



# INFLUENCES OF KETTLEBELL TRAINING ON LEG STRENGTH AND MUSCULAR STRENGTH AMONG COLLEGE LEVEL MEN ATHLETES

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## ABSTRACT

*The primary objective of this study was to investigate the effects of kettlebell training on leg strength and muscular strength among college-level men athletes. To achieve this goal, a sample of thirty college-level men athletes from Ramakrishna Mission Vidyalaya Maruthi College of Physical Education, located in Coimbatore, Tamil Nadu, India, was randomly selected to participate as subjects. The age range of the participants was between 21 and 25 years. The subjects were divided into two groups: the kettlebell group and the control group. The kettlebell group underwent a kettlebell training program, consisting of three sessions per week (Monday, Wednesday, and Friday), over a period of eight weeks. The training sessions were conducted in the evening. Leg strength and muscular strength were selected as the dependent variables in this study. After collecting the necessary data, statistical analysis was performed using the paired t-test. The significance level was set at 0.05. The results of the study indicated a significant improvement in both leg strength and muscular strength among college-level men athletes who underwent kettlebell training. These findings highlight the positive impact of kettlebell training on the physical abilities of college-level men athletes in terms of leg strength and overall muscular strength.*

**KEYWORDS:** *Kettlebell Training, Leg Strength, Muscular Strength and Athletes.*

## 1. INTRODUCTION

Kettlebell training has gained popularity as an effective and versatile form of exercise that targets various muscle groups, enhances overall strength, and improves athletic performance. Among college-level men athletes, the demand for training methods that can optimize leg strength and muscular strength is paramount. Therefore, exploring the influences of kettlebell training on these specific areas can provide valuable insights into its potential benefits for this population.

Leg strength is a fundamental aspect of athletic performance, particularly in sports that require explosive movements, such as basketball, soccer, and track and field events. Additionally, muscular strength is crucial for athletes to execute powerful actions, maintain stability, and reduce the risk of injuries. Kettlebell training, characterized by dynamic movements and resistance training, has the potential to enhance both leg strength and overall muscular strength. By engaging in kettlebell exercises that involve the lower body, such as kettlebell swings, goblet squats, and lunges, college-level men athletes can target their leg muscles, including quadriceps, hamstrings, glutes, and calves. These exercises utilize multiple muscle groups simultaneously, encouraging functional movements and coordination.

Furthermore, kettlebell training promotes muscular strength by challenging athletes to stabilize and control the weight while performing exercises. The dynamic nature of kettlebell exercises necessitates the engagement of core muscles, as well as secondary muscle groups, to maintain balance and control

throughout the movements. Consequently, athletes can experience improvements in total body strength and power. While research has been conducted on the benefits of kettlebell training in various populations, limited studies have specifically focused on its effects on leg strength and muscular strength among college-level men athletes. Understanding the potential influences of kettlebell training in this specific demographic can guide trainers, coaches, and athletes in incorporating kettlebell exercises into their training regimens effectively.

This study aims to fill this research gap by investigating the influences of kettlebell training on leg strength and muscular strength among college-level men athletes. By examining the changes in strength levels, muscle activation patterns, and athletic performance following a structured kettlebell training program, this study will provide valuable insights into the efficacy of kettlebell training for this population. Which build the components for the game, as a researcher special planned kettlebell training programme for the college level athletes.

## 2. METHODOLOGY

The primary objective of this study was to investigate the effects of kettlebell training on leg strength and muscular strength among college-level male athletes. To achieve this, a sample of thirty college-level male athletes from Ramakrishna Mission Vidyalaya Maruthi College of Physical Education in Coimbatore, Tamil Nadu, India, was randomly selected as participants. Their ages ranged from 21 to 25 years. The participants were divided into two groups: the kettlebell group and the control group.



The kettlebell group underwent kettlebell training sessions three times a week (on Mondays, Wednesdays, and Fridays) during the evening sessions for a duration of eight weeks. Leg strength and muscular strength were selected as the dependent variables for this study. After collecting the relevant data, a statistical analysis was conducted using the paired t-test, with a significance level set at 0.05.

