Benefits of the Clinical Pilates Program in Lower Back Pain in Young Handball Players

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BACKGROUND

Low back pain is defined as a slight or acute pain, or as a discomfromt that arises in the region of the lumbar spine, and may or may not radiate to the thigh[3]. Lumbar pain in athletes is related to multiple external factors such as sport, intensity, frequency of training and technique and planning, and internal factors such as gender and age[4].

Pilates Clinic uses minimal loads to improve the activation and endurance of slow motor units and the integration of movement from a stable center and increased kinesthesia, aiming to improve the posture and control of the movement and to develop lombo-pelvic stability through the strengthening of the core. The effectiveness of therapeutic exercises in the treatment of chronic low back[5] pain continues to be investigated; however, there is already strong evidence that the pain intensity and disability are reduced, although there are no recommendations on what types of specific exercises from individuals with low back pain[(6,7)]

PURPOSE

The aim of this study is to analyze the benefits of low back pain in young handball athletes by applying a 6 week clinical pilates.

Four specific objectives were defined:

- → Evaluate the functional incapacity of athletes with low back pain in their daily activities due to it, after the clinical pilates program;
- → Observe the behavior of lumbar pain intensity in young athletes after the clinical pilates program;
- → Evaluate the endurance of the trunk muscles of the athletes through McGill trunk endurance tests, after the clinical pilates program.

METHODS

A quasi-experimental study with 18 participants divided by an experimental group (athletes with lumbar pain from training overload, existing from more than 3 months, attending weekly handball training and Clinical Pilates program) and a control group (athletes with low back pain, attending weekly handball drills, who were given a pamphlet with trunk strengthening and postural control exercises). The study lasted from 6 weeks, with evaluation moments at week 0 and in the end of week 6.

Through the SPSS, the t-student test was used to analyze intra and inter-group data, with a significance level of 5%.

RESULTS

Analyzing the descriptive characteristics of the sample (Table 1), it was possible to verify that the groups were homogeneous regarding the age (19.66 ± 2.85 vs 19.61± 2.96) and weight (80.78 ± 7.35 vs 80.58 ± 5.43) the participants.

In the mean values, the athletes in the experimental group had lower values than the control group, functional disability (2.1 ± 1.5 vs 3.25 ± 1.75) and pain score (3 ± 1.5, vs 4.25 ± 0.7), and higher values from endurance of the trunk (flexors - 73.9 ± 24.5, extensors - 75.3 ± 24.7, right lateral flexors - 41.1 ± 26.5, left lateral flexors - 43.35 ± 26.8; ± 24.1, vs flexors 56.1 ± 24.1, extensors- 63.2 ± 15.6, right lateral flexors- 32.8 ± 16.1, left lateral flexors- 35.5 ± 19.2) (tables 2 and 3). In EG, we can see statistically significant differences in the functional disability variable (p = 0.02), pain intensity (p = 0.03) and endurance in the trunk flexors (p = 0.04) and extensors (p = 0.01) (table 2); In CG, there are no statistically significant differences except from pain intensity (p = 0.04) (table 3).

The functional disability and pain intensity value decreased from M0 to M1 in the EG with a moderate to high effect. The value of endurance of trunk flexors and extensors increase from M0 to M1 with a moderate to high effect (table 4).

Table 1- Mean and standard deviation (sd) of age, weight, per group and respective comparison

	Experimental Group mean ± sd	Control Group mean ± sd	Teste Shapiro-Wilk
Age (years)	19,66 ± 2,85	19,61 ± 2,96	p= 0,15
Weight (Kg)	80,78 ± 7,35	80,58 ± 5,43	p= 0,37

Table 2-Mean and standard deviation (sd), before (M0) and after exposure (M1), t-test and sig. value, in experimental group

