

CHAPTER IV

RESULTS AND DISCUSSION

4.1 OVERVIEW

The purpose of this study was to find out the effect of varied strength training on selected physical and performance variables among cricket players. To achieve the purpose of the study the investigator selected the cricket players from different colleges in Theni, Madurai and Dindigul Districts, Tamil Nadu, India. The subjects were explained the purpose and nature of the study and requested to be the volunteer for the study. 200 Cricket players in the age group of 18 to 25 years from various colleges were randomly selected as subjects. The selected subjects were divided into four equal groups namely three experimental groups and one control group which consists of 50 subjects each. The physical variables speed, strength, explosive power, agility, endurance and performance variables batting, bowling and fielding were selected as dependent variables for the study. Independent variables are weight training, circuit training and interval strength training.

To determine the significant difference between the groups on the dependent variable the statistical procedure analysis of variance (ANCOVA) was applied. To find out the significant difference on adjusted means of the group, Scheffe's Post-hoc test was administered.

4.2 LEVEL OF SIGNIFICANCE

To ascertain the significant difference between the groups the level of significance was set at 0.05 level of confidence which has considered adequate for the purpose of this study.

Table VI
Mean, Standard Deviation of four groups on Speed

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	8.56	0.440	8.27	0.280	7.180	50
Circuit Training	8.54	0.426	7.16	0.277	7.162	50
Interval Strength Training	8.56	0.444	7.26	0.292	7.257	50
Control	8.52	0.424	8.61	0.47	8.622	50

Table VI shows the pretest and posttest mean values on speed of the control group and three experimental groups. Figure 2 illustrating with bar diagram of the mean values on speed.

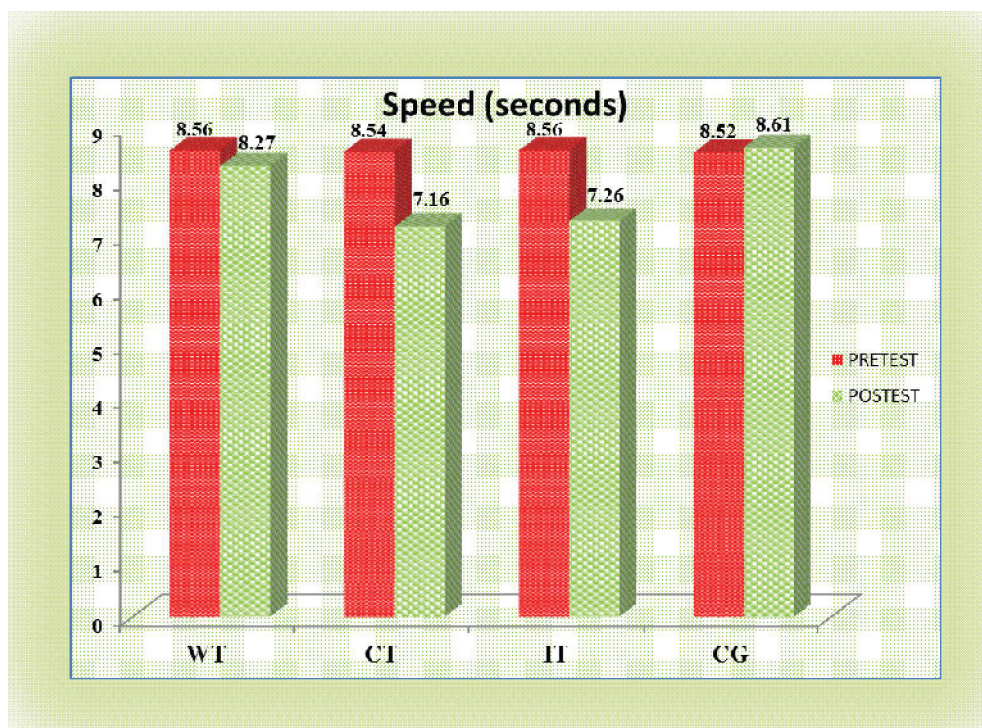


Figure 2 The mean values on speed

Table VII
ANCOVA Table on Speed

Source	Sum of Squares	df	Mean Square	F	Sig.
Pretest	2.982	1	2.982	29.630	.000
Treatment Groups	75.993	3	25.331	251.694	.000
Error	19.625	195	.101		
Corrected Total	97.731	199			

As presented in Table VII the obtained F-ratio value of 251.6974 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on speed.

Table VIII
Post-hoc analysis on adjusted mean values of speed

(I) TreatmentGroups	(J) TreatmentGroups	Mean Difference (I-J)	Sig.
Weight Training Group	Circuit Training Group	.018	.775
	Interval Strength Training Group	-.076	.232
	Control Group	-1.441 [*]	.000
Circuit Training Group	Interval Strength Training Group	-.094	.139
	Control Group	-1.459 [*]	.000
Interval Strength Training Group	Control Group	-1.365 [*]	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table VIII there was a significant difference between control group and other three experimental groups. Circuit training group (CT) with the adjusted mean value of 7.162 seconds showed more significant difference than the other two experimental groups (WT with 7.180 sec and IT with 7.257 sec) with control group (CG with 8.622 sec) on speed.

Table IX

Mean, Standard Deviation of four groups on Strength

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	20.88	1.612	24.18	1.424	23.968	50
Circuit Training	21.26	1.736	25.06	1.544	24.639	50
Interval Strength Training	20.58	1.486	23.62	1.159	23.573	50
Control	19.26	3.641	19.5	3.352	20.180	50

Table IX shows the pretest and posttest mean values on strength of control group and three experimental groups.

Figure 3 illustrating with bar diagram of the mean values on strength.

