

EFFECT OF GENERAL VERSUS SPECIALIZED EXERCISES ON MOVEMENT CONTROL OF LUMBO-PELVIC REGION IN SUBJECTS WITH CHRONIC LOW BACK PAIN

Toma Garbenytė¹, Vytautas Poškaitis², Vidmantas Zaveckas²,
Laimonas Šiupšinskas^{2,3}, Rimtautas Gudas^{2,4}

*Hospital of Lithuanian University of Health Sciences Kauno Klinikos, Children`s Rehabilitation
Hospital “Lopšelis”¹, Kaunas, Lithuania*

Lithuanian University of Health Sciences, Institute of Sport², Kaunas, Lithuania

Lithuanian Sports University³, Kaunas, Lithuania

*Hospital of Lithuanian University of Health Sciences Kauno Klinikos, Department of Orthopedics
Traumatology, Sports Trauma and Arthroscopic Surgery⁴, Kaunas, Lithuania*

ABSTRACT

Research background and hypothesis. Low back pain is a huge problem in the world. One of the main reasons why the low back pain problems arise is lumbo-pelvic motor control dysfunction. Specialized exercises are the basis of physical therapy for low back pain patients. Hypothesis: specialized exercises can be more effective for movement control of lumbo-pelvic region in subjects with chronic low back pain.

Research aim was to assess the effect of general versus specialized exercises for movement control of lumbo-pelvic region in subjects with chronic low back pain.

Research methods. The study involved 60 subjects with chronic low back pain, 29 women and 31 men, aged 21.5 years on average. All subjects were submitted to the Low Back Pain Duration and Beacke Habitual Physical Activity Assessment questionnaires (Baecke et al., 1982). Lumbo-pelvic motion control was evaluated by six Hannu Luomajoki movement control tests (Luomajoki et al., 2008). Specialized and general training programs were prescribed and performed under supervision of physical therapist. Video materials expert analysis was used for the evaluation of the study data.

Research results. The results showed that a specialized training program was more effective than general exercises in improving movement control in lumbo-pelvic region for patients with low back pain.

Discussion and conclusions. General exercise training program for general exercise group had no effect for all test results. Specialized exercise training program results showed that lumbo-pelvic movement control improved in five of the six control tests ($p < 0.05$).

Keywords: motor control, physical therapy program, stability, mobility.

INTRODUCTION

Low back pain is an important and increasing problem in modern society (Airaksinen et al., 2006). Sometimes the pain is so intensive that people are forced to stop their daily activity. Due to the deteriorating quality of life the person becomes more irritable and more

vulnerable, experiences psychological and physical stress, feels weakness and fatigue. All these factors affect the musculoskeletal system. The spine and joints are overloaded, strength and muscle flexibility decrease, movement control impairs. M. M. Panjabi (1992) asserts that abnormal

movement control is the result of incomplete spinal stability and it may be cause of micro injuries and low back pain (Figure 1).

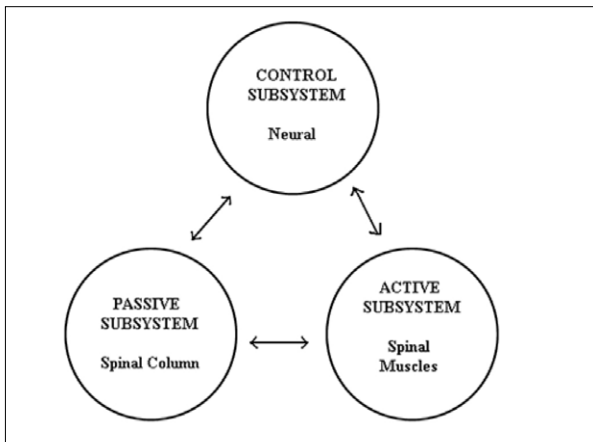


Figure 1. Spinal stability systems (Panjabi, 1992)

