Effect of kettlebell training on selected physical fitness variables of men volleyball players

Dr. S Somasundaramoorthy
Physical Director, PSG College of Technology, Coimbatore, Tamil Nadu, India

Abstract
The impartial of this study was to explore the effects of 8 weeks of kettlebell training on selected physical fitness variables of men volleyball players. The study involved 30 men volleyball players who were randomly assigned into two equal groups: a kettlebell training group and a control group. All participants underwent pre- and post-test assessments of arm explosive power and muscular strength endurance. The training group received 5 days per week of kettlebell training for 8 weeks, while the control group did not undergo any specific training. The results of the 't' test were analyzed to determine the changes in fitness variables. The findings indicated that 8 weeks of kettlebell training produced significant changes in arm explosive power and muscular strength endurance for men volleyball players.

Keywords: Kettlebell training, arm explosive power, muscular strength endurance, volleyball players

Introduction
Volleyball is an energetic sport that requires a high level of physical fitness. To become a successful volleyball player, one needs to overcome numerous physical obstacles. To achieve success, players must train rigorously using advanced training methods and equipment. Training with kettlebells challenges volleyball players physically and undoubtedly helps in developing their physical fitness. A kettlebell or gray is a traditional Russian cast-iron weight that resembles a cannonball with a handle. Its popularity in Russia is that any strongman or weight lifter was referred to as a grieve, or 'a kettlebellman'. The actual origin of the kettlebell is subject to debate. Strength and conditioning workouts are beneficial for improving daily living skills in leisure exercisers. Improvements in power, strength and other performance indices are elicited by powerlifting exercises both individually and in combination, and these improvements have been shown to be directly related to training adaptations. The kettlebell is an alternate training technique that will be researched and used to enhance performance and function. A kettlebell is a cast-iron weight with a handle that resembles a cannonball and is frequently used to improve strength, power, and general conditioning. The design of a kettlebell enables its centre of mass to go beyond the hand. Swings, raises, and presses are The Scots will claim that they invented the kettlebell as part of the High and Games, and the Chinese say that the giant padlocks used by the Shaolin monks were the original kettlebells.

Hypothesis
The hypothesis in this paper is that volleyball players can significantly change the arm explosive power and muscular strength endurance by combining technical and tactical sessions with kettlebell training over a consecutive 8 weeks period.

Methodology
To achieve the purpose of the study, 30 men volleyball players aged 20-25 years were selected from the Coimbatore district. The selected subjects were randomly assigned into two equal groups, each consisting of fifteen participants. The kettlebell training group received 5 days per week of training, while the control group did not undergo any specific training. The study included pre- and post-test assessments of arm explosive power and muscular strength endurance.
group (n=15). The respective training was given to the experimental group the 5 days per weeks (Monday to Friday) for the training period of eight weeks. The control group was not given any sort of training except their routine. The evaluated arm explosive power medicine ball throw the unit of measurement was in meters, muscular strength endurance were measured by modified sit-ups test the unit of measurement was in counts. The parameters were measured at baseline and after 8 weeks of kettlebell training were examined. The intensity was increased once in two weeks based on the variation of the exercises.

Training Programme
The training programme was lasted for 45 minutes for session in a day, 6 days in a week for a period of 8 weeks duration. These 45 minutes included warm up for 10 minutes, 25 minutes kettlebell and warm down for 10 minutes. The equivalent in kettlebell training is the length of the time each action in total 5 day per weeks. (Monday to Saturday)

Statistical Analysis
The collected data on arm explosive power and muscular strength endurance due to the effect of kettlebell training was statically analyzed with “t” test to find out the significant improvement between pre& posttest if any. In all case the criterion for spastically significance was set at 0.05 level of confidence (p<0.05).

Table 1: Computation of ‘T’ ratio on arm explosive power of men volleyball players on experimental group and control group (Scores in Percentage)

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>T ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm Explosive Power</td>
<td>Experimental Group</td>
<td>Pre test</td>
<td>9.25</td>
<td>1.61</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post test</td>
<td>10.91</td>
<td>1.93</td>
</tr>
<tr>
<td></td>
<td>Control Group</td>
<td>Pre test</td>
<td>8.65</td>
<td>0.99</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post test</td>
<td>8.46</td>
<td>0.92</td>
</tr>
</tbody>
</table>

*significant level 0.05 level (degree of freedom 2.14, 1 and 14)

Table I reveals the computation of mean, standard deviation and ‘t’ ratio on arm explosive power of experimental and control group. The obtained ‘t’ ratio on arm explosive power max were 17.87 and 1.82 respectively. The required table value was 2.14 for the degrees of freedom 1 and 14 at the 0.05 level of significance. Since the experimental group ‘t’ values were greater than the table value of 2.14, it was found to be statistically significant. The control group ‘t’ value is less then table value of 2.14 it was found to be statistically insignificant.

Table 2: Computation of ‘T’ ratio on muscular strength endurance of obese college women on experimental group and control group (Scores in Centimeters)

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>T ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscular Strength Endurance</td>
<td>Experimental Group</td>
<td>Pre test</td>
<td>41.15</td>
<td>6.36</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post test</td>
<td>47.25</td>
<td>8.20</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pre test</td>
<td>41.10</td>
<td>5.52</td>
<td>0.97</td>
</tr>
<tr>
<td></td>
<td>Post test</td>
<td>40.20</td>
<td>4.56</td>
<td></td>
</tr>
</tbody>
</table>

*significant level 0.05 level (degree of freedom 2.14, 1 and 14)
level of significance. Since the experimental group ‘t’ values were greater than the table value of 2.14, it was found to be statistically significant. The control group ‘t’ value is less than table value of 2.14 it was found to be statistically insignificant.

**Fig 2:** Bar diagram showing the mean value on muscular strength endurance of obese college girls on experimental group and control group

**Discussion on Findings**

Persons currently are not absorbed in exercising and jogging as they think that it wastes their time and had no other benefits rather than for health. However, when they practice kettlebell, this will become a sort of exercise and also become a skill to defend themselves from danger. The present study experimented the influence of eight weeks kettlebell training on the selected variables are arm explosive power and muscular strength endurance of the men volleyball players. The results of this study indicated that kettlebell training is more efficient to bring out desirable changes over the arm explosive power and muscular strength endurance of the men volleyball players. Suresh et al., (2018) [2018] find that explosive strength (ES) and strength endurance (SE) significantly increased due to six weeks of Kettlebell training. Seetha et al., (2013) [2013] Consequences showed significant improvements in core strength and muscle endurance in female volleyball players due to the 8 weeks kettlebell training. Parasuram et al., (2017) [2017] result of the study showed that systematic practice of kettlebell training improved the core strength and muscular endurance in volleyball players. Arumugam et al., (2015) [2015] present study have strongly indicates that Kettlebell training of six weeks has significant improvement in all the selected performance variables namely passing, dribbling and shooting among soccer players. The result from this study are very encouraging and it demonstrates the benefits of kettlebell training. The volleyball players are not only using exercises to improve their mobility but also to improve the performance. Besides, the results support that improvement in mobility can occur 8 weeks of kettlebell training.

**Conclusions**

1. Based on the result of the study it was concluded that the 8 weeks of kettlebell training have been significantly changes in arm explosive power of men volleyball players.
2. It was concluded that the 8 weeks of kettlebell training have been significantly changes in muscular strength endurance of men volleyball players.

**References**

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