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# IMPACT OF KETTLE BELL TRAINING ON SELECTED PHYSICAL AND PERFORMANCE RELATED VARIABLES AMONG BADMINTON PLAYERS

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**Abstract**

*The purpose of the study was to investigate the impact of Kettle bell training programme on selected physical and performance related variables among Badminton players. For the present study 20 male Badminton players from Anna University, BIT- Campus, Tiruchirappalli, Tamil nadu State, India, were selected at random and their age ranged from 18 to 25 years. For the present study pre test – post test randomized group design which consists of control group and experimental group was used. The subjects were randomly assigned to two equal groups of ten each and named as Group 'A' and Group 'B'. Group 'A' underwent Kettle bell training and Group 'B' acted as control and not exposed to any specific training / conditioning. The physical and performance related variables namely speed, agility, balance, flexibility, short service and long service respectively was measured by 30 meters dash, shuttle run (4×10m), stork balance test, sit & reach, french short service test and scott & french long service test. The data was collected before and after 6 weeks of training. The data was analyzed by applying Analysis of Co-Variance (ANCOVA) technique to find out the impact of Kettle bell training programme. The level of significance was set at 0.05. The findings of the present study have strongly indicates that Kettle bell training of six weeks has significant improvement in all the selected physical and performance related variables namely speed, agility, balance, flexibility, short service and long service among Badminton players.*

***Key words:*** *Badminton, Training, Kettle bell.*

## Introduction

Badminton is a one of the most popular game played in more than 170 counties around the world. Badminton has more than 150 year's history. The badminton player requires high degree of physical fitness factors such as speed endurance, power, agility, flexibility, balance and co-ordination, which plays influencial role in badminton performance.

To enhance the performance level of the players many training concepts have come up. Kettle bell training is a form of training that will not only improve the appearance of one's physique, it will give one strength and mental toughness. The Kettle bells and its techniques was introduced in 18$^{th}$ century by the Russians. According to **Hutchinson (2012)** the basic movements of the kettle bell training can raise the heart rate and improve muscles throughout the body. Kettle bell is the form of traditional weight training, but it was used for the specific muscles with the specific types of exercise to isolate the individual muscles. Kettle bell exercises were somewhat different than other types of resistance training, like kettle bell swing, accelerated swing, goblet squat, high dead lift, power clean, and back squat.

Kettle bell exercises are performed with a cast – iron weight, it is used to do the ballistic type of exercises, through this type of activity one can develops the cardiovascular endurance, muscular endurance, speed endurance, flexibility and strength **(Reed, 2009).** The research work on Kettle bell training among Badminton players is very limited.

## Objective of the Study

The objective of the study was to design Kettle bell training and to see its impact on selected physical and performance related variables among Badminton players.

## Methodology

Twenty male Badminton players from Anna University, BIT- Campus, Tiruchirappalli, Tamil nadu State, India were selected at random and their age ranged from 18 to 25 years. For the present study pre test – post test randomized group design which consists of control group (CG) and experimental

group (KTG) was used. The subjects were randomly assigned to two equal groups of ten each and named as Group 'A' and Group 'B'. Group 'A' underwent Kettle bell training and Group 'B' acted as control and not exposed to any specific training / conditioning. The physical and performance related variables namely speed, agility, balance, flexibility, short service and long service respectively was measured by shuttle run, stork balance test, sit and reach, french short service test and scott & french long service test. The data was collected before and after six weeks of training. The data was analyzed by applying analysis of co-variance (ANCOVA) technique to find out the impact of Kettle bell training programme. The level of significance was set at 0.05.