Low back pain is the most expensive pain syndrome to society. In all life four of five people felt pain on the planet, one tenth of their back pain became chronic (Sakalauskienė, 2009). This large scale computer-assisted telephone survey was undertaken to explore the prevalence, severity, treatment and impact of chronic pain in 15 European countries and Israel. In-depth interviews with 4839 respondents with chronic pain (about 300 per country) showed that 66% of them had moderate pain, 34% of them had severe pain, 46% of them suffered from constant pain, and 54% of the respondents had intermittent pain. Chronic pain is a major health care problem in Europe that needs to be taken more seriously (Breivik et al., 2006). Movement impairment syndromes are important for physical therapists when we consider that the detection of faulty movement or kinesiopathology is a key competence of physical therapy. Physical therapy improves, restores or supports the movement function (Kriščiūnas et al., 2008). There are two low back pain treatment trends – one of them is to improve movement control and the other is an application of specialized training programs (Macedo et al., 2008). In order to restore the patients function we have to pay more attention to spinal stability and the quality of movement control. Physical therapists must observe not only the primary or final movement phases, but also they have to focus on all movement in general. Research shows that low back pain should be treated with the understanding of teaching and emphasis on how to correctly perform the movement and how to strengthen the lumbo-pelvic stability muscles

(Hodges, 1999; Haxby et al., 2005; Cairns, 2006; Loumajoki, Moseley, 2011). Maladaptive movement control can also occur with hypo mobility (Cook et al., 2006). Decreased physical activity may be the cause of low back pain (Van Dijken et al., 2008).

H. Luomajoki et al. (2007) examined ten movement control tests for the back. For the intraobserver reliability, five tests out of ten showed an excellent reliability. In our research we examined the specialized training program impacts on movement control. This diagnostic test cannot be translated into diagnostic action but adds to our biological insight into mechanisms of disease and may serve later research into treatment as well as diagnosis (Sackett, Haynes, 2002).

RESEARCH METHODS

The research was accomplished in Lithuanian University of Health Sciences, Institute of Sport. We got a licence from Kaunas Regional Biomedical Research Ethics Committee (Be-FMR(M)-82).

The study involved 60 subjects with chronic low back pain: 31 men and 29 women, aged 21.5 years on average, their body mass index was 22.5 kg/m² and the subjects had to have experienced low back pain at some point in their life.

All subjects were submitted to the Low Back Pain Duration Questionnaire (a. Have you ever had low back pain? b. Have you had low back pain in the period of one year? c. Have you had low back pain in the period of three months? d. Do you have low back pain today? For each question the possible answers were as follows: a. No pain b. Mild pain c. Moderate pain d. Severe pain e. Worst pain possible) and Baecke Habitual Physical Activity Questionnaire (Baecke et al., 1982). Lumbo-pelvic movement control was evaluated by six functional movement control tests established by Hannu Luomajoki (Loumajoki et al., 2007) (Figure 2).









Video materials expert analysis was used for the evaluation of the study data. According to the answers in the questionnaires and the primary investigation, 30 people with inadequate lumbo-pelvic movement control were selected for further research. Patients were divided randomly into specialized exercise (n = 15) and general exercise (n = 15) groups (Table 1).

Specialized and general exercise training programs were applied twice a week, one hour, a total of 10 workouts (Table 2). In the general exercise group three subjects did not complete the program.

After the training cycle diagnostic test was repeated. The obtained data were statistically processed and compared. The study lasted for four months. The results showed that a specialized exercise training program was more effective in improving movement control.

Statistical analysis. This study used *SPSS 20.0 for Windows* program for statistical analysis.

The statistical significance was estimated at the probability ($p < \text{value}$) level lower than 0.05 ($p < 0.05$). Mann Whitney and Wilcoxon tests were used for non-normal distribution of data. For independent sample χ^2 criterion was applied. In order to compare the data, the mean (\bar{x}) and standard error of the mean estimate (SEM) were calculated. Qualitative variables are presented as percentage.

Test	Correct	Not correct
Test 1. "Waiters bow": Flexion of the hips in upright standing without movement (flexion) of the low back	Forward bending of the hips without movement of the low back (50-70° Flexion hips). 	Angle hip Flexion without low back movement less than 50° or Flexion occurring in the low back. 
Test 2. Pelvic tilt Dorsal tilt of pelvis actively in upright standing.	Actively in upright standing; keeping thoracic spine in neutral, lumbar spine moves towards Flexion. 	Pelvis does not tilt or low back moves towards Extension or compensatory Flexion in thoracic spine. 
Test 3. One leg stance: From normal standing to one leg stance: measurement of lateral movement of the belly button. (Position: feet one third of trochanter distance apart).	The distance of the transfer is symmetrical right and left. Not more than 2 cm difference between sides. 	Lateral transfer of belly button more than 10 cm. Difference between sides more than 2 cm. 
Test 4. Sitting knee extension. Upright sitting with neutral lumbar lordosis; extension of the knee without movement (flexion) of low back	Upright sitting with neutral lumbar lordosis; extension of the knee without movement of low back (30-50° Extension of the knee is normal). 	Low back is moving in flexion. Patient is not aware of the movement of the back. 







