

Effect of Aqua Exercises on the Performance of Adolescent Boys

Dr. Vikhe Pramod Madhavrao

Director of Sports and Physical Education, Arts, Commerce, Science & Computer Science College,

Ashwi Kd, Tal. Sangamner, Dist. Ahmednagar

Email: [pramodvikhe25\[at\]gmail.com](mailto:pramodvikhe25[at]gmail.com)

Mob. No.9822274725

Abstract: *In our education system sports has given the importance at school and college levels. Even though enriching athletic performance is a real problem in our country. Many rural students are up to the mark and willing for hardworking but due to lack of facilities they are lagging behind. Consequently, the participation of students in track and field athletics in Indian schools is also amazingly very less. They prefer major games because maximum incentives and importance are given by the sports world. Out media highlights mostly the sports starts of cricket, football, hockey, badminton, tennis, etc. but rarely gives importance to track and field athletes. Presently the status of 100 meters sprint event especially for boys have enriched as a competitive sports. The excitement and thrill provided by this particular event has won the heart of common man. After the pretest, with 100 meters sprint, the experimental group underwent a training programme of aqua exercises and control group did not participate in any training programme but they were following their daily routine in the school. The training program has been conducted three days in a week alternatively, for total period of 12 weeks. The training schedule prepared by the investigator was applied to the experimental group. The mid test of both the groups administered after every two weeks. A total five mid tests were administered and post test was administered after 12 week training program. The 100 meter sprint performance was considered as the main dependent variable as selected in this study and the training intervention (i. e. aqua exercises) was considered as independent variable. And finally it help to conclude that through the aqua exercise training program module there was gradual and useful improvement in performance ability of 100 meter sprint of school going boys.*

Keywords: Aquatic exercise, Anaerobic exercise, Sprint training.

1. Introduction

Present era is highly dominated by science and technology. In the modern scientific age in every field of human endeavor systematic objectives and scientific procedures are followed in accordance with the principles based on experiences, understanding and application of scientific knowledge. The field of games and sports is also no exception to this. Advanced countries like U. S. A., Germany, Russia, Australia, Britain and other have made rapid progress in games and sports like Athletics, Soccer, Hockey, Basketball etc. This progress and the international achievements have been possible due to the research, experimentation and application of scientific knowledge.

Sportsmen are trained scientifically with the latest training methods and sophisticated instruments for improvement in their performances in different sphere of sports. Sports science have enabled sportsman to develop physical capacities beyond anything imagined. Sports have become highly competitive and records are being broken at a greater speed.

Today sport is accepted as a cultural phenomenon. There is a constant endeavor to achieve higher standards of performance. As a result, today sport demands optimum physical fitness and highest degree of performance, many people take part in sports activities for the fun through it or for health and fitness. Sports have become profession to some with high skills and ample financial benefits linked with high degree of popularity.

Strength is an important component of physical fitness which effects the performances in all activities in some forms or the other. Development of strength is essential for power and speed. It has been proved that appropriate use of weights not only increases an athlete's strength and ability but also aids speed of reaction. Since strength base is an advantageous in Aqua exercises training program has been designed to compliment the development of power and speed.

Exercise: Exercise is generally thought of any form of physical activity carried out for the purpose of health or fitness. The main difference between sport and exercise is competition. Another difference is that exercise typically does not involve the same degree of institutionalization that characterizes sport.

Exercise is a physical activity that is planned, structured, and repetitive bodily movement done to improve or maintain one or more of the components of health related fitness.

Aerobic exercise: The American college of sports medicine (ACSM) defines aerobic exercise as "any activity that uses large muscle groups, can be maintained continuously, and is rhythmic in nature." The important idea behind aerobic exercise today, is to get up and get moving!! There are more activities than ever to choose from, whether it is a new activity or an old one. Find something enjoy doing that keeps your heart rate high for a continuous time period and get moving to a healthier life.

