

# **“A DIAGNOSTIC STUDY OF DEVELOPMENT OF ENDURANCE IN ATHLETES BY USING INTERVAL TRAINING METHOD ALONG WITH PRANAYAMA”**

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## **I.1 - INTRODUCTION:**

**Training:** The word ‘Training’ has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and years. The term ‘training’ is widely used in sports. The regular and systematic use of physical exercise, however, does not guarantee maximum improvement in performance. The effect of these exercises is increased or decreased by a multitude of factors. Some of these factors, if ignored, lead to a drastic reduction in the efficacy of physical exercise. The complex nature of sports training involving physical exercise along with other means becomes obvious when one looks at the training of advanced sports persons. The training of advanced sports persons is significantly supported by means and measures from several sports science disciplines e.g., sports medicine, sports physiology, nutrition, physiotherapy, sports psychology, sports biomechanics and so on. The training for specific sports is based on motor abilities viz. strength, speed, endurance, flexibility and coordinative abilities. Few sports are dominated by specific motor ability along with all other in supportive action. In this study the scholar is specified to only endurance ability, which is dominated in running athletic events.

**Interval Training Methods:** Woldemar Gerschler a faculty member at the University of Freiburg in European country and his athletes worked closely with Dr. Hans Reindell, a life scientist, and developed Interval coaching ways. Gerschler’s nice contribution was his understanding of the importance of vas acquisition and his fashioning a coaching theme that might maximize vas fitness. That is, he complete that sturdy legs alone don't build an excellent runner. He wanted a system that might increase the heart’s stroke volume, and therefore its ability to deliver blood and gas to the legs. With Reindell’s facilitate, he devised interval training-relatively quick runs over comparatively short distances perennial variety of times. The name of the system comes from the ‘interval’, or suspension, between the quick runs. Gerschler and Reindell thought of this the foremost necessary a part of the exercise, and that they controlled it rigorously. Basic cognitive process that the center custom-made and grew stronger throughout the interval, they'd not enable runners to start successive repeat till their rate had came to a hundred and twenty beats per minute. If this failed to occur among ninety seconds of the tip of the previous repeat, the exercise was too troublesome and had to be adjusted. Otherwise, the center would be overworked, resulting in fatigue and exhaustion, instead of to the required coaching impact. Interval coaching involves alternating short bursts of intense activity with what's known as active recovery, that is usually a less – intense variety of the first activity.

**Track and field** (also known as **track and field sports**, **track and field athletics**, or commonly just **track**) is a sport comprising various competitive athletic contests based around

the activities of running, jumping and throwing. The name of the sport derives from the venue for the competitions: a stadium which features an oval running track surrounding a grassy area. The throwing and jumping events generally take place within the central enclosed area.

Track and field is one of the sports which (along with road running, cross-country running and race walking) make up the umbrella sport of athletics. It is under the banner of athletics that the two most prestigious international track and field competitions are held: the athletics competition at the Olympic Games and the IAAF World Championships in Athletics. The International Association of Athletics Federations is the international governing body for track and field.

Track and field events are generally individual sports with athletes challenging each other to decide a single victor. The racing events are won by the athlete with the fastest time, while the jumping and throwing events are won by the athlete who has achieved the greatest distance or height in the contest. The running events are categorized as sprints, middle and long-distance events, relays, and hurdling. Regular jumping events include long jump, triple jump, high jump and pole vault, while the most common throwing events are shot put, javelin, discus and hammer. There are also "combined events", such as heptathlon and decathlon, in which athletes compete in a number of the above events.

**Pranayama:** In simple terms pranayama may be called the control of the breath. Its essence lies in the modification of our normal process of breathing. Breathing is an act in which we take air from the atmosphere into our lungs, absorb the oxygen from it into our blood, and expel the air again into the atmosphere together with carbon-dioxide and water vapors. This act of inhalation and exhalation is repeated every four to five seconds. Thus normally we breathe about fifteen times every minute. Every modification of this normal breathing process would not count as pranayama. Pranayama consists of modifications of the breathing process which we bring about deliberately and consciously. The process of breathing is modified in three different ways: (1) by inhaling and exhaling rapidly, taking shallow breaths, (2) By inhaling and exhaling slowly, taking long and deep breaths and (3) by stopping the act of breathing altogether. Many names are given to the variations to the breathing processes and are carried out along with two different endurance training methods for the development of endurance in athletes.