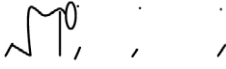

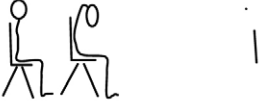
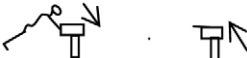


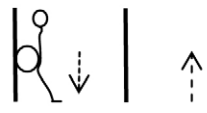
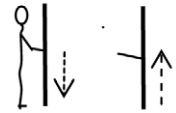
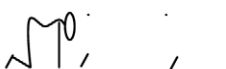




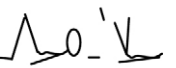
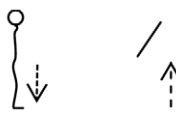
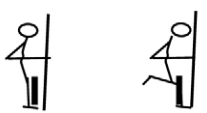
<p>Test 5. Quadruped position. Transfer of the pelvis backwards and forwards (“rocking”) keeping low back in neutral. Starting position 90° hip flexion.</p>	<p>120° of hip flexion without movement of the low back by transferring pelvis backwards.</p> 	<p>Hip flexion causes flexion in the lumbar spine (typically the patient not aware of this).</p> 
	<p>Rocking forwards to 60° hip flexion without movement of the low back.</p> 	<p>Hip movement leads to extension of the low back</p> 
<p>Test 6. Prone lying active knee flexion</p>	<p>Active knee flexion at least 90° without movement of the low back and pelvis.</p> 	<p>By the knee flexion low back does not stay neutral maintained but moves in extension or rotation</p> 

Figure 2. Movement control tests by Hannu Luomajoki (Luomajoki et al., 2008): 1) “Waiters bow”; 2) “Pelvic tilt”; 3) “One leg stance”; 4) “Sitting knee extension”; 5) “Quadruped position”; 6) “Prone lying active knee flexion”

Table 1. Characteristics of the study population

Characteristics	Specialized exercise group, m ± SEM	General exercise group, m ± SEM
Subjects, n	15	15
Men	4	5
Women	11	10
Age, years	20.87 ± 0.2	21.83 ± 0.3
Height, cm	172.87 ± 2.3	172.47 ± 1.6
Weight, kg	65.07 ± 3.2	67.73 ± 3.0
BMI, kg/m ²	21.1 ± 0.7	22.3 ± 0.7
Level of physical activity (from low (3 points) to high (15 points)) (Beacke habitual physical activity assessment questionnaire)	7.2 ± 1.7	7.2 ± 0.2
There was no statistically significant difference between groups.		

Table 2. Summary of specialized and general training programs

Training programs	Specialized exercise training program	General exercise training program
Duration	10 sessions (twice a week, one hour)	
Amount of exercise	5	
Repetitions of exercise	3 sets of 10 times (3X10)	
Muscle groups	Back, abdominal, legs, arms, chest	
Differences between groups	Priority operating sequence schema: finding, sensing and maintaining (stabilizing) physiological spine curves: neutral alignment in most cases and working alignment in crunches	We used B. Anderson and B. Peatl training instructions (Anderson, Peatl, 1996)
Exercise: Monday program		
The main accents of specialized exercise training program: 1. Warm up	Cycling on veloergometer	Cycling on veloergometer
2. Finding and sensing physiological spine curves neutral alignment		
3. Finding, sensing and regaining physiological spine curves (neutral alignment) "sitting tall" after bending forward and backward		
4. Maintaining (stabilizing) physiological spine curves (neutral alignment) in alternative knee rising		
5. Finding, sensing and maintaining (stabilize) physiological spine curves (neutral alignment) in squatting rolling fit ball		
Exercise: Thursday program		
1. Warm up	Cycling on veloergometer	Cycling on veloergometer
Maintaining (stabilizing) physiological spine curves (neutral alignment) in rising hand, straightening leg and alternative hand and leg simultaneously		
Finding, sensing and regaining physiological spine curves (neutral alignment) "sitting tall" after bending forward and backward		
Sense working spine alignment for optimal load distributing		
Maintaining (stabilizing) physiological spine curves (neutral alignment) in squatting with simultaneously hands rising		

RESEARCH RESULTS

The “Waiters bow” test is presented in Figure 3. Statistically significant difference was found in the specialized exercise training group before and after training (before the training program 100% of subjects failed the test, after training 73.3% of the patients passed the test). Statistically significant difference was also observed between the results of the specialized and general exercise training groups after training programs.

