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Effect of Weight Jocket Training Programme on Vo_2 Max among University Netball Players

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Original Research Article

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Abstract: The purpose of the study was to find out the effect of weight jocket on Vo2 Max among college football players. To achieve this purpose of the study, thirty netball players were selected as subjects who were from the various faculties, Annamalai University, Annamalainagar. The selected subjects were aged between 19 to 24 years. They were divided into two equal groups of fifteen each, Group I underwent weight jocket training and Group II acted as control that did not participate in any special training apart from their regular sports and games practices. The subjects were tested on selected criterion variable such as Vo_2 max prior to any immediately after the training period. The selected criterion variable such as Vo_2 max was determined through using Treadmill. 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. The 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 Vo_2 max.

Keywords: weight jocket training – Vo_2 max - netball players.

INTRODUCTION

The primary objective of sports training is to stress various bodily systems to bring about positive adaptation in order to enhance sporting performance. To achieve this objective, coaches and athletes systematically apply a number of training principles including overload, specificity and progression, organized through what is commonly termed periodization.

The application of these principles involves the manipulation of various programme design variables including choice of exercise, order of training activities/exercises, training intensity (load and repetition), rest periods between sets and activities/exercises and training frequency and volume in order to provide periods of stimulus and recovery, with the successful balance of these factors resulting in positive adaptation. Aerobic exercise refers to exercise that involves or improve oxygen consumption by the body. Aerobic training increased cardio-respiratory endurance, which in turn increased Vo2 max, because of it increased level of hemoglobin. Resistance training is an integral part of an adult fitness program and of a sufficient intensity to enhance strength, muscular endurance and maintain fat free mass. Resistance training involves exercise in which the muscles exert a force against an external load. It is most commonly referred to as weight training. Such a training program should be individualized, progressive and specific in terms of the way muscles are likely to be used in the chosen sport. Concurrent training is one method that many coaches employ as it consists of training multiple qualities at equal amounts of focus within the same training phase and often within the same workout. The biggest issue that can arise from this sort of programming is that often times the two or three qualities one is looking to enhance end up competing with each other for adaptation. All types of training, whether it is strength training or long distance running, will produce specific responses from the body which trigger gene expression and molecular changes that in turn cause the body to adapt to the training stimulus in order to make us more prepared to tackle this stressor should we need to face it again (our next workout or competition). One of the arguments against concurrent training is that the adaptations that the body's internal environment under goes in response to the differing training stimuli brought on by the multiple qualities being trained in the training day or training phase are on different ends of the spectrum thus confusing the body as to how it should respond and leading to less than favorable adaptations. This is referred to as the Interference Phenomenon. You can't be an elite powerlifter and an elite marathon runner at the same time. In addition to the arguments about performance outcomes another big issue with concurrent training is the reported overreaching or overtraining that tends to occur when an athlete attempts to cram several training qualities into a workout or training phase, detracting from their recovery time and increasing the amount of training miles they are placing on their body. Interestingly, despite these arguments against concurrent training studies looking at the effects of concurrent training appear to be mixed in regard to the results with some studies showing it to be effective and other studies showing it to be detrimental to strength, power, or endurance adaptations. Of course it is important to take into consideration the subjects in many of these studies, who are often college aged exercise science students with minimal to no training background, thus they may respond in a different manner than someone with a higher training age or more elite in status. The physiological response to dynamic aerobic exercise is an increase in oxygen consumption and heart rate that parallels the intensity of the imposed activity and a curvilinear increase in stroke volume. The cardiovascular system, composed of the heart, blood vessels and blood responds predictably to the increased demands of exercise. With few exceptions, the cardiovascular response to exercise is directly proportional to the skeletal muscle oxygen demands for any given rate of work and oxygen uptake increases linearly with increasing rates of work. A person's maximum oxygen uptake is a function of cardiac output multiplied by the arterial-mixed venous oxygen difference. Cardiac output thus plays an important role in meeting the oxygen demands for work. As the rate of work increases, the cardiac output increases in a nearly linear manner to meet the increasing oxygen demand, but only up to the point where it reaches its maximal capacity. The resting heart rate can be obtained through auscultation, palpation or ECG recordings. When taking heart rate by auscultation, the bell of the stethoscope is placed to the left of the sternum, just above the level of the nipple. The heart beats can be counted. VO2 max (also maximal oxygen consumption, maximal oxygen uptake, peak oxygen uptake or maximal aerobic capacity) is the maximum rate of oxygen consumption as measured during incremental exercise, most typically on a motorized treadmill. Maximal oxygen consumption reflects the aerobic physical fitness of the individual, and is an important determinant of their endurance capacity during prolonged, sub-maximal exercise. The name is derived from V - volume, O2 -oxygen, max - maximum. VO2 max is expressed either as an absolute rate in (for example) liters of oxygen per minute (L/min) or as a relative rate in (for example) milliliters of oxygen per kilogram of body mass per minute (e.g., ml/(kg·min)). The latter expression is often used to compare the performance of endurance sports athletes.

