



EFFECTS OF TWELVE-WEEKS CORE TRAINING PROGRAM ON SELECTED PHYSIOLOGICAL FITNESS PARAMETERS OF MALE MEDIUM FAST BOWLERS IN CRICKET

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ABSTRACT

The purpose of the study was to explore effects of core training on selected physiological parameters of university level male medium fast bowlers in cricket. Totally 10 medium fast bowlers were selected through purposive sampling aged 17-27 years. Pre and Post test data were collected and then compared values of all the parameters through paired sample "t" test (SPSS, V-26.0) and (sig level-0.05). The significant improvement observed in Diastolic Blood pressure, Vital Capacity, Body Fat Percentage, Resting Heart Rate (Sig. 2-tailed- .047, .013, .000, .029, .001) and only in the Systolic Blood pressure no significance differences (Sig. 2-tailed-.792) were found but some how mean differences were observed (mean difference- .5000). As a result, it could be said that there are positive effects of core strength training on selected physiological parameters of university level male medium fast bowlers in cricket.

KEYWORDS: core training, Vital Capacity, Blood pressure, Body fat percentage, Heart rate.

INTRODUCTION

Cricket is one of the most demanding and popular team sports in all over the world. It is a bat and ball sport similar to the game of baseball, usually played outdoors on natural grass fields. In cricket bowlers try to resist the batter to score, where batter try to scores maximum in the timespan of play. So, both the Skill are similarly important in this game.

Basically, bowling is two type – one is pace and another is spin. In Pace bowling various variations are found like as Fast bowling, medium fast bowling, Slow pace bowling etc. In Explosive bowling action; whereby a large amount of force must be generated in a very short period of time. medium Fast bowlers have always been identified as the type of cricket with the highest risk of injury.

Recent time in most of the cricket team specific trainers are recruited for specific purpose and also the specific coach's responsibility reduces the injury of the players. So various training program also implementing to do so and Core exercise is on of them.

According to Takanati core training is- The Exercise program that aims to strengthen muscle groups in lumbopelvic area and the deep muscles that are responsible for stabilizing spine, and done by athlete's own body weight.

Core strength trainings and their effects have been analysed by many researchers and results show that they help to development of athlete's motor skills, increasing of balance ability and prevention from sports injuries

Trainers have been directed to alternative power training methods that they can do by their own body weight, due to developmental and injury related risks that power trainings implemented with free weights may cause in athletes especially in adolescence. With the help of core exercises, controlling spine during dynamic movements is taught (Takanati, 2012). In addition, core training program shows benefits in strengthening the respiratory muscles, especially the diaphragm muscle (Özdal, 2016) which is one of the most important respiratory muscles (Özdal, 2016).

Researcher works on core training for physical fitness, skill related fitness; but less articles are found on physiological fitness.

The aim of the study is to analyse the effects of core training which is a kind of strength training, on physiological parameters in male medium fast bowlers in cricket.

MATERIAL AND METHOD

Subjects

The experimental study design to 10 university level male medium fast bowler aged 17 to 27 years, were purposively selected from Guru Ghasidas Vishwavidyalaya and Atal Bihari Vajpayee Vishwavidyalaya for the twelve weeks plyometric program.



Procedure

Before the 12-week training period data of selected physical fitness and physiological fitness parameters were collected as pre-test data. Then the core training program for 12 weeks and 3 days/week and 2 hours/day was introduced.

The participants were gone through a 5 minutes of warm-up session. This brief warm-up comprised of 2 min jogging, 3 min of stretching. In physiological variables Blood pressure (Systolic and Diastolic) was taken through standard Digital BP monitor, Vital Capacity was measured through Spirometry test, Body Fat Percentage was measured through Omron Body Fat Analyzer and Resting Heart Rate measures manually. Then, the Twelve-week plyometric training, done 3 days a week, was given to the bowlers, beside their regular practice session. Following 12 weeks of core training, post-readings for the physiological variables Blood pressure (Systolic and Diastolic) was taken through standard Digital BP monitor, Vital Capacity was measured through Spirometry test, Body Fat Percentage identical to that described in the pretesting protocol, were obtained and documented.

