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Original Research Article

Dynamic monitoring of the effect of special kinesitherapeutic program on the degree of disability in patients with chronic lumbalgy

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Abstract

To take account of the effect of kinesitherapeutic program of special exercises to influence the degree of disability in patients with chronic lumbalgia. The study included 110 patients diagnosed with chronic lumbalgia, divided equally into two treatment groups. The participants of the experimental group performed the recommended special exercises 3 times a week at home and those in the control group only follow the guidelines of the physician. At the beginning of the monitoring, on the 6th month and on the 12th month the degree of disability was assessed in all participants by mailed Oswestry questionnaire. In the patients from the experimental group on the 6th month and at the end of the monitoring there was observed a significant reduction in the degree of disability resulting from the application of the kinesitherapeutic program. There was an aggravation of the degree of disability in the participants in the control group on the 6th month and at the end of the monitoring. The treatment with specific exercises is more effective in reducing the degree of disability than the usually prescribed medication in patients with chronic lumbalgia.

Keywords: Low back pain, exercise, disability.

INTRODUCTION

Low back pain is one of the most frequent pathologies in industrial nations. It is considered to be chronic if it has been present for longer than 3 months. It also constitutes the second cause of consultation and the third cause of request of incapacity. Chronic low back pain comes along with a physical deconditioning, and frequently with a progressive desocialisation (Bogduk, 1980). This pathologyis responsiblein many casesof prolonged work stoppages and evendisability. This is why thetreatment and prevention of back pain are major public health issues (Olivier et al., 2007). Recommending exercise as a conservative treatment for chronic lumbalgy has often appeared to be effective by the results of some studies, but there is no evidence which exercises are more appropriate (Bogduk 1980; Richardson et al., 2014).

Given the social importance of this disease, for the first time in Bulgaria, there was carried out a prospective study of the degree of disability after the application of a kinesitherapeutic program of special exercises at home in patients with chronic lumbalgy.

Objective of the study

The objective of this study is to take into account the effect of a kinesitherapeutic program of special exercises in order to influence the degree of disability in patients with chronic lumbalgy.

PATIENTS AND METHODS

The study is representative, prospective, with test-retest design and tracking with filling out questionnaires at the

beginning and end of the observation /12 months/. It was carried out with the participation of a representative sample of 110 patients with chronic lumbalgy, distributed equally into two treatment groups /experimental and control/ of uniform age and gender. The selection of patients was done according to their appearance in the consulting room of the physiotherapy diagnosis and counseling center in Stamboliyski by involving all those who met the inclusion criteria. They were each diagnosed and were undergoing therapy at the time, having been referred to the center by a general practitioner after consultation with a neurologist.

All procedures related to the study were performed in accordance with the guidelines of good clinical practices. Prior to procedures, each patient was familiarized with the design of the study and signed an informed consent form.

The following inclusion criteria for the study were used: a signed informed consent, age 30 to 60 years; presence of X-ray of the lumbar spine and consultation with a neurologist; diagnosed chronic lumbalgy; lack of a herniated disc, tumor, trauma, inflammation of the spine and osteoporosis, etiologically related to lumbalgy; lack of focal neurological deficit - motor, sensory, pelvic reservoir violations; lack of accompanying psychiatric disorders with a view to a better cooperation. 135 consecutive patients with chronic lumbalgy were initially screened, 25 of which were not included in the survey due to non-compliance with the inclusion criteria. Of 110 patients included in the final stage of the study, a total of 51 patients dropped out /22 of the experimental group due to a temporary improvement or social commitments and 29 in the control group due to lack of motivation/.

Patient information was obtained by taking a history and focused review of available medical records of the therapist and neurologist. The experimental group was trained to perform special exercises 3 times a week at home, and participants in the control group followed the recommendations of a physician for medical treatment. Patients' follow-up lasted for a year. At the beginning, on the sixth month and at end of the study, the Oswestry questionnaire was applied through a guidebook sent by mail.