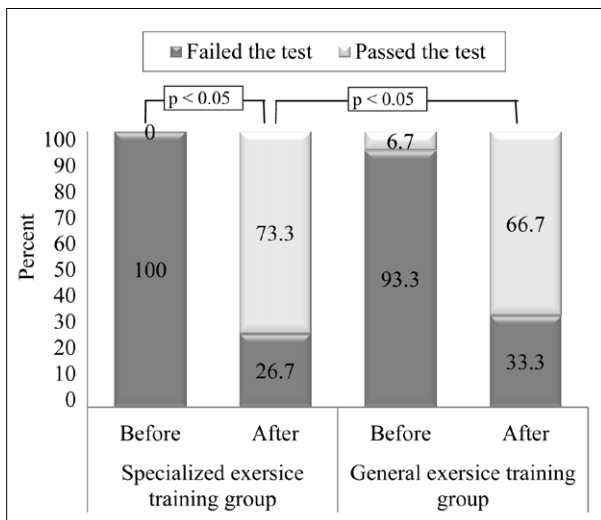


Figure 3. “Waiters bow”

The “Pelvic tilt” test is presented in Figure 4. Statistically significant difference was established in the specialized exercise training group before and after training (before training program 66.7% of subjects failed the test, after training 80% of subjects passed the test). Significant differences were observed after the training program in

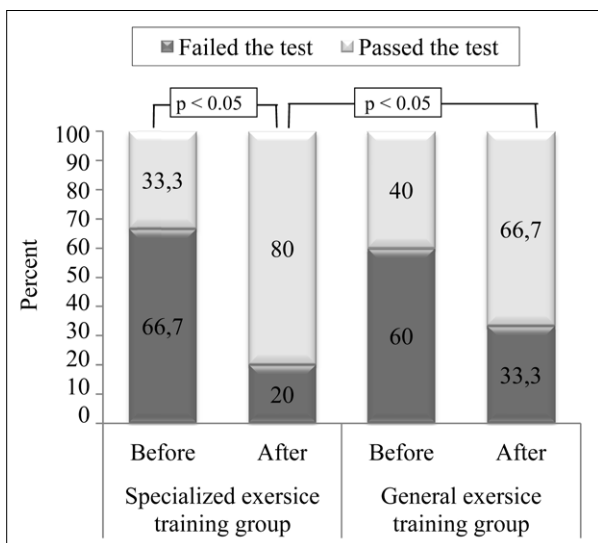


Figure 4. “Pelvic tilt”

specialized exercise group between subjects who passed (80%) and failed (20%) the test. Statistically significant difference was also found between the results in the specialized and general exercise training groups after training programs.

The “One leg stance” test is presented in Figure 5. The results did not improve in both groups.

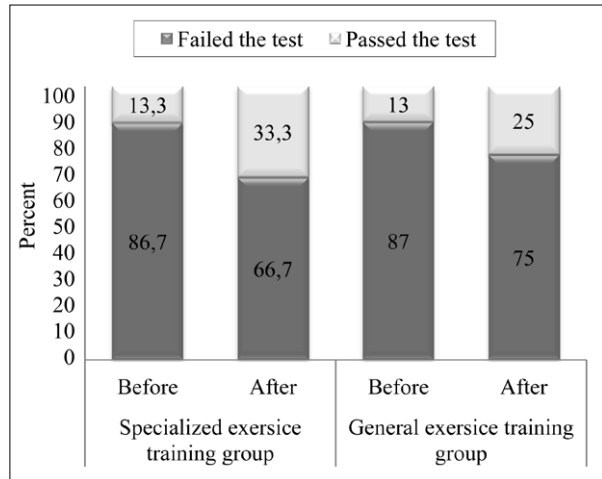


Figure 5. “One leg stance” test

The “Sitting knee extension” test is presented in Figure 6. There was statistically significant difference observed in the specialized exercise training group before and after training (before training program 86.7% of subjects failed the test, after training 93.3% of subjects passed the test). Significant differences were established before the training program in specialized exercise training group between the results of subjects who passed (13.3%) and failed (86.7) test and after training program in specialized exercise group between the results of subjects who passed (93.3%) and failed (6.7%) the test. Statistically significant difference