Training protocol included:

| Sl. No. | Core Stability Exercise |
|---------|----------------------------|
| 1. | Plank |
| 2. | Bicycle crunch |
| 3. | Single leg squat |
| 4. | Warrior Balance |
| 5. | Short bridge |
| 6. | Swiss ball crunch |
| 7. | Rotating Deadlift |
| 8. | Opposite arm and leg raise |

Criterion measures

| Physiological Fitness | | | | |
|-----------------------|--------------------|----------------------------------|------------|--------------------------------|
| 1. | Blood Pressure | Blood pressure | mmHg | Sphygmomanometer, Stethoscope |
| 2. | Vital Capacity | Vital capacity | Litter | Spirometer |
| 3. | Body Fat Percent | Bioelectrical Impedance Analyzer | Percentage | Omron Body Fat Monitor HBF-306 |
| 4. | Resting heart rate | beats numbers /minute | Manual | Stethoscope |

Statistical analysis

For analysis the collected data Pared “t” test was used through SPSS software, version 26.0. Before starting the statistical processes Shapiro-Wilk test was implemented for normal distribution control. For data sets that show non-normal distribution, Skewness and Kurtosis values were checked.

RESULTS

Measured features of participants in pre and post-tests have been examined and analysed in this section. Intra-group and inter-groups comparisons are presented below.

Table: 1

| Paired Samples Statistics | | | | |
|-----------------------------------|----------|----|----------------|-----------------|
| | Mean | N | Std. Deviation | Std. Error Mean |
| Systolic Blood Pressure Pre-test | 126.6000 | 10 | 10.24370 | 3.23934 |
| Systolic Blood Pressure Post-test | 127.1000 | 10 | 5.04315 | 1.59478 |

Table 1 shows that the descriptive statistics of the Systolic Blood Pressure. The result of the paired sample statistics shows that after getting the Core training the subjects Blood pressure decreases and performs better (pre-test mean-126.6000 & post-test mean 127.1000).

Table: 1.1

| Paired Samples Correlations | | | |
|--|----|-------------|------|
| | N | Correlation | Sig. |
| Systolic Blood Pressure Pre-test & Post-test | 10 | .934 | .000 |

In table number 1.1 shows that there was positive correlation (Corel-.934) was found in between Systolic Blood Pressure Pre-test & Post-test score (sig-.000)

Table: 1.2

| Paired Samples Test | | | | | | |
|--|--------------------|----------------|-----------------|-------|----|-----------------|
| | Paired Differences | | | t | df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | | | |
| Systolic Blood Pressure Pre-test & Post-test | -.50000 | 5.81664 | 1.83938 | -.272 | 9 | .792 |

Table 1.2 shows paired sample “t” test. Where the result shows that there was no significance difference was found (sig. 2-tailed .792). comparing both pre-test and post-test mean of the Systolic Blood Pressure shows the difference was .50000. So, we can conclude that due to the Core training no effect on Systolic Blood Pressure.