The Oswestry Disability Index (aka: Oswestry Low Back Pain DisabilityQuestionnaire) is an extremely important tool that researchers and disability evaluators use to measure a patient's permanent functional disability. The test has been around for 25 years (Fairbank et al.,1980) and is considered the "gold standard" of low back functional outcome tools (Fairbank et al., 2013).

Instructions

Simply answer the below questions by choosing the 'best answer' that describes your 'typical' pain and/or limitations within the last week or two. You can only choose ONE answer. If your limitations fall in-between two questions, pick the higher point value question. After you have finished the test, add up your points, divide that number by 50, and multiply by 100 to get your percent disability.

There are currently four English versions of the OSI floating around. I will use version 2.0 which is the same that Stanford uses.

Section 1: Pain Intensity

I can tolerate the pain I have without having to use pain killers. (0 points)
The pain is bad but I manage without taking pain killers. (1 point)
Pain killers give complete relief from pain . (2 points)
Pain killers give moderate relief from pain. (3 points)
Pain killers give very little relief from pain. (4 points)
Pain killers have no effect on the pain and I do not use them. (5 points)

Section 2: Personal Care

I can look after myself normally without causing extra pain. (0 points)
I can look after myself normally but it causes extra pain. (1 point)
It is painful to look after myself and I am slow and careful. (2 points)
I need some help but manage most of my personal care. (3 points)
I need help every day in most aspects of self care. (4 points)

Section 3: Lifting

I can lift heavy weights without extra pain. (0 points)
I can lift heavy weights but it gives extra pain. (1 point)
Pain prevents me from lifting heavy weights off the floor but I can manage if they are conveniently positioned for example on a table. (2 points)
Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned. (3 points)
I can lift only very light weights. (4 points)
I cannot lift or carry anything at all.(5 points)

Section 4: Walking (bad question)

Pain does not prevent me walking any distance. (0 points)
Pain prevents me walking more than 1 mile. (1 point)

Pain prevents me walking more than 0.5 miles. (2 points)
Pain prevents me walking more than 0.25 miles. (3 points)
I can only walk using a stick or crutches. (4 points)
I am in bed most of the time and have to crawl to the toilet. (5 points)

Section 5: Sitting („Favorite chair" includes a recliner)

I can sit in any chair as long as I like. (0 points)
I can only sit in my favorite chair as long as I like. (1 point)
Pain prevents me sitting more than 1 hour. (2 points)
Pain prevents me from sitting more than 0.5 hours. (3 points)
Pain prevents me from sitting more than 10 minutes. (4 points)
Pain prevents me from sitting at all. (5 points)

Section 6: Standing (Remember, standing is NOT walking)

I can stand as long as I want without extra pain. (0 points)
I can stand as long as I want but it gives me extra pain. (1 point)
Pain prevents me from standing for more than 1 hour. (2 points)
Pain prevents me from standing for more than 30 minutes. (3 points)
Pain prevents me from standing for more than 10 minutes. (4 points)
Pain prevents me from standing at all. (5 points)

Section 7: Sleeping

Pain does not prevent me from sleeping well. (0 points)
I can sleep well only by using tablets. (1 point)
Even when I take tablets I have less than 6 hours sleep. (2 points)
Even when I take tablets I have less than 4 hours sleep. (3 points)
Even when I take tablets I have less than 2 hours of sleep. (4 points)
Pain prevents me from sleeping at all. (5 points)

Section 8: Sex Life (by pain = for fear of causing pain)

My sex life is normal and causes no extra pain. (0 points)
My sex life is normal but causes some extra pain. (1 point)
My sex life is nearly normal but is very painful. (2 points)
My sex life is severely restricted by pain. (3 points)
My sex life is nearly absent because of pain. (4 points)
Pain prevents any sex life at all. (5 points)