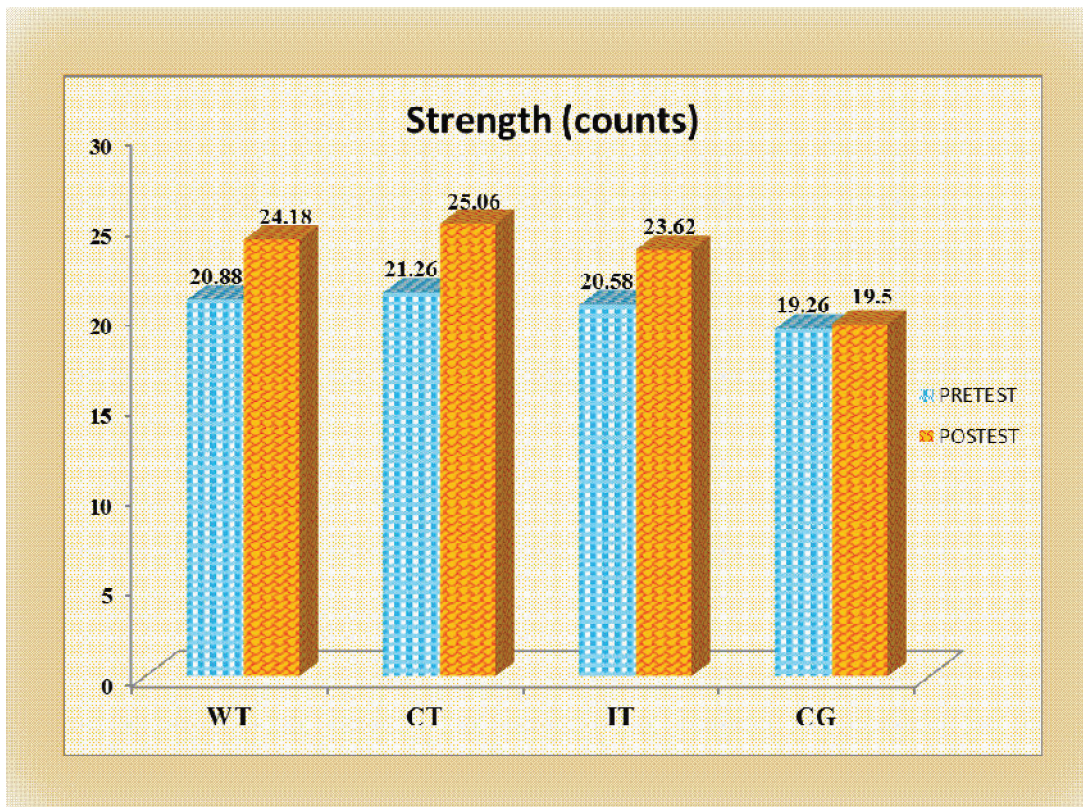


Figure 3 The mean values on the strength

Table X

ANCOVA Table on Strength

Source	Sum of Squares	df	Mean Square	F	Sig.
Pretest	313.311	1	313.311	117.680	.000
TreatmentGroups	535.434	3	178.478	67.036	.000
Error	519.169	195	2.662		
Corrected Total	1744.380	199			

As represented in Table X the obtained F-ratio value of 67.036 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on strength.

Table XI

Post-hoc analysis

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Sig.
Weight Training Group	Circuit Training Group	-.671*	.042
	Interval Strength Training Group	.395	.228
	Control Group	3.788*	.000
Circuit Training Group	Interval Strength Training Group	1.065*	.001
	Control Group	4.458*	.000
Interval Strength Training Group	Control Group	3.393*	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XI there was a significant difference between control group and other three experimental groups. Also, significant difference was noted between the experimental groups on strength of the cricket players. There was no significant difference between weight training group and interval strength training group. Circuit training group (CT) with the adjusted mean value of 24.639 showed significant difference than the other three groups (WT with 23.968, IT with 23.573 and CG with 20.180) on strength.

Table XII

Mean, Standard Deviation of four groups on Explosive Power

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	1.59	0.117	1.74	0.079	1.735	50
Circuit Training	1.64	0.065	1.79	0.068	1.785	50
Interval Strength Training	1.55	0.109	1.7	0.08	1.699	50
Control	1.54	0.07	1.53	0.07	1.534	50

Table XII the pretest and posttest means values on explosive power of control group and three experimental groups. Figure 4 illustrating with bar diagram of the mean values on explosive power.