Figure: 1

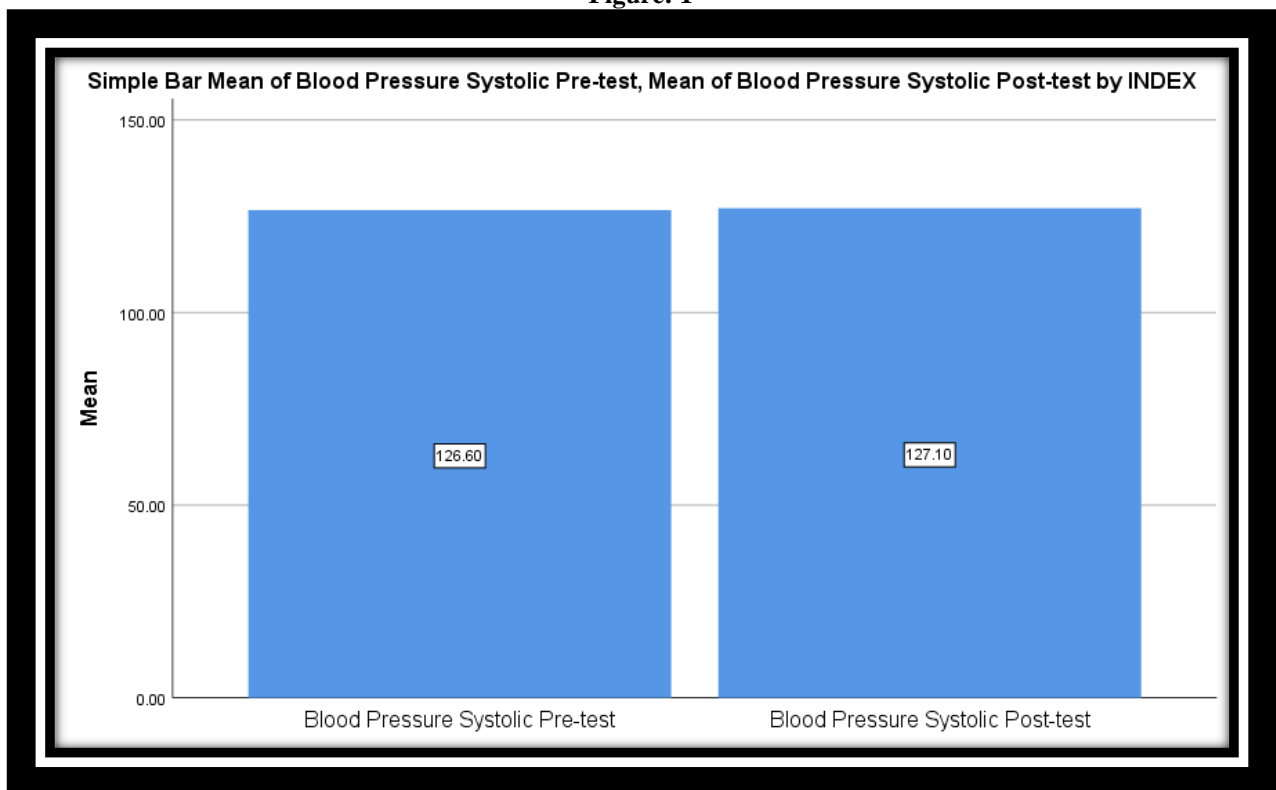


Figure 1 shows that the mean value of Systolic Blood Pressure Pre-test & (after getting core training) Post-test score of Medium fast bowlers.

Table: 2

| Paired Samples Statistics | | | | |
|------------------------------------|---------|----|----------------|-----------------|
| | Mean | N | Std. Deviation | Std. Error Mean |
| Diastolic Blood Pressure Pre-test | 75.6000 | 10 | 7.07421 | 2.23706 |
| Diastolic Blood Pressure Post-test | 79.2000 | 10 | 3.04777 | .96379 |

Table 2 shows that the descriptive statistics of the Diastolic Blood Pressure. The result of the paired sample statistics shows that after getting the core training the subjects perform better (pre-test mean-75.6000 & post-test mean 79.2000).

Table: 2.1

| Paired Samples Correlations | | | |
|---|----|-------------|------|
| | N | Correlation | Sig. |
| Diastolic Blood Pressure Pre-test & Post-test | 10 | .808 | .005 |

In table number 2.1 shows that there was positive correlation (Correl-.808) was found in between Systolic Blood Pressure Pre-test & Post-test score (sig-.005)

Table: 2.2

| Paired Samples Test | | | | | | |
|---|--------------------|----------------|-----------------|--------|----|-----------------|
| | Paired Differences | | | t | df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | | | |
| Diastolic Blood Pressure Pre-test & Post-test | -3.60000 | 4.94862 | 1.56489 | -2.300 | 9 | .047 |

In Table number 2.2 shows paired sample “t” test. Where the result shows that there was significance difference was found (sig. 2-tailed .047). comparing both pre-test and post-test mean of the Systolic Blood Pressure shows the difference was 3.60000. So, we can conclude that due to the Core training improves medium fast bowlers Systolic Blood Pressure improves.

