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Effect of Strength Training and Endurance Training on Selected Psychological Variables

V. Saratha[1] & Dr. S. Chidambara Raja[2]

[1]*Ph.D., Research Scholar, Department of Physical Education, Annamalai University, Tamilnadu, India.*
[2]*Professor & Research Supervisor, Department of Physical Education, Annamalai University, Tamilnadu, India.*

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Abstract

The purpose of the study was to find out the effect of resistance training and endurance training on selected psychological variables. Forty five female students aged between 17 and 22 years were selected for the study. They were divided into three equal groups, each group consisting of fifteen subjects in which three experimental groups and one control group, in which the group I (n=15) underwent resistance training, group II (n = 15) underwent endurance training for three days (alternative days) per week for twelve weeks, and group III (n=15) acted as control, which did not participate in any training. The subjects were tested on selected criterion variables such as anxiety and aggression at prior to and immediately after the training period. For testing the anxiety, Taylor Manifest Anxiety Scale was used and to measure the aggression, Buss and Perry Aggression Questionnaire was used. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in the present study, the Scheffé S test was used as post-hoc test. The selected criterion variables such as anxiety and aggression were decreased significantly for the training groups when compared with the control group.

Keywords: Resistance training, endurance training, physical fitness, anxiety and aggression.

Introduction

Physical training is focuses on mechanistic goals. The overall muscles and some specific skill will develop within particular period of time after the physical training. Psychological will be improved by the most of the physical training programme.[1] Dale S. Beach[2] defines training as 'the organized procedure by which people learn knowledge and/or skill for a definite purpose'. It is a process of teaching of particular skill to somebody, either human or animal and the aim is to improve the capacity, performance capacity or productivity of an individual.[3]. Physical training is the most important ingredient to achieve high level of performance of athlete. It's objectives are to increase the highest standards of an athletes' physiological potential and biomotor abilities.[4] Physical training should be given to the athlete on the basis of scientific principles and which, through systematic development of mental and physical efficiency, capacity and motivation, which help the athlete to produce outstanding and record breaking performances.[5]

During a specific period of time, an organized training which involves increasing cycle of training programme which enhance the performance of an individual is called as periodization.[6] During the periodization, the competitor gets optimum adaptation before an important event. Instead of performing the regular routing workouts month after month, the athlete change his or her program with regular periods or interval to work harder with adequate rest.[7] A study was conducted at Human Performance Laboratory, Ball State University shown that there was a significant improvement in muscular performance was found in favour of periodized strength training programme than the non-periodized program.[8]

The strength training also refers as a type of physical exercise, uses of resistance which enhance the muscular contraction which contributes the strength, increase the size of skeletal muscle and anaerobic endurance. It can improve the overall health and well-being, including the size of muscle, tendon, strengthen and improves the toughness of ligament and joint function, reduced for injury[9] increased the bone density, fitness, metabolism and cardiac function.[10,11]. Training the aerobic system is called as endurance training which is opposed to the anaerobic system, which is divided into two categories, general and specific endurance.[12] Anxiety could be an advanced emotion, characterized by a general concern or fore binding, sometimes in the course of tension. There are two wide category of aggression, that embrace emotive or retributory aggression, hostile and instrumental, predatory, or goal-oriented aggression.[13]

Correspondence
Dr.S.Chidambara Raja
E.Mail: rajadi42@gmail.com

Methods

In this study it was aimed to find out the effect of resistance training, and endurance training on anxiety and aggression. To achieve the purpose forty five female students from various faculties of Annamalai University, Annamalainagar, Tamilnadu were selected as subjects at random from the total population of 143 students. They were divided into three equal groups of fifteen each and further divided as two experimental groups and one control group, in which the group I (n=15) underwent resistance training, group II (n = 15) underwent endurance training for three days (alternative days) per week for twelve weeks, and group III (n=15) acted as control which did not participate in any special training apart from the regular curricular activities. For every training programme there would be a change in various structure and systems in human body. So, the researchers consulted with the experts and then selected the following variables as criterion variables: 1. Anxiety, 2. Aggression.

Analysis of the Data

Analysis of covariance was used to determine the differences, if any, among the adjusted post test means on selected criterion variables separately. Whenever the 'F' ratio for adjusted post test mean was found to be significant, the Scheffé *S* test was applied as post-hoc test. The level of significance was fixed at .05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

Table 1

Analysis of Covariance and 'F' ratio for Anxiety and Aggression of Resistance Training Group, Endurance Training Group and Control Group

Variable Name	Group Name	Resistance Training Group	Endurance Training Group	Control Group	'F' Ratio
Anxiety (in Points.)	**Pre-test Mean±S.D.**	10.53 ± 1.25	10.00 ± 1.51	10.60 ± 1.18	0.929
	Post-test Mean±S.D.	8.07 ± 1.22	8.73 ± 1.39	10.67 ± 1.45	21.05*
	Adj. Post-test Mean	7.928	8.071	10.468	65.96*
Aggression (in Meters)	**Pre-test Mean±S.D.**	20.00 ± 3.12	21.07 ± 3.67	19.87 ± 2.97	0.61
	Post-test Mean±S.D.	18.13± 3.38	19.07 ± 3.43	20.27 ± 2.55	1.73
	Adj. Post-test Mean	18.419	18.374	20.674	27.54*

* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively).

Table – 1 shows that pre and post test means 'f' ratio of resistance training group, endurance training group and control group on anxiety was 0.929, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 21.05 and 65.96 which was significant at 0.05 level of confidence. The pre and post test means 'f' ratio of resistance training group, endurance training group and control group on aggression was 0.61 and 1.73, which is insignificant at 0.05 level of confidence. The adjusted post test mean 'f' ratio value of experimental groups and control group was 27.54, which was significant at 0.05 level of confidence. The overall study shows that there was a significant decrease in anxiety and aggression. Further, to find out which of the paired mean significantly differ, the Scheffĕ *S* test was applied and presented below.

Table 2
Scheffĕ S Test for the Difference Between the Adjusted Post-Test Mean of Anxiety and Aggression

Resistance Training Group	Endurance Training Group	Control Group	Mean Difference	Confidence Interval at 0.05 level
Adjusted Post-test Mean Difference on Anxiety				
7.928		10.468	2.54*	0.63
7.928	8.071		0.143	0.63
	8.071	10.468	2.397*	0.63
Adjusted Post-test Mean Difference on Aggression				
18.419		20.674	2.255*	0.89
18.419	18.374		0.045	0.89
	18.374	20.674	2.30*	0.89

* Significant at 0.05 level of confidence.

Table – 2 shows that the Scheffĕ *S* Test for the difference between adjusted post-test mean of resistance training group and control group (2.54) and endurance training group and control group (2.397) which were significant at 0.05 level of confidence. But there was no significant difference between resistance training group and endurance training group (0.143) on anxiety after the respective training programme. Table – 2 shows that the Scheffĕ *S* Test for the difference between adjusted post-test mean difference in aggression between resistance training group and control group (2.255) and resistance training group and endurance training group (2.30) were significant at 0.05 level of confidence in favour of endurance training group. But there was no significant difference between resistance training group and endurance training group (0.045) on aggression after the respective training programme.

Conclusions

The result of the present study shows that the anxiety has decreased all the training groups except, endurance training group. Findings of Gordon *et al*[15] K. Spanos *et al*,. In Khorvash *et al*,[16] found that there was a significant decrease in aggression after the continuous running.

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