Examples of aerobic exercise are:

- 1) Aerobic dance
- 2) Walking for fitness

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- 3) Rope skipping
- 4) Running
- 5) Stair climbing
- 6) Swimming
- 7) Bicycling
- 8) Cross country

Anaerobic exercises: Anaerobic means 'without oxygen'. During anaerobic work, involves maximum effort, the body works so hard that it demands for oxygen and fuel goes above the rate of the supply and muscles have to rely on the stored reserves of the fuel. In this case waste products gather, the main one being lactic acid. The muscles, being hungry of oxygen, takes the body into a state known as oxygen debt. The body's stored fuel soon runs out and activity ceases painfully. Activity will not be resumed until the lactic acid is removed and the oxygen debt rapid.

Anaerobic exercises can be divided as follows:

- Short anaerobic exercises: less than 25 seconds
- Medium anaerobic exercises: 25 to 60 seconds
- Long anaerobic exercises: 60 to 120 seconds.

Concept of Aqua Exercise: "Aqua exercises are the exercises that are performed in deep or shallow water."

Concept of Sprint: Sprinting is a race category includes all distances up to 400 meters, with the 400meter classified as a long sprint.

In the words of F. A. M. Webster, "Sprinting is the generic term applied to the running of such short distances as man can cover at top speed in one continuous effort." The key phrase here is at a top speed.

Concept of Sprint Training

'Are sprinters born or they made?' This question is often asked, but the answer is not a simple one. Although it is true that you need to have natural gift for sprinting in order to do well in sprint event, it is equally true that this alone is not enough. In order to become a successful sprinter you need to perfect such talent through training.

Usually the speed training program includes six major factors:

- 1) Speed training
- 2) Speed endurance training
- 3) Resistance training
- 4) Plyometrics
- 5) Form work
- 6) Relaxation.

Objectives of the Study

- 1) To prepare training program of aqua exercises in an experimental set up.
- 2) To study the effect of Aqua exercise training on the performance of 100 meter sprint.

Assumptions

- 1) It is assumed that the school boys (Adolescent) need a better strength and fitness level which may help for enriching the overall performance.

- 2) The school boys will take part actively and enthusiastically in whole programme.
- 3) Further it will assume that the effect of aqua exercises may be of immense use for improving 100 meter sprint performance of school boys.
- 4) It is assumed that trainees were not familiar with aqua exercises.
- 5) Though scientific method of research is used, it is assumed that the effect of dependent variable after experiment will be because of independent variable.

Hypothesis

Non - Directional Research Hypothesis

H₁: There would be significant change in performance of 100 meter sprint of school boys due to aqua exercise training program.

H₁: M₁ ≠ M₂

Hypothesis for testing - Null Hypothesis

H₀: There would be no significant difference in 100 meter sprint performance of control group and experimental group after aqua exercise training program.

H₀: M₁ = M₂

Delimitations of the Study

- 1) The study was delimited to the boys of the Dr. Vikhe Patil Sainik School, Loni.
- 2) The study was delimited to the age group of 13 to 15 years.
- 3) The intervention was delimited to selected aqua exercises.
- 4) The experimental period was delimited to 12 weeks.
- 5) The measurement of sprint performance was restricted to 100 meter sprint only.

Scope and Limitations

- 1) The researcher could not control the habits, the daily routine and living style of the subjects.
- 2) The follow up study of the experiment could not be extended further due to the paucity of the time.
- 3) The present investigator could not conduct the experiment on the large sample due to insufficient manpower and limited time.
- 4) The subjects of the experimental and control groups were totally ignorant and have no background of aqua exercises.

2. Methodology

The methodology of this study consisted of one experiment using one experimental and one control group for testing the effects of selected aqua exercises on the performance of 100 meter sprint. The purpose of the present study to gather scientific evidence in connection with the utility of aqua exercises in the promotion of 100 meter sprint performance.