Experimental Group		M0 mean ± sd	M1 mean ± sd	T-Test (t)	Sig. (p)
	Roland Moris Questionaire (0-23)	4.3± 2.1	2.1±1.5	t=2.5	p=0.02*
	Pain Scale (1-10)	4.9±1.9	3±1.5	t=2.4	p=0.03*
Endurance	Flexor	53.7±16.6	73.9±24.7	t=-2.1	p=0.04*
	Extensor	50.1±15.9	75.3±24.7	t=-2.7	p=0.01*
	Right Lateralflexor	26.3±19.03	41.1±26.5	t=-1.4	p=0.16
	Left Lateralflexor	26.8±18.9	43.3±26.8	t=-1.5	p=0.13

* statistically significant differences

Table 3-Mean and standard deviation (sd), before (M0) and after exposure (M1), t-test and sig. value, in control group

Control Group		M0 mean ± sd	M1 mean ± sd	T-Test (t)	Sig. (p)
	Roland Moris Questionaire (0-23)	4.2± 1.66	3.2±1.7	t=1.1	p=0.26
	Pain Scale (1-10)	5.3±1.1	4.2±0.7	t=2.3	p=0.04*
Endurance	Flexor	47.3±24.7	56.1±24.1	t=-0.7	p=0.48
	Extensor	51.8±15.5	63.2±15.6	t=-1.4	p=0.16
	Right Lateralflexor	23.2±15.9	32.8±16.1	t=-1.1	p=0.25
	Left Lateralflexor	26.3±20.1	35.5±19.2	t=-0.9	p=0.37

* statistically significant differences

Table 4- Effect size of the variables in each group

Effect size (Cohen(d))		Experimental Group	Control Group
Roland Moris Questionaire		d=1.1	d=0.9
Pain Scale		d=1.1	d=1.1
Endurance	Flexor	d=0.9	d=0.3
	Extensor	d=1.2	d=0.7
	Right Lateralflexor	d=0.6	d=0.5
	Left Lateralflexor	d=0.7	d=0.4

CONCLUSIONS

Clinical Pilates has benefits on handball athletes with low back pain, leading to a decrease of the pain intensity and functional incapacity, as well as an increase of the endurance of the trunk flexors and extensors. This study shows the relevance of the introduction of Clinical Pilates in the recovery of handball athletes with low back pain. However, further investigation should be done with an increased sample.

REFERENCES

1. Blyth F, March L, Brnabic A, Jorm L, Williamson M, Cousins M. Chronic pain in Australia: A prevalence study. Pain. 601; 89: pp. 127-34.
2. Phillips C. Clinical Pilates, Phisiotherapy Myotherapy: a Perfect Combin. Journal of the Australian Association of Massage Therapists. 608; pp. 6-9.
3.Chou, R., Qaseem, A., Snow, V., Casey, D., Cross, J,R,T., Shekelle, P., Owens, D.K., American Pain Society Low Back Pain Guidelines Panel. (2007) Diagnosis and treatment of low back pain: a joint clinical practice Guideline from the American College of Physicians and the American Pain Society. Ann Intern Med, Vol 147, 478-91.
4.Lundin, O., Hellstrom, M., Nilsson, I. and Sward, L. (2001) 'Back pain and radiological changes in the thoraco-lumbar spine of athletes. A long-term follow-up', Scandinavian Journal of Medicine and Science in Sports, 11(2): 103–9.
5.Phillips, C. (2008). Clinical Pilates, Phisiotherapy Myotherapy: a Perfect Combin. Journal of the Australian Association of Massage Therapists, 6-9.
6.Rydeard, R., Leger, A., Smith, D. (2006) Pilates-based therapeutic exercise effect on subjects with nonspecific chronic low back pain and functional disability: a randomized controlled trial. Journal of Orthopaedic & Sports Physical Therapy, Vol. 36, pp. 472-484.
7.Gladwell, V., Head, S., Haggar M. & Beneke R. (2006) Does a Program of Pilates Improve Chronic Non Specific Low back Pain? Journal of Sports Rehabilitation, Vol. 15, pp. 338-350.