0.59	p < .15
Traveling	2.05	0.00	5.00	1.45	70.96	0.19	0.69	-0.42	p < .05
H omemaking	1.85	0.00	5.00	1.31	70.96	0.17	0.87	0.27	p < .15
Disability level	19.80	0.00	47.00	10.62	53.65	1.36	0.56	-0.09	p > .20

From the review of table 1, it can be seen that in the initial measurement the skewness values of all the variables that were an integral part of the questionnaire "Oswestry questionnaire for assessment of back pain" are within the limits of the recommended values from -1 to +1, which indicates that the distribution of results is approximately symmetrical. From the kurtosis values (table 1.), it can be seen that all applied variables show flattening (platykurtic distribution). The values of the coefficients of variation range from 53.65 (for the disability level variable - total disability index) to 98.29 (for the Walking variable). The

results of the Kolmogorov Smirnova procedure showed that most of the applied variables in the initial measurement are normally distributed. Deviation from the normal distribution was determined at the .01 level for the sleeping variable, while the deviation was determined at the .05 level for the standing and traveling variables.

Table 2. Descriptive statistics and normality of the distribution of the variables that were an integral part of the questionnaire "Oswestry questionnaire for assessment of back pain", in the final measurement

	Mean	Min	Max	SD	KV%	SE	Skew	Kurto	KS
Pain intensity	1.48	0.00	3.00	1.18	79,82	0.15	0.00	-1.49	p < .05
Personal care	0.97	0.00	3.00	1.01	104.26	0.13	0.68	-0.67	p < .15
Lifting	1.27	0.00	4.00	1.26	99.51	0.16	0.84	-0.28	p < .15
Walking	0.71	0.00	3.00	1.02	143.00	0.13	1.22	0.22	p < .15
Sitting	1.03	0.00	4.00	1.13	109.79	0.15	1.01	0.15	p < .15
Standing	1.03	0.00	4.00	1.06	102.30	0.14	0.82	-0.12	p < .01
Sleeping	0.81	0.00	4.00	0.98	121.12	0.13	1.43	2.25	p < .15
Social life	0.79	0.00	4.00	1.02	129.42	0.13	1.23	0.82	p < .15
Traveling	1.97	1.00	5.00	1.05	53,29	0.13	0.87	-0.03	p < .15
H omemaking	1.84	1.00	4.00	0.95	51.84	0.12	0.94	-0.06	p < .01
Disability level	11.75	2.00	35.00	7.97	67,77	1.02	1.20	0.86	p < .20

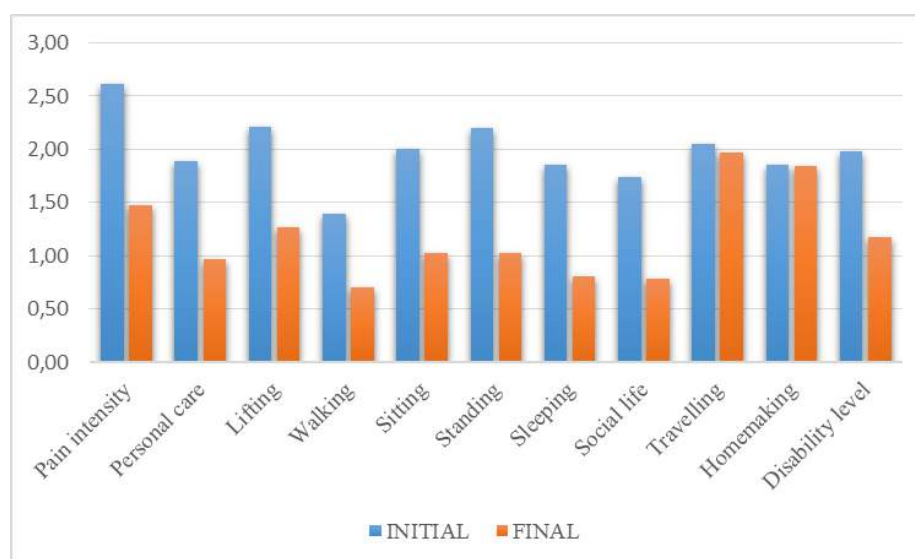
From the review of table 2, it can be seen that in the final measurement the skewness values of most of the variables that were an integral part of the questionnaire "Oswestry questionnaire for assessment of back pain" are within the limits of the recommended values from -1 to +1, which indicates that the distribution of results is approximately symmetrical. Positive asymmetry - epicurticity (a greater number of the results are in the better zone), is observed in the variables Walking (Sk=1.22), Sitting (Sk=1.01), Sleeping (Sk=1, 43) and Social life (Sk=1.23). From the kurtosis values (table 2.), it can be seen that all applied variables show flattening (platykurtic distribution). The values of the coefficients of variation range from 102.3 (for the variable Employment / homemaking - home/work activities) to 143.0 (at the Walking variable). The results of the Kolmogorov Smirnova procedure showed that most of the applied variables in the final measurement were normally distributed. Deviation from normal distribution at the .01 level. was determined for the variables Standing - standing and Employment/homemaking - home/work activities, while deviation at the .05 level. was determined in the Pain intensity variable.

In order to define the differences in the variables from the questionnaire "Oswestry questionnaire for assessment of back pain" from the initial and final measurement, T-tests for dependent samples were applied. The results of the tests are shown in table 3. From table 3 it can be seen that between the initial and final measurement (before and after the end of the physiotherapy treatment and the exercise program) statistically significant differences were determined in the variables: pain intensity, personal care, lifting , walking, sitting, standing, sleeping, social life and disability level. Statistically significant differences between the initial and final measurement were not determined in the traveling and employment/homemaking variables.