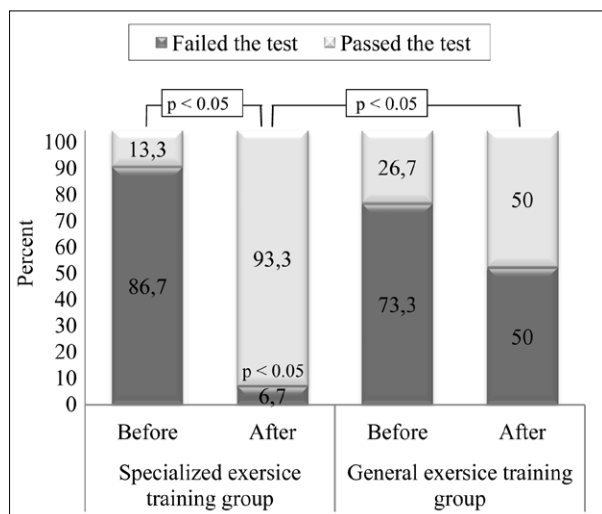


Figure 6. Sitting knee extension

was also found between the results in the specialized and general exercise training groups after training programs.

The “Quadruped position” test is presented in Figure 7. There was statistically significant difference observed in the specialized exercise training group before and after training (before training program 66.7% of subjects failed the test, after training 93.3% of subjects passed the test). Significant differences were established after the training program in specialized exercise group between the results of subjects who passed (93.3%) and failed (6.7%) the test. Statistically significant difference was also found between the results in the specialized and general exercise training groups after training programs.

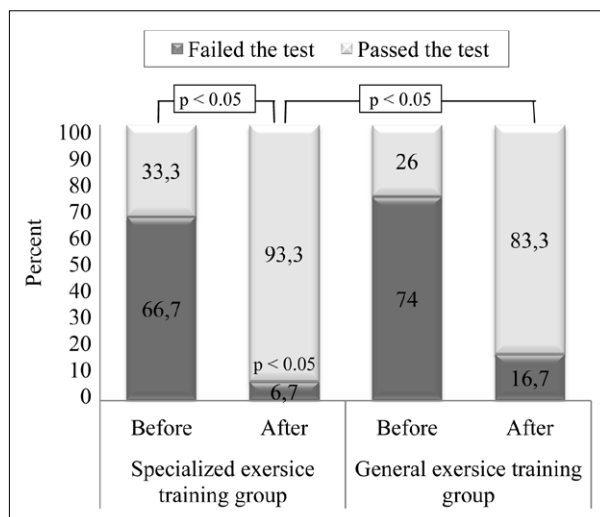


Figure 7. “Quadruped position”

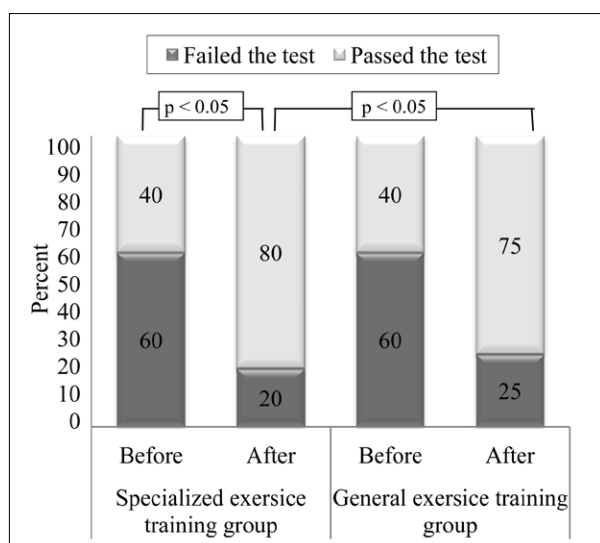


Figure 8. Prone lying active knee flexion test

The “Prone lying active knee flexion” test is presented in Figure 8. There was statistically

significant difference observed in the specialized exercise training group before and after training (before training program 60% of subjects failed the test, after training 80% of subjects passed the test). Statistically significant difference was also found between the results in the specialized and general exercise training groups after training programs.

DISCUSSION

Our study demonstrated a clear difference between general and specialized exercise programs for patients with low back pain regarding their ability to actively control the movements of the lumbo-pelvic region. Lumbo-pelvic movement control assessment is a relatively new concept. In our studies the biggest effect on lumbo-pelvic region movement control was shown in the subjects who performed specialized exercises.

