Comparison the effect of core stabilization training in water and on land in the management of chronic non-specific low back pain

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Aims

Low back pain is one of the most common health problems in different societies of the world (1). For the treatment of low back pain in recent years, the focus has been on the use of exercises with a core stability approach. Core stabilization exercises provide the right motor skills to protect the spine. In stability exercises with emphasis on training the voluntary contraction of the transverse abdominal muscle, in addition to the number of repetitions, the accuracy of separate muscle training is also an important and determining factor in the quality of retraining (2). In previous studies, the duration of the exercises was between four and six weeks. But it is necessary to design treatments with a shorter duration. Therefore, the aim of the present study was to investigate the difference between the effect of twelve consecutive sessions of water and land exercises with the core stability approach on pain and dynamic balance in women with chronic nonspecific back pain.

Materials and methods

The method of this research was quasi-experimental. The statistical population of the present study consisted of women with chronic non-specific low back pain referred to medical clinics in Mashhad, whose age range was between 30 to 40 years. The statistical sample of this study consisted of 36 women, who were selected in an accessible and purposeful method. Then the subjects were randomly divided into three groups (control: 12, experimental 1:12, experimental 2: 12) and then the subjects were pre-tested and then experimental groups 1 and 2 were exercises, respectively Core stability in water and land was implemented, and at the end, the post-test was performed according to the pre-test. The duration of the training program, in both water and land protocols, varied from 20 to 40 minutes, depending on the number of repetitions of each movement and the progress and increase of movements.

Patients' low back pain was measured using the Quebec questionnaire. This questionnaire contains 25 5-choice questions. In previous studies, the validity of the Quebec questionnaire has been reported to be 0.84 (3). The Y test was used to measure dynamic balance. The Y test is a grid with

three lines in the anterior, posterior-internal and posterior-external directions in which the person stands in the center of the network with one foot and the other leg in different directions. Each subject made three attempts, then the mean of each calculated direction was divided by the length of the foot and multiplied by a percentage to determine the subject's dynamic balance score in one direction. The validity of the Y test was 0.98 and its reliability was reported between 0.78 and 0.96 (4).

Results

There was no statistically significant difference between the groups in the variables of age 34.75 ± 2.89 years, height 163.94 ± 4.53 and weight 67.01 ± 4.76 (P >0.05). Paired t-test was used to examine the changes within the group from pretest to posttest. The results showed that in experimental groups 1 (training in water) and 2 (training on land), the variables of pain and dynamic balance had a significant difference during 12 training sessions (P <0.05); But in the control group, these indicators were not significant (P>0.05).

One-way analysis of variance was used to examine the differences between groups. The results showed that after 12 training sessions, there were significant changes between the three groups, pain variables and dynamic balance (P <0.05); However, in the analysis of variance, it is not possible to determine which group differences are significant between the three groups as a result of the difference between the two groups in the present study. To investigate this, multiple comparisons were performed using the Tukey post hoc test. The results of Tukey post hoc test show (Table 1) that the amount of pain in both experimental groups 1 (training in water) and experimental 2 (training on land) was significantly reduced compared to the control group (P <0.05); Also, the amount of pain in experimental group 1 was significantly reduced compared to experimental group 2 (P <0.05). In addition, the rate of advance in all directions in both experimental groups 1 (water training) and experimental 2 (land training) increased significantly compared to the control group (P <0.05); Also, the amount of advance in all directions increased significantly in experimental group 2 compared to experimental group 1 (P <0.05).

Variable	Group	Mean dif	p
Pain	1,2	14.2	0.001*
	1,3	7.67	0.001*
	2,3	6.52	0.001*
Anterior	1,2	6.41	0.001*
	1,3	11.91	0.001*
	2,3	5.5	0.002*
Posterior/medial	1,2	2.8	0.03*
	1,3	6.5	0.001*
	2,3	3.6	0.005*
Posterior/lateral	1,2	2.41	0.03*
	1,3	5.58	0.001*
	2,3	3.16	0.005*

1= Control / 2=In water / 3=On land

* Significant level was considered P<0.05

Conclusion

In performing core stability exercises, the activity of the trunk muscles is necessary in order to control and ensure the stability of the spine, and this activity should be returned to the desired level in patients with low back pain. Achieving this important goal requires coordination between active, passive and neural structures. Therefore, an exercise program that focuses on retraining the trunk muscles to control spinal movements can reduce stress on bone-ligament tissues, reduce pain, and thus improve the function of patients with low back pain (5). In the present study, after 12 sessions of central stability exercises in water and land, a significant improvement in pain was observed, which was greater in the group of core stability in water. In addition, the dynamic balance was significantly improved in both groups compared to the control group, which this time on land training group showed more dynamic improvement.

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