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**Zahoor Ahmad Bhat**
Ph. D Research Scholar, Dept. of Physical Education, Annamalai University, Tamil Nadu, India

**Dr. K Sreedhar**
Associate Professor, Dept. of Physical Education, Annamalai University, Tamil Nadu, India

**Correspondence**
**Zahoor Ahmad Bhat**
Ph. D Research Scholar, Dept. of Physical Education, Annamalai University, Tamil Nadu, India

# Effect of cricket specific fitness training program on systolic and diastolic blood pressure among college level men cricketers of J & K State

**Zahoor Ahmad Bhat and Dr. K Sreedhar**

**Abstract**
Today in the modern competitive cricket era, every cricket player is in a race to excel others, and cricket competitions have become fundamental mode of human expression as they are one of the very important functions by which national and international recognition and prestige is gained. The purpose of the present study was to determine the effect of cricket specific fitness training on systolic and diastolic blood pressure among college level men cricket players. Forty male students (n =40) were randomly selected from Govt. Degree College kulgam of J&K state as subjects and the age was ranged between 19 and 23 years. The selected subjects were randomly assigned into two equal groups namely control group (CON) and the experimental group (EXP) with equal strengths of twenty (n=20) each. Experimental training group underwent cricket specific fitness training programme for twelve weeks for five days per week and two sessions on each day. The control group did not involve in any special training apart from their regular activities. The systolic and diastolic blood pressure were taken as a criterion variable for the present study and they were measured by sphygmomanometer. Analysis of covariance (ANCOVA) was used to analyse the collected data. The results revealed that the cricket specific fitness training was made significant improvement ($p \leq 0.05$) in systolic and diastolic blood pressure of the selected subjects. The level of confidence was fixed at 0.05 in all cases.

**Keywords:** Fitness training, systolic and diastolic blood pressure, cricket

## Introduction
International cricket is undergoing a phase of rapid change as it competes to attract a more global audience. International cricketers are now exposed to greater demands reflected by more five-and one day matches per season, longer seasons and more frequent touring (Noakes & Durandt, 2000) [6]. Thus, there is a real need to understand critically the physiological demands of modern cricket, initially for the benefit of individual players and teams, but eventually for the survival and growth of the game itself. Blood pressure is defined as the pressure at which the blood flows in the arteries (Shantilal *et al.*, 1993) [8]. The positive association between either systolic blood pressure (SBP) or diastolic blood pressure (DBP) and the risk of cardiovascular disease (CVD) is well established (joint national committee on the detection, evaluation and treatment of high blood pressure, 1997). Blood pressure is also characterized by its pulsatile and steady components (Safar, 1989) [7]. The pulsatile component, estimated by pulse pressure (PP), represents blood pressure variation and is affected by left ventricular ejection fraction, large –artery stiffness, early pulse wave reduction and heart rate (Franklin and Gustin, 1997) [2]. Sports specific training is basically fitness and performance training designed specifically for sports performance enhancement and which include areas such as strength, speed, power, endurance, flexibility, mobility, agility, mental preparedness (including goal setting), sleep, recovery/regeneration techniques and strategies, nutrition, rehabilitation, rehabilitation and injury risk reduction. Even though cricket is the most popular game in India, very few scientific research were done on sports training on performance related variables, so thus study was taken to determine the effect of cricket specific fitness training program on systolic and diastolic blood pressure among college level men cricketers of J&K state.

## Materials and Methods

The present study was to determine the effect of cricket specific fitness training on selected systolic and diastolic blood pressure among college level men cricket players. Forty cricket players (N = 40) were randomly selected as subjects from Government Degree College Kulgam, of Jammu and Kashmir, state. The age was ranged between 19 and 23 years. The selected subjects were randomly assigned into two equal groups namely experimental group (EXP) and the control group (CON) for the strengths of twenty (N=20) each. Experimental training group underwent cricket specific fitness training programme for twelve weeks for five days per week and two sessions on each day. The control group did not involve in any special training apart from their regular activities. The systolic and diastolic blood pressure were taken as a criterion variable for the present study and they were measured by sphygmomanometer. Experimental training group underwent cricket specific training programme for twelve weeks for five days per week and two sessions on each day. The duration of study was restricted to 180 hours (2 hours in the morning session and 1 hour in the evening session) for the 12 weeks duration. The training programme consisted of two training duration - 4 weeks of early pre season followed by 8 weeks of late pre season. In the early preseason 60% of 60 hours (36 hours) of training duration was dedicated to fitness development (explosive strength-13 hours, cardio respiratory endurance-7 hours, strength endurance-7 hours, agility-5 hours and speed-4 hours) and 40% of 60 hours (24hours) of training duration for basic skills (12 hours), basic drills (6 hours) and net practice (6 hours)**.** In the late preseason 40% of 120 hours (48 hours) of training duration was dedicated to fitness development (explosive strength-16 hours, cardio respiratory endurance-10 hours, strength endurance-10 hours, agility-7 hours and speed-5 hours) and 60% of 120 hours (72 hours) of training duration for advance skills (21 hours), basic drills (7 hours), advance drills (14 hours) and net practice (30 hours). The collected data were statistically examined by analysis of variance (ANOVA). The confidence level was fixed at 0.05 levels, which is appropriate to the present study.

