

# Effect of Resistance Training on Hemoglobin among Players

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**Abstract:** The purpose of the study was to find out the effect of resistance training on hemoglobin among players. To achieve this purpose of the study, thirty players who were attended the coaching camp held at ADM College for Women, Nagapattinam. The selected subjects were aged between 18 to 22 years. They were divided into two equal groups of fifteen each, Group I underwent resistance training and Group II acted as control that did not participate in any special training apart from their regular curricular activities. The subjects were tested on selected criterion variable such as hemoglobin prior to and immediately after the training period. The selected criterion variable such as hemoglobin was determined through Cyanmethaemoglobin method. The analysis of covariance (ANCOVA) was used to find out the significant differences if any, between the experimental group and control group on selected criterion variable. In all the cases, 0.05 level of confidence was fixed to test the significance, which was considered as an appropriate. The result of the present study has revealed that there was a significant difference among the experimental and control group on hemoglobin.

**Keywords:** training, resistance, women, players, hemoglobin.

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## 1. INTRODUCTION

Regular exercise and physical activity are extremely important and beneficial for long-term health and well-being. Specificity is the principle of training that states that sports training should be relevant and appropriate to the sport for which the individual is training in order to produce a training effect. The specificity principle simply states that training must go from highly general training to highly specific training. General fitness training works towards broad goals of overall health and well-being, rather than narrow goals of sport competition, larger muscles or concerns over appearance. A regular moderate workout regimen and healthy diet can improve general appearance markers of good health such as muscle tone, healthy skin, hair and nails, while preventing age or lifestyle-related reductions in health and the series of heart and organ failures that accompany inactivity and poor diet. Diet itself helps to increase calorie burning by boosting metabolism, a process further enhanced while gaining more lean muscle. An aerobic exercise program can burn fat and increase the metabolic rate. Resistance training should be an integral part of an adult fitness program and of a sufficient intensity to enhance strength, muscular endurance and maintain fat-free mass (FFM). Resistance training should be progressive in nature, individualized and provide a stimulus to all the major muscle groups. "adding strength training to a program of regular physical activity will help to decrease the risk of 'chronic diseases' while improving quality of life and functionality, allowing people of all ages to improve and maintain their health and independent life style. Resistance training is for everyone. It is an important tool for achieving a complete healthy life. Resistance training is not just for people who are athletes, want to build or tone muscle, or are using resistance training to achieve a better looking body. Resistance training has two different, sometimes confused meanings – a more broad meaning that refers to any training that uses a resistance to the force of muscular contraction (better termed strength training), and elastic or hydraulic resistance which refers to a specific type of strength training that uses elastic or hydraulic resistance, which refers to a

specific type of strength training that uses elastic or hydraulic tension to provide this resistance. Regular endurance exercise has profound benefits on overall health, including the prevention of obesity, cardiovascular disease, and diabetes. Hemoglobin is a protein found within red blood cells. Its main function is to absorb oxygen at the lungs and carry this oxygen to the working muscles via the bloodstream. The makeup of hemoglobin allows it to absorb oxygen quickly and efficiently transport it through the body. It also plays a less important role in the removal of carbon dioxide from working muscle. During training cells within the body become short of oxygen. One of the ways the body adapts to this is to produce more red blood cells and hemoglobin to meet the oxygen needs of the cells. While it is not a large increase, it does improve individuals abilities to absorb and deliver oxygen to working muscles. Hemoglobin consists of the protein globin bonded to which are four chains of amino acids each leading to a haem group and an atom of iron. In normal adult hemoglobin the four amino acid chains are made up of two identical alpha ( $\alpha$ ) chains of 141 amino acids and two identical beta ( $\beta$ ) chains of 146 amino acids. The four iron atoms serve as the oxygen-binding sites. Hemoglobin deficiency results in anaemia and may be particularly problematic for endurance athletes. Indeed the anaemic endurance athlete seems to be a contradiction in terms, because decreased levels of hemoglobin.

### 1.1 Statement of the problem:

The purpose of the study was to determine the effect of resistance training on hemoglobin among players.