For the study experimental method was used. All the 40 subjects were divided randomly into two equal groups viz group I is experimental and group II is control consisted of 20 subjects each. Training intervention was delimited to aqua exercises. The group I receives training of aqua

exercises for a total period of 12 weeks, whereas group II (i.e. control group) did not participate in any training program. However, all the subjects participated in their regular school activities as per daily timetable of the school.

The design of the experiment was repeated test random group design and has been planned in three phases:

Phase I: Pretest

Phase II: Aqua training program

Phase III: Mid test after every two weeks. (Total six tests)

1) Pretest (Phase I): As the purpose of the study is to observe the effect of aqua exercise training on 100 meter sprint performance, all the subjects of experimental and control groups were exposed to 100 meter run to record the pretest data.

Administration of test

Title: 100 meter sprint.

Objective: To measure the speed of the subjects.

Equipment: 100 meter running track, clapper, stop watch.

Procedure: The test was performed in group of two subjects.

For this test, the subjects stood behind the starting line. The starter was position behind the subjects and gave the command ‘on your mark’, ‘set’ and ‘go’. At the command

go the starter claps the clapper so that the timer can start the timing. The subjects ran as fast as possible to the finish line which was 100 meter away and started decelerating only after the finish line.

Scoring: The time keeper records the timing to cover the 100meter distance to one tenth of a second.

2) Aqua training program (Phase II): After the pretest, experimental group was exposed to a 12 week aqua exercise training program and control group did not participate in any of the training program, but they were following their daily routine in the school.

Aqua exercise training program was as follows:

A. Warming up: Warm up procedure was consisting of jogging or easy running, gradual stretching, and general exercise for 8 to 10 minutes.

B. Aqua exercise training schedule: The training schedule prepared by the investigator was applied to the experimental group and the training was personally supervised by the investigator with the help of swimming coach of the school who strictly followed the instructions of the investigator. The training was carried out for three days alternately in a week and for 12 weeks.

Table 1: Aqua Exercise Training Program

Sr. No.	Aqua Exercise	Week 1 - 2	Week 3 - 4	Week 5 - 6	Week 7 - 8	Week 9 - 10	Week 11 - 12
		40 - 50% THR	40 - 50% THR	50 - 60% THR	50 - 60% THR	70 - 80% THR	70 - 80% THR
1	Bent arm pull	1 Set 10 - 15R	1 Set 10 - 15R	2 - 3 Set 5 - 10 R	2 - 3 Set 5 - 10 R	3 - 4 Set 1 - 5 R	3 - 4 Set 1 - 5 R
2	Straight arm pull	1 Set 10 - 15R	1 Set 10 - 15R	2 - 3 Set 5 - 10 R	2 - 3 Set 5 - 10 R	3 - 4 Set 1 - 5 R	3 - 4 Set 1 - 5 R
3	Brest Stroke	1 Set 10 - 15R	1 Set 10 - 15R	2 - 3 Set 5 - 10 R	2 - 3 Set 5 - 10 R	3 - 4 Set 1 - 5 R	3 - 4 Set 1 - 5 R
4	Pendulum Exercise pulls	1 Set 10 - 15R	1 Set 10 - 15R	2 - 3 Set 5 - 10 R	2 - 3 Set 5 - 10 R	3 - 4 Set 1 - 5 R	3 - 4 Set 1 - 5 R
5	Resistive shoulder flexion/ extension	1 Set 5 - 10 R	1 Set 5 - 10 R	1 - 2 Set 5 - 10 R	1 - 2 Set 5 - 10 R	3 Set 1 - 5 R	3 Set 1 - 5 R
6	Walking with tray	1 Set 5 - 10 R	1 Set 5 - 10 R	1 - 2 Set 1 - 5 R	1 - 2 Set 1 - 5 R	3 Set 1 - 5 R	3 Set 1 - 5 R
7	Marching	1 Set 5 - 10 R	1 Set 5 - 10 R	1 - 2 Set 1 - 5 R	1 - 2 Set 1 - 5 R	3 Set 1 - 5 R	3 Set 1 - 5 R
8	Jogging	1 Set 5 - 10 R	1 Set 5 - 10 R	1 - 2 Set 1 - 5 R	1 - 2 Set 1 - 5 R	3 Set 1 - 5 R	3 Set 1 - 5 R
9	Pelvic Movement	1 Set 5 - 10 R	1 Set 5 - 10 R	1 - 2 Set 1 - 5 R	1 - 2 Set 1 - 5 R	3 Set 1 - 5 R	3 Set 1 - 5 R
10	Bicycle	1 Set 10 - 15 R	1 Set 10 - 15 R	2 - 3 Set 10 - 15 R	2 - 3 Set 10 - 15 R	3 - 4 Set 8 - 10 R	3 - 4 Set 5 - 10 R

