ISSN: 2349 - 4891

International
Journal of Recent Research and Applied Studies
(Multidisciplinary Open Access Refereed e-Journal)

Impact of Plyometric Training on Selected Motor Ability Component Physiological and Haematological Variables of College Students

Dr.K.Divya

Assistant Professor, Alagappa University College of Physical Education, Karaikudi, Tamilnadu, India.

Received 15th October 2016, Accepted 15th November 2016

Abstract

The purpose of this study was to analyze the impact of plyometric training on selected motor ability componenets, physiological and haematological, variables of college students. The research scholar employed random sample of thirty subjects drawn at random among the college women of Alagappa Arts College karaikudi. Their age ranges from eighteen to twenty five years. They are divided into three equal groups namely control group (Group I) plyometric training with 3days (Group II) plyometric training with 5days (Group III) The Group I control group did not involve any training, the Group II were given plyometric training with 3days frequency. Plyometric training with 5 days frequency (Group III).The initial and final results were recorded and the pilot study was conducted. The selected test was measured by the following units of testing the hypothesis.50yards run was used to estimate the speed, measured in seconds. Standing broad jump was used to estimate the explosive power, measured in meters. Digital blood pressure monitor was to used estimate the blood pressure, pulse rate, measured in mmHg per minutes. Visual comparison on sahils acid haematin method was used to estimate the haemoglobin concentration through haemoglobin meter and measured in grams. Buck dilution method was used to estimate the RBC count through haemocytometer neubaucer counting chamber and measured in million per C.mm. The independent variables were plyometric training with 3days frequency and the plyometric training with 5days frequency. ANCOVA and Scheffe's post hoc test was administered to find out the paired means significant difference. The motor ability components (Speed & Explosive power) and the physiological variables (Blood pressure & pulse rate) and haematological variables (RBC count & haemoglobin concentration) are increased due to the treatment with 5days frequency is better than the 3 days frequency of plyometric training. Hence the hypothesis was accepted on the above said variables.

Keywords: Plyometric, Speed, Blood Pressure, College Students.

Introduction

Physical Activity is probably the most enjoyable and yet most inexpensive form of preventive medicine. Physical fitness is soundness of body, a condition in which its functions are duly and efficiently discharged. It benefits body mobility, strength etc. To lead a happy and successful life, people have to develop physical fitness because it is necessary for the proper functioning of the body and the system. The eleven of fitness components is generally not uniform. Fitness is the state which characterises the degree to which a person is able to function efficiently. The concept of health related physical fitness was developed during the mind 1970's. In 1980 AAHPER introduced the health related physical fitness test. The test was designed to measure components of physical fitness affecting a positive cardio - respiratory function, fitness of the body and low back musculoskeletal function. Later the inception of fitness tests (AAHPER 1956), various test items measuring parameters considered to be skill related rather than health were deleted from fitness batteries (AAHPER 1956 and 1976). The deletion of skill related tests items can be attributing to the evolution of the definition of physical fitness characteristics associated with good health problems and the prevention of health problems associated with inactivity. Physical fitness plays a vital role in the performance. Performance depends on the co-ordinated functioning of the various factors such as physical, physiological abilities, nutrition, technique, tactics, body size and composition.

Correspondence
Dr.K.Divya
E-mail: dhivya_phy_edu@yahoo.co.in, Ph. +9182204 36393

Methodology

The purpose of this study was to analyze the impact of plyometric training on selected motor ability componenets, physiological and haematological, variables of college students. The research scholar employed random sample of thirty subjects drawn at random among the college women of Alagappa Arts College karaikudi. Their age ranges from eighteen to twenty five years. They are divided into three equal groups namely control group (Group I) plyometric training with 3days (Group II) plyometric training with

5days (Group III) The pre and post test design employing ANCOVA technique was adopted. The initial tests on selected variables were recorder for three groups. The Group I control group did not involve any training, the Group II were given plyometric training with 3days frequency. plyometric training with 5 days frequency (Group III).The initial and final results were recorded and the pilot study was conducted.

The selected test was measured by the following units of testing the hypothesis.50yards run was used to estimate the speed, measured in seconds. Standing broad jump was used to estimate the explosive power, measured in meters. Digital blood pressure monitor was to used estimate the blood pressure, pulse rate, measured in mmHg per minutes. Visual comparison on sahils acid haematin method was used to estimate the haemoglobin concentration through haemoglobin meter and measured in grams. Buck dilution method was used to estimate the RBC count through haemocytometer neubaucer counting chamber and measured in million per C.mm. The independent variables were plyometric training with 3days frequency and the plyometric training with 5days frequency. The analysis of data collected from the samples under study. Hence the difference among the difference between the means of three groups in pre-test had to taken in to account during the analysis of the post-test difference between the means. This was achieved by the application of analysis of co-variance, where the final means were adjusted for differences in the initial means and the adjusted means were tested for significance when the post test means were significant. The Scheffe's post hoc test was administered to find out the paried means significant difference.

