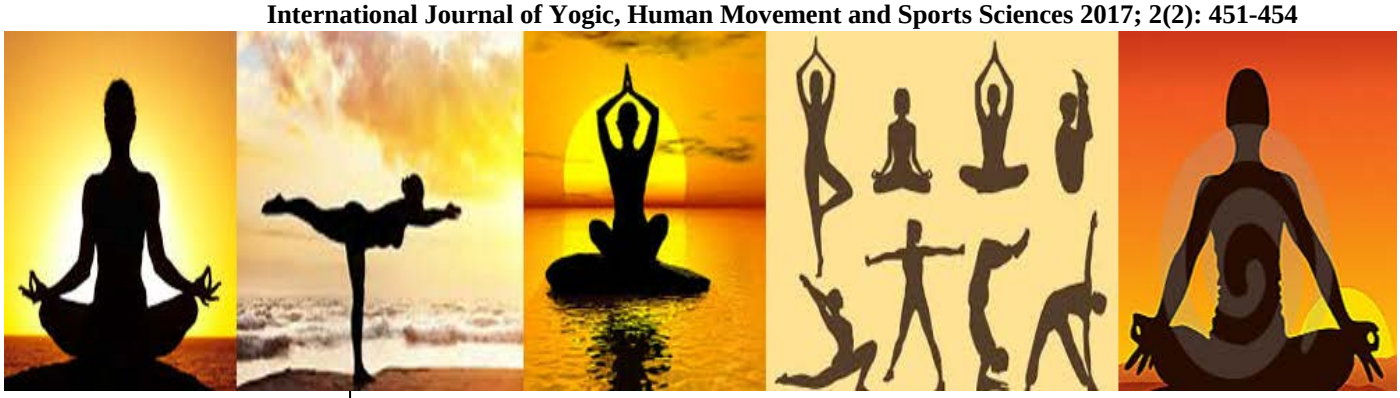
International Journal of Yogic, Human Movement and Sports Sciences 2017; 2(2): 451-454



ISSN: 2456-4419
Impact Factor: (RJIF): 5.18
Yoga 2017; 2(2): 451-454

www.theyogicjournal.com
Received: 22-05-2017
Accepted: 05-06-2017

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Assessment study of effect of weight training exercises on physical fitness ability of the Shotput throwers

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Abstract
Physical fitness is not only one of the most important keys for a healthy body, but it is also the basis for dynamic and creative activity. Healthful living implies freedom from disease, enough strength, endurance, skill, agility, capacity to meet the daily demands and sufficient reserves to meet extra ordinary stresses without undue fatigue, besides mental development and emotional balance according to the maturity level of the individual.
Method: The purpose of the present study to find out the effect of weight training exercises for the development of physical fitness ability among f Shot put Throwers. The sample for the present study consists of 40 Male Shot put throwers out of which 20 are experimental group and 20 are controlled group. Weight training exercises are given four times a week for six weeks for experimental group and controlled group were given general training of Shot Put. To assess the Physical fitness Pre Test and Post Test were conducted on Shot put back throw, 50 Meters run and standing broad jump to assess the physical fitness for both the groups.
Results: This study shows that due to the weight training exercises there is a rapid improvement of experimental group in the physical fitness ability and controlled group has less improvement in physical fitness due to the general training.
Discussion: Physical fitness is one of the most important things in life and one of the most valuable assets one can ever have Most Shot put Throwers are relatively strong and sturdily built. Their workouts include various weight training exercises to develop the Physical fitness.

Keywords: Physical fitness, weight training exercises, shot put, etc.

Introduction

Physical fitness comprises two related concepts: general fitness (a state of health and well-being), and specific fitness (a task-oriented definition based on the ability to perform specific aspects of sports or occupations). Physical fitness is generally achieved through correct nutrition, exercise, hygiene and rest. Physical fitness is considered a measure of the body's ability to function efficiently and effectively in work and leisure activities, to be healthy, to resist hypo kinetic diseases, and to meet emergency situations.

The main benefits of Physical Fitness are:-

1. Condition of heart and lungs by increasing the oxygen available to the body therefore enabling the heart to use oxygen more efficiently.
2. Development of physical fitness components such as strength, endurance, agility, flexibility etc., and improvement of muscle tone.
3. Fosters correct posture, figure, body image and physical appearance.
4. Quick recovery after injury, illness and decrease the risk of cardio-vascular disease.
5. Reduces and controls body fat, exercise combined with a proper diet will reduce body fat and also fulfil proper nutritional requirement.
6. Increase energy level of a person and helps to maintain ideal body weight.
7. Through Participation in physical fitness program, leisure (free) time is properly utilized.
8. Improve mood and reduce depression and anxiety.
9. Postpones fatigue and reduces recovery time after vigorous activity.
10. Helps people to meet challenges of life, make them self-confident and postpones ageing process.

