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Original Article

Effect of Circuit Training on Selected Performance Variables among Male Hockey Players

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ABSTRACT

The purpose of the study was to investigate the effect of circuit training on selected performance variables among hockey players. It was hypothesized that there would be significant differences on selected performance variables due to the effect of circuit among hockey players. For the present study, the 30 male hockey players were selected as individuals at random from Alagappa University College of Physical Education, Alagappa University, Karaikudi, Tamil Nadu, India and their ages ranged from 18 to 25 years. For the present study, pretest – posttest random group design which consists of control group and experimental group was used. The individuals were randomly assigned to two equal groups of 15 each and named as Group "A" and Group "B." Group "A" underwent circuit training, and Group "B" has not underwent any training. Dribbling and hitting were assessed by subjective rating by experts. The data were collected before and after 12 weeks of training. The data were analyzed by applying analysis of covariance. The level of significance was set at 0.05.

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INTRODUCTION

A change in one of the components of the shoulder girdle leads to a complete change in shoulder motion. The orientation of the scapula is predicted in the upright position mainly from the length of the trapezius and levator scapulae muscles, and to a lesser extent from the length of the rhomboids and serratus anterior muscle.[1] In recreational athletes, same symmetry between the two shoulders in all the measured variables. As in tennis or baseball players, volleyball players also have a depressed playing shoulder. This leads to a narrowed subacromial space in the upright position.[2] Some researchers suggested that a circuit-based training consisting of endurance and resistance exercises might be preferred, rather than one focused only on a single mode of exercise[3,4] even if not all researchers agreed.[5,6] Resistance training and aerobic exercise are established approaches to help manage obesity and associated risk factors.[7,8] Both types of exercise have been prescribed to sedentary and obese individuals and resulted in improved blood pressure (BP), heart rate, body composition, biochemical markers (insulin, glucose, cholesterol, etc.), and strength.[9,10] Combination training (i.e., aerobic and resistance training combined) appears to have a greater effect on BP, arterial stiffness, body composition, and then performing either type of exercise independently.[11,12]

METHODOLOGY

The purpose of the study was to investigate the effect of circuit training on selected performance variables among hockey players. It was hypothesized that there would be significant differences on selected performance variables due to the effect of circuit among hockey players. For the present study, the 30 male hockey players were selected as individuals at random from Alagappa University College of Physical Education, Alagappa University, Karaikudi, Tamilnadu, India and their ages ranged from 18 to 25 years. For the present study, pretest – posttest random group design which consists of control group and experimental group was used. The individuals were randomly assigned to two equal groups of 15 each and named as Group "A" and Group "B." Group "A" underwent circuit training and Group "B" has not underwent any training. Dribbling and hitting were assessed by subjective rating by experts. The data were collected before and after 12 weeks of training. The data were analyzed by applying analysis of covariance (ANCOVA). The level of significance was set at 0.05.

RESULTS

The findings pertaining to ANCOVA between experimental group and control group on selected performance variables among intercollegiate male hockey players for pretest – posttest, respectively have been presented in Tables 1 and 2.

Table 1 revealed that the obtained "*F*" = 5.57 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was a significant difference in adjusted means of dribbling of hockey players between experimental group and control group. The graphical representation of data has been presented in Figure 1.

Table 2 revealed that the obtained "*F*" = 66.25 was found to be significant at 0.05 level with df 1, 27 as the tabulated value of 4.21 required to be significant at 0.05 level. The same table indicated that there was significant difference in adjusted means of hitting of intercollegiate male hockey players between experimental group and control group. The graphical representation of data has been presented in Figure 2.

In case of performance variables, i.e., dribbling and hitting the results between pre and post (12 weeks) test has been found significantly higher in experimental group in comparison to control group. This is possible because due to regular circuit training which may also bring sudden spurt in performance variables in hockey players. The findings of the

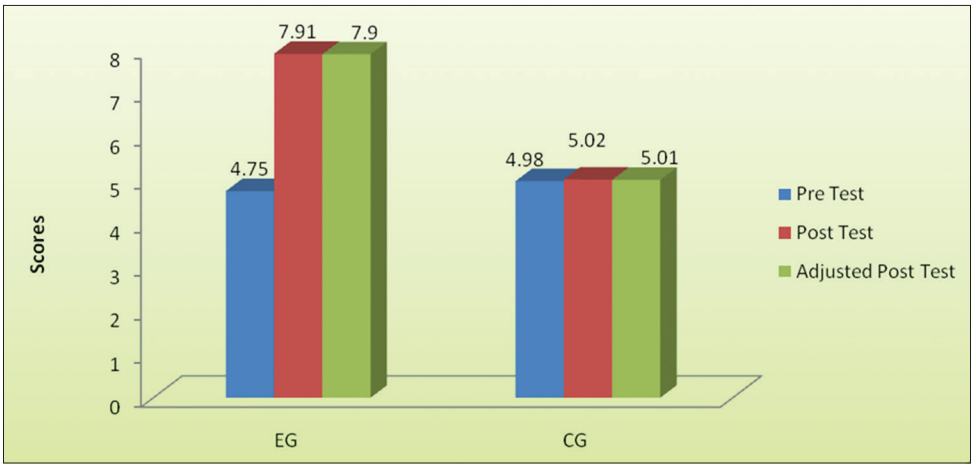

Figure 1: Comparisons of pre-test means, post-test means, and adjusted post-test means for control group and experimental group in relation to dribbling

Table 1: ANCOVA between experimental group and control group on dribbling of hockey players for pre, post, and adjusted test

