



**EFFECT OF KETTLE BELL TRAINING ON CARDIOVASCULAR ENDURANCE
MUSCULAR ENDURANCE AND MUSCULAR STRENGTH AMONG
COLLEGE STUDENTS**

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ABSTRACT

The purpose of the study was to find out the effect of kettle ball training on cardiovascular endurance, muscular endurance and muscular strength among college students. Twenty four male students studying from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur were selected randomly as subjects. The age of the subjects ranged from 21 to 28 years. The selected subjects were divided into two groups. Group I underwent kettle bell training and Group II acted as control. The experimental group was subjected to the kettle bell training for alternative three days per week up to six weeks. The kettle bell training was selected as independent variable and the criterion variables cardiovascular endurance, muscular endurance, and muscular strength were selected as dependent variables and the selected dependent variables were assessed by the standardized test items. Cardiovascular endurance was assessed by Harvard step test and the unit of measurement in numbers, muscular endurance was assessed by bent knee sit ups and the unit of measurement in numbers and speed endurance was assessed by 150m run and the unit of measurement in seconds. The experimental design selected for this study was pre and post test randomized design. The data were collected from each subject before and after the training period and statistically analyzed by using dependent 't' test and analysis of covariance (ANCOVA). It was found that there was a significant improvement and significant different exist due to the effect of kettle bell training on cardiovascular endurance, muscular endurance and speed endurance among college students when compared to control group.

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INTRODUCTION

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 develop the cardiovascular endurance, muscular endurance, speed endurance, flexibility and strength. **(Bill Reed, 2009)**

The trainer may perform various exercise through kettle bell, the swing 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 develop strength and endurance, particularly lower back, legs and shoulder, and also it increases the grip strength. Kettle bells were developed in Russia in the 1700s. **(Andy Rathbun, 2009)**

The kettle bells and its techniques were introduced in 18th century by the Russians. 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. **(Alex Hutchinson).**

Kettle bell training is a form of training that will not only improve the appearance of your physique, it will give you strength and mental toughness that you did not know was even possible. Through kettle bell exercises can benefit from, kettle bell exercises such as: the Turkish get-up, Bent Press, and Windmill will develop a rock-hard midsection and increase shoulder flexibility and stability. These types of exercise have to increase size and strength. Kettle bell exercises: Double Clean and Press, Double Front Squat, Renegade Row, Double Swing, and the Double Clean (Scroll down for more info). The women also have to lose weight and tighten up their glutes, quads, abs, and arms. **(Mike Mahler)**

METHODOLOGY

To achieve the purpose, twenty four men students studying from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur were selected randomly as subjects. The age of the subjects ranged from 21 to 28 years. They were assigned randomly into two groups (group I) underwent kettle bell training and (group II) acted as control of twelve subjects each. The experimental group was subjected to the training during morning hours for alternative three days for six weeks and group II acted as control. The kettle bell training was selected as independent variable and the criterion variables cardiovascular endurance, muscular endurance and speed endurance were selected as dependent variables and the selected dependent variable were assessed by the standardized test items. Cardiovascular endurance was assessed by Harvard step test and the unit of measurement in numbers, muscular endurance was assessed by bent knee sit ups and the unit of measurement in numbers and speed endurance was assessed by 150m and the unit of measurement in seconds. The experimental design selected for this study was pre and post test randomized design. The data were collected from each subject before and after the training period and statistically analyzed by using dependent 't' test and analysis of covariance (ANCOVA).

RESULTS AND DISCUSSIONS

The data pertaining to the variables in this study were examined by using dependent 't' test to find out the significant improvement and analysis of covariance (ANCOVA) for each variables separately in order to determine the difference and tested at .05 level of significance. The analysis of dependent 't' test on data obtained for cardiovascular endurance, muscular endurance and speed endurance of the pre test and post test means of experimental and control group have been analyzed and presented in Table I.

TABLE- I
MEAN AND DEPENDENT 't' TEST OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Mean	Kettle bell Training	Control Group
Cardiovascular Endurance	Pre test Mean	98.35	98.01
	Post test Mean	98.94	97.99
	't' test	9.71*	1.34

Muscular Endurance	Pre test Mean	36.67	36.67
	Post test Mean	37.92	36.50
	't' test	9.57*	1.48
Speed Endurance	Pre test Mean	32.78	32.91
	Post test Mean	32.54	32.93
	"t" test	5.45*	1.48

*Significant at 0.05 level of confidence (11) = 2.201

The obtained 't' ratio value of experimental group is higher than the table value, it is understood that kettle bell training had significantly improved the performance of cardiovascular endurance, muscular endurance and speed endurance. However, the control group has no significant improvement as the obtained 't' value is less than the table value; because it was not subjected to any specific training. The analysis of covariance on the data obtained on cardiovascular endurance, muscular endurance and speed endurance due to the effect of kettle bell training and control groups have been analysed and presented in Table II.

TABLE- II
ANALYSIS OF COVARIANCE OF EXPERIMENTAL AND CONTROL GROUPS ON SELECTED VARIABLES

Variables	Adjusted Post Test Means		Source of Variance	SS	df	Mean Squares	'F'- Ratio
	Stick Drill Training	Control Group					
Cardiovascular Endurance	98.79	98.14	Between	2.459	1	2.459	71.38*
			Within	0.723	21	0.034	
Muscular Endurance	37.92	36.50	Between	12.042	1	12.042	72.60*
			Within	3.483	21	0.166	
Speed Endurance	32.71	32.86	Between	0.148	1	0.148	29.82*
			Within	0.104	21	0.005	

*Significant at .05 level of confidence, df (1, 21) = 4.32

Table II shows that the obtained 'F' ratio value are 71.38, 72.60, 29.82 and which are higher than the table value 4.32 with df 1 and 21 required to be significant at 0.05 level. Since the obtained value of 'F' ratio is higher than the table value, it indicates that there is significant difference among the adjusted post- test means of kettle bell training and control group on cardiovascular endurance, muscular endurance and speed endurance.

To the most sports people, kettle bell training offered a better method of developing cardiovascular endurance, muscular endurance and speed endurance. The present study also produced the same result.

CONCLUSIONS

1. The kettle bell training had significantly improved the cardiovascular endurance, muscular endurance and speed endurance.
2. There was significant difference among the adjusted post – test means of kettle bell training and control group on cardiovascular endurance, muscular endurance and speed endurance.

REFERENCES

Reed Bill., (2009), “saved by the kettle bell”, Winnipeg free press. Retrieved from <http://www.wikipedia.org//>. On 15/02/2014.

Rathbun Andy., (2009), “The Kettle bell way: Focused workouts mimic the movements of everyday activities”, heralnet. Retrieved from <http://www.wikipedia.org//>. On 15/02/2014.

Hutchinson Alex., (2012), “How effective are kettle bell workout?”, Special to the globe mail, Jun, 10, 2012, 4.00pm. Retrieved from <http://www.theglobeandmail.com//>. On 16/02/2014.

Mike Mahler, “The benefits of kettle bell training for fat loss, strength training, explosive power, and muscle building”. Retrieved from <http://www.mikemahler.com//>. On 16/02/2014.