There are already studies carried out to assess the reliability of these tests. H. Luomajoki et al. (2007) used ten lumbo-pelvic movement control tests for subjects who complained of low back pain. In that study six tests showed good reliability. H. Luomajoki et al. (2010) studied 38 people complaining of non-specific low back pain and those with lumbo-pelvic movement control dysfunction. For subjects lumbo-pelvic movement control function was assessed in six movement control tests and a specialized exercise program. All subjects had nine workouts. The results showed that lumbo-pelvic movement control function significantly improved, pain and the level of disability decreased. The same results we obtained in our study measuring the quality of movement control of lumbo-pelvic region. Only in the “One Leg Stance” test, we did not get statistically significant results. However, we found a similar study performed on side to side weight bearing which demonstrated a significant difference between patients with low back pain and healthy controls (Childs et al., 2003).

P. O’Sullivan (2005) developed a classification system of LBP. The first distinction is between centrally evoked and peripherally evoked LBP. The centrally evoked pain is associated with psychological factors, such as fear avoidance, catastrophizing or depressive mood (approximately 30% of LBP patients). The peripherally evoked LBP is mechanically caused and includes movement

impairment and movement control impairment (each approximately 30%). Patients with movement impairment have a painful restriction of movement. Patients with movement control impairment have complaints in certain positions, such as sitting, standing or in twisted positions. Movement control impairment is direction specific, either provoked by flexion, extension, rotation or multidirectional movements.

V. Lehtola (2012) and H. Luomajoki (2011) said that it was enough to change the movement patterns and decrease disability. Large reviews conclude that there is strong evidence for the effectiveness of exercise as a treatment for LBP (van Tulder et al., 2000; Hayden et al., 2005; Airaksinen et al., 2006).

Benefits of specific exercises were demonstrated in subgroups of patients with LBP. Specific stabilizing and movement control exercises are more effective than general exercises in postpartum women with pelvic instability (Stuge et al., 2004) and patients with spondylolisthesis (O'Sullivan et al., 1997). There is evidence to indicate that patients with movement control deficits are an important subgroup of LBP and that they may benefit from specific exercises (Maluf et al., 2000; O'Sullivan, 2000; Comerford, Mottram, 2001, 2001 a).

In our study we tried to review the physical activity questionnaire, lumbo-pelvic movement control assessment and training programs in the impact assessment. Analysing research literature we did not find studies of all these aspects in complex. We found information only on the

individual tests which we tried to analyse and compare.

CONCLUSIONS AND PERSPECTIVES

Movement control of lumbo-pelvic region improved after ten physical therapy sessions with specialized exercises for people with chronic low back pain ($p < 0.05$). Five of six functional tests were performed with better quality after the treatment. General exercises had no effect on movement control of lumbo-pelvic region in people with chronic low back pain. So we can state that specialized exercises were more effective for the movement control of lumbo-pelvic region and should be used in physical therapy practice for people with chronic low back pain. Functional tests of H. Luomajoki (Luomajoki et al., 2007) are recommended as a good and reliable tool for the assessment movement control of lumbo-pelvic region for low back pain patients.

Practical recommendation. During the exercise the patient should be accompanied by an active participant in shaping the visual exercise. To achieve this goal the necessary conditions are:

- Motivation.
- Teaching to pay attention to and prioritise: “nesting, stability and movement quality”.
- Creating a complex of daily individual exercises and teaching to do them correctly.

REFERENCES

- Airaksinen, O., Brox, J., Cedraschi, C. et al. (2006). European guidelines for the management of chronic nonspecific low back pain. *European Spine Journal*, 15 (Suppl. 2), S 192–300, Chapter 4.
- Anderson, B., Pearl, B., Burke, E., R. (1996). *Workout Programs for Men and Women*. Vilnius: Avicena. P. 21–27, 29, 57, 87, 91, 98, 106.
- Baecke, J. A., Burema, J., Frijters, J. E. (1982). A short questionnaire for the measurement of habitual physical activity in epidemiological studies. *American Journal of Clinical Nutrition*, 36, 936–942.
- Breivik, H., Collett, B., Ventafridda, V. et al. (2006). Survey of chronic pain in Europe: Prevalence, impact on daily life, and treatment. *European Journal of Pain*, 10, 287.
- Cairns, M. C., Foster, N. E., Wright, C. (2006). Randomized controlled trial of specific spinal stabilization exercises and conventional physiotherapy for recurrent low back pain. *Spine*, 31, E 670–681.
- Childs, J. D., Piva, S. R., Erhard, R. E., Hicks, G. (2003). Side-to-side weight-bearing asymmetry in subjects with low back pain. *Manual Therapy*, 83, 166–169.
- Comerford, M. J., Mottram, S. L. (2001 a). Functional stability re-training: Principles and strategies for managing mechanical dysfunction. *Manual Therapy*, 6 (1), 3–14.
- Comerford, M. J., Mottram, S. L. (2001). Movement and stability dysfunction – contemporary developments. *Manual Therapy*, 6 (1), 15–26.