Weight training is a common type of strength training for developing the strength and size of skeletal muscles. It uses the weight force of gravity (in the form of weighted bars, dumbbells or weight stacks) to oppose the force generated by muscle through concentric or eccentric contraction. Weight training uses a variety of specialized equipment to target specific muscle groups and types of movement. Sports where strength training is central are bodybuilding, weightlifting, power lifting, and strongman, Highland games, shot put, discus throw, and javelin throw. Many other sports use strength training as part of their training regimen, notably football, wrestling, rugby, track and field, rowing, lacrosse, basketball, hockey. Popularity of strength training for other sports and physical activities is becoming increasingly popular.

Shot put, sport in athletics (track and field) in which a spherical weight is thrown, or put, from the shoulder for distance. It derives from the ancient sport of putting the stone.

The first to use a shot (cannon ball) instead of a stone competitively were British military sports groups. Although the weight varied in early events from 3.63 to 10.9 kg (8 to 24 pounds), a standard, regulation weight 7.26-kg (16-pound) shot was adopted for men in the first modern Olympic Games (1896) and in international competition. The event was added to the women's Olympic program in 1948. The weight of the shot used for women's competition is 4 kg (8.8 pounds); lighter weights are also used in school, collegiate, and veteran competitions.

The shot generally is made of solid iron or brass, although any metal not softer than brass may be used. It is put from a circle 2.135 metres (7 feet) in diameter into a 40° sector as measured from the centre of the circle. The circle has a stop board 10 cm (4 inches) high at its front; if the competitor steps on or out of the circle, the throw is invalidated. The shot is put with one hand and must be held near the chin to start. It may not drop below or behind shoulder level at any time.

Weight training is very important in the development of speed and power in the shot putter. It's also crucial that shot putters realize it's a method that supplements shot put training; it's not a separate sport or discipline. The development of power through weight training must be done hand-in-hand with developing a thrower's technique. If these two elements are not balanced, serious problems can occur with the thrower's technique in the long term.

A thrower can develop their strength levels in the weight room at a very fast pace. This gives the athlete some quick short-term gains in throwing performance, especially for a big thrower who can get strong very fast. However, there is a potentially large downside to these short-term gains: relying on strength to throw far at an early age will decrease the efficiency of intra- and inter- muscular coordination regarding further development of shot put technique. As the shot putter continues to get stronger, the law of diminishing returns will kick in with increasing strength, and the gains in distance will quickly get smaller and smaller. When a shot putter relies entirely on strength to throw far, their long-term development may cap at a very early age.

When setting up weight training throughout a season, the following considerations should be made:

- The principal weight training exercises involved in power development are the Olympic lifts (clean, snatch, overhead press/jerk variations) and the power lifts (bench press, squat variations, and deadlift variations). Throwers perform these exercises throughout training in some shape or form.
- The volume for these exercises is highest in the general and specific preparation phases while intensities are highest in the specific preparation phase and the pre-competition phase.
- As the shot putter becomes more advanced, they can lift heavier with more frequency, if desired, because their training capacity has had more time to develop.

Examples of appropriate exercises and their variations for shot putters are as follows:

- Bench press
- Incline bench press
- Front squat
- Box squat
- Push press
- Clean
- Snatch
- Speed clean and jerk

Of all the weight room exercises, the Olympic and power lifts will usually tax the thrower's nervous system the most. For this reason, these lifts should be inserted into the training program around the throwing sessions, so the fatigue accumulated during the lifting sessions does not negatively affect the throwing sessions. More experienced throwers can recover from their lifting sessions with greater ease, however, and will be able to throw with less recovery time between sessions. This gives throwers more flexibility in their training.

Purpose of the study

The purpose of the present study to find out the effect of weight training exercises for the development of physical fitness ability among Shot Put Thrower. This study will bring the true facts of weight training exercises and their impact to improve the Physical fitness ability among Shot Put Throwers. This study also helps the physical educators and coaches to improve their training regime to excel in Shot Put.

Methodology

The sample for the present study consists of 40 Male Shot Put Throwers out of which 20 are experimental group and 20 are controlled group. Weight training exercises are given four times a week for six weeks for experimental group and controlled group were given general training of Shot Put.

Weight Training Exercises used for training to experimental group.

1. Snatch and Snatch Pull
2. Push Press
3. Back Squat
4. Bench Press
5. Clean Jerk
6. Clean Pull
7. Incline Bench Press
8. Front Squat
9. Jump Squat
10. Power Clean
11. Sit ups
12. Back Raises

To assess the physical fitness Pre Test and Post Test were conducted on Shot Put back throw, 50 Meters run and standing broad jump to assess the physical fitness for both the groups.

Shot put back throw
This test involves throwing an 8 pound shot put for maximum distance. The Back Throw Test is one of the tests used in the International Physical Fitness Test.

Aim: This test measures core body strength and total body power.

Equipment required: 8lb shot put, tape measure, clear open area for testing.

Procedure: The athlete starts with his back to the throwing area, with their heels at the start line, and the shot cradled in both hands between the knees. The subject bends forward and downward before throwing the shot backwards over their head in a two-handed throwing action (optimally at about 45 degrees). Several practices may be required to get the best trajectory for maximum distance.

Scoring: Measurement is made from the starting line to the point of impact of the shot put with the ground. The measurement is recorded in meters and centimeters. The best result of two trials is recorded.