### 1.2 Delimitations:

1. The study was delimited to players attended the coaching camp at A D M College for Women, Nagapattinam.
2. The study was delimited to 30 players, their age was 18 to 22 years.
3. The study was restricted to the dependent variable is hemoglobin and independent variable is resistance training.

### 1.4 Significance of the Study:

1. The findings of the study may be helpful for players to apply resistance training which will help in better health and fitness.
2. The findings of the study would be helpful for the exercise physiologist to know the role of hemoglobin influence their physical fitness.
3. The results of the study may be helpful to fitness trainers, coaches, physical educationist and exercise physiologists to design proper training protocol for other populations

## 2. METHODOLOGY

In the present study all the students who were attended the coaching camp held in A D M College for Women, Nagapattinam were considered as population for the study. Thirty players in the age of 18-22 years were chosen as sample for the study. The selected participants were divided into two groups. Group I underwent resistance training and group II act as control group. The experimental groups underwent eight weeks of training in their particular workout. For this study dependent variable is hemoglobin.

### 2.1 Test Administration – Estimation of Hemoglobin:

Hemoglobin concentration was estimated using calorimetric procedure by Cyanmethaemoglobin method. An aliquot of well mixed whole blood was taken and reacted with a solution of potassium cyanide and potassium ferricyanide. The chemical reaction yields a product of stable color, Cyanmethaemoglobin. The intensity of the color is proportional to the hemoglobin concentration at 540 nm. The following reagents were used for the assay.

- (a) Reagent 1: Drabkin's reagent (50 mg potassium cyanide, 200 mg potassium ferricyanide and 1000 ml distilled water).
- (b) Reagent 2: Cyanmethaemoglobin standard.

Three sets of test tubes were taken and marked as blank, Test and standard. In the blank 5.0ml of reagent 1, then 20  $\mu$ l of an aliquot of well mixed EDTA- anticoagulated blood specimen was added, mixed well and stand for 10 minutes.

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Another tube marked as standard contained 5.0ml of Cyanmethaemoglobin standard. Blank solution was used for setting the spectrophotometer. Absorbance (Abs) of the test and standard was performed using spectrophotometer at 540nm.

### Scoring

Hemoglobin concentration was expressed as g/dl.

### 2.2 Analysis of Data:

The data obtained were analyzed by analysis of covariance (ANCOVA). Analysis of covariance was computed for any number of experimental groups, the obtained 'F' ratio compared with critical F value for significance.

## 3. RESULTS

**Findings:** The statistical analysis comparing the initial and final means of blood parameter, hemoglobin due to resistance training has been presented in Table I.

**TABLE I COMPUTATION OF ANALYSIS OF COVARIANCE ON HEMOGLOBIN**

Test	Experimental Group		Control Group		F ratio
	Mean	S D	Mean	S D	
Pre	13.46	1.23	13.49	1.12	0.86
Post	13.92	1.25	13.45	1.08	5.82*
Ad Post	14.03		13.51		17.23*

Table I shows the analysed data of hemoglobin. The hemoglobin pre means were 5.36 for the resistance training group and 5.33 for the control group. The resultant 'F' ratio of 1.23 was not significant at .05 levels indicating that the three groups were no significant variation. The post test means were 6.01 for the resistance training group and 5.35 for the control group. The resultant 'F' ratio of 9.20 at .05 levels indicating that was a significant difference. The difference between the adjusted post-test means of 5.99 for the resistance training group and 5.39 for the control group yield on 'F' ratio 18.72 which was significant at .05 level. The results of the study indicate that there is a significant difference among resistance training and control group on the hemoglobin.

## 4. DISCUSSIONS

The results of the study proved that there were significant differences between control group and resistance training group. The eight weeks of experimental treatment significantly influence on hemoglobin content in netball players. The above results are supported by (Akbar Sazvar and others (2013) and Nahid Bijeh and others (2013)).

## 5. RECOMMENDATIONS

1. It was recommended that adequate steps may be taken to include aerobic, resistance and concurrent training in the physical education curriculum as these exercises significantly improves the hemoglobin of the subjects.
2. Similar study may be conducted on a larger population.
3. Similar study may be undertaken and its influence on psychological and biochemical parameters may be assessed.

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