- Cook, C., Brismee, J. M., Sizer, P. S. Jr. (2006). Subjective and objective descriptors of clinical lumbar spine instability: A Delphi study. *Manual Therapy*, 11 (1), 11–21.
- van Dijken, C. B., Fjellman-Wiklund, A., Hildingsson, C. (2008). Low back pain, lifestyle factor and physical activity: A population – based study. *Journal of Rehabilitation medicine*, 10 (40), 864–869.
- Haxby, A. J., Brendan, Mc., Peter, H. et al. (2005). Lumbar segmental instability: A criterion – related validity study of manual therapy assessment. *BMC Musculoskeletal Disorders*, 6, 56.
- Hayden, J. A., van Tulder, M. W., Malmivaara, A., Koes, B. W. (2005). Exercise therapy for treatment of non-specific low back pain. *Cochrane Database Systematic Reviews*, CD000335.
- Hodges, P. W. (1999). Is there a role for Transversus abdominis in lumbo-pelvic stability? *Manual Therapy*, 4 (2), 74–86.
- Kriščiūnas, A., Kimtys, A., Rimdeikienė, I. ir kt. (2008). *Kineziterapija*. Kaunas: Vitae Litera. P. 17–18.
- Lehtola, V. (2012). Efficacy of movement control exercises versus general exercises on recurrent sub-acute nonspecific low back pain in a sub-group of patients with movement control dysfunction. Protocol of a randomized controlled trial. *BMC Musculoskeletal Disorders*, 13, 55.
- Luomajoki, H., Koo, J., de Bruin, E. D., Airaksinen, O. (2008). Movement control tests of the low back; evaluation of the difference between patients with low back pain and healthy controls. *BMC Musculoskeletal Disorders*, 9, 170–16.
- Luomajoki, H., Kool, J., de Bruin, E. D. et al. (2010). Improvement in low back movement control, decreased pain and disability, resulting from specific exercise intervention. *Sports Medicine, Arthroscopy, Rehabilitation, Therapy & Technology*, 2, 11–12.
- Luomajoki, H., Kool, J., de Bruin, E. D. et al. (2007). Reliability of movement control tests in the lumbar spine. *BMC Musculoskeletal Disorders*, 8 (90), 14.
- Luomajoki, H., Moseley, G. L. (2011). Tactile acuity and lumbo pelvic motor control in patients with back pain and healthy controls. *British Journal of Sports Medicine*, 45, 437–440.
- Macedo, L. G., Latimer, J., Maher, C. G. et al. (2008). Motor control or graded activity exercises for chronic low back pain? A randomised controlled trial. *BMC Musculoskeletal Disorders*, 9, 65–72.
- Maluf, K. S., Sahrman, S. A., van Dillen, L. R. (2000). Use of a classification system to guide nonsurgical management of a patient with chronic low back pain. *Physical Therapy*, 80 (11), 1097–1111.
- O’Sullivan, P. (2005). Diagnosis and classification of chronic low back pain disorders: Maladaptive movement and motor control impairments as underlying mechanism. *Manual Therapy*, 10 (4), 242–255.
- O’Sullivan, P. B. (2000). Masterclass. Lumbar segmental ‘instability’: Clinical presentation and specific stabilizing exercise management. *Manual Therapy*, 5 (1), 2–12.
- O’Sullivan, P. B., Phyt, G. D., Twomey, L. T., Allison, G. T. (1997). Evaluation of specific stabilizing exercise in the treatment of chronic low back pain with radiologic diagnosis of spondylolysis or spondylolisthesis. *Spine*, 22 (24), 2959–2967.
- Panjabi, M. (2003). Clinical spinal instability and low back pain. *Journal of Electromyography and Kinesiology*, 13, 371–379.
- Panjabi, M. M. (1992). The stabilizing system of the spine. Part I. Functions, Dysfunctions, Adaptation, and Enhancement. *Journal of Spinal Disorders & Techniques*, 5, 4–13.
- Sackett, D. L., Haynes, R. B. (2002). The architecture of diagnostic research. *British Medical Journal*, 324 (7336), 539–541.
- Sakalauskiene, G. (2009). Apatinės nugaros dalies skausmo nemedikamentinė korekcija pavienėmis bei kompleksinėmis medicininėmis reabilitacijos priemonėmis ir jų poveikio įvertinimas. *Medicina (Kaunas)*, 45 (9), 739–749.
- Stuge, B., Veierod, M. B., Laerum, E., Vollestad, N. (2004). The efficacy of a treatment program focusing on specific stabilizing exercises for pelvic girdle pain after pregnancy: A two-year follow-up of a randomized clinical trial. *Spine*, 29 (10), E 197–203.
- van Tulder, M., Malmivaara, A., Esmail, R., Koes, B. (2000). Exercise therapy for low back pain: A systematic review within the framework of the Cochrane collaboration back review group. *Spine*, 25 (21), 2784–2796.

