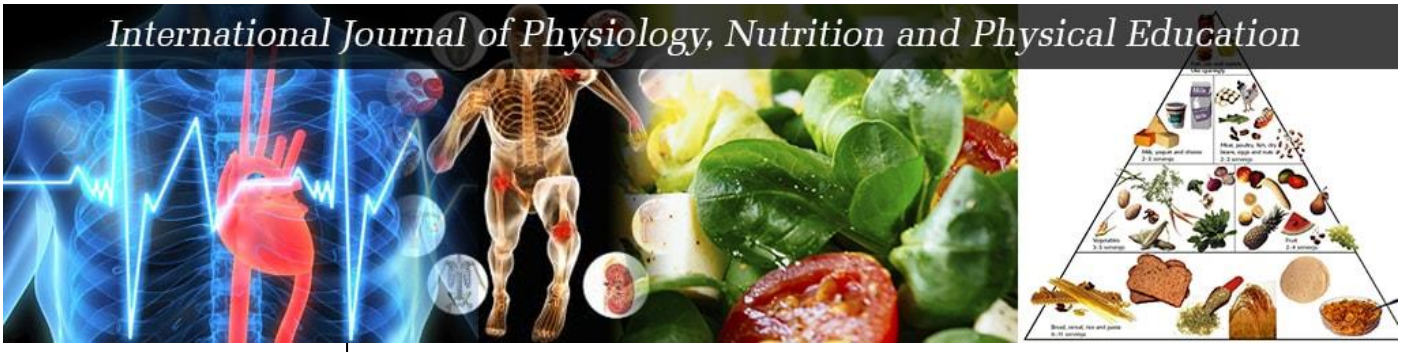

ISSN: 2456-0057
IJPNPE 2021; 6(2): 377-379

www.journalofsports.com
Received: 03-04-2021
Accepted: 09-06-2021

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Impact of aquatic plyometric practice training on explosive power improvement in handball players

Dr. Adarsh Tiwari

Abstract
The present study focused on to understand the Effect of Aquatic Plyometric Practice Training on Explosive Power Improvement in Handball Players. With the application of Aquatic Plyometric Training on Handball players, there was much improvement in the explosive power while in jump shot in Handball Shooting. The high intensity of aquatic plyometric training gives several changes in physical fitness. The purpose of the present study was to find out the improvement of explosive power in Handball players by practice of 5 weeks aquatic plyometric Training. Subjects were randomly assigned to two groups. That is control group (n=10) and experimental group (n=10). The data pertaining to selected physical fitness variable were analyzed by applying the analysis of covariance (ANCOVA) in between initial & final for control group and experimental group.

Keywords: Aquatic Plyometric Practice Training, Handball, Explosive Power, Jump Shot etc.

Introduction
Plyometrics, or bounding exercises, are excellent for building power, reactions, coordination, and explosiveness, as well as the stretch-shortening cycle due to the rapid rebounding after landing. Boxes are sometimes used to capitalize on the effect of gravity, adding more resistance.

Plyometrics are a highly effective form of power training designed to significantly improve sports performance. Used by athletes to reach peak physical condition, plyometric exercises manipulate the elasticity and strength of muscles by increasing the speed and force of their contractions. This gives plyometric workouts the ability to produce fast and powerful movements that provide explosive power for a variety of sports.

There has been little research done into formulating best practices for plyometric training. The National Strength & Conditioning Association and others have proposed some guidelines but it has been left mainly to the experience of coaches to formulate their own training plans. Therefore, plyometric exercises should only be done by fit individuals under supervision to avoid any risk of injury. Good physical strength and flexibility are required to cope with the powerful forces that are generated during plyometric workouts.

Plyometric exercises are a method of power training used by many team and individual sports. In the simplest of terms, plyometrics are exercises that involve a jumping movement. For example, skipping, bounding, jumping rope, hopping, lunges, jump squats, and clap push-ups are all examples of plyometric exercises.

Plyometric exercises use the stretch shortening cycle to generate quick, powerful pre-stretch or counter- movements. Muscles are loaded with a lengthening (eccentric) action, followed immediately by a shortening (concentric) action to reach their optimum force in the fastest time possible. Plyometric exercises strengthen muscle tissue and train nerves to produce the specific muscle contraction.

A plyometric contraction involves three consecutive phases.

