LUMBAR SPINE PROBLEMS CAUSED BY HYPEREXTENSIO AND IT IS PREVENTION, AS WELL AS BALANCE DEVELOPMENT IN RHYTHMIC GYMNASTS

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OBJECTIVES

Aim of the study was to assess lumbar spine issues in rhythmic gymnasts, explore the underlying causes of pain, and develop a preventive exercise program.

METHODS

Our research was a longitudinal, quantitative, prospective study. A total of 36 female rhythmic gymnasts participated in our study, with experimental group (n=18) who participated in the 12-week exercise program, control group (n=18). Pain intensity was assessed using the Visual Analog Scale (VAS), trunk muscle strength was measured with the Kraus-Weber-, Core-, and Side-plank tests. To determine static balance the Flamingo test, for dynamic balance the Y-balance test was used. The tests were conducted before and after the program.

RESULTS

The program shows a significant improvement in pain on the VAS scale in the experimental group ($p<0.001$). The experimental group value was 14.50±12.24 and improved to 6.61±8.73 while the control group changed from 23.33±12.31 to 18.22±13.34. The trunk muscle strength tests demonstrated significant improvements in the Kraus-Weber test's "A" part ($p<0.001$), the Core test resulted significant improvement ($p<0.001$) and in the Side-plank test also significant improvement occurred on both the sides for the experimental group ($p<0.001$). In the evaluation of the Flamingo test significant improvement was observed in the right leg for the experimental group ($p=0.02$). In the dynamic balance test significant improvements in multiple directions were found in both the experimental and control groups after 12 weeks. There was significant improvement in forward-right side measurement ($p=0.05$) and left-back-left side measurement ($p=0.02$) in the experimental group. In the control grou, significant differences occurred in forward-left side measurement ($p=0.03$), right-back-right side measurement ($p=0.005$), right-back-left side measurement ($p=0.004$), left-back-right side measurement ($p=0.004$), and left-back-left side measurement ($p<0.001$).

CONCLUSIONS

The exercise program has proven to be effective in the development of balance and core muscle strength, as well as in its positive impact on pain.

	Average ± Spread		Min		Max		Difference	
	Pre	*Post*	*Pre*	*Post*	*Pre*	*Post*	*Diff. bet. avar.*	*P-value*
Kraus-Weber A	1.11 ± 2.32	7.06 ± 2.39	0	4	7	10	5.95	**<0.001**

Table 1.
Results of the Kraus-Weber test A after the first and second measurements for the study group
(Explanation: Diff. aet. avar.=Difference between averages)

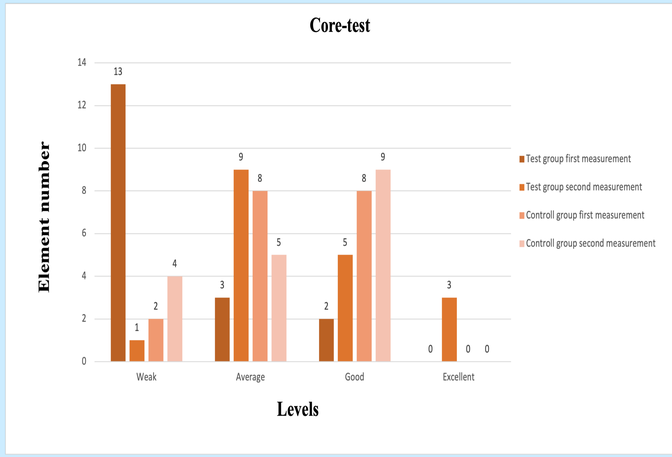

Figure 1.
Core test evaluation according to levels and based on the number of items belonging to the levels

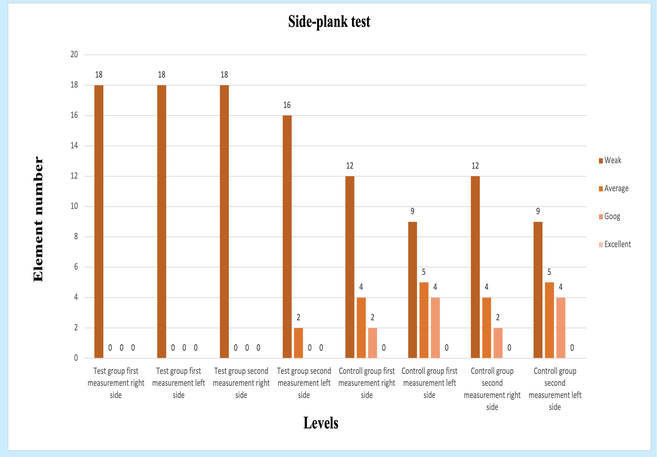

Figure 2.
Comparison of the test and control group to the right and left based on the number of items belonging to the levels

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