



## EFFECT OF KETTLEBELL TRAINING AND YOGIC PRACTICES ON MUSCULAR STRENGTH AND FLEXIBILITY

### Physical Education & Sports

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### ABSTRACT

The purpose of the study was to find out the impact of kettlebell training and yogic practices on muscular strength and flexibility. Forty five male football players aged between 17 and 21 years were selected for the study. They were divided into three equal groups, each group consisting of fifteen subjects in which two experimental groups and one control group, in which the group I (n=15) underwent kettlebell training, group II (n = 15) underwent yogic practices for three days (alternative days) per week for twelve weeks, and group III (n=15) acted as control, which did not participate in any training. The experimental group – I (kettlebell training) & experimental group – II (yoga practice) who participated were informed to report at the early hours of the day around 5.30 A.M. at their training places. The subjects tested on selected criterion variables, such as muscular strength and flexibility at prior to and immediately after the training period. For testing the muscular strength, push-up test was used and to measure the flexibility, sit and reach test was administered. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in the present study, the Scheffé S test was used as post-hoc test. The selected criterion variables such as muscular strength and flexibility were improved for the training groups when compared with the control group. Moreover, there were no significant difference was occurred between the training groups on selected criterion variables.

### KEYWORDS

Kettlebell training, yogic practices, muscular strength and flexibility.

### INTRODUCTION

The highest level of success and metabolic efficiency is the main determinant of a person's fitness. Being stress-, stain-, or illness-free is the norm for a human being in their body, mind, and soul. This is referred to as being in "good health" or "healthy." According to the World Health Organisation, a person's fitness is an asset that includes their overall mental, physical, and well-being and does not just mean that they are free of sickness or illness. Additionally, this meaning has been the subject of discussion, particularly given the dearth of operating costs and the difficulty presented by the usage of the word "complete," which remains the most durable. The International Classification of Functioning (ICF), the International Classification of Diseases (ISD), and the World Health Organization's Family of International Classifications are used to define and decide the mechanism of health.

High-intensity physical activity is a type of exercise that increases the circulatory system's efficiency in absorbing and delivering oxygen. The presence of oxygen increases the intensity of cardiac exercise. It also implies that this type of activity utilises oxygen as part of the body's metabolic process, or manner of generating energy. There are so many different types of high-impact exercises, which all involve exerting a moderate amount of energy for a given period of time.

Various training techniques are used to enhance all aspects of physical and motor fitness at different levels.[1] The main goal of training is to induce biological adaptation to enhance performance in a particular task. Cast iron or steel kettlebells, which resemble cannonballs with handles and are used for a range of exercises, including but not limited to ballistic exercises that combine cardio, strength, and flexibility training, are utilised for this type of training. They are the primary implements in the weightlifting discipline known as kettlebell lifting. It is generally accepted that complex, whole-body motions seen in kettlebell workouts are superior to muscle-separating devices for improving muscular tone, body composition, and strength.[2]

By using kettlebells, the tendons and ligaments are also strengthened, making the joints stronger and less prone to injury. strengthens every muscle in your body, from head to toe. Kettlebell training consists of movements involving the entire body.

The complex, whole-body motions of a kettlebell workout are renowned for improving muscular tone, body composition, and strength more than those of equipment that separates muscles. Kettlebell training should be a part of the conditioning plans for all sports, not only strength sports. Every sport will benefit from their increased muscle strength and endurance as they strengthen their legs. Our muscles contract more when we exercise. This produces the game's elements as well as a uniquely created kettlebell workout routine.[3]

According to proponents of the kettlebell workout, exercises like the swing may concurrently increase physical strength, endurance, and power in addition to cardiovascular fitness. The force used in cornerstone exercises like the swing would not be sufficient to increase maximum or explosive strength because the mass of commercially available kettlebells is relatively small (typically 16–40 kg), according to a review of the benefits of kettlebell exercise in the process of strength and conditioning. Exercise programme.[4] Only a few scientific studies have focused on the immediate effects of a kettlebell training. Schnettler et al. (2010) looked at the energy consumption and relative intensity of a 20-minute kettlebell workout.[5] They found that during a kettlebell snatch session, the average heart rate and oxygen intake of the participants were, respectively, 93% and 78% of their maximal values.