**TABLE – I**

**Pre, post and adjusted post tests mean and standard deviation scores of experimental and control groups on selected physical and performance related variables of Badminton players**

| Variables | Group | Descriptive Statistics | Pre test | Post test | Adjusted post |
|---|---|---|---|---|---|
| **Speed (Seconds)** | KTG | Mean | 4.53 | 4.47 | 4.47 |
| | | SD(±) | 0.16 | 0.13 | |
| | CG | Mean | 4.59 | 4.97 | 4.96 |
| | | SD(±) | 0.18 | 0.48 | |
| **Agility (Seconds)** | KTG | Mean | 11.63 | 11.44 | 11.63 |
| | | SD(±) | 0.31 | 0.30 | |
| | CG | Mean | 12.00 | 12.05 | 11.86 |
| | | SD(±) | 0.56 | 0.59 | |
| **Balance (Seconds)** | KTG | Mean | 4.02 | 4.17 | 4.00 |
| | | SD(±) | 0.51 | 0.48 | |
| | CG | Mean | 3.69 | 3.68 | 3.84 |
| | | SD(±) | 0.49 | 0.49 | |
| **Flexibility (Centimetres)** | KTG | Mean | 26.80 | 30.30 | 30.15 |
| | | SD(±) | 4.18 | 4.08 | |
| | CG | Mean | 26.50 | 26.50 | 26.65 |
| | | SD(±) | 2.41 | 2.59 | |
| **Short service (Points)** | KTG | Mean | 64.70 | 70.80 | 71.24 |
| | | SD(±) | 5.29 | 4.39 | |
| | CG | Mean | 65.70 | 65.90 | 65.46 |
| | | SD(±) | 4.39 | 4.65 | |
| **Long service (Points)** | KTG | Mean | 62.60 | 70.40 | 69.31 |
| | | SD(±) | 2.76 | 4.55 | |
| | CG | Mean | 60.20 | 59.90 | 60.98 |
| | | SD (±) | 3.62 | 3.28 | |

The above table indicates the pre, post and adjusted post tests mean values and pre & post tests standard deviation scores of experimental and control groups on selected physical and performance related variables of Badminton players are numerically presented in the above table

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**Table – II**
**Analysis of covariance of the data on speed, agility, balance, flexibility, short service and long service of pre, post and adjusted post test scores of experimental and control groups**

| Variables | Test | Source of Variance | Sum of Squares | df | Mean Square | F |
|---|---|---|---|---|---|---|
| **Speed (Seconds)** | Pre test | BG | 0.02 | 1 | 0.02 | 0.60 |
| | | WG | 0.51 | 18 | 0.03 | |
| | Post test | BG | 1.24 | 1 | 1.24 | 9.95* |
| | | WG | 2.24 | 18 | 0.12 | |
| | Adjusted Post test | BS | 1.15 | 1 | 1.15 | 8.82* |
| | | WS | 2.22 | 17 | 0.13 | |
| **Agility (Seconds)** | Pre Test | BG | 0.69 | 1 | 0.69 | 3.29 |
| | | WG | 3.74 | 18 | 0.21 | |
| | Post Test | BG | 1.82 | 1 | 1.82 | 8.41* |
| | | WG | 3.89 | 18 | 0.22 | |
| | Adjusted Post test | BS | 0.23 | 1 | 0.23 | 29.39* |
| | | WS | 0.13 | 17 | 0.01 | |
| **Balance (Seconds)** | Pre Test | BG | 0.56 | 1 | 0.56 | 2.26 |
| | | WG | 4.51 | 18 | 0.25 | |
| | Post Test | BG | 1.19 | 1 | 1.19 | 5.04* |
| | | WG | 4.26 | 18 | 0.24 | |
| | Adjusted Post test | BS | 0.19 | 1 | 0.19 | 65.97* |
| | | WS | 0.03 | 17 | 0.002 | |
| **Flexibility (Centimetres)** | Pre Test | BG | 0.45 | 1 | 0.45 | 0.04 |
| | | WG | 210.10 | 18 | 11.67 | |
| | Post Test | BG | 72.20 | 1 | 72.20 | 6.17* |
| | | WG | 210.60 | 18 | 11.70 | |
| | Adjusted Post test | BS | 61.45 | 1 | 61.47 | 73.25* |
| | | WS | 14.27 | 17 | 0.84 | |
| **Short service (Points)** | Pre Test | BG | 5.00 | 1 | 5.00 | 0.21 |
| | | WG | 426.20 | 18 | 23.68 | |
| | Post Test | BG | 120.05 | 1 | 120.05 | 5.86* |
| | | WG | 368.50 | 18 | 20.47 | |
| | Adjusted Post test | BS | 164.84 | 1 | 164.84 | 66.91* |
| | | WS | 41.88 | 17 | 2.46 | |
| **Long Service (Points)** | Pre Test | BG | 28.80 | 1 | 28.80 | 2.78 |
| | | WG | 186.00 | 18 | 10.33 | |
| | Post Test | BG | 551.25 | 1 | 551.25 | 35.03* |
| | | WG | 283.30 | 18 | 15.74 | |
| | Adjusted Post test | BS | 300.77 | 1 | 300.77 | 38.76* |
| | | WS | 131.92 | 17 | 7.76 | |