- Eccentric Phase – a rapid muscle lengthening movement
- Amortization Phase – a short resting phase
- Concentric Phase – an explosive muscle shortening movement

So a plyometric exercise is an exercise in which an eccentric muscle contraction is quickly followed by a concentric muscle contraction. In other words, when a muscle is rapidly

contracted and lengthened, and then immediately followed with a further contraction and shortening, this is a plyometric exercise. This process of contract-lengthen, contract-shorten is often referred to as the stretch – shortening cycle.

This combination gets the muscles to work in unison while engaged in a particular movement. The myotatic reflex is stimulated to enable the automatic contraction of muscles. The explosive movements generated develop muscular power by acting on nerves, muscles, and tendons.

Plyometric Training used in training method to develop speed, explosive power, explosive reactivity, strength and endurance. Present days Aquatic Plyometric Training very popular to achieving significant fitness in physical power. In the present study Handball players were get improvement in explosive power by adopting Aquatic Plyometric Training. While attempting jump shot in Handball, the players were executing explosive power perfectly. Main purpose of this aquatic plyometric training to adopted from water fitness education to rehabilitate injuries while jumping and landing in improving explosive power training (Aukerman, 2008; Reilly, Dowzer, & Cable, 2003). Water Fitness education is much more than a method to rehabilitate injuries due to land exercises (Aukerman, 2008; Reilly, Dowzer, & Cable, 2003). Water Fitness education is a bold application of physiological physics even greater than the sand workouts performed by Herchel Walker which transfer to land with benefits (Sanders, 2000). The benefits of water fitness exercise gives weight less body, skeletal muscle sourness, decrease injuries in the joints, increases the action of fast twitch fibers in the muscles, improve the explosive power and speed, adopt rapidly eccentric to concentric contraction, increases in blood circulation work, reducing body fat and increases testosterone level. By the following positive results aquatic plyometric high intensity training is best method to improving explosive power in the handball players.

The Benefits of Plyometrics

Muscular power and muscular strength are not the same thing. Muscular power is determined by the time it takes for muscular strength to convert into speed. A short, fast muscle contraction will produce higher energy than a slower and more powerful contraction. Increasing muscular power by quickly converting muscular strength into speed gives athletes the ability to perform movements that strength alone cannot allow.

$$\text{Power} = \text{mass} \times \text{speed} / \text{distance}$$

Plyometrics improves the athlete's ability to apply more force, more rapidly. This ability to generate maximal force can be transformed into a sport-specific power in sports like martial arts, soccer, tennis, handball and athletics. This is achieved through plyometric exercises that repeatedly stimulate the elasticity of muscles with movements that mimic the chosen sport.

- Plyometrics train an athlete to apply a set amount of force in the shortest period of time.
- Plyometrics converts maximal strength into fast, powerful and explosive movements.
- Plyometric movements, or drills, are applied as sport-specific power by mimicking the movement patterns of the sport, which enables the athlete to run faster, hit harder, throw farther, react quicker, etc.

Why are Plyometric Exercises Important for Injury Prevention?

Plyometrics are often used by athletes to develop power for their chosen sport, and a lot has been written about how to accomplish this, but few people realize how important plyometrics can be in aiding injury prevention.

Essentially, plyometric exercises force the muscle to contract rapidly from a full stretch position. This is the position in which muscles tend to be at their weakest point. By conditioning the muscle at its weakest point, (full stretch) it is better prepared to handle this type of stress in a real or game environment.

Why are Plyometric Exercises Important for Injury Rehabilitation?

Most injury rehabilitation programs fail to realize that an eccentric muscle contraction can be up to three times more forceful than a concentric muscle contraction. This is why plyometric exercises are important in the final stage of rehabilitation, to condition the muscles to handle the added strain of eccentric contractions.

Neglecting this final stage of the rehabilitation process can often lead to re-injury, because the muscles have not been conditioned to cope with the added force of eccentric muscle contractions.

Minimum Strength Requirements

Minimum strength requirements before doing plyometrics vary depending on the intensity of the plyometric workouts. The following examples give a basic idea of what is required before commencing plyometrics.

- Individuals should be able to perform 5 squats at 60% of their body weight.
- Individuals should be able to perform 1 squat of 1.5 to 2 times their body weight for lower body plyometrics, and a bench press of 1 to 1.5 times their body weight for upper body plyometrics.

Methodology

The aim of the present study was to analyze the effect of aquatic plyometric training on Handball players on selected physical fitness (explosive power). In this study has been carried following steps of methods as taken.

Selection of Subject

This study was conducted on a total sample of 20 Handball players randomly at the age of 15 to 18 years, which are divided into two group {Control group (n=10) and Experimental group (n=10)}.