Mean	Experimental group	Control group	Source of variance	Sum of squares	df	Mean square	F
Pretest mean	4.75	4.98	Between groups	219.63	1	219.63	0.85
			Within groups	7162.66	28	255.80	
Posttest mean	7.91	5.02	Between groups	2050.53	1	2050.53	5.11*
			Within groups	11235.33	28	401.26	
Adjusted post mean	7.90	5.01	Between groups	2117.92	1	2117.92	5.57*
			Within groups	10250.16	27	379.63	

*Significant at 0.05 level. df: 1/27=4.21. ANCOVA: Analysis of co-variance

Table 2: ANCOVA between experimental group and control group on hitting of intercollegiate male hockey players for pre, post, and adjusted test

Mean	Experimental group	Control group	Source of variance	Sum of squares	df	Mean square	F
Pretest mean	4.88	4.57	Between groups	62.5	1	62.5	1.10
			Within groups	1583.86	28	56.56	
Posttest mean	6.88	4.66	Between groups	3340.83	1	3340.83	73.88*
			Within groups	1266.13	28	45.21	
Adjusted post mean	6.70	4.66	Between groups	3288.82	1	3288.82	66.25*
			Within groups	1340.28	27	49.64	

*Significant at 0.05 level. df: 1/27=4.21. ANCOVA: Analysis of co-variance

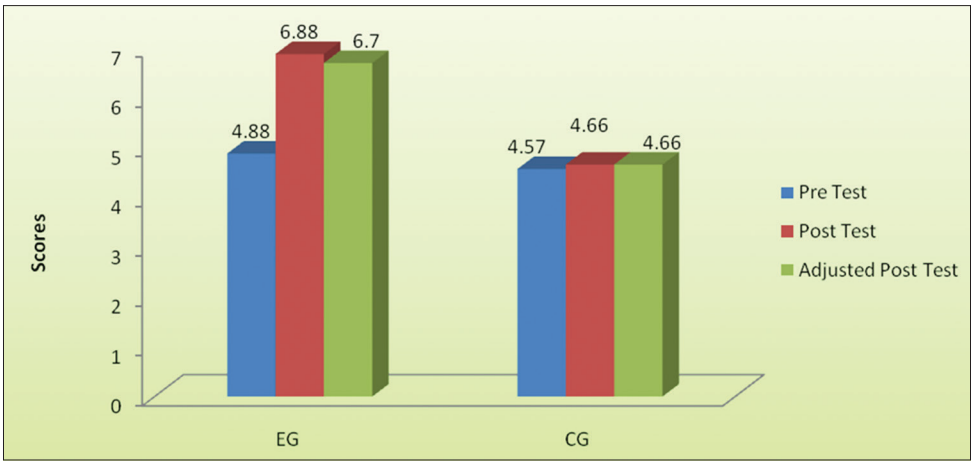

Figure 2: Comparisons of pre-test means, post-test means, and adjusted post-test means for control group and experimental group in relation to hitting

present study have strongly indicates that circuit training of 12 weeks have significant effect on selected performance variables, i.e., dribbling and hitting of hockey players. Hence, the hypothesis earlier set that circuit training program would have been significant effect on selected performance variables in light of the same the hypothesis was accepted.

CONCLUSIONS

On the basis of findings and within the limitations of the study the following conclusions were drawn: The circuit training had positive impact on dribbling and hitting among hockey players. The experimental group showed better improvement on dribbling and hitting among hockey players than the control group.

REFERENCES

1. Dupuis C, Tourny-Chollet C. CETAPS increasing explosive power of shoulder in volleyball players. Strength Cond J 2003;25:7-11.
2. Kraemer JB, Stone MH, O'Bryant HS, Conley MS, Johnson RL. Effect of single versus multiple sets of eight training: Impact of volume, intensity and variation. J Strength Cond Res 1997;11:143-7.
3. Marzolini S, Oh PI, Brooks D. Effect of combined aerobic and resistance training versus aerobic training alone in individuals with coronary artery disease: A meta-analysis. Eur J Prev Cardiol 2012;19:81-94.
4. Paoli A, Pacelli F, Bargossi AM, Marcolin G, Guzzinati S, Neri M, *et al.* Effects of three distinct protocols of fitness training on body composition, strength and blood lactate. J Sports Med Phys Fitness 2010;50:43-51.
5. Bateman LA, Slentz CA, Willis LH, Shields AT, Piner LW, Bales CW, *et al.* Comparison of aerobic versus resistance exercise training effects on metabolic syndrome (from the studies of a targeted risk reduction intervention through defined exercise-STRRIDE-AT/RT). Am J Cardiol 2011;108:838-44.
6. Willis LH, Slentz CA, Bateman LA, Shields AT, Piner LW, Bales CW, *et al.* Effects of aerobic and/or resistance training on body mass and fat mass in overweight or obese adults. J Appl Physiol 2012;113:1831-7.
7. Church T. Exercise in obesity, metabolic syndrome, and diabetes. Prog Cardiovasc Dis 2011;53:412-8.
8. Strasser B, Schobersberger W. Evidence for resistance training as a treatment therapy in obesity. J Obes 2011;2011:482564.
9. Alkahtani SA, King NA, Hills AP, Byrne NM. Effect of interval training intensity on fat oxidation, blood lactate and the rate of perceived exertion in obese men. Springerplus 2013;2:532.
10. Lafontaine T. Resistance training for patients with hypertension. Strength Cond J 1997;19:5-9.
11. Ho SS, Dhaliwal SS, Hills AP, Pal S. The effect of 12 weeks of aerobic, resistance or combination exercise training on cardiovascular risk factors in the overweight and obese in a randomized trial. BMC Public Health 2012;12:704.
12. Ho SS, Radavelli-Bagatini S, Dhaliwal SS, Hills AP, Pal S. Resistance, aerobic, and combination training on vascular function in overweight and obese adults. J Clin Hypertens 2012;14:848-54.

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