### 3. TRAINING PROTOCOL

The kettlebell group in this study underwent a structured training program, consisting of three training sessions per week for a duration of eight weeks. The training sessions were specifically scheduled in the evening, allowing the participants to allocate dedicated time for their workouts. Each training session was designed to include warm-up and cool-down routines to prepare the body for exercise and facilitate proper recovery.

The duration of the training sessions lasted approximately 50 to 60 minutes on average. Within this timeframe, the participants engaged in a variety of exercises targeting different muscle groups. The specific exercises included in the training program

were pistol squats, biceps curls, rows, and front raises. These exercises were carefully selected to target various muscle groups, such as the legs, biceps, back, and shoulders, aiming to enhance leg strength and overall muscular strength.

During the training sessions, the kettlebell group followed a structured schedule that was meticulously regulated by the researcher. This ensured consistency in exercise selection, technique, and intensity. The participants received guidance and supervision from the researcher to maintain proper form and maximize the effectiveness of their training. In contrast, the control group did not participate in any additional training or exercise during the experimental period. They maintained their regular daily activities but did not engage in the specific training program provided to the kettlebell group. This allowed for a comparison between the effects of kettlebell training and the absence of additional training on leg strength and muscular strength among the participants.

By implementing a well-structured training program for the kettlebell group and maintaining a control group without additional training, this study aimed to evaluate the specific impacts of kettlebell training on leg strength and muscular strength among the participants.

### 4. RESULTS

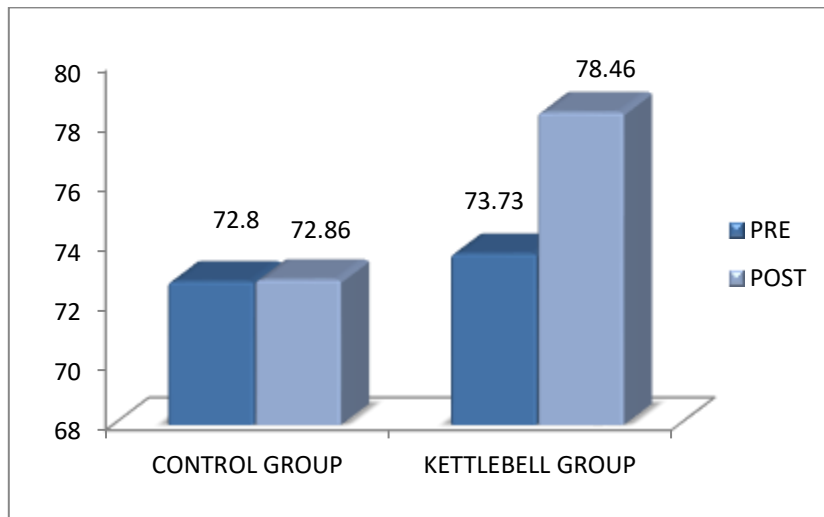
**TABLE-I**  
**RELATIONSHIP OF MEAN, SD AND 't'-VALUES OF THE LEG STRENGTH BETWEEN PRE & POST TEST OF THE KETTLEBELL AND CONTROL GROUPS OF ATHLETES**

Leg Strength	Groups	Test	Mean	S.D	't' Values
	Control Group	Pre Test		72.80	17.12
Post Test			72.86	17.27	
Kettlebell Group	Pre Test		73.73	11.84	8.38*
	Post Test		78.46	12.18	

\*Significant at 0.05 level of confidence

Table-I reveals that the mean values of pre test and post test of control group for leg strength were 72.80 and 72.86 respectively; the obtained t ratio was 0.26 respectively. The tabulated t value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated t ratio was lesser than the table value. It is found to be insignificant change in leg strength of the athletes. The obtained mean and standard deviation

values of pre test and post test scores of kettlebell group were 73.73 and 78.46 respectively; the obtained t ratio was 8.38. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The obtained t ratio was greater than the table value. It is found to be significant changes in leg strength of the athletes. The mean values on kettlebell group and control group are graphically represented in figure-1