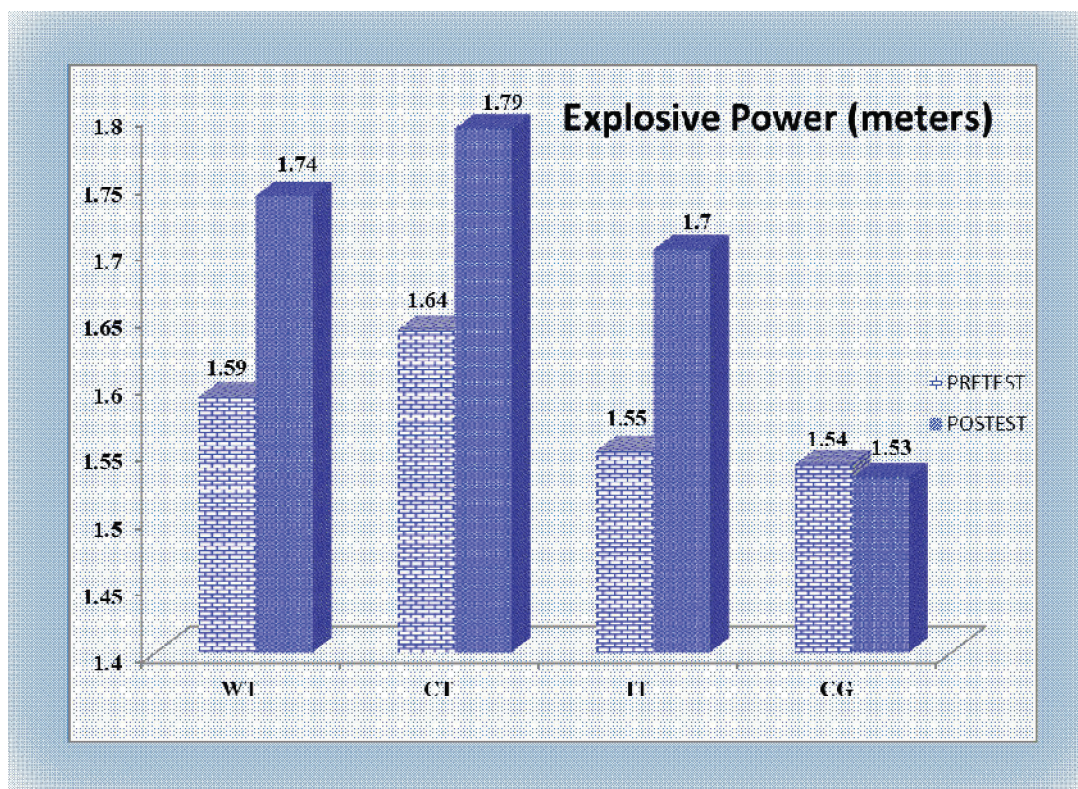


Figure 4 Mean values on explosive power

Table XIII**ANCOVA Table on Explosive Power**

Source	Sum of Squares	df	Mean Square	F	Sig.
Pretest	1.573E-5	1	1.573E-5	.003	.958
Treatment Groups	1.577	3	.526	94.162	.000
Error	1.088	195	.006		
Corrected Total	2.867	199			

As mentioned in Table XIII the obtained F-ratio value of 94.162 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on explosive power.

Table XIV**Post-hoc analysis**

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Sig.
Weight Training Group	Circuit Training Group	-.050*	.001
	Interval Strength Training Group	.036*	.017
	Control Group	.201*	.000
Circuit Training Group	Interval Strength Training Group	.086*	.000
	Control Group	.251*	.000
Interval Strength Training Group	Control Group	.165*	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XIV there was a significant difference between control group and other three experimental groups. Also, significant difference was noted between the experimental groups on explosive power of the cricket players. Circuit training group (CT) with the adjusted mean value of 1.785 meters showed significant difference than the other three groups (WT with 1.735M, IT with 1.699M and CG with 1.534M) on explosive power.

Table XV

Mean, Standard Deviation of four groups on Agility

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	13.21	0.350	11.48	0.229	11.482	50
Circuit Training	13.18	0.336	11.43	0.251	11.437	50
Interval Strength Training	13.34	0.36	11.62	0.226	11.601	50
Control	13.17	0.316	13.2	0.317	13.207	50

Table XV shows the pretest and posttest mean values on agility of control group and three experiment groups.

Figure 5 illustrating with bar diagram of the mean values on agility.

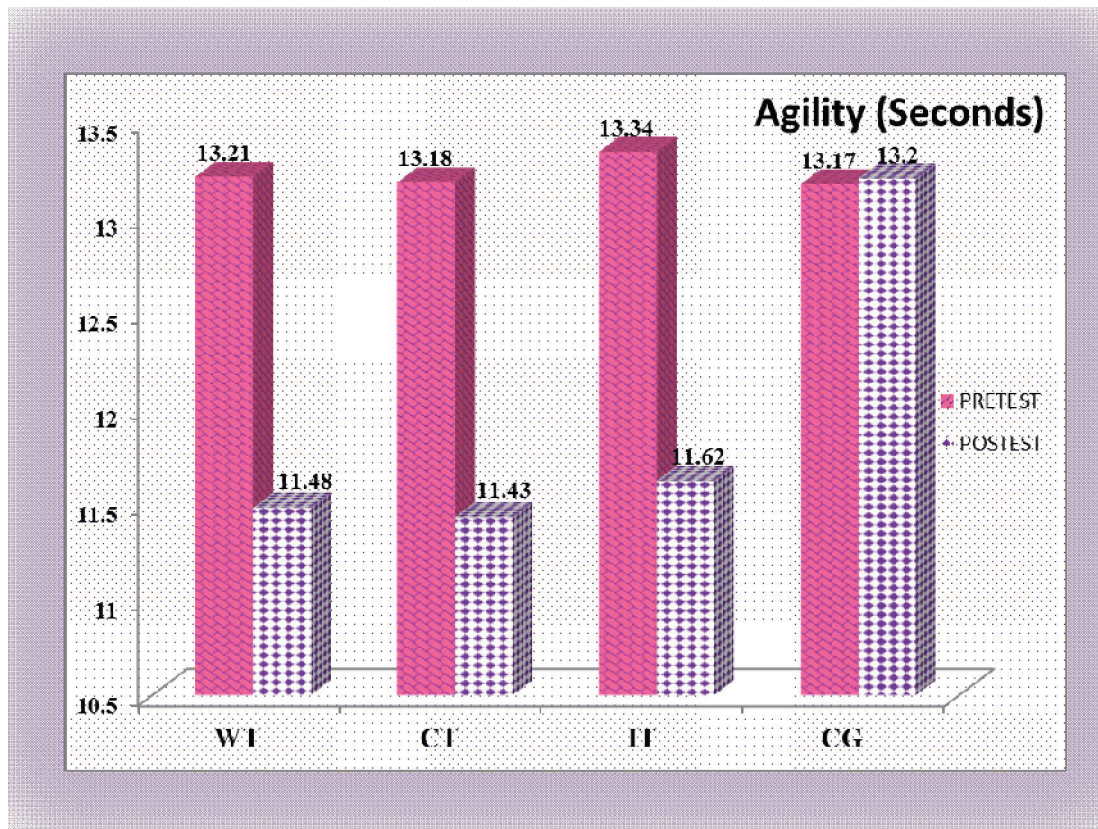


Figure 5 The mean values on agility

Table XVI

ANCOVA Table on Agility

Source	Sum of Squares	df	Mean Square	F	Sig.
Pretest	.686	1	.686	10.812	.001
Treatment Groups	108.526	3	36.175	569.956	.000
Error	12.377	195	.063		
Corrected Total	120.907	199			

As noted in Table XVI the obtained F-ratio value of 569.956 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on agility.