**Table 1:** Baseline characteristics of the Subjects

| | Experimental Group | | Control Group | | Total | |
|---|---|---|---|---|---|---|
| | **Mean** | **SD** | **Mean** | **SD** | **Mean** | **SD** |
| Age | 21.65 | 1.18 | 21.10 | 1.17 | 21.38 | 1.18 |
| Height | 1.69 | 0.04 | 1.68 | 0.06 | 1.69 | 0.05 |
| Weight | 67.60 | 4.27 | 67.05 | 4.76 | 67.33 | 4.52 |
| BMI | 23.54 | 0.86 | 23.45 | 1.60 | 23.50 | 1.23 |

## Results and Discussion

**Table 2:** Analysis of covariance for systolic and diastolic blood pressure among experimental & control groups.

| | | Experimental group | Control group | F-ratio |
|---|---|---|---|---|
| Systolic Blood Pressure | Pre Test | 119.65±1.76 | 119.95 ± 1.79 | 0.29 |
| | Post Test | 117.95±1.64 | 119.50 ± 1.73 | 8.46* |
| | Ad Po Test | 118.08 | 119.37 | 39.37* |
| Diastolic Blood Pressure | Pre Test | 79.55 ± 2.01 | 79.75 ± 1.74 | 0.11 |
| | POST TEST | 77.80 ± 1.94 | 79.35 ± 1.79 | 6.93* |
| | AD PO TEST | 77.90 | 79.26 | 66.82* |

Table III, *****Significant at .05 level of confidence.

(The Table value required for significance at .05 of confidence with degrees of freedom 1&38 and 1 &37 are 4.10 and 4.11 respectively).

Table II shows that on the variable systolic blood pressure, the pre test mean and SD values of control group are 119.95 ±1.79 respectively and the pre test mean and SD values of experimental group are 119.65 ± 1.76 respectively. The obtained 'F' ratio of 0.29 for pre test scores is lesser than the table value of 4.10 for df 1 and 38 required for significance at .05 level of confidence. On the variable systolic blood pressure, the post test mean and SD values of control group are 119.50 ± 1.73 respectively and the post test mean and SD values of experimental group are 117.95 ± 1.64 respectively. The obtained 'F' ratio of 8.46 for post test scores is greater than the table value of 4.10 for df 1 and 38 required for significance at .05 level of confidence. On the variable systolic blood pressure, the adjusted post test mean value of control group is 119.37 and the adjusted post test mean value of experimental group is 118.08. The obtained 'F' ratio of 39.37 for adjusted post test scores is greater than the table value of 4.11 for df 1 and 37 required for significance at .05 level of confidence. The results of the study indicates that there is a significant change in systolic blood pressure of the experimental group when compared with the control group. After going through the results, it was concluded that the specific training program has resulted in a significant change in systolic blood pressure of the experimental group when compared with the control group.

Table II also shows that on the variable diastolic blood pressure, the pre test mean and SD values of control group are 79.75 ± 1.74 respectively and the pre test mean and SD values of experimental group are 79.55 ± 2.01 respectively. The obtained 'F' ratio of 0.11 for pre test scores is lesser than the table value of 4.10 for df 1 and 38 required for significance at .05 level of confidence. On the variable diastolic blood pressure, the post test mean and SD values of control group are 79.35 ± 1.79 respectively and the post test mean and SD values of experimental group are 77.80 ± 1.94 respectively. The obtained 'F' ratio of 6.93 for post test scores is greater than the table value of 4.10 for df 1 and 38 required for significance at .05 level of confidence. On the variable diastolic blood pressure, the adjusted post test mean value of control group is 79.26 and the adjusted post test mean value of experimental group is 77.90. The obtained 'F' ratio of 66.82 for adjusted post test scores is greater than the table value of 4.11 for df 1 and 37 required for significance at .05 level of confidence. The results of the study indicates that there is a significant change in diastolic blood pressure of the experimental group when compared with the control group. After going through the results, it was concluded that the specific training program has resulted in a significant change in diastolic blood pressure of the experimental group when compared with the control group.