**Pranayama** (Devanagari: प्राणायाम, *prāṇāyāma*) is a Sanskrit compound.

V. S. Apte provides fourteen different meanings for the word *prana* (Devanagari: प्राण, *prāṇa*) including these:

- Breath, respiration
- The breath of life, vital air, principle of life (usually plural in this sense, there being five such vital airs generally assumed, but three, six, seven, nine, and even ten are also spoken of)
- Energy, vigor
- The spirit or soul

## **I.2 – OBJECTIVES OF THE STUDY:**

1. To find out, access and analyze the developments taking in endurance ability among college athletes at particular age group.
2. To understand if any specific endurance development method is helpful for the college athletes.
3. To understand various parameters of endurance ability associated with pranayama in certain age group of certain sport.
4. To understand scientific base for methods of training in endurance for athletes along with the traditional means of pranayama.
5. To understand how the endurance ability will enhance with any specific training methods of endurance.

## **I.6 – HYPOTHESIS:**

According to the researcher, there may be **significant** difference of development of endurance through **interval endurance training** method supplemented **with pranayama** in experimental group of athletes when compared to the experimental group imparted with **only interval endurance training** method.

## **I.7 – DELIMITATIONS:**

1. The study is delimited to the male students only.
2. The study is further delimited to the age group between 18 to 25 years.
3. The study is delimited to students from Nashik District, Maharashtra.
4. The study is delimited to the standard endurance training and tests applicable for specific age groups and sex.
5. The study is further delimited to the college going students.
6. The study is delimited to few types of pranayama.

## **I.8 – LIMITATIONS:**

1. Diet and rest of the college students was a limitation.
2. Involvement of students during endurance training and endurance test is a limitation.
3. Involvement of students during pranayama training during the sessions is a limitation.
4. Physical, mental, weather, college, house and surrounding conditions is a limitation.
5. The present research work had various limitations which are beyond the control of researcher and will be considered as one of the major limitations of the study.

## **METHODOLOGY**

### **II.1 – SAMPLE:**

The samples of this study will be Athletes ranging between 18 to 25 years of age and are studying in undergraduate and postgraduate college. In all 75 athletes will be selected for the study in which 15 Athletes will be imparted continuous endurance training method along with pranayama, 15 Athletes will be imparted with only continuous training, 15 Athletes will be imparted with interval training along with pranayama, 15 Athletes will be imparted with only interval training and remaining 15 Athletes will not be provided with any endurance training but are made to practice their event regularly without any specific training.

The initial tests will be administered on each individual considering all the required conditions for the standard tests. All the subjects will be regularly trained according to the

weekly training scheduled prepared considering the science of training. In all 5 groups of 15 will be trained regularly according to their experimental groups and control group.

After every month the same tests will be administered on all the subjects for noting the development accordingly. In all 7 times the tests will be conducted and the results will be noted for statistical calculation and analysis.

### **III.2 – VARIABLES:**

#### **DEPENDENT VARIABLES:**

College Students

#### **INTERWEAVING VARIABLES:**

(1) Sex: Boys

(2) Age: 18 years to 25 years

(3) Criteria: Athletes

(4) Times: Initial and Final.

#### **INDEPENDENT VARIABLES: DEVELOPMENT OF ENDURANCE:**

(1) Canadian fit test (for VO<sub>2</sub> max and Metabolic Equivalent MET)

(2) Harvard Step Test.

(3) Coopers Test.

### **III.3 - TOOLS AND MEANS:**

All the selected endurance tests used will be standard tests with specification according to age, sex or category and the coefficient of the reliability and validity are already proved.

Hence research scholar will use some of the selected motor ability tests which are applicable to the selected age group and samples and are universally accepted and established standard tests for assessing development of motor abilities.

#### **MEANS:**

**Personal data bank:** It will be used to collect the information of an individual. Personal data bank will consist of the following aspect: Full name, date of birth and age, diet (vegetarian/mix), sportsman / non-sportsman, height and weight.

#### **Motor ability tests:**

(1) Canadian fit test (for VO<sub>2</sub> max and Metabolic Equivalent MET)

(2) Harvard Step Test.

(3) Coopers Test.

### **III.4 – PROCEDURE:**

The subjects will be selected randomly from the athletic group of the college. Overall 75 subjects will be divided into 5 equal groups of 15 each ranging between 18 to 25 years of age group. The tests will be administered with all specified and standard conditions starting with warming up exercises, optimum active rest periods in between and cooling down at the end. The condition of the subjects will be observed normal and motivated to take part in the tests. An introductory talk will be arranged regarding the initial day's workout assessment for confirmation of tireless and recovered state.

### III. 5 - COLLECTION OF DATA:

The subjects selected randomly from the athletics group of undergraduate and postgraduate classes will be made to undergo regular training under expert supervision. Periodically the tests will be conducted to assess the development in the endurance with different training means and methods adopted along with their specific events. In all 5 groups viz. (1) Experimental Group Continuous Endurance Training Method only, (2) Experimental Group Continuous Endurance Training Supplemented with Pranayama, (3) Experimental Group Interval Endurance Training Method only, (4) Experimental Group Interval Endurance Training Method Supplemented with Pranayama and (5) Control Group will be imparted training according to standard weekly training schedule.