Figure: 2

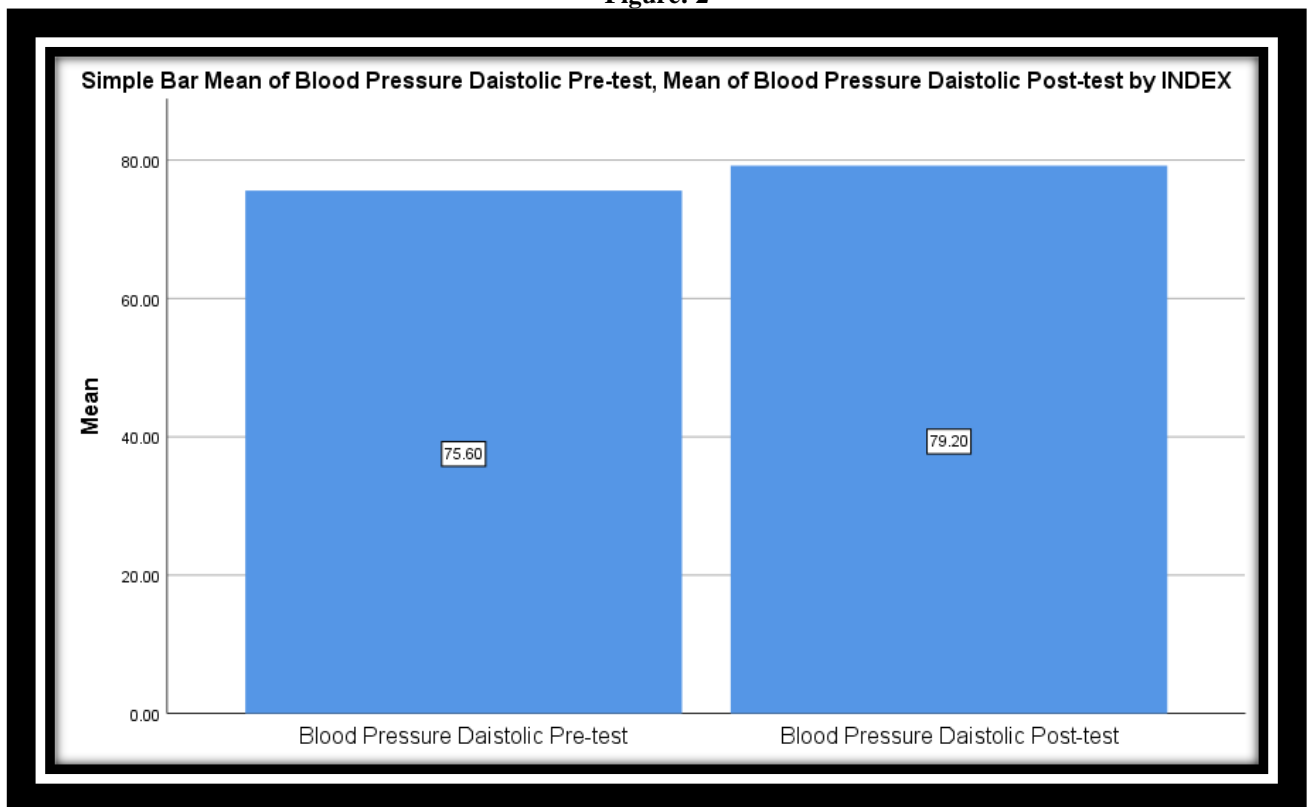


Figure 1 shows that the mean value of Diastolic Blood Pressure Pre-test & (after getting core training) Post-test score of Medium fast bowlers.