Table XVII
Post-hoc Analysis

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Std. Error	Sig.
Weight Training Group	Circuit Training Group	.046	.050	.364
	Interval Strength Training Group	-.119*	.051	.020
	Control Group	-1.725*	.050	.000
Circuit Training Group	Interval Strength Training Group	-.165*	.051	.001
	Control Group	-1.770*	.050	.000
Interval Strength Training Group	Control Group	-1.606*	.051	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XVII there was a significant difference between control group and other three experimental groups. There was no significant difference between weight training group and circuit training group. Circuit training group (CT) with the adjusted mean value of 11.437 seconds showed significant difference than the other two groups namely weight training group (WT with 11.482 sec) and control group (CG with 13.207 sec) on agility.

Table XVIII

Mean, Standard Deviation of Four Groups on Endurance

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	2471	110.458	3539	392.451	3.540E3	50
Circuit Training	2471	110.1	3552	389.35	3.553E3	50
Interval Strength Training	2465	104.28	3534	390.96	3.533E3	50
Control	2471	107.93	2477	106.31	2.478E3	50

Table XVIII shows the pretest and posttest means values on endurance of control group and three experimental groups. Figure 6 illustrating with bar diagram of the mean values on endurance.

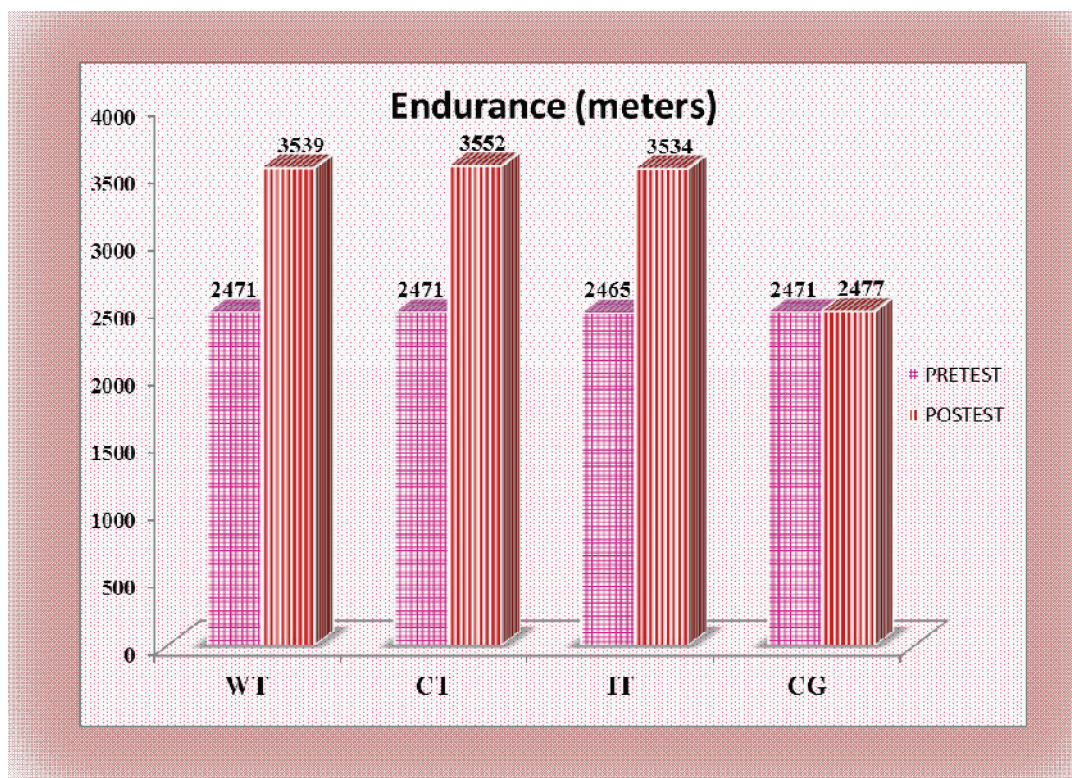


Figure 6 The mean values on endurance

Table XIX**ANCOVA Table on Endurance**

Source	Sum of Squares	df	Mean Square	F	Sig.
pretest	77549.657	1	77549.657	.659	.418
Treatment Groups	4.248E7	3	1.416E7	120.365	.000
Error	2.294E7	195	117646.298		
Corrected Total	6.553E7	199			

As denoted in Table XIX the obtained F-ratio value of 120.365 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on endurance.

Table XX**Post-hoc Analysis**

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Std. Error	Sig.
Weight Training Group	Circuit Training Group	-12.955	68.599	.850
	Interval Strength Training Group	6.540	68.614	.924
	Control Group	1062.118*	68.599	.000
Circuit Training Group	Interval Strength Training Group	19.494	68.614	.777
	Control Group	1075.073*	68.599	.000
Interval Strength Training Group	Control Group	1055.579*	68.613	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XX there was a significant difference between control group and other three experimental groups. There was no significant difference among experimental groups. Circuit training group (CT) with the adjusted mean value of 3.553E3 meters showed significant difference than the other three groups namely weight training group, interval strength training group (WT with 3.540E3 M and IT with 3.533E3M) and control group (CG with 2.478E3) on endurance.

Table XXI

Mean, Standard Deviation of Four Groups on Batting

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	5.68	0.621	7.74	0.527	7.724	50
Circuit Training	5.94	0.682	8.28	0.671	8.213	50
Interval Strength Training	5.48	0.505	7.36	0.563	7.384	50
Control	5.3	0.974	5.62	0.878	5.679	50

Table XXI shows pretest and posttest mean values on batting of control group and three experimental groups.

Figure 7 illustrating with bar diagram of the mean values on batting.

