



## A STUDY OF THE EFFECTS OF COMPLEX TRAINING ON CORPOREAL VARIABLES OF INTER COLLEGIATE BASKETBALL PLAYERS

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### Abstract

Complex training describes a power developing workout that combines weights and plyometric exercises. Many athletes include plyometric exercises in their training programme and are well aware of their benefits. However it is slightly less known that the combination of traditional strength with power and plyometric exercises together results in greater type II recruitment and consequently greater improvements in power and rate of force development. To achieve the purpose of the study forty women intercollegiate Basketball players were selected from various colleges affiliated to Maa, Shakumbhari University, Saharanpur. The age of the subjects was ranged between 19-25 years. The subjects were divided in two groups namely experimental group I (N-20) underwent complex training, control group II (N-20) did not undergo any specific training. All the treatment groups under their training protocol as per the schedule for a period of ten weeks. The corporeal variables that influence the performance in the game of Basketball were selected with greater care on the basis of personal experience of the research and the result of the study was analyzed by using SPSS software.

**Keywords:** Strength, Power, Endurance, Basketball and Inter collegiate.

### Introduction

Complex training is a workout comprising of a resistance exercise followed by a matched plyometric exercise e.g. squats followed by squat jumps; bench press followed by plyometric press up. The logic behind these

matched pair of exercise is that the resistance work gets the nervous system into full action so that more type II fibers are available for the explosive exercise, hence a better training benefit of complex training programme can be used in the general, specific and competitive phase of training. Ebbon (2002) in his recent literature review has stated that complex training has investigated both the acute and long term effects of this conditioning approach. Complex training describes a power developing workout that combines resistance and plyometric exercises. About 10 years ago, these workouts were greeted with great acclaim as research indicated that they could significantly enhance fast twitch muscle fiber power and, therefore, dynamic sports performance. The two benefits from traditional strength work are increased neural activity and increased muscle mass (hypertrophy). It is a highly effective form of physical training that combines both resistance strength training and plyometric explosive power training. The idea is to use the 26 combination of strength and Plyometric exercises to superbly engage the nervous system and activate more fibers. Complex training describes a power-developing workout that combines weights and plyometric exercises. The combination of plyometric training and resistance training are thought to be useful for developing athletic power. More specifically, complex training alternates bio mechanically similar high load weight training exercises with plyometric exercises, set for set, in the same workout. An example of complex training would include performing a set of squats followed by a set of jump squats. Anecdotal sources have



described the application of complex training (Ebben and Blackard, 1998; Fees, 1997; Fleck and Kontor, 1986). The idea that prerequisite strength is necessary for complex training to be most effective and that this type of training may be best suited for those who are highly trained (Ebben and Watts, 1998). The vertical jump performance improvement associated with complex training is consistent with the purported role of complex training as an effective training strategy for improving power (Ebben and Watts, 1998). Ebben and Watts (1998) reviewed the research on various combinations of weight training and plyometric training as well as complex training. At that time, despite numerous brief references to complex training. The results from that study were difficult to interpret, however, due to the absence of published numerical data (Verrkhoshansky and Tetyan, 1973).

## Methodology

### Selection of Subjects

To achieve the purpose of the study forty women inter collegiate Basketball players were selected from various college affiliated to Maa-shakumbhari University, Saharanpur the age of the subject was ranged between 19 to 25 years and students were equally divided in to two groups namely Experimental group 1 (N=20) underwent complex training, Control Group - II (N=20) did not underwent any specific training.

### Training Protocol

All the treatment groups under their training protocol as per the schedule for a period of twelve weeks. The corporeal variables that influence the performance in the game of Basketball were selected with greater care on the basis of personal experience of the research, long discussion with the coaches, and critical analysis of the related literature with joint consideration of the feasibility of the test availability of the equipments and acceptability of the subjects.

### Selection of Variables

After having taken care of the above criteria into consideration the following corporeal variables were considered for the study.

- Agility
- Explosive Power
- Cardiovascular Endurance

### Criterion Measures

S. No.	Variables	Test Items	Units
1	Agility	Illions agility test	1/10th Second
2	Explosive Power	Sargent Jump	In Centimeters
3	Cardiovascular Endurance	12 Minutes Run and Walk Test	In Meters

### Statistical Analysis

To find out the effects of complex training on corporeal variables of inter collegiate Basketball player, mean, SD and 't'-ratio were computed.

## RESULTS

To find out the significance of difference between pretest and posttest mean scores of agility, explosive power and cardiovascular endurance of inter collegiate female Basketball players, mean, SD and t-ratio were computed and data pertaining to this, has been presented in Table 1 to 3.

TABLE 1  
 COMPARISON OF PRETEST AND POSTTEST MEAN  
 SCORES OF AGILITY OF INTER COLLEGIATE FEMALE  
 BASKETBALL PLAYERS

Test	M $\pm$ SD	MD	$\sigma$ DM	t-ratio
Pretest	18.2360+0.697	0.452	0.0479	9.436*
Posttest	17.7833+0.655			

\*Significant at .05 level, t.05 (38)=2.02

Table 1 shows that statistically significant difference was found between pretest and posttest mean scores of agility of female Basketball players, as the obtained t-value of 9.346 for corporeal variable of agility was higher than the required t.05 (38)=2.02.



TABLE 2  
COMPARISON OF BETWEEN PRETEST AND POSTTEST  
MEAN SCORES OF EXPLOSIVE POWER OF INTER  
COLLEGIATE FEMALE BASKETBALL PLAYERS

Test	M $\pm$ SD	MD	$\sigma$ DM	t-ratio
Pretest	47.3333+2.894	1.9333	0.18170	10.64*
Posttest	49.2667+2.939			

\*Significant at .05 level, t.05 (38)=2.02

Table 2 shows that statistically significant difference was found between pretest and posttest mean scores of explosive power of female Basketball players, as the obtained t-value of 10.64 for corporeal variable of explosive power was higher than the required t.05 (38)=2.02.

TABLE 3  
COMPARISON OF BETWEEN PRETEST AND POSTTEST  
MEAN SCORE OF CARDIO-VASCULAR ENDURANCE OF  
INTER COLLEGIATE FEMALE BASKETBALL PLAYERS

Test	M $\pm$ SD	MD	$\sigma$ DM	t-ratio
Pretest	1334.00+140.224	52.00	5.451	9.54*
Posttest	1386.000+146.862			

\*Significant at .05 level t.05 (38)=2.02.

Table 3 indicates that statistically significant difference was found between pretest and posttest mean scores of cardio-vascular endurance of female Basketball players, as the obtained t-value of 10.64 for corporeal variable of cardio-vascular endurance was higher than the required t.05 (38)=2.02.

## DISCUSSION

Now a day's Basketball is one of the most strengthens type of game, it required more speed and power, so many studies are available to the study, even though and especially complex with swimming may enhance the speed and power for basketball player. The present study showed the results due to Complex training Group significantly improved the corporeal variables like agility, explosive power and cardiovascular endurance.

## CONCLUSION

Inter Collegiate female Basketball players differed significantly in their agility, explosive power and cardio-vascular endurance components of physical fitness. The present study also showed that complex training group significantly improved all the selected physical fitness components.

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