Selection of Variable

On selected subjects to find out the physical fitness of explosive power.

Selection of Training

Control group was went daily in sand plyometric training, in addition special aquatic plyometric Training was given to Experimental group day after day up to 5 weeks.

Selection of Test

Sergeant Vertical jump test of lower body, vertical explosive power was measured by means of the sergeant vertical jump test according to the method.

Test Administration

Explosive power was measured by means of the Sergeant

Vertical jump test methods. The participant took off from two feet with no preliminary steps or shuffling. Participants used an arm swing and jumped as high as possible, leaving a chalk mark on the measuring board with the inner hand. This distance was then recorded as maximum jump height. The difference between the reach and maximum jump height was then calculated and recorded to the nearest cm.

Statistical Analysis

The study was designed to find out the influence of aquatic plyometric Training on selected physical fitness variables among Handball players. The subjects of two groups were tested on selected criterion variables i.e., physical fitness changes (explosive power) and prior and after training period. The analysis of covariance (ANCOVA) was applied to find out the variance in each criterion variables. The level of significance to test and 'F'- ratio, obtained by the analysis of covariance was fixed at .05 level of confidence. The analysis of Physical fitness changes (explosive power) and prior and after training shows in the Table 1.

Table 1: The Analysis of Physical Fitness Changes (Explosive Power) and Prior and After Training

	Control Group	Experimental Group	Sources of Variance	Sum of Squares	Mean Square	F'- ratio
	Pre-test					
Mean	23.18	23.33	Between	0.11	0.11	0.11
SD	1.25	0.70	With in	18.48	1.03	
	Post-test					
Mean	23.21	24.05	Between	3.56	3.50	5.12
SD	0.93	0.72	With in	12.52	0.70	
	Adjusted Post-test					
Mean	23.20	24.05	Between	3.55	3.55	4.82
			With in	2.52	0.74	

* Significant at 0.05 level of confidence. The value for significance at 0.05 with df land 18 and land 17 are 4.41 and 4.45 respectively.

The mean values of control group and experimental group were graphically represented in Fig.1.

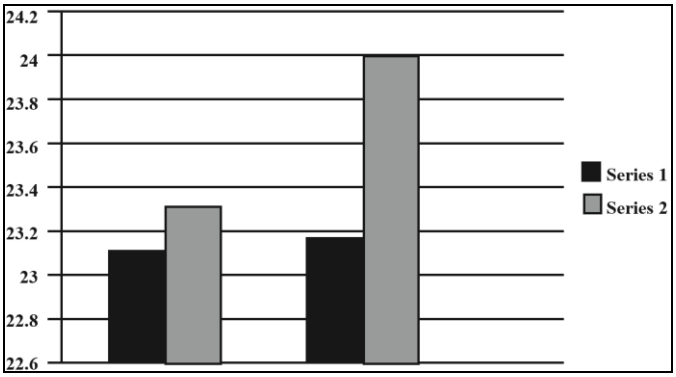

Fig 1: Series 1 Control Group, Series 2 Experimental Group

Table 1 indicated that the pre-test mean of explosive power between Control Group and Experimental Group were 23.18, ± 1.25 and 23.33, ± 0.70 respectively. The obtained 'F' ratio of 0.11 indicated that the pre-test means was not significant at 0.05 level of confidence. The posttest mean of explosive power between Control Group and Experimental Group were 23.21, ± 0.93 and 24.05, ± 0.72 respectively. The obtained 'F' ratio of 5.12 indicated that the post-test means was significant at 0.05 level of confidence. The adjusted post-test mean of explosive power between Control Group and Experimental Group were 23.20 and 24.05 respectively. The obtained 'F' ratio was 4.82 and it was greater than the tabulated 'F' ratio for degree of freedom 1 and 17 was 4.45. It was concluded that there was significant improvement after the experimental period.

References

1. Yadav, Devraj, Scientific Principles of Sports Training, Angel Publication, New Delhi.
2. Aukerman MM. Train smart with deep water running. AMAA Journal. 2008.
3. Dabas, Sunil. Theory of Scientific Sports Training, Sports Publication, New Delhi.
4. Reilly T, Dowzer CN, Cable NT. The physiology of deep-water running. Journal of Sports Sciences, 2003.
5. Khan, Anis Ahmed. Physiology of Exercise, Sports Vision, New Delhi.
6. Sanders ME. Hot trends: From turf to surf. Idea Health & Fitness Source, 2000.
7. Banerjee, Rajat Kumar. Test and Measurement in Physical Education, Sports Vision, New Delhi.