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EFFECT OF COMPLEX TRAINING ON SELECTED MOTOR FITNESS VARIABLES AMONG BASKETBALL PLAYERS

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Abstract:

The purpose of the study was to find out the effect of complex training on selected motor fitness variables among basketball players. It was hypothesized that there would be significant differences on selected motor fitness variables due to the effect of complex training among basketball players. For the present study the 40 basketball players from Madurai Kamaraj University, Madurai, Tamilnadu were selected at random and their age ranged from 18 to 24 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of twenty basketball players each and named as Group 'A' and Group 'B'. Group 'A' underwent complex training and Group 'B' has not undergone any training. The data was collected before and after twelve weeks of training. The data was analyzed by applying dependent't test. The level of significance was set at 0.05. The complex training had positive impact on strength endurance, speed and shoulder strength among college basketball players than the control group.

Key Words: Complex Training, Strength Endurance, Speed, Shoulder Strength & Basketball Players

Introduction:

Complex training is a combination of high intensity resistance training followed by plyometrics. Complex training, one of the most advanced forms of sports training, integrates strength training, plyometrics, and sport-specific movement. It consists of an intense strength exercise followed by a plyometric exercise. Complex training activates and works the nervous system and fast twitch muscle fibers simultaneously. The strength exercise activates the fast twitch muscle fibers. The plyometric movement stresses those muscle fibers that have been activated by the strength training movement. During this activated state, the muscles have a tremendous ability to adapt. This form of intense training can teach slow twitch muscle fibers to perform like fast twitch fibers (Beven, 2003).

The main aim of a basketball player is to obtain points by putting the ball into the basket of the opponent team's court. A goal is considered when the ball enters into the basket from above and passes through or remain in the net. The main goal of tactics is to determine the means, methods and actions of play against a particular opponent. Thus the player's tactical actions lie essentially in the continuous solving of tasks which unfold during the constantly changing situations of play in attack and defense. (Kunha, 2008).

Review of Literature:

Alves et al. (2010) analyzed the short-term effects of complex and contrast training (CCT) on vertical jump (squat and countermovement jump), sprint (5 and 15 m), and agility (505 Agility Test) abilities in soccer players. Twenty-three young elite Portuguese soccer players (age 17.4 6 0.6 years) were divided into 2 experimental groups (G1, n = 9, and G2, n = 8) and 1 control group (G3, n = 6). Groups G1 and G2 have done their regular soccer training along with a 6-week strength training program of CCT, with 1 and 2 training sessions/week, respectively. G3 has been kept to their regular soccer training program. Each training session from the CCT program was organized in 3 stations in which a general exercise, a multiform exercise, and a specific exercise were performed. The load was increased by 5% from 1 repetition maximum each 2 weeks. Obtained results allowed identifying a reduction in sprint times over 5 and 15 m (9.2 and 6.2% for G1 and 7.0 and 3.1%, for G2; p , 0.05) and an increase on squat and jump (12.6% for G1 and 9.6% for G2; p , 0.05). The results suggested that the CCT induced the performance increase in 5 and 15 m sprint and in squat jump. Vertical jump and sprint performances after CCT program were not influenced by the number of CCT sessions per week (1 or 2 sessions/week). From the obtained results, it was suggested that the CCT is an adequate training strategy to develop soccer players' muscle power and speed.

Daniel, et al. (2009) evaluated and to compare the effects of a complex training program and a conventional training program, on power and strength development in sport science students. Sixteen undergraduates were randomly divided into two equivalent groups: Complex Training Group (CPG; n=8) and Conventional Training Group (CVG, n=8), both of which completed a similar volume and intensity of training. CPG combined maximum strength exercises with power exercises using the complex training method. Subjects comprising the CVG group performed similarly to their CPG counterparts in the first four weeks and the equivalent power training during the second half of the program. Both programs produced gains in the weight

lifted (p<0.01) 1RM back squat and the Squat Jump (p< 0.01). CPG subjects achieved gains in Maximum Strength, the Counter Movement Jump (p< 0.01), and 10, 15 and 20-m runs (p< 0.05) whereas CVG subjects achieved improvements in the 5-m run (p< 0.05). After detraining, CPG subjects experienced a decline in the Counter Movement Jump and in the 10-m run (p< 0.05). Complex and non-complex training programs in untrained subjects may increase the power and maximum strength, and generally result in improvement of these parameters without any one program showing appreciable advantages over the other.