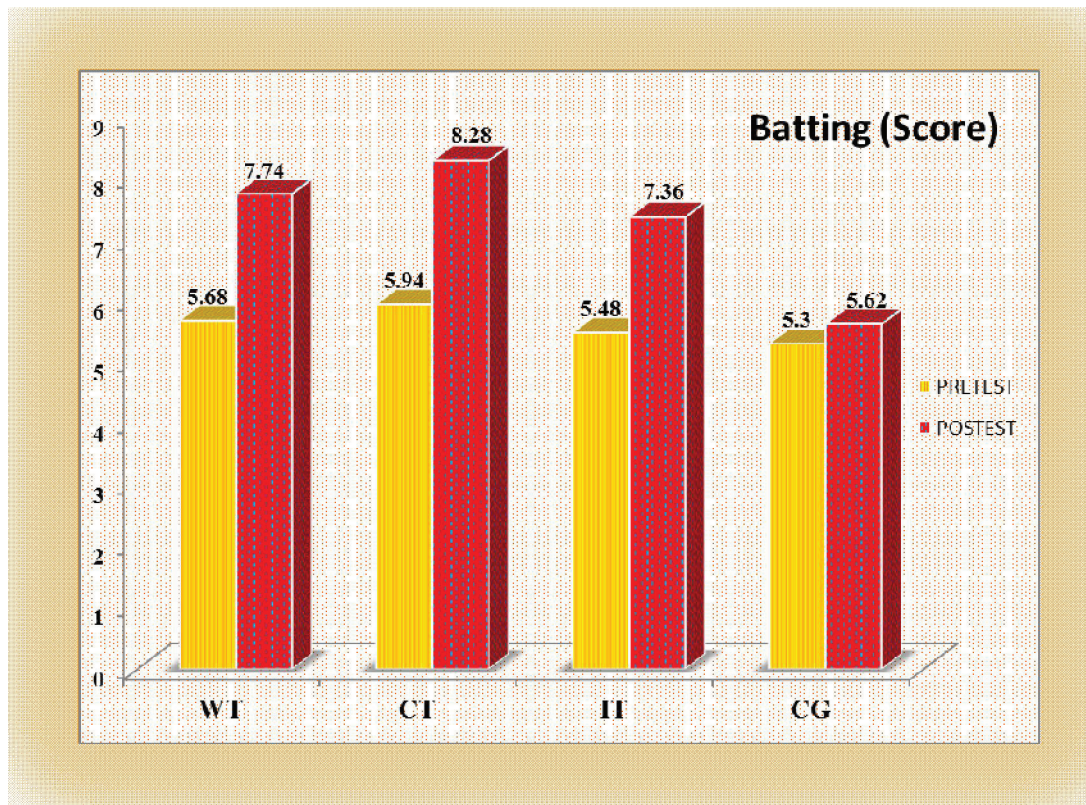


Figure 7 The mean values on batting

Table XXII

ANCOVA Table on Batting

Source	Sum of Squares	df	Mean Square	F	Sig.
Pretest	3.870	1	3.870	8.866	.003
Treatment Groups	166.933	3	55.644	127.460	.000
Error	85.130	195	.437		
Corrected Total	287.500	199			

As shown in Table XXII the obtained F-ratio value of 127.460 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on batting performance in cricket.

Table XXIII
Post-hoc Analysis

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Std. Error	Sig.
Weight Training Group	Circuit Training Group	-.489*	.133	.000
	Interval Strength Training Group	.341*	.133	.011
	Control Group	2.045*	.134	.000
Circuit Training Group	Interval Strength Training Group	.830*	.136	.000
	Control Group	2.535*	.139	.000
Interval Strength Training Group	Control Group	1.705*	.133	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XXIII there was a significant difference between control group and other three experimental groups. Also, significant difference was noted between the experimental groups on batting performance of the cricket players. Circuit training group (CT) with the adjusted mean value of 8.213 showed significant difference than the other three groups (WT with 7.724, IT with 7.384 and CG with 5.679) on batting performance of the cricket players.

Table XXIV

Mean, Standard Deviation of Four Groups on Bowling

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	5.18	0.720	8.04	0.925	8.051	50
Circuit Training	5.36	0.802	8.74	0.443	8.721	50
Interval Strength Training	5.08	0.752	7.58	0.575	7.608	50
Control	5.36	0.827	5.5	0.839	5.481	50

Table XXIV show the pretest and posttest adjusted mean values on bowling of control group and three experimental groups. Figure 8 illustrating with bar diagram of the mean values on bowling.