Section 9: Social Life

My social life is normal and gives me no extra pain. (0 points)
My social life is normal but increases the degree of pain. (1 point)
Pain has no significant effect on my social life apart from limiting energetic interests such as dancing. (2 points)
Pain has restricted my social life and I do not go out as often. (3 points)
Pain has restricted my social life to my home. (4 points)
I have no social life because of pain. (5 points)

Section 10: Traveling

I can travel anywhere without extra pain. (0 points)
I can travel anywhere but it gives me extra pain. (1 point)
Pain is bad but I manage journeys over 2 hours. (2 points)
Pain restricts me to journeys of less than 1 hour. (3 points)
Pain restricts me to short necessary journeys under 30 minutes. (4 points)
Pain prevents me from traveling except to the doctor or hospital. (5 points)

Interpretation

Now, simply add up your points for each section and plug it in to the following formula in order to calculate your level of disability: point total / 50 X 100 = % disability (aka: 'point total' divided by '50' multiply by ' 100 = percent disability)
For example: my Current level of disability, 11-11-04 is calculated as follows: 14 / 50 X 100= 28%

Odi scoring:

0% to 20%: minimal disability

The patient can cope with most living activities. Usually no treatment is indicated apart
from advice on lifting sitting and exercise.

21%-40%: Moderate disability

The patient experiences more pain and difficulty with sitting lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal

care sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.

41%-60%: severe disability

Pain remains the main problem in this group but activities of daily living are affected.
These patients require a detailed investigation.

61%-80%: Crippled

Back pain impinges on all aspects of the patient's life. Positive intervention is required.

81%-100%

These patients are either bed-bound or exaggerating their symptoms.
The kinesitherapeutic program applied in patients with chronic lumbalgy in the experimental group included five types of training:
1. Training for lumbar stability: elevation of the pelvis to maintain neutral position, axial withdrawal during co-contraction, maintaining co-contraction with elevation of one foot and abduction of the upper limb, bending the trunk forward while maintaining a neutral lumbar position, moving from sitting into an upright position while maintaining neutral lumbar position.
2. Training for mobility: suppling in flexion position, suppling in extensional position, axial withdrawal from a bent knee position, abductor muscle active tension, adductor muscle active tension, active tension of the ischiocrural muscle group.
3. Flexor workout: exercise for strengthening the abdominal muscles from side leg position as well as exercise for co-contraction m. obliquus abdominis externus, m. obliquus abdominis internus, m. transversus abdominis and m. quadratus lumborum with lateral support with bent knees, co-contraction training for the anterior oblique system involving the anterior abdominal fascia, placed under tension, stabilizing the sacroiliac joint by tension m. obliquus abdominis externus, m. obliquus abdominis internus, and the opposite adductors of the hip; dynamic workout m. obliquus abdominis externus, m. obliquus abdominis internus and adductor of the hip; dynamic strength training m. obliquus abdominis externus and m. obliquus abdominis internus.
4. Extensors workout: exercises for extension of the spine from a prone position with hands support and holding for 30 sec. in extensional position; strength training of the gluteal muscles from prone position, co-contraction for strength of m. gluteus maximus and m. latissimus dorsi.
5. Training for sensory-motor reprogramming: exercises for the trunk rotators with abduction of the upper limb to improve the stabilizing function of the spine from its original seating position on a Swiss-ball; exercises for upper limb flexion and extension of homolateral lower limbs from side leg position on a Swiss-ball for improving the proprioception of the spinal column structures, exercises to maintain the neutral position by moving the Swiss-ball on the wall.
Monitoring and evaluation of the results of kinesitherapeutic program was carried out by an experienced physiotherapist.

The collected primary information was checked, encoded, and entered into a computer database for statistical analysis. Data were processed using SPSS 13.0. Results for quanlitative variables (age, pain intensity) were expressed as mean±SE (standarderror) and resultsfor qualitative variables (gender, risk factor) as percentages. Age, gender, risk factors,aswell as the assessments ofthe VAS and Oswestry test results were compared by means of Pearson's correlationcoefficient (r), 12 - test, t - test, u - test, and Fisher's criterion (F) were used toanalyze the correlation between age, gender, risk factors, pain intensity, and theassessment ofOswestry test results.Multiple regressionanalysiswas appliedto estimatethe simultaneousimpact of age, gender,risk factors,and pain intensity on the Oswestry testresults.The level of significance was set at P<0,05.