Eduardo et al. (2008) evaluated the effects of a complex training program, a combined practice of weight training and plyometrics, on explosive strength development of young basketball players. Twenty-five young male athletes, aged 14–15 years old, were assessed using squat jump (SJ), countermovement jump (CMJ), Abalakov test (ABA), depth jump (DJ), mechanical power (MP), and medicine ball throw (MBT), before and after a 10-week in-season training program. Both the control group (CG; n = 10) and the experimental group (EG; n = 15) kept up their regular sports practice; additionally, the EG performed 2 sessions per week of a complex training program. The EG significantly improved in the SJ, CMJ, ABA, and MBT values (p, 0.05). The CG significantly decreased the values (p, 0.05) of CMJ, ABA, and MP, while significantly increasing the MBT values (p, 0.05). Our results support the use of complex training to improve the upper and lower body explosively levels in young basketball players. In conclusion, this study showed that more strength conditioning is needed during the sport practice season. Furthermore, we also conclude that complex training is a useful working tool for coaches, innovative in this strength-training domain, equally contributing to a better time-efficient training.

Methodology:

The purpose of the study was to find out the effect of complex training on selected motor fitness variables among basketball players. It was hypothesized that there would be significant differences on selected motor fitness variables due to the effect of complex training among basketball players. For the present study the 40 basketball players from Madurai Kamaraj University, Madurai, Tamilnadu were selected at random and their age ranged from 18 to 24 years. For the present study pre test – post test random group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of twenty basketball players each and named as Group 'A' and Group 'B'. Group 'A' underwent complex training and Group 'B' has not undergone any training. The data was collected before and after twelve weeks of training. The data was analyzed by applying dependent 't test. The level of significance was set at 0.05.

Table 1: Variables and Test

S.No	Variables	Tests
1	Strength Endurance	Sit Ups for 30 Seconds
2	Speed	50 Meter Dash
3	Shoulder Strength	Medicine Ball Throw

Results:

The findings pertaining to analysis of dependent 't' test between experimental group and control group on selected motor fitness variables among basketball players for pre-post test respectively have been presented in table 2 to 3.

Figure 1: Comparisons of Pre – Test Means and Post – Test Means for Experimental Group in Relation to Motor Fitness Variables

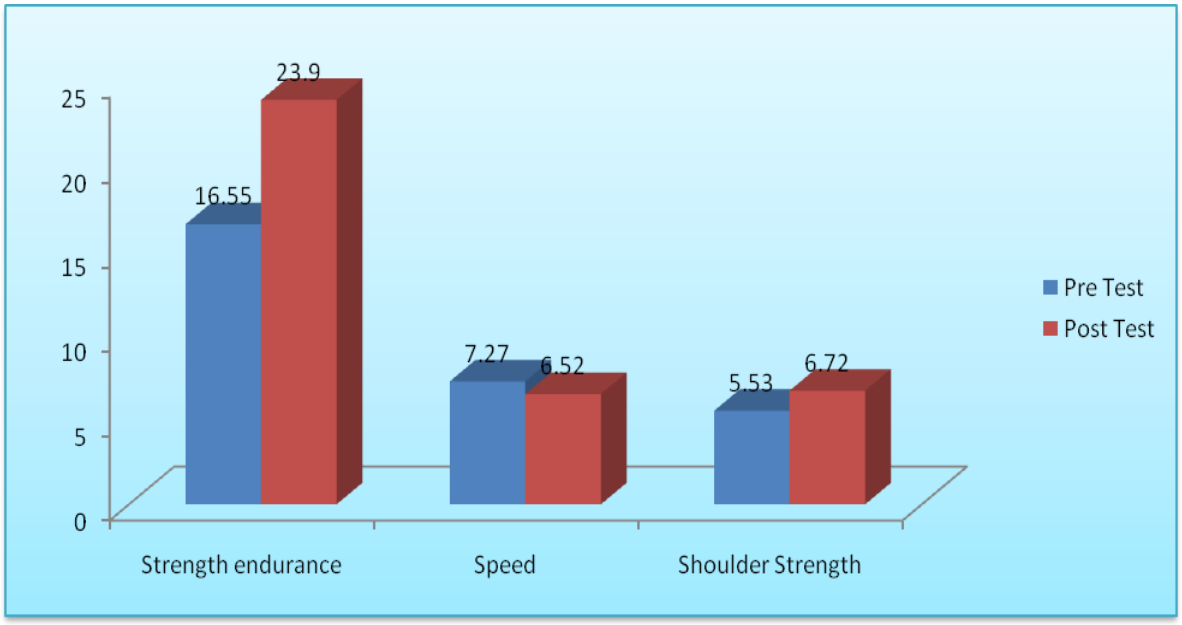


Table 2: Significance of Mean Gains & Losses between Pre and Post Test Scores on Selected Variables of Complex Training Group (CTG)