Table 3 . Significance of differences of arithmetic means in the variables from the questionnaire "Oswestry questionnaire for assessment of back pain" from the initial and final measurement

Variables	INITIAL		FINALLY		%	R	T-test	Sig
	Mean	SD	Mean	SD				
Pain intensity	2.62	1.63	1.48	1.18	-43.75	0.93	13,20	0.00
Personal care	1.89	1.34	0.97	1.01	-48.72	-0.38	-30.70	0.00
Lifting	2.21	1.44	1.27	1.26	-42.77	0.96	18,25	0.00
Walking	1.39	1.37	0.71	1.02	-48.91	0.85	7,13	0.00
Sitting	2.00	1.48	1.03	1.13	-48.33	0.96	15,12	0.00
Standing	2.20	1.34	1.03	1.06	-52.96	0.94	18,19	0.00
Sleeping	1.85	1.57	0.81	0.98	-56.26	0.83	8,32	0.00
Social life	1.74	1.32	0.79	1.02	-54.72	0.84	10,36	0.00
Traveling	2.05	1.45	1.97	1.05	-4.00	0.92	1,00	0.32
Homemaking	1.85	1.31	1.84	0.95	-0.88	0.91	0,22	0.83
Disability level	19.80	10.62	11.75	7.97	-40.65	0.95	16,32	0.00

Graph 1. Differences of the arithmetic means in the variables of the questionnaire "Oswestry questionnaire for assessment of back pain" from the initial and final measurement



Discussion

In recent years, the treatment of disorders in the lumbar part of the spine has been moving towards the so-called aggressive conservative approach. The number of broad therapy programs that include a multidisciplinary approach and numerous treatment modalities is increasing. This non-operative trend in the treatment of changes in the lumbar spine places a greater emphasis on traditional physical therapy modalities. In the current healthcare system, the identification of cost-effective treatment options is a growing trend (Berthelot et al., 1999 ; Atchinson et al., 2000; Brosseau et al., 2002) .

Early initiation of treatment and patient adherence to advice regarding pain and inflammation are critical to achieving rapid recovery and prevention of chronic pain and disability.

The conservative treatment utilized for lumbar syndrome is not simply a collection of prescribed measures for the patient. Rather, it is a dynamic process that is tailored based on the established working diagnosis, thorough medical history, and clinical examination. The treatment plan is subject to adjustments based on the patient's response to the prescribed interventions, considering their individual tissue reactivity and psychosocial adaptation. (BenEliyahu, 1996; Bogduk 2000; Buchner, 2000).

A number of treatment modalities are recommended, but studies show mixed results. There is little consensus about the best method for treating patients with low back pain who have no absolute indication for surgery. The clinical course of low back pain varies, as does the effectiveness of conservative treatment. Judgment is necessary in choosing between continued conservative therapy and surgical intervention.

Various programs of conservative (medicinal, physical and/or manual) treatment have been applied in various researches. Some studies have evaluated the effect of a nonsteroidal anti-inflammatory drug (Atchinson et al. 2000 ; Ala-Kokko , 2002), the epidural application of corticosteroids (Bankov, 1986 ; Atlas, et al., 2000), fluoroscopically guided periradicular inflammation with corticosteroids (Bankov, 1986), the action of traction or autotraction (Atchinson et al., 2000; Burton et al., 2000), the action of a 2-week physical procedure (Carpenter & Nelson, 1999).

However, in most of the research on the outcome of the conservative treatment of patients with lumbar syndrome, several types of treatment were applied: drug therapy, physical therapy modalities, manual therapy, myofascial techniques, treatment with different exercise programs.

Chronic pain is a complex medical and psychosocial problem. It requires a comprehensive and multidisciplinary approach to evaluation and treatment. In the world, the so-called Pain clinics should be comprehensive and multidisciplinary, that is, they should be able to offer a wide selection of treatment techniques. Often these clinics work on an outpatient basis. The goals of treatment in an interdisciplinary center program are to reduce pain, improve function, and reduce health care utilization. These goals include reduction in medication use, modification of pain response, increased activity, and reduction in "pain behavior" (BenEliyahu, 1996; Carpenter & Nelson, 1999 ; Ala-Kokko, 2002).

The results of the research showed that between the initial measurement (before starting the physiotherapy treatment and exercise program) and the final measurement (after 15 days of physiotherapy and exercise program) we have significant differences in the decline of disability, where we have the elimination of severe impairment and total disability. After the end of the physiotherapy treatment, there was a change in the variables Pain intensity by -43.75%, for Personal care -48.72%, Lifting -42.77%, Walking -48.91%, Sitting -48.33%, Standing -52.96%, Sleeping -56.26%, Social life -54.72%, Traveling -4.00%, Employment/homemaking -0.88% and Disability level -40.65%.

Regarding the proportional differences between the initial and final measurements, it can be observed that in the initial measurement, 11.5% of the respondents were identified as completely disabled, and 16.4% experienced severe disability. However, in the final measurement, only 1.6% of the patients exhibited complete disability, and 8.2% had severe disability.

Conclusion

Based on the results obtained, it can be concluded that significant differences in the reduction of disability were observed between the initial measurement (prior to commencing the physiotherapy treatment and exercise program) and the final measurement (after 15 days of physiotherapy and exercise program). These differences resulted in the elimination of severe impairment and complete disability.

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