**Table 3:** The pre and post test means of specific training (exp) and control (con) groups with percentage of gain

| | | Pre Test | Post Test | Gain | Percentage of Gain |
|---|---|---|---|---|---|
| Systolic Blood Pressure | Experimental | 119.65 ± 1.76 | 117.95 ± 1.64 | 1.70 ↓ | 1.42 % ↓ |
| | Control | 119.95 ± 1.79 | 119.50 ± 1.73 | 0.45 ↓ | 0.38 % ↓ |
| Diastolic Blood Pressure | Experimental | 79.55 ± 2.01 | 77.80 ± 1.94 | 1.75 ↓ | 2.20 % ↓ |
| | Control | 79.75 ± 1.74 | 79.35 ± 1.79 | 0.40 ↓ | 0.50 % ↓ |

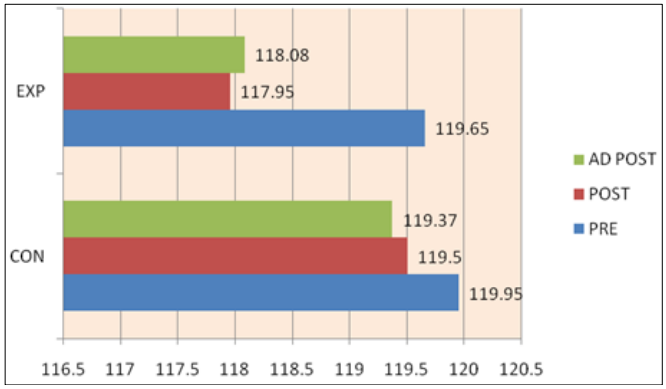


**Fig 1:** Bar Diagram showing the Pre, Post and Adjusted Post test means of Experimental and Control groups on Systolic Blood Pressure

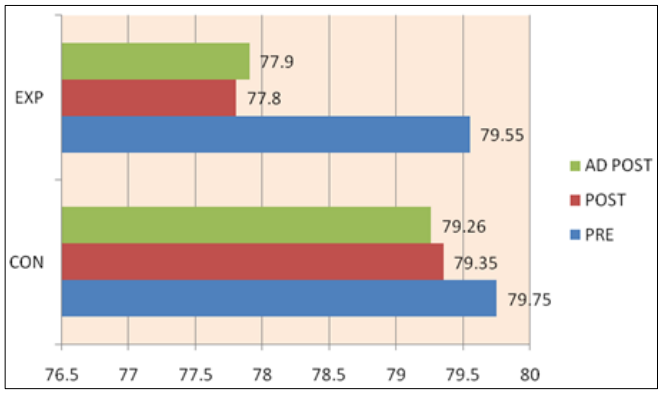


**Fig 2:** Bar Diagram showing the Pre, Post and Adjusted Post test means of Experimental and Control groups on Diastolic Blood Pressure

## Discussion

The result of the present study pointed out that there was a significant difference in systolic and diastolic blood pressure due to twelve weeks of cricket specific training. The current study utilized twelve weeks programme duration with ten sessions per week and found that systolic and diastolic blood pressure decreases due to cricket specific training. The findings are also in agreement with the findings of Ghobadi *et al*. (2016) [3], who found that moderate-intensity resistance exercise decreases systolic blood pressure, Singh, and Verma, (2014) [8], Ve´ronique *et al*. (2011) [9] also found that there was a significant reduction on diastolic blood pressure due to resistance training. Several studies suggested that interval and circuit training exercises are very valuable for determining the diastolic blood pressure, Jaiswal *et al*. (2015) [4]. In this study we adopted a training program which has elements of resistance, endurance, interval and circuit training. From the results of the present study and on the basis of available literature, it is concluded that dependent variables namely systolic and diastolic blood pressure has significantly decreased due to the cricket specific training.

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