The subjects will be made to undergo standard tests every month and in all 7 times tests will be organized in 6 months of training. The initial test and the final scores of the tests will be compared to assess the development of difference in endurance when imparted with different methods.

### III.6 – STATISTICAL METHODS:

To analyze the collected data the scores will be arranged according to the comparison and in sequential order so as to find out the statistical values. The following statistical variables will be selected for comparing, analyzing and interpretation of numerical values and basing on which the findings will be discussed.

(1) Mean will be computed by adding all the scores and then dividing by the number of scores involved. The mean will be used in the study to measure the average in growth and development.

(2) Standard Deviation will be computed in the study for the measures of variability. Standard deviation reflected the magnitude of the deviations of the scores from their mean.

(3) For testing the null hypothesis for the difference between various samples means the t-Test is used at significance of .05 levels.

### IV. RESULTS AND DISCUSSION:

**H:** According to the researcher, there may be **significant** difference of development of endurance through **interval endurance training** method supplemented **with pranayama** in experimental group of athletes when compared to the experimental group imparted with **only interval endurance training** method.

**Table Showing the T – Test Values of All Endurance Tests Comparing Between Development through Interval Training plus Pranayama and Only Interval Training**

Variables	Df	Table Value of T	Obtained Values of T-Test	Comments
Weight (pre)	48	2.02	0.952	Insignificant
Height (pre)		2.02	1.53	Insignificant
Canadian Fit Test for VO <sub>2</sub> Max (pre)		2.02	1.13	Insignificant
Canadian Fit Test for Metabolic EquivalenT (pre)		2.02	1.16	Insignificant
Coopers VO <sub>2</sub> max (pre)		2.02	0.36	Insignificant

Harvard Step Test (pre)		2.02	1.70	Insignificant
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\* Significant at .05 level

Variables	Df	Table Value of T	Obtained Values of T-Test	Comments
Weight (post)	48	2.02	1.07	Insignificant
Height (post)		2.02	1.50	Insignificant
Canadian Fit Test for VO <sub>2</sub> Max (post)		2.02	2.311	significant
Canadian Fit Test for Metabolic EquivalentT (post)		2.02	3.189	significant
Coopers VO <sub>2</sub> max (post)		2.02	-0.5	Insignificant
Harvard Step Test (post)		2.02	2.950	significant

\* Significant at .05 level

The values of the Mean, Standard Deviation of Canadian Fit Test, Cooper Test, Metabolic Equivalent, and Harvard Step Test, of the groups are given in the table with those who are imparted with only interval endurance training method with pranayama and also with the only Interval training method. The calculated values of t for the development of endurance through interval training supplemented with pranayama and continuous training supplemented with pranayama are compared with the table value of t for the degree of freedom 48 is 2.02 at significance level of .05 level, displays **insignificant** difference of development of endurance through **Interval endurance training with pranayama** method in experimental group of Athletics players when compared to the experimental group imparted with **only Interval endurance** method in all but significant difference is shown in the Canadian fit test VO<sub>2</sub> max post, Canadian fit test Metabolic equivalent post and Harvard Step Test post, hence **Hypothesis: 4 is rejected** and accepted in few cases.

#### REFERENCES:

1. Intone, Stephen (15 November 2009). The Olympics: Ancient versus Modern. BBC. Retrieved on 23 March 2010.
2. Ancient Olympic Events; Pentathlon. Perseus digital library. Retrieved on 3 August 2009.
3. Waldo E. Sweet, Erich Segal (1987). *Sport and recreation in ancient Greece*. Oxford University Press. p. 37. Retrieved on 3 August 2009.
4. Jean-Paul Thuillier, *Le sport dans la Rome antique (French)*, Paris, Errance, 1996, pp. 115–116, ISBN 2877721140
5. The Olympic Games in Antiquity. The Olympic Museum. Retrieved on 25 March 2010.
6. 100 m – Introduction. IAAF. Retrieved on 26 March 2010.
7. 200 m Introduction. IAAF. Retrieved on 26 March 2010.
8. 400 m Introduction. IAAF. Retrieved on 26 March 2010.
9. 100 m – For the Expert. IAAF. Retrieved on 26 March 2010.
10. 200 m For the Expert. IAAF. Retrieved on 26 March 2010.
11. Superb Bolt storms to 150m record . BBC Sport (17 May 2009). Retrieved on 26 March 2010.
12. Tucker, Ross (26 June 2008). Who is the fastest man in the world?. The Science of Sport. Retrieved on 26 March 2010.
13. Middle-distance running. *Encyclopedia Britannica*. Retrieved on 5 April 2010.
14. 800 m – Introduction. IAAF. Retrieved on 5 April 2010.
15. 1500 m – Introduction. IAAF. Retrieved on 5 April 2010.

16. Rosenbaum, Mike. Introduction to Middle Distance Running. Track and field-About.  
Retrieved on 5 April 2010.