RESULTS

Table 1. shows the characteristics of the individuals in the two groups in terms of age, gender, pre-existing risk factors for chronic lumbalgy. The described risk factors include: strenuous physical activity, repetitive motion with rotations of the body, spinal column burdening in upright and seated position, being overweight.

At the beginning of the study there were ascertained no significant differences between the participants in the experimental and control groups in terms of mean age $P > 0.05$ ($u = 0.41$), gender $P > 0.05$ ($\chi2 = 0.15$) and present risk factors, $P > 0.05$ ($\chi2 = 0.04$). No correlation was found between the participants' gender and the presence of risk factors $P > 0.05$ ($\chi2 = 3.51$) as well as between age and the presence of risk factors $P> 0.05$ ($\chi2 = 2.81$).

Table 2 presents a comparison of the average Oswestry test values in the experimental group by monitoring stages.
Proof of the proportion of patients with minimal disability increased in stages of the study, while reducing the percentage of those with moderate and severe disability. This conclusion is supported by Table. 3

The distribution of patients in both treatment groups by degree of disability according to Oswestry test at the

Table 1. Age, gender and presence of risk factors in patients from the experimental and control groups at the beginning and end of the study W

Indicator	Experimental Group		Control Group	
	At the beginning of study	At the end of study	At the beginning of study	At the end of study
Mean age(yr.) (mean ± SE)	43.31±1.11	44.24±1.35	43.90 ± 0.87	44.57 ± 0.55
Gender/N (p%)/	26 (47.27%)	11 (39.39%)	24 (43.63%)	8 (30.76%)
- male	29 (52.73%)	20 (60.61%)	31 (56.37%)	18 (69.24%)
- female				
Risk factors				
- *yes*	33(60.00%)	19 (57.57%)	32(58.18 %)	15 (57.69%)
- *no*	22 (40.00%)	14 (42.43%)	33 (41.82%)	11 (42.31%)

Table 2. Comparison of the average Oswestry test values in the experimental group by monitoring stages.

Monitoring stages	Abs. number	$\overline{X} \pm \overline{Sx}$	Sx	t	P
On 0 month	32	37,94±1,82	10,31	5,59	<0,001
On 6 month	32	31,22±1,71	9,64		
On 6 month	32	31,22±1,71	9,64	3,25	<0,01
On 12 month	32	29,88±1,90	10,73		
On 0 month	32	37,94±1,82	10,31	6,26	<0,001
On 12month	32	29,88±1,90	10,73		

Table 3. A comparison of the average Oswestry test values in the experimental group by monitoring stages.

Monitoring stages	Indices	Disability Minimal	Moderate	Severe	Total
0 month	Abs. number	1	33	21	55
	p±Sp	1,8± 1,00	60±5,74	38,2±4,58	100,00
6^{th} month	Abs. number	4	20	8	32
	p±Sp	12,5±2,00	62,5±	25± 4,47	100,00
12^{th} month	Abs. number	10	15	7	32
	p±Sp	31,3±3,16	46,9± 3,87	21,8± 2,64	100,00

beginning of the study is shown in Table 4.

It is noteworthy that in the initial stage there was no significant difference in distribution between the two groups. In the final stage, we observed a marked difference between the two groups - Table. 5.

The proportion of patients with severe and moderate disability in the experimental group wassignificantly reduced, with the result that the proportions of those with a minimal had exploded. In the controls this dependence was not observed. The proportion of participants with severe disability dramatically increased in the latter, while the proportion of those with moderate disability decreased.