The asana, commonly known as yoga poses, aid in stretching and loosening the skeletal system and muscle tissues of the body. The physical potential that may be released via relaxing acts can help to create a sense of tranquility and well-being. People who experience high levels of anxiety can benefit from physical activity of any kind, and asana has the added benefits of particularly promoting deep muscle relaxation while harmonising at the same time.[6]

The pranamaya kosha, or cover of prana, is one of five crucial processes of the physical and mental plurality in yoga. The 5 koshas are: a) annamaya kosha or the gadget of digestion, b) pranamaya kosha or the oxygen which gives the world of dwelling in nano or cellular, which is nearly the complete body, c) vijnanamaya kosha or the goal and mathematical, in which the left talent have to desires and have an extra crucial position to play in all choice making, d) manonmaya kosha or the interesting proper Genius and e) anandamaya kosha or the world of heavenly bliss. Additionally, this Kosha is continuous in the human body.[7]

Fitness is the capacity of the person to function and maintain themselves effectively, purposefully, and joyfully. To boldly face the difficulties and disaster that are part of life's expectations, right now.[8] According to Bucher and Prentice[9], "health" is a general term that refers to vivacious characteristics that enable a person's demands in terms of intellectual and emotional stability, social recognition and adoptability, religious and ethical fibre, and natural fitness to be stable with ones' heredity.

Universal fitness affects physical health. The phrase "bodily health" has been utilised in several ways. The most crucial requirement for achieving the best quality of life, staying greater or much less, and providing the most in this modern world is good physical health. A sound physique and a sound thought are male or female's most valuable belongings.[10]

Although it used to be a common component, flexibility is now much more specific to each joint. Even the two joints of a bilateral aircraft might move appreciably when they are in equal character. An indication of experimental data supports the findings that age and sexual orientation disparity are less important than innate and that flexibility connects with conventional motion patterns for every participant and every joint. The well-known adaptability gradually declines as people become older. In comparison to males their age, women and girls are more flexible.

## MATERIALS AND METHODS

In this study it was aimed to find out the effect of kettlebell training and yogic practices on muscular strength and flexibility. To achieve the purpose forty five male football players from various colleges of Thiruvalluvar University, Vellore, were selected as subjects at random from the total population of 86 students. They were divided into three equal groups of fifteen each and further divided as two experimental groups and one control group, in which the group I (n=15) underwent kettlebell training weekly three days (alternative days – Monday, Wednesday and Friday), group II (n = 15) underwent yogic practices for six days (Monday to Saturday) per week for twelve weeks, and group III (n=15) acted as control which did not participate in any special training apart from the regular curricular activities. The experimental group – I (kettlebell training) & experimental group - II (yoga practice) who participated were informed to report at the early hours of the day around 5.30 A.M. at their training places. For every training programme there would be a change in various structure and systems in human body. So, the researchers consulted with the experts and then selected the following variables as criterion variables: 1. Muscular strength, 2. Flexibility.

## Data Analysis

Analysis of covariance was used to determine the differences, if any, among the adjusted post test means on selected criterion variables separately. Whenever the 'F' ratio for adjusted post test mean was found to be significant, the Scheffé S test was applied as post-hoc test. The level of significance was fixed at .05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

