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## A Study on the Effect of Plyometric Exercises for Development of Speed in 50 M Back Stroke in Swimming

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### Abstract

Plyometrics are designed for the maximum generation of force by your muscles in the shortest amount of time possible. Backstroke in swimming is referred to the long-axis strokes, as you are rotating on the long-axis of your body while swimming. The purpose of the present study to find out the effect of Plyometric exercises for the development of speed in Back Stroke style in swimming. The sample for the present study consists of 20 Male Swimmers of Hyderabad out of which 10 are experimental group and 10 are controlled group. Plyometric Exercises such as hopping, bounding, chest pass, Power drop, box jumps, tuck jumps etc were given to the experimental group for six weeks. Pre Test and Post Test were conducted 50 M Back Style Swimming to assess the speed. This study shows that due to the Plyometric training there is an improvement of the experimental group in the 50 M back stroke. Swimming compare to the controlled group. Plyometric training is essential for elite swimming performance. To optimize the benefit of land-based training, you must select exercises with mechanical relevance to the swimming action, particularly those movements which propel the swimmer through the water, such as the arm pull and leg kick

**Keywords:** Plyometric Training, back stroke etc.

### 1. Introduction

Swimming is a sport that requires both muscular strength and endurance, and for this reason when training with plyometrics exercises you need to concentrate on developing strong muscles with high endurance capabilities.

The sport of swimming has been recorded since prehistoric times; the earliest recording of swimming dates back to Stone Age paintings from around 14,000 years ago. Written references date from 2000 BC. Some of the earliest references to swimming include the Gilgamesh, the Iliad, the Odyssey, the Bible, Beowulf, Quran and other sagas. In 1538, Nikolaus Wynmann, a German professor of languages, wrote the first swimming book, The Swimmer or A Dialogue on the Art of Swimming "Der Schwimmer oder ein Zweigespräch über die Schwimmkunst". Competitive swimming as we know it today started in the United States around 1800.

Plyometric exercise refers to movements that allow the muscle to reach a maximal force generation in the shortest amount of time. These movements typically use a prestretch, or countermovement, that allows the muscle to store elastic energy. The countermovement serves to increase explosive reactive power throughout the entire range of motion of the subsequent movement. After the countermovement, the stored elastic energy is used to increase the force generation of the following movement. Research has shown that the addition of plyometrics to a strength and conditioning program allows the athlete to enhance force generation potential of explosive-reactive movements. The effectiveness of a plyometrics program depends on sport-specific movements and the appropriate intensity and frequency of the plyometric program. Sport-specific movements enhance neuromuscular development, which allows the athlete to perform a specific movement with a greater amount of available muscle mass. The increased use of muscle mass allows for greater force generation during the movement.

Types of Styles in Swimming:

- Free style (free)
- Backstroke (back)
- Breaststroke (breast)
- Butterfly (fly)

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**Fig 1:** Back Stroke style in Swimming

The backstroke, also sometimes called the back crawl or the upside-down freestyle, is one of the four swimming styles regulated by FINA, and the only regulated style swum on the back. This has the advantage of easy breathing, but the disadvantage of swimmers not being able to see where they are going. It is also the only competition swimming style that has a different start. The swimming style is similar to an *upside down* front crawl. Both backstroke and front crawl are long-axis strokes. In Individual medley backstroke is the second style swum; in the team medley it is the first style swum.

**2. Method**

The purpose of the present study to find out the effect of Plyometric exercises for the development of speed in Back Stroke swimming. The sample for the present study consists of 20 Male Swimmers of Hyderabad out of which 10 are experimental group and 10 are controlled group.

The following Plyometric exercises are used for training the Experimental group for six weeks.

1. Hopping
2. Bounding
3. Power Drop
4. Box Jumps
5. Tuck jumps
6. Hurdle Jumps
7. Standing Jumps
8. Squat Jump
9. Front Cone Hops
10. Medicine ball throws
11. Jumps with weights
12. Dumbbell throws

General Training of Swimming is given to the controlled group. Pre Test and Post Test were conducted 50 M Back Stroke Style Swimming to assess the speed for both the groups after six weeks of training.

**3. Result**

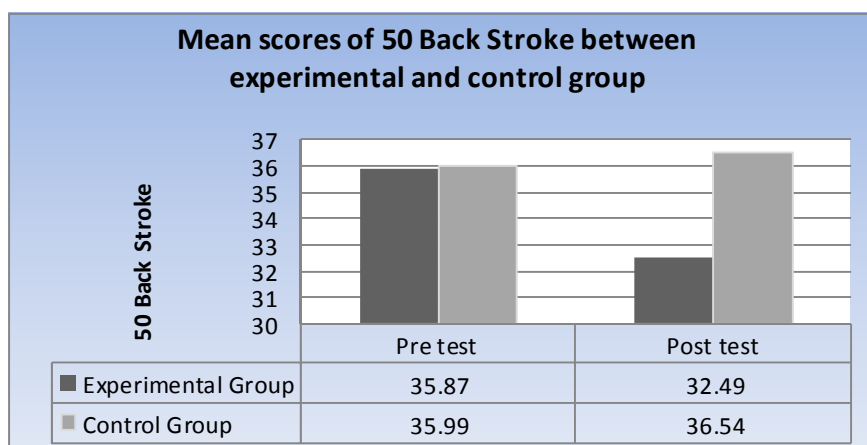
This study shows that due to the Plyometric training there is an improvement of the experimental group in the 50 M Back Stroke swimming compare to the controlled group.

Table Showing the Performance of Swimming Experimental Group and Swimming Controlled Group in 50 Meters Back Stroke Swimming.

**Table 1:** Mean values and Independent Samples Test of 50 M Back Stroke between experimental and control groups

Variables	Group	Pre Test Mean ± SD	Post Test Mean ± SD	t	P - Value
50 M Back Stroke	Experimental	35.87±0.771	32.49±1.25	-8.56	0.000
	Control	35.99±0.786	36.54±0.805		

\*Significant at 0.05 level



The Mean Performance of Experimental Group in 50 M Back Stroke Style Swimming in Pre Test is 35.87 there is an improvement in performance in 32.49 in Post Test. That Means Experimental group has improved 3.38 due the Plyometric exercise training in the mean from Pre Test to Post Test.

The Mean Performance of Control Group in 50 M Back Stroke Style Swimming in Pre Test is 35.99 there is decreased in performance to 36.54. That Means Experimental group has decreased by 0.55 due to the general training of swimming. The t value is -8.56 and p value is 0.000

#### **4. Conclusion**

Professional Swimmers have even a small edge on a competitor due to plyometric training. Plyometrics can decrease a swimmer's start time of the starting block, cutting the time by those few seconds to start and swimming strokes can spell victory.

Plyometrics are a potential asset to any dry land program. Always consider the swimmer exercises, training plan and environment to make informed choices on how to fit them into the training program. It is concluded that due to the Plyometric training there is improvement in the 50 M Back Stroke swimming.

#### **5. Recommendations**

It is recommended that Plyometric training program must be included in the coaching program for swimmers. Similar Studies can be conducted in other events and also in females in swimming.

#### **6. References**

1. Wikipedia, swimming and 50 M Backstroke style.
2. Jesselyn Mcguice, CSCS, NFHS Coaching Today.