BENDRŲJŲ IR SPECIALIŲJŲ FIZINIŲ PRATIMŲ PROGRAMOS POVEIKIS JUOSMENS-DUBENS SRITIES JUDESIŲ VALDYMUI

**Toma Garbenytė¹, Vytautas Poškaitis², Vidmantas Zaveckas²,
Laimonas Šiupšinskas^{2,3}, Rimtautas Gudas^{2,4}**

*Lietuvos sveikatos mokslų universiteto Kauno klinikų Vaikų reabilitacijos ligoninė „Lopšelis“¹,
Kaunas, Lietuva*

Lietuvos sveikatos mokslų universiteto Sporto institutas², Kaunas, Lietuva

Lietuvos sporto universitetas³, Kaunas, Lietuva

*Lietuvos sveikatos mokslų universiteto Kauno klinikų Ortopedijos ir traumatologijos departamentas⁴,
Kaunas, Lietuva*

SANTRAUKA

Tyrimo pagrindas ir hipotezė. Nugaros apatinės dalies skausmas yra viena aktualiausių problemų visame pasaulyje. Dažniausia nugaros skausmo priežastis – juosmens-dubens judesių valdymo sutrikimas. Specialieji pratimai yra svarbiausi gydant nugaros skausmą. Hipotezė: specialiosios treniruotės programa yra veiksmingesnė lavinant žmonių, jaučiančių lėtinį nugaros skausmą, juosmens-dubens srities judesių valdymą.

Tikslas – palyginti specialiosios ir bendrojo lavinimo treniruotės programos poveikį žmonių, jautusių lėtinį nugaros apatinės dalies skausmą, juosmens-dubens srities judesių valdymui.

Metodai. Buvo tiriama 60 asmenų, jautusių nespecifinį nugaros apatinės dalies skausmą. Tiriamieji – 31 vyras ir 29 moterys, vidutinis amžius – 21,5 m. Visiems buvo taikomas nugaros apatinės dalies skausmo ir *Baecke* fizinio aktyvumo klausimynai. Juosmens-dubens srities judesių valdymas vertinamas šešiais testais pagal Hannu Luomajoki. Taikyta specialioji ir bendrojo lavinimo treniruotės programa priziūrint kineziterapeutams. Norint tiksliau surinkti duomenis panaudota vaizdo filmavimo kamera.

Rezultatai. Paskaičiavus ir įvertinus specialiosios treniruotės programos rezultatus galima teigti, kad ši programa labiau paveikė judesių valdymą.

Aptarimas ir išvados. Po bendrojo lavinimo treniruotės programos ciklo kontrolinės grupės vertinimo testų rezultatai nepakito ($p > 0,05$). Po specialiosios treniruotės programos ciklo tiriamosios grupės penkių testų iš šešių rezultatai pagerėjo.

Raktažodžiai: judesių valdymas, kineziterapijos programa, stabilumas, mobilumas.

Gauta 2013 m. birželio 27 d.
Received on June 27, 2013

Priimta 2013 m. rugsėjo 9 d.
Accepted on 9 September, 2013

Corresponding author **Toma Garbenytė**
Hospital of Lithuanian University of
Health Sciences Kauno Klinikos
Varnių str. 39-85, Kaunas
Lithuania
Tel +370 62437907
E-mail tomagarbenyte@gmail.com