The comparison between the experimental and control groups in terms of average Oswestry test results at the beginning and end of the study recorded statistically significant difference as to the sixth and the 12th month P <0.001 - Table. 6.

It is noteworthy that on 12th month this difference was better expressed as the participants in the control group underwent more severe disability, and those of the experimental remained moderate with significantly lower values of the indicator compared with the initial stage of the study.

The results obtained from Oswestry tests in the experimental group at the beginning of the survey are highly dependent on the age P <0.001 (r = 0.86) and gender of the studied P <0.01 (r = 0.39), as the

Table 4. The distribution of patients in both treatment groups by degree of disability according to Oswestry test at the beginning of the study.

Groups	Indices	Disability according to Oswestry at the beginning of study			Total
		Minimal	Moderate	Severe	
Experimental	Abs. number	1	33	21	55
	p±Sp	1,82± 1,00	60,00±6,61	38,18±6,55	100,00
Control	Abs. number	-	34	21	55
	p±Sp	-	61,82±6,55	38,18±6,55	100,00
Total	Abs. number	1	67	42	110
	p±Sp	0,91± 1,00	60,91±4,65	38,18±4,63	100,00

Table 5. The distribution of patients in both treatment groups by degree of disability according to Oswestry test at the end of the study.

Groups	Indices	Disability according to Oswestry at the end of study			Total
		Minimal	Moderate	Severe	
Experimental	Abs. number	10	15	7	32
	p±Sp	31,25±8,19	46,88±8,82	21,87±7,31	100,00
Control	Abs. number	1	10	15	26
	p±Sp	3,85± 1,00	38,46±9,54	57,69±9,69	100,00
Total	Abs. number	11	25	22	58
	p±Sp	1,90± 1,79	43,10±6,50	37,93±6,37	100,00

Table 6. Comparison between the experimental and control groups in terms of average Oswestry test results at the beginning and end of study

Results from Oswestry тест and stage	Groups	Abs. number	$\overline{x}$± $\overline{Sx}$	Sx	u	P
Beginning of study	Experimental	55	36,24±1,46	10,79	0,63	>0,05
	Control	55	37,47±1,30	9,66		
On 6th month	Experimental	32	31,22±1,71	9,64	3,87	<0,001
	Control	26	40,12±1,55	7,87		
End of study	Experimental	32	29,88±1,90	10,73	4,62	<0,001
	Control	26	41,77±1,74	8,89		

correlation for both indicators is direct, significant for the first variable and moderate for the second.

The results obtained in the experimental group at the end of the survey are highly dependent on the age P <0.001 (r = 0.90). and pain intensity P <0.05 (r = 0.37)., as the correlation is directt, significant for the first variable and moderate for the second.

In comparing the gender of the test results of the experimental group at the beginning and end of the observation no considerable difference in the average values of the test was established but for the initial stage of the study. Women have a higher degree of disability than men P <0,05 (t = 2,05). After starting gymnastics women showed much more rapid improvement and reduced the degree of disability - Table. 7.

It is noteworthy that in women the kinesitherapeutic program hada better effect on the sixth month of the study - the average of the Oswestry test from 40,95 ± 2,13 32,26 ± 2,29 becomes P <0.001 (t = 8,39). This effect lasted over time and on 12th month there was no significant difference in the outcome of the test compared to the sixth month P> 0.05. In men, there was a difference only after the sixth month of observation - the average of the test decreased from 29,69 ± 2,57 to 27,92 ± 2,83 P <0,01 (t = 3,32) – Table 7.

When comparing age we proved that young people up to 39 years have the least degree of disability; in the last stage of the study they passed in the lighter group of minimal disability. The most serious is the age group of patients over 50 years. These patients also had an improvement, but remained with severe disability - Table. 8.

There were found no correlation between the presence of risk factors and Oswestry test results in both groups at the beginning and end of the monitoring period P> 0.05.

When examining the relationship between pain inten-

Table 7. Comparison of the averagevalues of the Oswestry test in the experimental group by gender in the course of monitoring.