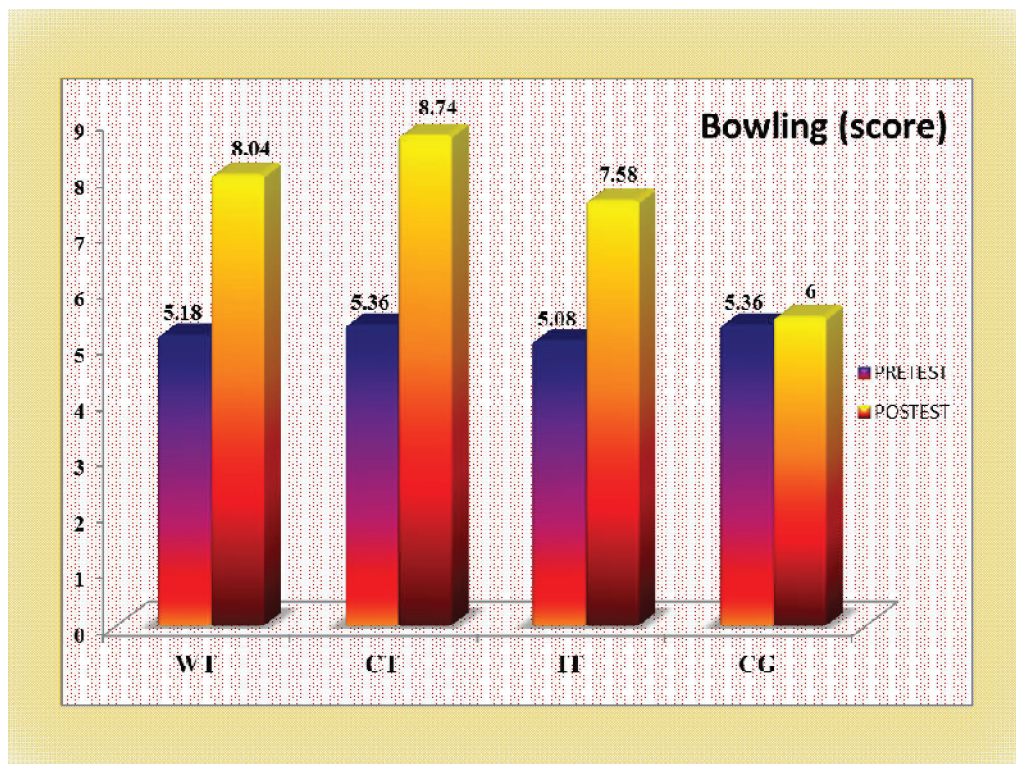


Figure 8 The mean values on bowling

Table XXV
ANCOVA Table on Bowling

Source	Sum of Squares	df	Mean Square	F	Sig.
pretest	3.387	1	3.387	6.683	.010
Treatment Groups	293.479	3	97.826	193.013	.000
Error	98.833	195	.507		
Corrected Total	393.755	199			

As indicated in Table XXV the obtained F-ratio value of 193.013 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on bowling performance in cricket.

Table XXVI
Post-hoc Analysis on Adjusted Mean Values of Bowling

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Std. Error	Sig.
Weight Training Group	Circuit Training Group	-.670*	.143	.000
	Interval Strength Training Group	.443*	.143	.002
	Control Group	2.570*	.143	.000
Circuit Training Group	Interval Strength Training Group	1.113*	.144	.000
	Control Group	3.240*	.142	.000
Interval Strength Training Group	Control Group	2.127*	.144	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XXVI there was a significant difference between control group and other three experimental groups. Also, significant difference was noted between the experimental groups on bowling performance of the cricket players. Circuit training group (CT) with the adjusted mean value of 8.721 showed significant difference than the other three groups (WT with 8.051, IT with 7.608 and CG with 5.481) on bowling performance of the cricket players.

Table XXVII

Mean, Standard Deviation of Four Groups on Fielding

Groups	Pretest	Std	Posttest	Std	Posttest adjusted mean	N
Weight Training	6.04	0.880	7.88	0.594	7.880	50
Circuit Training	6.2	0.926	8.42	0.499	8.420	50
Interval Strength Training	5.52	0.646	7.46	0.579	7.460	50
Control	5.2	0.904	5.2	0.904	5.200	50

Table XXVII shows the pretest and posttest adjusted mean values on fielding of control group and three experimental groups.

Figure 9 illustrating with bar diagrammed of the mean values on fielding.

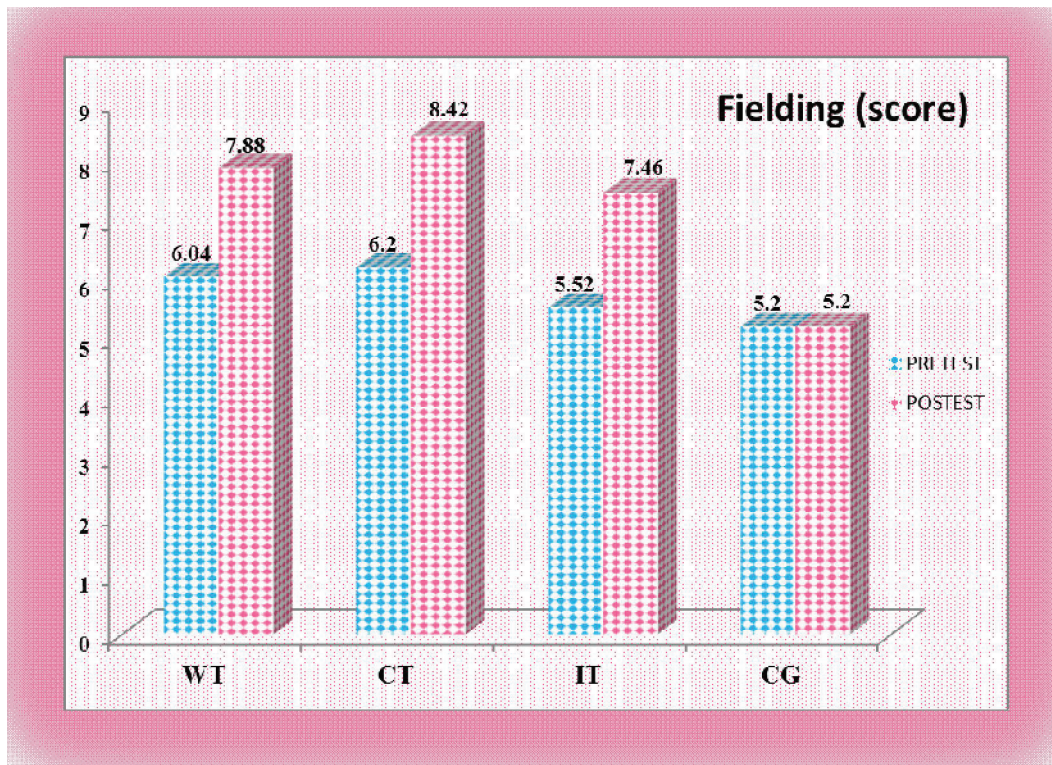


Figure 9 The mean values on fielding

Table XXVIII

ANCOVA Table on Fielding

Source	Sum of Squares	df	Mean Square	F	Sig.
Pretest	4.558E-5	1	4.558E-5	.000	.992
Treatment Groups	254.179	3	84.726	192.381	.000
Error	85.880	195	.440		
Corrected Total	386.480	199			

As given in Table XXVIII the obtained F-ratio value of 192.381 was greater than the required table value at 3, 195 df at 0.05 level of confidence ($p > 0.05$). Hence, the null hypothesis was rejected. There was a significant difference among the groups on fielding performance in cricket.

