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## Physical performance changes after Training in athletes

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### Abstract

A sports is all about the technique, endurance and persistence, a persistence and adequate techniques along with timing makes a winner, this equation is devoid of sex and gender. The training of athletes to endure and increase their pace and agility comes in handy if their kinetometrics were strong and persistent. The biomechanics of a body if well proportionate with the training it will give a winner performance. This papers gives an idea about the change in the basic sports endurance phenomenon after basic training.

**Keywords:** Training cycle, sports, speed, agility, endurance

### Introduction

Biomechanics Helps in improving Techniques Utilizing the various innovative techniques of Biomechanical Principles in practice and Sports helps To improve various error detections, improves skills, develop and strengthen qualitative and quantitative analysis with proper and selected tools and equipments. Design new equipment as biomechanics is the main part in the students' overall sports performance; it also helps to develop and design structure of equipments, Shoes and sports clothes design, sports tools facilities like single plate Photography, Automatic Tracking System, Electro goniometry, Accelerometer, Pressure Measurement, Ground structure, surface structure and lab activities etc in proper way. According to sports type and place, sports equipments also are used as per the principles of biomechanics in physical Education and Sports. Increase in sports performance utilizing various new techniques of biomechanical principles in the Physical Education can help to enhance performance of students in the several sports. With several models of scientific quantitative analysis like force-motion, force-time, inertia, motion, coordination, continuum, segmental interaction and balance performance of player in terms of speed, time, and accuracy in sports can be improved. Under the proper Guidance of biomechanical techniques students who have such training show better result in comparison to those who don't have proper guidance. Prevention of Injuries Applying the innovative principles of it, player's injury risk can be reduced by maintaining proper care about cause, diagnosis, cure and rehabilitate them. In the qualitative type of analysis techniques to prevent and recover injuries also provided accordingly. Muscles improvement by following the biomechanical principles, various muscle groups and tissue structure can be improved in well condition. Actions such as kicking football by legs, throwing and Catching Ball, Jumping Long, lifting weight etc helps to maintain the elasticity in the muscles and build Biceps and Triceps, building joints that leads to strengthen the physical endurance. Improve internal organ system with the help of several structured approach and techniques of biomechanics in sports assist to keep internal body organ system properly because in the qualitative analysis there are various moves useful related to health of several internal organ systems. Working of all joints, function properly if the physical exercise is done accordingly.

### Methodology

The selected variables seek to identify the physical and motor skills attributes in the formation of the probable athlete, according to the applied tests described below:

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**Rapid Strength and Agility (RSA)**

1. Agility test. Running back and forth. It consists of running back and forth between two parallel lines located at a distance of 10 meters apart picking up and carrying two wooden blocks to the opposite line (one at a time). The final route consists of 4 races of 10 meters each, which includes the reaction, acceleration, stopping, change of direction and hand-eye coordination rate. The time required per route is noted.

**2. Peak Oxygen Uptake (VO2 max)**

Multi-stage fitness test or Leger-test. It consists of a test of progressive intensity, running continuously back and forth at a predetermined pace. It consists in running as long as possible on a route of 20 meters in both directions back and forth at the pace of a beep. This signal is measured in a way that the initial velocity is 8 km/h and increases by 0.5 km/h at one-minute intervals. Every time the signal sounds, the individual must be on either end of the 20 m route. The test is finished when the individual cannot keep up with the pace of the race. The oxygen consumption is estimated indirectly, calculated on the average energy cost of the running velocity reached during the last complete charge and the age of the

**Individual, from the following equation**

$$VO2 \text{ Max (ml/kg/min)} = 31.025 = (3.238 * V) - (3.248 * A) + (0.1536 * A * V)$$

VO2 max. = estimation of maximal oxygen consumption (ml/kg/min)

V = maximum velocity reached during the last completed half (km/h)

A = Age of the athletes

**Objective**

To determine the main attributes of an athlete i.e, Rapid Strength and Agility and Peak Oxygen Uptake which were found to be the key attributes responsible of the athlete performances. Total number of respondents were 150 were studied before Training and after Training.

Variables	Training	Mean	St deviation	St error	Variance
Rapid Strength and Agility	Pre Training	14.229	6.55	0.0648	42.924
	Post Training	23.956	7.45	0.1612	61.997
Peak Oxygen Uptake	Pre Training	47.214	9.59	0.0945	91.992
	Post Training	66.562	11.35	0.1101	99.121

**Rapid Strength and Agility**

$$t = \frac{M^1 - M^2}{\sigma_{ed}} \sigma_{ed} = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$$

M1= 14.229 σ 1= 6.55  
M2= 23.956 σ 2= 11.45

$$\sigma_{ed} = \sqrt{\frac{6.55^2}{75} + \frac{11.45^2}{75}} =$$

$$\sqrt{\frac{42.902}{75} + \frac{131.102}{75}} =$$

$$\sqrt{0.572 + 1.74} = 1.523$$

$$t = \frac{23.956 - 14.229}{1.52} = 6.339$$

DF= 150-2 = 148

**Peak Oxygen Uptake**

$$t = \frac{M^2 - M^1}{\sigma_{ed}} \sigma_{ed} = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$$

M1= 47.214 σ 1= 9.59  
M2= 66.562 σ 2= 11.35

$$\sigma_{ed} = \sqrt{\frac{9.52^2}{75} + \frac{11.35^2}{75}}$$

$$= \sqrt{\frac{90.63}{75} + \frac{128.822}{75}} = \sqrt{1.21 + 1.717} = 2.927$$

$$t = \frac{66.562 - 47.214}{2.927} = 6.610$$

DF= 150-2 = 148

**Results**

For 148 DF the t value at 0.05 significance is 1.97 and value of t at 0.01 significance level is 2.60. both the Rapid Strength /Agility and Peak Oxygen Uptake t values has been recorded i.e, 6.339 and 6.610 which were in no comparison with the tabulated value at 0.05% significance and 0.01% significance, hence there is significant difference in the Rapid Strength /Agility and Peak Oxygen Uptake of athletes during pre-Training and post Training period.

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