MATERIALS AND METHODS

To achieve this purpose thirty (N = 30) male netball players were randomly selected from various faculties, Annamalai University, Tamilnadu, India. The selected subjects were aged between 19 to 24 years. They were divided into two equal groups of fifteen each, Group I underwent weight jocket training and Group II acted as control that did not participate in any special training apart from their regular curricular activities. The experimental group underwent twelve weeks for 3 days per week training. The selected criterion variable cholesterol to assess body fat monitor. Pre-test data were collected before the training program and post-test data were collected after the training program.

Training Program

The intensity variations in 12 weeks training for experimental groups are given in Table - I.

Table-I: INTENSITY VARIATIONS IN TRAINING PROGRAM

Weeks	1&2	3&4	5&6	7&8	9&10	11&12
% of intensity	70	74	78	82	86	90

Assessment of Vo2 max

VO2 max (maximal oxygen uptake) was predicted using a sub maximal treadmill test on a motor driven treadmill. The test began at a speed with which each subject could jog comfortably. After 3 minutes when a steady state heart rate (HR) was achieved, the speed and heart rate was recorded VO2 max was predicted using the following formula.

The estimated VO2 max can be calculated in ml/kg/min.

$$VO2\ max = 54.07 - 0.1938 \times \text{Body weight} + (4.47 \times \text{Speed}/1.6) - 0.1453 \times \text{heart rate} + 7.62 \times \text{gender}$$

Where, speed = km/h
gender = 1 for men, 0 for women
body weight = kg

Statistical Technique

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.

RESULTS

The statistical analyses of Vo_2 max due to weight jocket training have been presented in Table II.

Table – II: computation of analysis of covariance on VO2 max

		Exp Group	Con Group	F ratio
Pre Test	**Mean**	38.84	39.38	1.12
	S D	3.68	3.94	
Post Test	**Mean**	45.08	39.45	12.58*
	S D	3.74	3.89	
Ad Post Test	**Mean**	45.16	39.42	64.57*

* Significant at .05 level of confidence. Table value required for significance at .05 level with df 1 and 28 and 1 and 27 are 4.20 and 4.21.

Table – II showed that the pre-test values of Vo_2 max for weight jocket training group and control group were 38.84 ± 3.68 and 39.38 ± 3.94 respectively. The obtained 'F' ratio value of 1.12 for pre-test score of weight jocket training group and control group on cholesterol was less than the required table value of 4.20 for significance with df 1 and 28 at .05 level of confidence.

The post-test mean values of Vo_2 max for weight jocket training group and control group were 45.08 ± 3.74 and 39.45 ± 3.89 respectively. The obtained 'F' ratio value of 12.58 for post-test scores of weight jocket training group and control group was more than the required table value of 4.20 for significance with df 1 and 28 at .05 level of confidence.

The adjusted post-test mean values of Vo_2 max for weight jocket training group and control group were 45.16 and 39.42 respectively. The obtained 'F' ratio value of 64.57 for adjusted post-test scores of weight jocket training and control group was more than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence.

The results of this study showed that there was a significant difference among weight jocket training group and control group on Vo_2 max.

CONCLUSIONS

The result of this study showed that there was a significant improvement after the weight jocket training on Vo_2 max when compared with control group. The eight weeks of experimental treatment significantly influence on Vo_2 max thickness in university netball players. The above results are supported by Millet and others, Zabiholah Tarasi and others, Wilson and others and Ferrauti, Bergermann and Fernandez-Fernandez.

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