Table XXIX**Post-hoc Analysis on Adjusted Means Values of Fielding**

(I) Treatment Groups	(J) Treatment Groups	Mean Difference (I-J)	Std. Error	Sig.
Weight Training Group	Circuit Training Group	-.540*	.133	.000
	Interval Strength Training Group	.420*	.136	.002
	Control Group	2.680*	.141	.000
Circuit Training Group	Interval Strength Training Group	.960*	.138	.000
	Control Group	3.219*	.144	.000
Interval Strength Training Group	Control Group	2.260*	.134	.000

Since F-ratio was significant post-hoc test was employed to find out the significant difference between the posttest adjusted means of four groups namely weight training group (WT), circuit training group (CT), interval strength training group (IT) and control group (CG).

As shown in Table XXIX there was a significant difference between control group and other three experimental groups. Also, significant difference was noted between the experimental groups on fielding performance of the cricket players. Circuit training group (CT) with the adjusted mean value of 8.420 showed significant difference than the other three groups (WT with 7.880, IT with 7.460 and CG with 5.20) on fielding performance of the cricket players.

4.3 DISCUSSION ON PHYSICAL VARIABLES

The purpose of this study was to find out the effect of varied strength training on selected physical and performance variables among cricket players. The physical variables speed, strength, explosive power, agility and endurance were selected and statistically analyzed. The level of significance was fixed as 0.05 level.

Circuit training group, weight training group and interval strength training group showed significant improvement than the control group on speed after the eight weeks of regular training. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on speed are 7.162, 7.18, 7.257 and 8.622 respectively. Circuit training showed more improvement on the speed of the cricketers than the other two experimental groups weight training and interval strength training groups.

The finding of the study was in relation to the findings of the study conducted by **Maniazhagu. D (2014)** that the circuit weight training improves the speed.

The results of the study is in accordance with the findings of the **Taipale RS and et.al.(2014)** that the circuit training improves the speed thereby developing overall fitness that may be important for other adaptive processes and larger training loads associated with the sport.

The result of the study is in line with the findings of **Dhanaraj. S (2014)** that Speed is the rate which a body moves from one location to another the circuit

training programme involved motor movements that had to be executed with high speed over a period of eight weeks. This might be the reason for the significant improvement of speed of the research study.

In the strength of the cricketers there was a significant difference between the control group and weight training group, circuit training group, interval strength training group. There was a significant difference between the circuit training group and weight training group, interval strength training group. No significant difference was observed between weight training group and interval strength training group. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on strength are 24.639, 23.968, 23.573 and 20.180 respectively. Circuit training significantly improved strength of the cricketers than the other two experimental groups, weight training and interval strength training groups.

The finding of the study is in accordance with the results of the study conducted by **Hakkinen K and et.al., (2013)** that the systematic training improves the strength of the muscles.

Anek A and et.al., (2011) proved that regular and systematic circuit training reduces the body fat and thereby increasing the muscle mass and develops the strength. The result of the present study also reveals the same fact that eight weeks of circuit training develops the strength.

The result of the study is in line with the findings of **Nash MS and et.al., (2007)** that circuit training with proper progression in load improves the muscle strength.

The finding of the present research is in association with the findings of **Jacobs PL and Rusinowski JW.(2001)** that short-term circuit resistance training program develops the muscle strength by making the effect of hypertrophy in the muscle fibers.

All the three experimental groups, circuit training group, weight training group and interval strength training group showed significant improvement than the control group on explosive power after the eight weeks of regular training. Significant difference was observed among experimental groups, circuit training group, weight training group and interval strength training group. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on explosive power are 1.785, 1.735, 1.699 and 1.534 respectively. Significant improvement took place on the explosive power of the cricket players due to eight weeks of circuit training, weight training and interval strength training.

The result of the present research is in association with the findings of the study conducted by **Jakobsen MD and et.al., (2012)** that properly designed circuit strength training enhances neuromuscular activity in the hip extensors (hamstrings) and plantar flexors, and increases myofiber fiber size and these are responsible for the enhanced explosive power and muscle performance.

The finding of the study on explosive power that the circuit strength training improves the explosive power is in contrast with the findings of the **Ferrauti A and et.al., (2010)**

Agility was improved by the eight weeks of regular training of circuit, weight and interval strength training programmes. Adjusted posttest mean values of circuit training group, weight training group, interval strength training group and control group on agility are 11.437, 11.482, 11.601 and 13.207 respectively and showed significant difference between the three experimental groups and control group. No significant difference exists between circuit training and weight training on agility. Circuit training group was better than the other experimental groups on the agility of the cricketers.

Taskin H.(2009) proved that circuit training, which is designed to be performed three days a week during eight weeks of training, improves sprint-agility. The finding of the study is in accordance with the findings of the present research.

The result of the present study is in line with the finding of the study conducted by **Jullien H and et.al., (2008)** that specific training composed of exercise circuits specifically adapted to the different types of effort actually used in match play can enhance agility and coordination.

AlemuMinisha and et.al., (2014) proved that circuit training improves the speed and coordination of the athlete which enhances the agility of the athlete. The result of the study is in association with the finding of the present research.

In the endurance there was a significant difference between the three experimental groups, circuit training group, weight training group, interval strength training group and control group. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on endurance are 3553, 3540, 3533 and 2478 respectively. Circuit

training showed more development on the endurance of the cricketers than the other two experimental groups weight training and interval strength training groups.