**Table – I** Analysis of Covariance and 'F' ratio for Muscular and Flexibility endurance of Kettlebell training Group, Yogic Practices Group and Control Group

| Variable Name                    | Group Name                | Kettlebell training Group | Yogic Practices Group | Control Group    | 'F' Ratio |
|----------------------------------|---------------------------|---------------------------|-----------------------|------------------|-----------|
| Muscular strength (in Nos./Min.) | Pre-test Mean $\pm$ S.D.  | 31.86 $\pm$ 1.02          | 31.55 $\pm$ 1.13      | 32.01 $\pm$ 1.22 | 0.89      |
|                                  | Post-test Mean $\pm$ S.D. | 35.26 $\pm$ 1.22          | 33.79 $\pm$ 1.53      | 32.96 $\pm$ 1.52 | 28.86*    |
|                                  | Adj. Post-test Mean       | 35.556                    | 33.979                | 32.253           | 39.25*    |
| Flexibility (in Inches)          | Pre-test Mean $\pm$ S.D.  | 6.56 $\pm$ 0.59           | 6.63 $\pm$ 0.44       | 6.59 $\pm$ 0.39  | 0.024     |
|                                  | Post-test Mean $\pm$ S.D. | 7.99 $\pm$ 0.35           | 8.56 $\pm$ 0.54       | 6.60 $\pm$ 0.61  | 28.69*    |
|                                  | Adj. Post-test Mean       | 8.08                      | 8.889                 | 6.633            | 41.86*    |

\* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively).

Table – I shows that pre test means 'f' ratio of kettlebell training group, yogic practices group and control group on muscular strength was 0.89, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 28.86 and 39.25, which was significant at 0.05 level of confidence. The pre and post test means 'f' ratio of kettlebell training group, yogic practices group and control group on flexibility was 0.027, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 28.69 and 41.86 which was significant at 0.05 level of confidence. The overall study shows that there was a significant decrease in flexibility and muscular strength. Further, to find out which of the paired mean significantly differ, the Scheffé S test was applied and presented below.

**Table – II** Scheffé S Test for the Difference Between the Adjusted Post-Test Mean of Muscular strength and Flexibility

| Kettlebell training Group                               | Yogic Practices Group | Control Group | Mean Difference | Confidence Interval at 0.05 level |
|---------------------------------------------------------|-----------------------|---------------|-----------------|-----------------------------------|
| Adjusted Post-test Mean Difference on Muscular strength |                       |               |                 |                                   |
| 35.556                                                  |                       | 32.253        | 3.303*          | 1.089                             |
| 35.556                                                  | 33.979                |               | 1.577*          | 1.089                             |
|                                                         | 33.979                | 32.253        | 2.726*          | 1.089                             |
| Adjusted Post-test Mean Difference on Flexibility       |                       |               |                 |                                   |
| 8.08                                                    |                       | 6.633         | 1.447*          | 0.713                             |
| 8.08                                                    | 8.889                 |               | 0.809*          | 0.713                             |
|                                                         | 8.889                 | 6.633         | 2.256*          | 0.713                             |

\* Significant at 0.05 level of confidence.

Table – II shows that the Scheffé S Test on muscular strength for the difference between adjusted post-test mean of kettlebell training group and control group (3.303), kettlebell training group and yogic practices group (1.577) and yogic practices group and control group (2.726) which were significant at 0.05 level of confidence.

Table – II shows that the Scheffé S Test for the difference between adjusted post-test mean difference in flexibility between kettlebell training group and control group (1.447), kettlebell training group and yogic practices group (0.809) and yogic practices group and control group (2.256) were significant at 0.05 level of confidence in favour of yogic practices group.

## CONCLUSIONS

- The kettlebell training and yoga practice group has shows their improvement in muscular strength than the control group. Shetler [11] has found that muscular strength was improved after the kettlebell training. Tran *et al* [12] has found that there was a significant improvement in muscular strength after the yoga practice. The result of the study also shown that there was a significant difference between the experimental groups on muscular strength in favour of kettlebell training group.
- Flexibility was also significantly improved for all the training groups, such as, resistance training group and yogic practices group when compared with the control group. Erbes [13] also found that the kettlebell was improved the flexibility. Jay Polsgrove *et al* [14] found that the yoga practice has improved the flexibility among college athletes. The result of the study also shown that there was a significant difference between the experimental groups on muscular strength in favour of yoga practice group.

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