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean Difference	Std. Dev (±)	σ DM	't' Ratio
1	Strength endurance	16.55	23.90	7.35	1.92	0.43	17.05*
2	Speed	7.27	6.52	0.75	0.15	0.03	22.00*
3	Shoulder Strength	5.53	6.72	1.18	0.50	0.11	10.55*

* Significant at 0.05 level

Table 2 shows the obtained 't' ratios for pre and post test mean difference in the selected variable of strength endurance (17.05), speed (22.00) and shoulder strength (10.55). The obtained ratios when compared with the table value of 2.09 of the degrees of freedom (1, 19) it was found to be statistically significant at 0.05 level of confidence. It was observed that the mean gain and losses made from pre to post test were significantly improved in motor fitness variables namely strength endurance (7.35, $p<0.05$), speed (0.75, $p<0.05$) and shoulder strength (1.18, $p<0.05$) thus the formulated hypothesis was accepted.

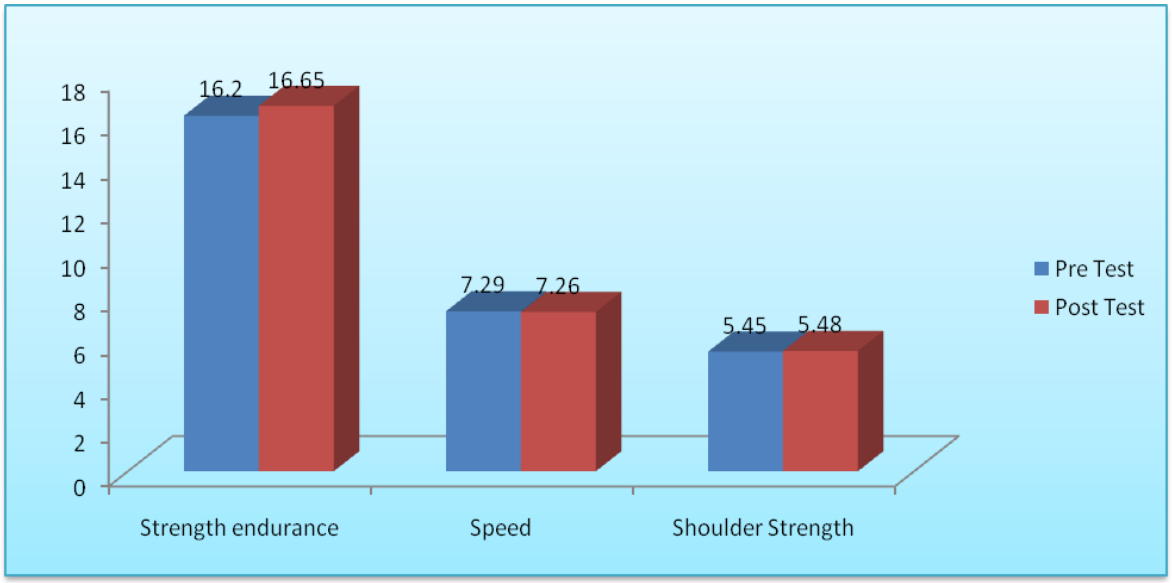
Table 3: Significance of Mean Gains & Losses between Pre and Post Test Scores on Selected Variables of Control Group (CG)

S.No	Variables	Pre-Test Mean	Post-Test Mean	Mean difference	Std. Dev (±)	σ DM	't' Ratio
1	Strength endurance	16.20	16.65	0.45	1.82	0.40	1.10
2	Speed	7.29	7.26	0.02	0.16	0.03	0.61
3	Shoulder Strength	5.45	5.48	0.02	0.38	0.08	0.32

* Significant at 0.05 level

Table 3 shows the obtained 't' ratios for pre and post test mean difference in the selected variable of endurance (1.10), speed (0.61) and shoulder strength (0.32). The obtained ratios when compared with the table value of 2.09 of the degrees of freedom (1, 19) it was found to be statistically significant at 0.05 level of confidence. It was observed that the mean gain and losses made from pre to post test were not significantly improved in motor fitness variables.

Figure 2: Comparisons of Pre – Test Means and Post – Test Means for Control Group in Relation to Motor Fitness Variables



Conclusions:

On the basis of findings and within the limitations of the study the following conclusions were drawn:

- ✓ The complex training had positive impact on strength endurance among college basketball players than the control group.
- ✓ The complex training had positive impact on speed among college basketball players than the control group.
- ✓ The complex training had positive impact on shoulder strength among college basketball players than the control group.

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