** Significant at 0.05 level.

The table value required for 0.05 level of significance with df 1, 18 is 4.41 and 1, 17 is 4.45.

The above table revealed that the obtained 'F' value of post test scores of 9.95, 8.41, 5.04, 6.17, 5.86 and 35.03, was found to be significant at 0.05 level with df 1, 18 as the table value of 4.41 was lesser than calculated value at 0.05 level of confidence. The table also indicated that there was a significant difference in post test of speed, agility, balance, flexibility, short service and long service of Badminton players between experimental group and control group.

The above table also indicates that the obtained 'F' value of adjusted post means of 8.82, 29.39, 65.97, 73.25, 66.91 and 38.76 was found to be significant at 0.05 level with df 1, 17 as the table value of 4.45 was lesser than calculated value at 0.05 level of confidence. The table also indicated that there was a significant difference in adjusted means of speed, agility, balance, flexibility, short service and long service of Badminton players between experimental group and control group.

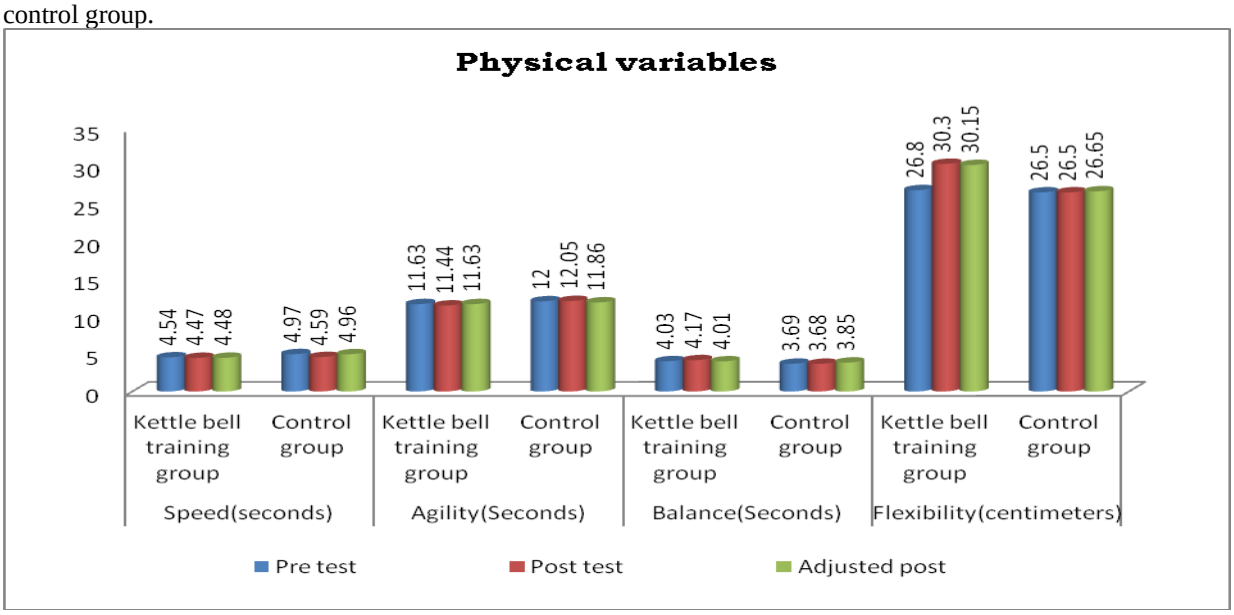


**Figure - 1:** The pre, post and adjusted post test mean values of experimental and control groups on selected physical variables among badminton players.

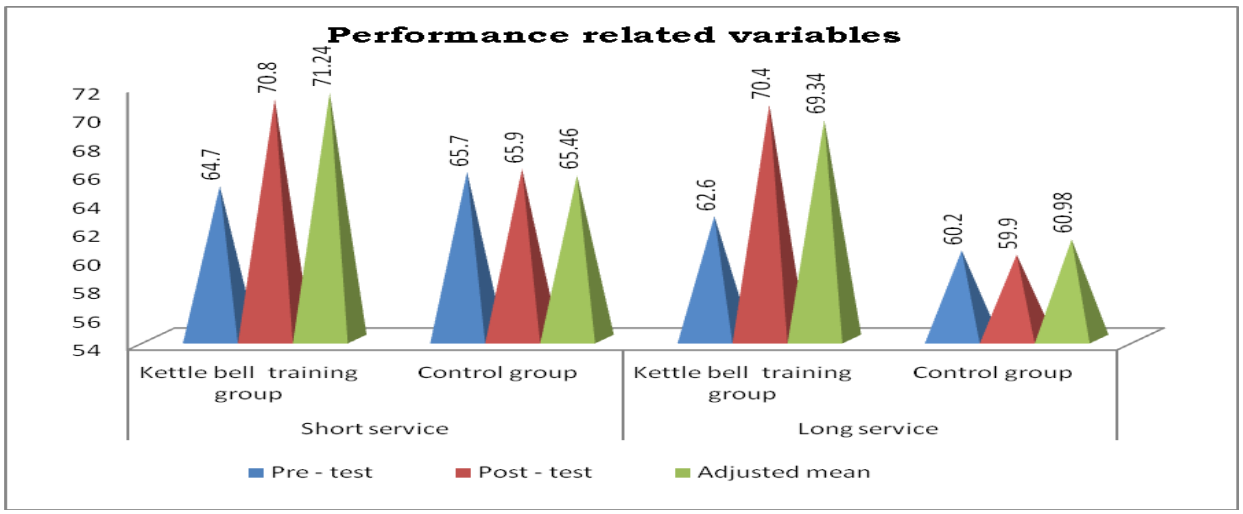


**Figure - 2:** The pre, post and adjusted post test mean values of experimental and control groups on selected performance related variables among badminton players.

**Discussion on findings**

The findings of the present study have strongly indicates that Kettle bell training of six weeks has shown significant improvement in all the selected physical and performance related variables namely Speed, agility, balance, flexibility, short service and long service of badminton players. **Rathbun (2009)** observed that Kettle bell is the basic exercise for the improvement of upper and lower extremities, the handle of the kettle bell is used to make the swinging action. The kettle bell exercises are develops strength and endurance, particularly lower back, legs and shoulder, and also it is increases the grip strength.

**Conclusions**

From the analysis of data, the following conclusions were drawn.

1. The experimental group showed significant improvement in all the selected physical and performance related variables such as speed, agility, balance, flexibility, short service and long service, after undergoing six weeks of Kettle bell training.
2. The control group did not show significant improvement in any of selected variables.

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