Table: 3

| Paired Samples Statistics | | | | |
|---------------------------|--------|----|----------------|-----------------|
| | Mean | N | Std. Deviation | Std. Error Mean |
| Vital Capacity Pre-test | 4.4600 | 10 | .27508 | .08699 |
| Vital Capacity Post-test | 4.5020 | 10 | .24303 | .07685 |

Table 3 shows that the descriptive statistics of the Vital Capacity. The result of the paired sample statistics shows that after getting the Core training the subjects perform better (pre-test mean-4.4600 & post-test mean 4.5020).

Table: 3.1

| Paired Samples Correlations | | | |
|-------------------------------------|----|-------------|------|
| | N | Correlation | Sig. |
| Vital Capacity Pre-test & Post-test | 10 | .994 | .000 |

In table number 3.1 shows that there was positive correlation (Corel-.994) was found in between Vital Capacity Pre-test & Post-test score (sig-.000)

Table: 3.2

| Paired Samples Test | | | | | | |
|-------------------------------------|--------------------|----------------|-----------------|--------|----|-----------------|
| | Paired Differences | | | t | df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | | | |
| Vital Capacity Pre-test & Post-test | -.04200 | .04290 | .01356 | -3.096 | 9 | .013 |

In Table number 3.2 shows paired sample “t” test. Where the result shows that there was significance difference was found (sig. 2-tailed .013). comparing both pre-test and post-test mean of the Vital Capacity shows the difference was .04200. So, we can conclude that due to the Core training improves medium fast bowlers Vital Capacity improves.

Figure: 3

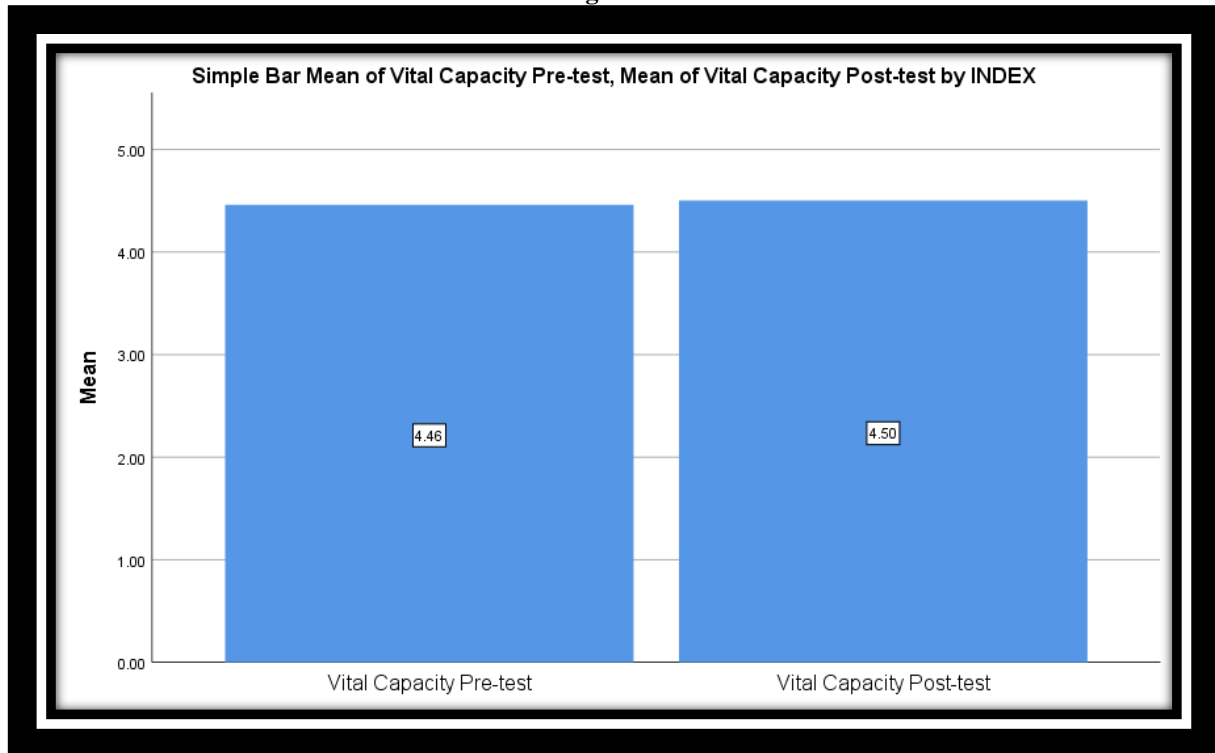


Figure 1 shows that the mean value of Vital Capacity Pre-test & (after getting core training) Post-test score of Medium fast bowlers.