Stages	Groups	Abs. number	$\overline{x} \pm \overline{Sx}$	Sx	t	P
0 month	Men	13	33,54±2,91	10,49	2,05	<0,05
	Women	19	40,95±2,13	9,29		
6th month	Men	13	29,69±2,57	9,27	0,75	>0,05
	Women	19	32,26±2,29	10,00		
12th month	Men	13	27,92±2,83	10,21	0,86	>0,05
	Women	19	31,21±2,56	11,14		

Table 8. Comparison of the average values of the Oswestry test in the experimental group by age group at the beginning and end of the monitoring.

Stages	Groups	Abs. number	$\overline{x} \pm \overline{Sx}$	Sx	F	P
0 month	Up to 39 yr.	9	26,44±1,30	3,91	40,67	<0,001
	40-49 yr.	11	36,36±2,18	7,22		
	over 50 yr.	12	48,00±1,30	4,51		
12th month	Up to 39 yr.	9	18,56±0,60	1,81	63,03	<0,001
	40-49 yr.	11	26,45±1,92	6,38		
	Over 50 yr.	12	41,50±1,33	4,62		

Table 9. Dependence of the Oswestry test results of patients in the experimental group from pain intensity (VAS).

Stages	Disability	Abs. number	$\overline{x} \pm \overline{Sx}$	Sx	F	P
O month	Minimal	1	3,00± -	-	3,90	<0,05
	Moderate	33	4,18±0,17	0,98		
	Severe	21	4,90±0,26	1,18		
6month.	Minimal	4	4,00±0,71	-	5,86	<0,01
	Moderate	20	3,90±0,22	0,97		
	Severe	8	5,36±0,38	1,06		
12month	Minimal	10	4,00±0,33	1,05	2,56	>0,05
	Moderate	15	4,07±0,27	1,03		
	Severe	7	5,14±0,55	1,46		

sity on VAS and Oswestry test results at the beginning and end of the study in both groups we found a significant difference in pain intensity between the experimental group of patients at baseline with moderate disability (4,18 ± 0 17) and severe disability (4,90 ± 0,26) P <0.05 (F = 3,90). At the end of the study we did not find such a difference in this group P> 0.05-Table 9.

In the control group we proved such a difference at the beginning and end of the study in terms of pain intensity among participants with moderate (1,68 ± 0,08) and severe disability (1,90 ± 0,07) P <0.05 (u = 2.07).

The performed multiple stepwise regression analysis of the results shows that the most important factor for the obtained results of the test at the beginning and end of the observation is age only and it explains about 76% of the changes in results at the beginning and 81% of their variations at the end of the monitoring P <0,001 (F = 124,68).

DISCUSSION

In analyzing the results of the degree of disability in Oswestry we found that the proportion of patients in the experimental group with minimal disability increased in the stages of the study, while the percentage of those with moderate and severe disability was reduced. A comparison of the experimental and control groups in terms of average Oswestry test results at the beginning and end of the study showed a statistically significant difference as to the sixth and the 12th month P <0.001. In the experimental group the proportion of patients with severe and moderate disability was significantly reduced,

with the result that the proportion of those with a minimal result had exploded. In controls this dependence was not observed. In the latter groups the proportion of participants with severe disability dramatically increased, while the proportion of those with moderate disability decreased.

The increase in the percentage of patients with minimal disability and the reduction of the percentage of patients with moderate and severe disability of the experimental group was due to the applied kinesitherapeutic program, which helped to improve the functionality of the spine. The program includes exercises for active stretching, exercises for strength and endurance of the muscles of the body, a partnership series isometric contractions of the muscles of the anterior, posterior and lateral system, as well as exercises for lumbar-pelvic control and proprioception This program of special exercises is the cause of reducing the rate of disability among participants of the experimental group, resulting in improving the quality of life of the patients. In support of our results we can adduce the survey carried out by (Decarreaux et al., 2002) which examined the effect of the application of special exercises in patients with back pain for 12 weeks at home. The participants in the experimental group received a standard brochure with instructions to maintain activity and were trained to perform special exercises, including stretching, strengthening and relaxation of back muscles. The participants in the control group were only given drug therapy. On 12th week there was registered in the experimental group a significant reduction in disability by Oswestry, and a significant change in all components of quality of life. Those participants had a significantly improved flexion of the spine, the weight and body mass index was reduced as well as the use of nonsteroidal anti-inflammatory drugs (Decarreaux et al., 2002).