Table I. Computation of analysis of co-variance

	Control Group	Exp. G – I	Exp. G – II	Source of variance	Some of squares	Df	Mean Square	Obtained f-ration
Adjusted post test mean speed	8.021	7.885	7.694	B :	0.55	2	0.27	27.000*
				W :	27.00	26	0.01	
Adjusted post test mean Explosive power	1.899	1.940	2.086	B :	0.73	2	0.36	9.000*
				W :	0.95	26	0.04	
Adjusted post test mean systolic pressure	123.049	120.4	105.734	B :	1476.338	2	738.169	124.924*
				W :	153.632	26	5.909	
Adjusted post test mean diastolic pressure	85.382	80.613	71.105	B :	1024.177	2	512.008	41.386*
				W :	321.711	26	12.373	
Adjusted post test mean pulse rate	73.363	71.101	69.735	B :	61.376	2	30.688	18.162*
				W :	43.933	26	1.690	
Adjusted post test mean Haemoglobin concentration	10.348	10.398	10.614	B :	0.380	2	0.190	28.257*
				W :	0.1750	26	0.007	
Adjusted post test mean RBC count	3.433	3.555	3.743	B :	0.467	2	0.233	30.908*
				W :	0.196	26	0.008	

Significant 0.05 Levels

Results and Discussion

The obtained F-ratio is 27.000, 9.000, 124.924, 41.386, 18.162, 28.257, 30.908 more than the table F-ratio at 0.05 level of confidence for 2 and 26 (df) =3.37. The hypothesis was accepted. The Scheffe's post hoc test means difference of speed for different groups. The obtained F-ratio's of the mean difference were 0.135, 0.19*, 0.325* the second and third comparison were significant and the 1st comparison were insignificant. The adjusted trail mean differences of explosive power for different groups were 0.073, 0.114, and 0.217*.The 1st and 2nd comparisons were significant. The adjusted trail mean difference of diastolic pressure for difference groups were 4.766, 9.508, 14.277 all the three comparisons were significant. The adjusted trails means different groups were 2.262, 1.366, 3.628 all the three comparisons were significant. The adjusted trails mean difference of haemoglobin concentration for different groups were 0.05, 0.216, 0.266.The 2nd and 3rd comparisons were significant and the 1st comparisons were insignificant. The adjusted trails mean difference of RBC count for different groups was 0.122, 0.188, 0.310.The 3rd comparisons were significant and the 1st and the 2nd comparison were insignificant.

The analysis of co-variance Dependent variables had indicated that experimental group I (Plyometric training with3days frequency) and the experimental group II (Plyometric training with 5 days frequency. It may be due to the nature of varied frequencies of plyometric training which would have

influenced to increase the biochemical levels of the functions of various organs and systems. The physical activities increase the percentage of haemoglobin in the blood. Any physical training is generally found to result in increased blood volume and total haemoglobin content. During exercise one of your goals is to lower the pulse rate. This will make the heart work more efficiently. The way to do this to place more stress on the heart to make it work a little harder and a little faster without over burdening it like any become stronger and more efficient. During exercise the dilation of blood vessels in the working muscles reduces the arterial resistance to blood flow more than the vasoconstriction in the non-working tissues, increases the resistance. The net effect of changes in blood vessels , size, during exercise to decrease the blood pressure simultaneously however , cardiac output cause a greater systolic pressure that more than counteracts the tendency toward reduced pressure caused by vasodilatation in the working muscles.

Since only a slight fall in blood pressure, speed is mainly determined by the characteristics of the muscle fibres. Due to training the involvement of fast twitch fibers, enzymes, were greatly increased. It helps to increase the reaction time, movement time, stride length and frequency. Hence there was significant improvement in speed. Plyometric training enhance both elastic and contractile components of the muscles, it has been successfully used to enhance power. it may also be noted that plyometric training the height of jumps and this may be the reason for plyometric training with 5 days have produced better result. Further findings of the study showed that the experimental group I did not improve the motor ability components, physiological and haematological variables. However the experimental of Group II had more effect on the improvement of speed, explosive power, pulse rate, blood pressure, RBC and haemoglobin concentration greater than the experimental group I and control group.

Conclusion

The motor ability components (Speed & Explosive power) and the physiological variables (Blood pressure & pulse rate) and haematological variables (RBC count & haemoglobin concentration) are increased due to the treatment with 5days frequency is better than the 3 days frequency of plyometric training. Hence the hypothesis was accepted on the above said variables.

Reference

1. Charles A.Bucher, “Anatomy and Physiology” (Saint Louis: Training Mirror,1987),P.422.
2. Chu Donald, “plyometric,the link between strength and speed”,1983,p.20-21
3. Clarke H.David and Harrison H.Clarke , “Research process in physical education”,1970.
4. Daniel D.Arnheim,” Modern principles of athletic Training”, 1982 p.10.
5. K.P.Manilal and K.P. Sajilal, “plyometric training important consideration and principles”, NIS Scientific journal,1995,p.5.
6. LKeubbers PE et.al. “Effects of plyometric training and recovery on vertical jump performance and Anaerobic power”, journal of strength and conditioning research, 2003, nov 17(4), 704-9.
7. Toumi H.et.al. “Effects of eccentric phase velocity of plyometric training on the vertical jump” International journal of sports Medicine, 2004, Jul: 25(5):391-8.
8. Turner A.M.et.al. “Improvement in Running Economy after 6 weeks plyometric training”, Journal strength conditioning Research, 2003, Feb”17(1):60-7.