**Figure-1: Bar Diagram Showing the Pre-Test & Post Test On Leg Strength of Control and Kettlebell Groups**

**TABLE-II**

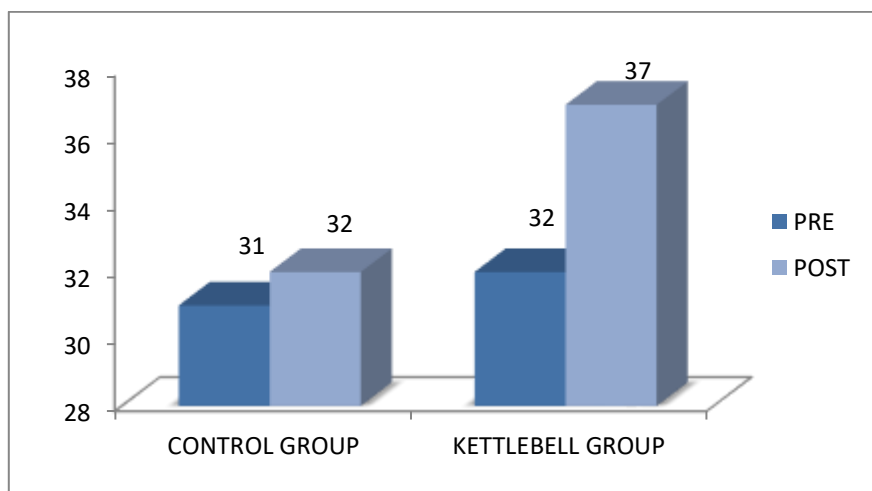
**RELATIONSHIP OF MEAN, SD AND 't'-VALUES OF THE MUSCULAR STRENGTH BETWEEN PRE & POST TEST OF THE KETTLEBELL AND CONTROL GROUPS OF ATHLETES**

Muscular Strength	Groups	Test	Mean	S.D	't' Values
Control Group	Post Test	32	6.52		
Kettlebell Group	Kettlebell Group	Pre Test	32	5.16	5.19*
		Post Test	37	5.73	

\*Significant at 0.05 level of confidence

Table-II reveals that the mean values of pre test and post test of control group for muscular strength were 31.46 and 31.33 respectively; the obtained t ratio was 0.48 respectively. The tabulated t value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The calculated t ratio was lesser than the table value. It is found to be insignificant change in muscular strength of the athletes. The obtained mean and standard deviation values of pre test and post test scores of kettlebell

group were 32.66 and 37.80 respectively; the obtained t ratio was 5.19. The required table value is 2.14 at 0.05 level of confidence for the degree of freedom 14. The obtained t ratio was greater than the table value. It is found to be significant changes in muscular strength of the athletes. The mean values on kettlebell group and control group are graphically represented in figure-2



**Figure-2: Bar Diagram Showing the Pre-Test & Post Test on Muscular Strength Of Control and Kettlebell Groups**



## 5. DISCUSSION ON FINDINGS

Kettlebell training has emerged as a highly effective and versatile training method for athletes, including college-level athletes. This study aimed to investigate the impacts of kettlebell training specifically on leg strength and muscular strength among these athletes, utilizing a differentiation between a kettlebell group and a control group. The kettlebell training program focused on selected physical fitness components that are essential for athletic performance. The exercises included in the program were pistol squats, biceps curls, rows, and front raises. These exercises target specific muscle groups and have been found to enhance leg strength, muscular strength, muscle size, as well as other physical fitness components like speed, agility, and power.

The results obtained from the study demonstrated a significant improvement in leg strength and muscular strength among the kettlebell group. This finding suggests that kettlebell training has a positive impact on the development of these physical attributes in college-level athletes. These findings align with previous studies conducted by **Vijay and Vallimurugan (2021)**, **Abdul Halik et al. (2021)**, and **Ooraniyan and Senthil Kumaran (2018)**. Which also reported positive effects of kettlebell training on leg strength and muscular strength in various athlete populations. On the other hand, the control group, which did not undergo kettlebell training, did not show significant improvements in leg strength and muscular strength. This further supports the notion that the observed improvements in the kettlebell group can be attributed to the specific effects of kettlebell training

## 6. CONCLUSIONS

Based on the results obtained and considering the limitations of the study, it was observed that the practice of kettlebell training had a positive impact on leg strength and muscular strength among college-level athletes. The selected criterion variables showed progressive improvement in the kettlebell group athletes after participating in an eight-week kettlebell training program. This training program contributed to enhancing leg strength and muscular strength.