50 M Run
Sprint or speed tests can be performed over varying distances, depending on the factors being tested and the relevance to the sport.

Purpose: The aim of this test is to determine acceleration and speed.

Equipment required: measuring tape or marked track, stopwatch, cone markers, flat and clear surface of at least 70 meters.

Procedure: The test involves running a single maximum sprint over 50 meters, with the time recorded. A thorough warm up should be given, including some practice starts and accelerations. Start from a stationary standing position (hands cannot touch the ground), with one foot in front of the other. The front foot must be behind the starting line. Once the subject is ready and motionless, the starter gives the instructions "set" then "go". The tester should provide hints for maximizing speed (such as keeping low, driving hard with the arms and legs) and the participant should be encouraged to not slow down before crossing the finish line.

Results: Two trials are allowed, and the best time is recorded to the nearest 2 decimal places. The timing starts from the first movement (if using a stopwatch) or when the timing system is triggered, and finishes when the chest crosses the finish line and/or the finishing timing gate is triggered.

Standing broad jump: The Standing long jump, also called the Broad Jump, is a common and easy to administer test of explosive leg power.

Purpose: To measure the explosive power of the legs equipment required: tape measure to measure distance jumped, non-slip floor for takeoff, and soft landing area preferred. Commercial Long Jump Landing Mats are also available. The take-off line should be clearly marked.

Procedure: The athlete stands behind a line marked on the ground with feet slightly apart. A two foot take-off and landing is used, with swinging of the arms and bending of the knees to provide forward drive. The subject attempts to jump as far as possible, landing on both feet without falling backwards.

Scoring: The measurement is taken from take-off line to the nearest point of contact on the landing (back of the heels). Record the longest distance jumped, the best of three attempts. Attempts are allowed.

Results
This study shows that due to the weight training exercises there is a rapid improvement of experimental group in the physical fitness ability and controlled group has less improvement in physical fitness due to the general training. This study shows there is a effect of Weight Training Exercises for improvement of Physical fitness ability among the shot put throwers.

Discussion
Physical fitness is one of the most important things in life and one of the most valuable assets one can ever have Most shot putters are relatively strong and sturdily built. Their workouts include various weight training exercises to develop the Physical fitness.

Table 1: Mean Values and Independent Samples Test of Shot Put Back Throw Between Experimental and Control Groups

Variables	Group	Pre Test	Post Test	t	P-Value
		Mean ± SD	**Mean ± SD**		
Shot Put Back	Experimental	13.14±1.26	13.42±1.23		
Throw				1.22	0.231
	Control	13.06±1.22	12.95±1.20		

*Significant at 0.05 level.

In Table 1 the Mean Values of Pre Test of Experimental Group in Shot put Back Throw is 13.14 and control group is 13.06 and in the Post Test the Mean values of Experimental Group has improved from 13.14 to 13.42 and control group has decreased from 13.06 to 12.95. The Standard Deviation on Experimental Group is 1.26 in Pre Test and 1.23 in Post Test and control group is 1.22 in Pre Test and 1.20 in Post Test and t is 1.22 and P-Value is 0.231.

Table 2: Mean Values and Independent Samples Test of 50 M Run Test Between Experimental and Control Groups

Variables	Group	Pre Test	Post Test	t	P – Value
		Mean ± SD	**Mean ± SD**		
	Experimental	7.51 ± 0.294	7.23 ± 0.262		
50 M Run Test				4.58	0.000
	Control	7.64 ± 0.376	7.73 ± 0.408		

*Significant at 0.05 level.

In Table 2 the Mean Values of Pre Test Experimental Group in 50 M Run is 7.51 and control group is
7.64 and in the Post Test the Mean values of Experimental Group has decreased the mean timing from 7.51 to 7.23 and control group has increased from 7.64 to 7.73. The Standard Deviation on Experimental Group is 0.294 in Pre Test and 0.262 in Post Test and control group is 0.376 in Pre Test and 0.408 in Post Test and t is 4.58 and P-Value is 0.000.

Table 3: Mean Values and Independent Samples Test of Standing Broad Jump between Experimental and Control Groups

Variables	Group	Pre Test	Post Test	t	P-Value
		Mean ± SD	**Mean ± SD**		
	Experimental	2.30 ± 0.157	2.42 ± 0.185		
Standing Broad				3.55	0.001
Jump	Control	2.26 ± 0.159	2.22 ± 0.161		

*Significant at 0.05 level.

In Table 3 the Mean Values of Pre Test Experimental Group in Standing Broad Jump is 2.30 and control group is 2.26 and in the Post Test the Mean values of Experimental Group has increased from 2.30 to 2.42 and control group has decreased from 2.26 to 2.22. The Standard Deviation on Experimental Group is 0.157 in Pre Test and 0.185 in Post Test and control group is 0.159 in Pre Test and 0.161 in Post Test and t is 3.55 and P-Value is 0.001.

Conclusion

1. It is concluded that there will be improvement in the fitness ability of the shot put throwers due to the weight training.
2. Weight training exercises plays a major role for improvement of physical fitness and performance in the shot put throwers.
3. Similar studies can be conducted on other throwing events in Athletics.

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