Tracking by periods the relationship between pain intensity and degree of disability of Oswestry,we established a statistical difference only at the start of monitoring in patients with moderate disability and those with severe disability P <0.05. We observed that more pain is associated with a pronounced disability. It is important to note that at the end of the monitoring we found no difference in pain intensity in patients from the experimental group with varying degrees of disability P> 0.05. This explains the application of kinesitherapeutic program affecting back pain. Studies confirm the efficacy of programs for functional recovery in patients with chronic lumbalgia. The authors note that these programs help reduce symptoms of pain and the resocialization and the following return to work of patients (Poiraudeau et al.,

2007;Olivier at al., 2007). (Flicker et al., 1993) cites evidence suggesting that the specific stabilizing exercises are effective in reducing the pain and disability in chronic, but not with acute low back pain.

The comparison by age in the experimental group showed that young people up to 39 have a lower degree of disability and at the end of the study they pass in the lighter group of minimal disability. Patients over 50 years old remain with severe disability despite the improvement observed. In the literature we find support for our finding in the study of (Peterson et al., 2005) in which the authors examined 353 patients with low back pain. The results of the monitoring show that the elderly experience significantly more pronounced pain P = 0.039 and severe disability P = 0.002 (Peterson et al., 2005).

In comparison by gender with the Oswestry test results in the experimental group we found that at the beginning of the study women had a higher degree of disability than men P<0,05 (t =2,05). After starting gymnastics women showed much more rapid improvement on the sixth month and reduction of the degree of disability. This improvement was maintained until the 12th month. In men, there was a difference only after the sixth month of observation P <0,01 (t = 3,32). The more rapid improvement and reduction of the degree of disability in women we associated with their motivation, responsibility and accuracy in the implementation of the kinesitherapeutic program unlike men. In the literature we do not find data for comparative characteristics between the degree of disability and gender of the participants.

The performed multiple stepwise regression analysis of the results at the beginning of the study showed that age had the greatest influence on the obtained results from the questionnaire. This characteristic explains about 76% of the changes of the results at the beginning of the study. At the end, the determining factor for the results obtained from the Oswestry questionnaire was again age P <0,001 (F = 124,68). It explains about 81% of the variance. In the literature, we find confirmation of our result in the research of(Beaudreuil et al. 2010) who investigated the functional recovery of 39 patients for five weeks with a follow up of one year. The authors revealed a reduction in absenteeism by 51% in younger individuals, while the older patients were not able to return to work and had had more difficulty in performing everyday activities. (Beaudreuil et al., 2010).

LIMITATIONS OF THE STUDY

The limitations of our study refer to the reduced number of participants and the relatively large number of patients who did not complete the tests. Another limitation was that the participants were only from Plovdiv. However, these limitations do not downplay the results of the first such study in Bulgaria. There are forthcoming studies with a larger number of patients with chronic lumbalgy from different regions of Bulgaria.

CONCLUSION

As a result of the applied kinesitherapeutic program

patients in the experimental group significantly reduced the rate of disability progression by Oswestry with the observation suggesting optimization of all aspects of the quality of life and reduction in the direct and indirect costs for the state and society.

The lack of such a program in the control group is the reason for the increase in the degree of disability by Oswestry. Our results may motivate the introduction and implementation of the described kinesitherapeutic program in the clinical practice in Bulgaria in people with chronic lumbalgy

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