Table: 4

| Paired Samples Statistics | | | | |
|-------------------------------|---------|----|----------------|-----------------|
| | Mean | N | Std. Deviation | Std. Error Mean |
| Body Fat percentage Pre-test | 27.2700 | 10 | 3.90869 | 1.23604 |
| Body Fat percentage Post-test | 26.4300 | 10 | 3.12696 | .98883 |

Table 3 shows that the descriptive statistics of the Body Fat percentage. The result of the paired sample statistics shows that after getting the Core training the subjects perform better (pre-test mean 27.2700& post-test mean 26.4300).

Table: 4.1

| Paired Samples Correlations | | | |
|--|----|-------------|------|
| | N | Correlation | Sig. |
| Body Fat percentage Pre-test & Post-test | 10 | .982 | .000 |

In table number 3.1 shows that there was positive correlation (Corel-.982) was found in between Body Fat percentage Pre-test & Post-test score (sig-.000)

Table: 4.2

| Paired Samples Test | | | | | | |
|--|--------------------|----------------|-----------------|-------|----|-----------------|
| | Paired Differences | | | t | df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | | | |
| Body Fat percentage Pre-test & Post-test | .84000 | 1.02545 | .32428 | 2.590 | 9 | .029 |

In Table number 4.2 shows paired sample “t” test. Where the result shows that there was significance difference was found (sig. 2-tailed .029). comparing both pre-test and post-test mean of the Body Fat percentage shows the difference was .84000. So, we can conclude that due to the Core training improves medium fast bowlers Body Fat percentage improves.