The result of the present study is in relation with the findings of the study conducted by **Mikkola J and et.al., (2011)** that endurance runners developed endurance performance such as improving sprinting ability at the end of a race, by undergoing strength training in their training programmes to enhance endurance performance.

Explosive strength training improved the level of VO₂ max thereby increasing the endurance capacity (**Kraemer WJ and et.al., 2010**) and low intensity circuit strength training enhances the cardiorespiratory endurance of the beginners (**Kaikkonen H and et.al., 2000**). The findings are in line with findings of the present research.

4.4 DISCUSSION ON THE PERFORMANCE VARIABLES

The purpose of this study was to find out the effect of varied strength training on selected physical and performance variables among cricket players. The performance variables batting, bowling and fielding were selected and statistically analyzed. The level of significance was fixed as 0.05 level.

In the batting performance there was a significant difference between the control group and other three experimental groups, circuit training group, weight training group, interval strength training group. Circuit training group showed significant difference than the weight training group and interval strength

training group. And, there was a significant difference between weight training group and interval strength training group. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on the batting performance are 8.213, 7.724, 7.384 and 5.679 respectively. Circuit training group was better in the batting performance than the other two experimental groups weight training and interval strength training groups.

The finding of the study is in relation to the finding of the research conducted by **LemmerHH (2011)** that the strength training improves the strike power and develops the batting performance to score high average runs.

Weissensteiner J (2008) proved that the strength training increases the percentage of anticipatory skill, which is of great need for the batsman to become elite cricketer. The present study was in line with the above said findings.

In the bowling performance there was a significant difference between the control group and other three experimental groups, circuit training group, weight training group, interval strength training group. Circuit training group showed significant difference than the weight training group and interval strength training group. And, there was a significant difference between weight training group and interval strength training group. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on the bowling performance are 8.721, 8.051, 7.608 and 5.481 respectively. Circuit training group was better in the bowling performance than

the other experimental groups due to the eight weeks of proper and regular training.

The finding of the research is in line with the findings of the research conducted by **McNamara DJ and et.al., (2013)** that improvement in the neuromuscular function increases the bowling performance and it decreases the flight time of the ball.

The results of the study is in association with the finding of the study (**Chin A, 2009**) that the risk of injury is lowered while the fast or spin bowlers regularly doing strength training and thereby it increases the bowling performance.

The finding of the study is accordance with the results of **Marshall R and Ferdinands R (2003)** that greater wrist/ball speeds by using upper arm internal rotation is achieved by the strength training which improves the bowling performance.

In the fielding performance there was a significant difference between the control group and other three experimental groups, circuit training group, weight training group, interval strength training group. Circuit training group showed significant difference than the weight training group and interval strength training group. And, there was a significant difference between weight training group and interval strength training group. Posttest adjusted mean values of the circuit training group, weight training group, interval strength training group and control group on the fielding performance are 8.420, 7.880, 7.460 and 5.20 respectively. Circuit training group was better in the fielding performance than

the other experimental groups due to the eight weeks of proper and regular training.

The results of the study are in association with the findings of the study conducted by **Freeston J and Rooney K (2014)** the properly designed weight training with the skill practice improves the strength and neuromuscular coordination which enhances the throwing speed and accuracy.

The finding of the present research is in relation with the following findings that step length could lead to enhanced sprint acceleration in cricketers which is an essential component in the cricket fielding with the combination of good coordination(**Robert GL and et.al., 2014**)which can be achieved by the strength training.

4.5 DISCUSSION ON HYPOTHESES

1. It was mentioned in the first hypothesis that the effect of weight training would be more significant in the performance variable and physical variables than the other experimental groups. Weight training showed significant improvement on the physical variables speed, strength, and endurance than the control group. Weight training showed significant improvement on the physical variables explosive power and agility than the control and interval strength training group at 0.05 level of confidence.

Weight training significantly improved the performance variables batting, bowling and fielding than the control group and interval strength

training group. But, circuit training group was better than the weight training group in physical and performance variables. Hence the hypothesis stated that the effect of weight training would be more significant in the performance variable and physical variables than the other experimental groups was rejected.

2. Second hypothesis stated that the effect of circuit training would be more significant in the performance variable and physical variables than the other experimental groups. Eight weeks of circuit training showed more significant improvement on the physical variables speed, strength, explosive power, agility and endurance than the weight training and interval strength training groups. Performance variables batting, bowling and fielding also significantly improved by the eight weeks of weight training. Hence the hypothesis stated that the effect of circuit training would be more significant in the performance variable and physical variables than the other experimental groups were accepted at 0.05 level of confidence.

3. It was denoted in the third hypothesis that the effect of interval strength training would be more significant on the physical and performance variables than the other experimental groups. The interval strength training was significant in the physical variables speed, strength, explosive power, agility, endurance and performance variables batting, bowling, and fielding than the control group. Circuit training and weight training groups showed better improvement on the physical and performance variables than the interval strength training. Hence, the third

hypothesis stated that the effect of interval strength training would be more significant on the physical and performance variables than the other experimental groups was rejected at 0.05 level of confidence.

4. Fourth hypothesis stated that the experimental groups weight training, circuit training and interval strength training would have significant difference than the control group on physical variables speed, strength, explosive power, agility and endurance. The experimental groups weight training, circuit training and interval strength training have significant improvement on the physical variables speed, strength, explosive power, agility and endurance. Hence, the hypothesis stated that the experimental groups weight training, circuit training and interval strength training would have significant difference than the control group on physical variables was accepted at 0.05 level of confidence.
5. Fifth hypothesis mentioned that there would be a significant difference on the performance variables between the experimental groups weight training, circuit training, interval strength training and control group. Eight weeks of weight training, circuit training and interval strength training improved the batting, bowling and fielding performance in cricket. And, there was a significant difference between the experimental groups and control group on performance variables. Hence, the fifth hypothesis stated that there would be a significant difference on the performance variables between the experimental groups weight training, circuit training, interval strength training and control group was accepted at 0.05 level of confidence.