* R = Repetitions,
THR = Target Heart Rate

Cool down: Cool down exercises for 8 to 10 minutes. The excited physiological and psychological homeostasis is brought down slowly so as to facilitate the next training session.

Table 2: Training Time Table

Exercise	Time Duration
Warming Up	10 Minute
Aqua Exercises (1 st to 4 th week)	25 to 30 Minute
Aqua Exercises (5 th to 8 th week)	30 to 40 Minute
Aqua Exercises (1 st to 12 th week)	40 to 50 Minute
Cooling Down / Warming down	10 Minute

Aqua Training: However in order to impart different training intervention and to make it effective, the selection of exercise (aqua) was important, which was made on the basis of following points.

- 1) Upper body exercises
- 2) Lower body exercises
- 3) Simple to complex (starting from easy movement and gradually intensifying the exercise)

The involvements of major muscles in sprinting event are considered to be the base while selecting exercises in aqua

training programme. The descriptions of these exercises are as following.

List of the exercises:

Bent arm pull Straight arm pull Breast stroke
 Pendulum exercise pulls Resistive exercise flexion/extension
 Walking with tray Marching Jogging
 Pelvic Movement Bicycle

3. Data Analysis

Table 3: Group* Speed

GROUP	Test	Mean	Std. Error
Experimental	1	19.497	.290
	2	18.644	.265
	3	17.964	.250
	4	17.268	.293
	5	16.885	.277
	6	16.375	.294
	7	16.071	.314
Control	1	19.461	.290
	2	18.986	.265
	3	18.769	.250
	4	18.543	.293
	5	18.357	.277
	6	18.053	.294
	7	18.371	.314

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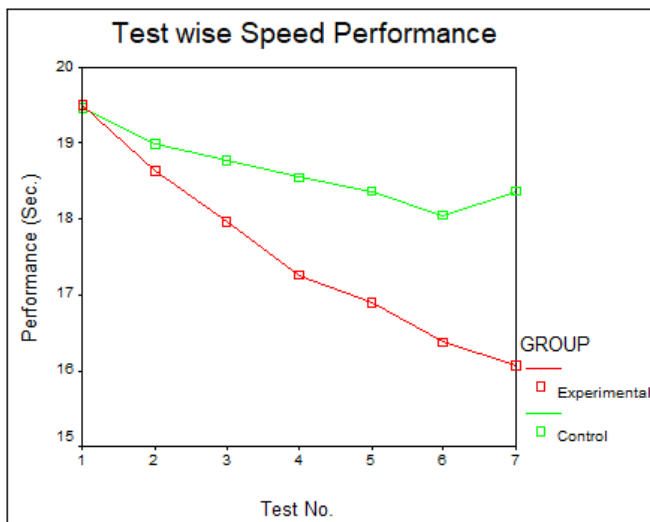


Figure 1: Graphical representation of test wise Speed Performance

4. Conclusion

The observation of the experimental data, within limitations, help to conclude that through the aqua exercise training program module there was gradual and useful improvement in performance ability of 100 meter sprint of school going boys.

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