Figure: 4

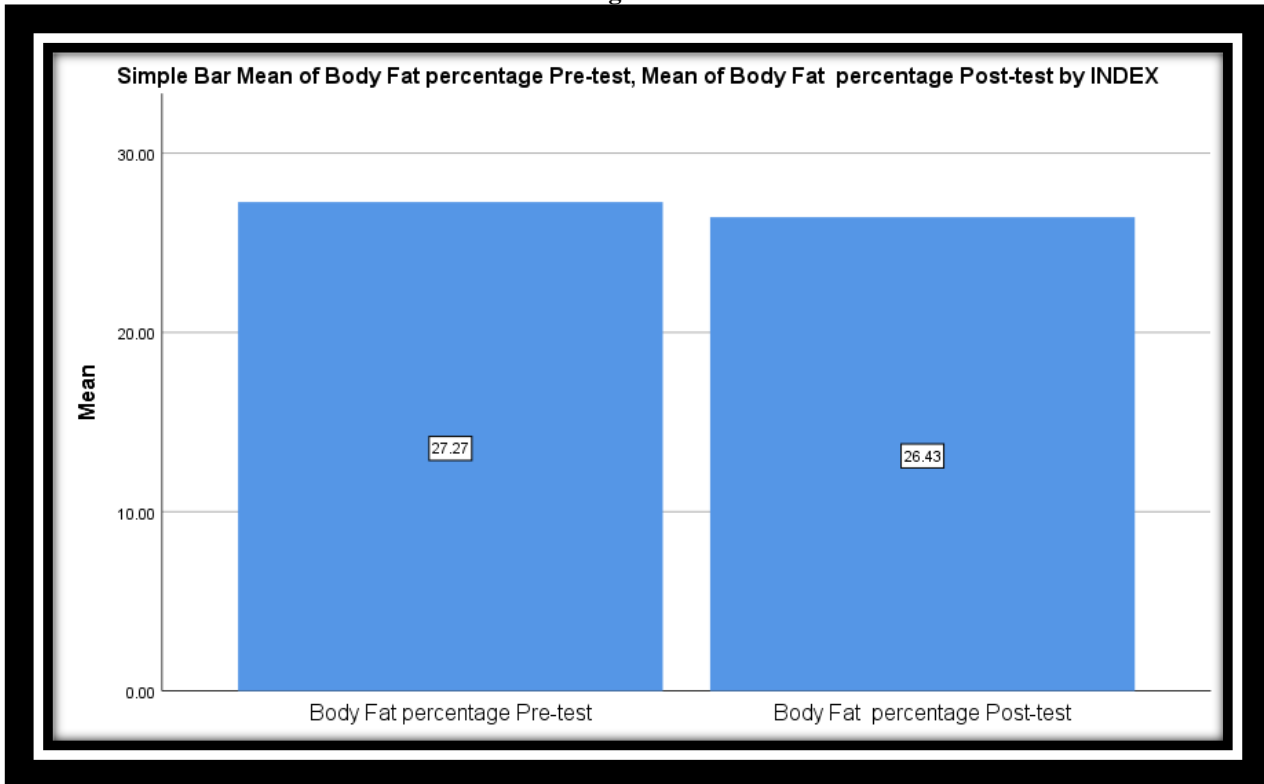


Figure 4 shows that the mean value of Body Fat percentage Pre-test & (after getting core training) Post-test score of Medium fast bowlers.

Table: 5

| Paired Samples Statistics | | | | |
|------------------------------|---------|----|----------------|-----------------|
| | Mean | N | Std. Deviation | Std. Error Mean |
| Resting Heart Rate Pre-test | 73.6000 | 10 | 2.87518 | .90921 |
| Resting Heart Rate Post-test | 71.2000 | 10 | 1.68655 | .53333 |

Table 5 shows that the descriptive statistics of the Resting Heart Rate. The result of the paired sample statistics shows that after getting the Core training the subjects perform better (pre-test mean 73.6000 & post-test mean 71.2000) and improves their Resting Heart Rate.

Table: 5.1

| Paired Samples Correlations | | | |
|---|----|-------------|------|
| | N | Correlation | Sig. |
| Resting Heart Rate Pre-test & Post-test | 10 | .912 | .000 |

In table number 3.1 shows that there was positive correlation (Corel-.912) was found in between Resting Heart Rate Pre-test & Post-test score (sig-.000)

Table: 5.2

| Paired Samples Test | | | | | | |
|---|--------------------|----------------|-----------------|-------|----|-----------------|
| | Paired Differences | | | t | df | Sig. (2-tailed) |
| | Mean | Std. Deviation | Std. Error Mean | | | |
| Resting Heart Rate Pre-test & Post-test | 2.40000 | 1.50555 | .47610 | 5.041 | 9 | .001 |

In Table number 5.2 shows paired sample “t” test. Where the result shows that there was significance difference was found (sig. 2-tailed .001). comparing both pre-test and post-test mean of the Resting Heart Rate shows the difference was 2.40000. So, we can conclude that due to the Core training improves medium fast bowlers Resting Heart Rate improves.