1. The findings of the study concluded that the individualized impacts of the kettlebell group demonstrated statistically significant improvements in leg strength and muscular strength among college-level athletes during the treatment period.
2. Conversely, the individualized impacts of the control group showed statistically insignificant changes in leg strength and muscular strength over the course of the study period among college-level athletes.
3. The comparative analysis of the results leads to the conclusion that the kettlebell group exhibited significantly greater improvements in leg strength and muscular strength among college-level athletes compared to the control group.

It is important to acknowledge that the study had certain limitations which may have influenced the results. However, based on the obtained outcomes, it can be inferred that

kettlebell training has a beneficial effect on leg strength and muscular strength in college-level athletes.

## 7. REFERENCES

1. J. Vijay and Dr. V. Vallimurugan (2021) *badminton player's fitness output in response to kettlebell training*. EPRA International Journal of Multidisciplinary Research, Vol. 7, Issue.09, Pgs: 38-41.
2. Abdul Halik, Senthil Kumaran, Arun Kumar, Rajesh, Princy (2021) *Effect of Complex Training on Strength Endurance and Agility among Basketballers*. International Journal of Research Publication and Reviews; 2(8): 157-166.
3. S. Senthil Kumaran, Dr. V. Vallimurugan, N. Kodeeswaran (2022), *Abdominal Strength as a Result of Core Exercise*. International Journal of Research Publication and Reviews, Volume-3, Issue-2, Pages: 109-111.
4. K. Ooraniyan, S. Senthil Kumaran (2018) *Impacts Of Kettlebell Training On Selected Physical Fitness Components Among Handball Players*, International Journal of Current Trends in Science and Technology, Vol. 8, Issue. 05, Page no: MS 20427-20430
5. B Vivekanth, V Vallimurugan (2019). *Effect of Strength Training on Physical Fitness Variables of Intercollegiate Volleyball Players*. International Journal of Applied Research; 5(6): 442-444
6. Vallimurugan, V., & Vincent, J. P. (2012). *Effect of SAQ Training On Selected Physical Fitness Parameters of Men Football Palyers*. International Journal of Advanted and Inovation Research, 1(2), 2278-7844.
7. Senthil kumaran. *Impacts of Plyometric Training on Selected Physical Fitness Variables among Basketball Players*. International Journal of Yoga, Physiotherapy and Physical Education 2018; 3(4): 52-54.
8. Ooraniyan and Senthil Kumaran. *Effect of Game Specific Aerobic Training on Motor Fitness Components among Handball Players*. International Journal of Yoga, Physiotherapy and Physical Education 2018; 3(4): 68-70.
9. Falatic et al., (2015) *Effects of Kettlebell Training on Aerobic Capacity*. The Journal of Strength & Conditioning Research, Volume 29 - Issue 7 - p 1943-1947.
10. Manocchia, P et al., (2015) *Transference of Kettlebell Training to Strength, Power, and Endurance*. Journal of Strength and Conditioning Research, 27, 2, 477-484.
11. Joe girard et al., (2014) *the Effects of Kettlebell training on Strength, Power and Endurance*. Journal of Physical Therapy, Volume 20 - Issue 1.
12. Matthew R. Maulit et al., (2017) *Effects of Kettlebell Swing vs. Explosive Deadlift Training on Strength and Power*. International Journal of Kinesiology & Sports Science, Vol. 5 No.1
13. Jay K et al., (2010) *Kettlebell Training for Musculoskeletal and Cardiovascular Health: A Randomized Controlled Trial*. Scand J Work Environ Health. Epub