Figure:5

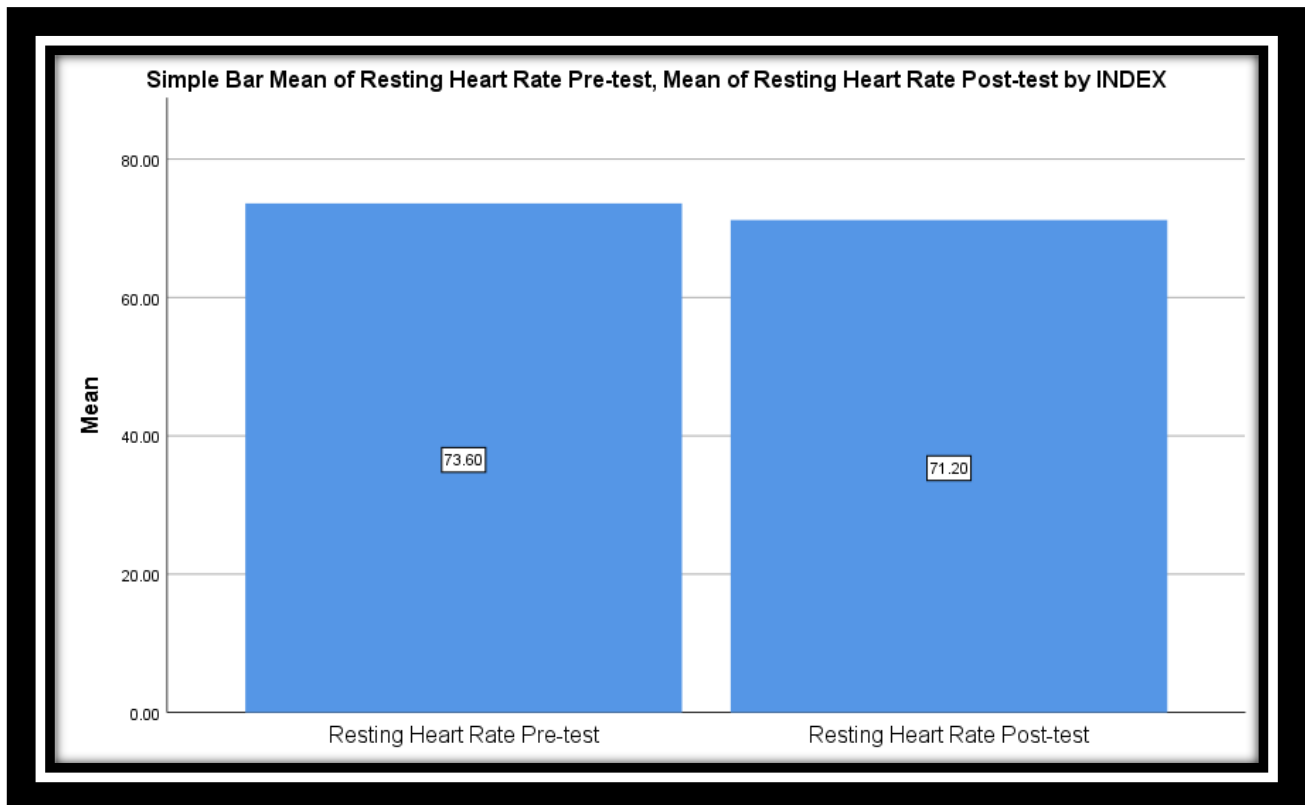


Figure 5 shows that the mean value of Resting Heart Rate Pre-test & (after getting core training) Post-test score of Medium fast bowlers.

CONCLUSION

The results of this study showed that after 12-week of Core training, subjects have shown a significant improvement in medium fast bowlers Diastolic Blood pressure, Vital Capacity, Body Fat Percentage, Resting Heart Rate and also improve was found but not significance Systolic Blood pressure.

All the subjects in the present study were moderately trained athletes to be given the core training program which contributed to the significant increase in the various variables observed after the training procedure. The Twelve-week core training program consists of series of functional exercises performed at high volume to simulate the movements and positions.

Following the overload principle, athletes performing the 12-week core training program experience both muscle strength and endurance adaptability. The twelve-week program consists of a group of core exercises performed intermittently with appropriate rest intervals between sets to challenge both anaerobic and aerobic capacity of the shoulder.

Reductions in body fat percentage are seen as a result of burning high amounts of calories (Koç, 2010). Power trainings cause changes on body composition by increasing fat-free body weight with anabolic effect and by decreasing body fat percentage (Harbili, 1999). Similar studies in literature point out this result (Otto et al. 2012; Gremeaux et al., 2012; Abe et al., 2014). It could be said that the significant decline in the body weight is related to the decline in the body fat percentage ($p < 0.05$).

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