Research Paper

Volume : 4 | Issue : 5 | May 2015 • ISSN No 2277 - 8179

Effect of Plyometric Training on Muscular Strength Among Nagaland University Students

Physical Education

KEYWORDS : plyometric training, muscular strength, university students

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ABSTRACT

The purpose of the study was to find out the effect of plyometric training on muscular strength among Nagaland university students. To achieve this purpose of the study, thirty men students were selected as subjects who were from the various faculties, Nagaland University, Lumami. The selected subjects were aged between 19 to 24 years. They were divided into two equal groups of fifteen each, Group I underwent plyometric 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 variables such as muscular strength prior to any immediately after the training period. The selected criterion variable such as muscular strength was determined through using Leg dynomometer. 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 muscular strength.

INTRODUCTION

Physical fitness is most easily understood by examining these components, or elements, or parts i.e., (endurance, strength, speed, agility, flexibility). Body composition is also considered as a component of fitness. It refers to the makeup of the body in terms of lean mass (muscle, bone, vital tissue and organs) and fat mass. An optimal ratio of fat to lean mass is an indication of fitness, and the right types of exercise will help to decrease body fat and increase or maintain muscle mass [1]. Training has been explained as a programme of exercise designed to improve the skills and increase the energy capacities of an athlete for a particular event. Training has been a part of human life since ancient times. It denotes the process of preparation for some task. Through systematic training programme one can improve his fitness both physically and mentally [2]. The concept of training is reflected in words or terms, which are given to separate components of training (technique training, strength training) or separate methods of procedures of doing physical exercise (interval training and circuit training). Training means are various physical exercises and their objective, methods and procedures, which are used for the improvement, maintenance and recovery of performance capacity and performance readiness. Physical exercises are the physical means of training. The other means are used in addition to physical exercises or separately as per requirement. Each training means has its own specific effect on the performance capacity. This effect may be direct or indirect. Physical exercises have a direct effect on performance capacity. Means like physiotherapy, autogenious training has indirect effect [3]. Plyometrics is defined as exercises that enable a muscle to reach maximum strength in as short time as possible. This speed strength ability is known as power. Although most coaches and athletes know that power is the name of the game, few have understood the mechanics, necessary to develop it. Plyometrics is a common training methodology used by competitive athletes to develop speed and power. Jumping, bounding, skipping, throwing or any basic recoil movement, which ballistically stretches muscles are characteristic of plyometric drills, and are characteristic of motions found virtually in energy sport. The acquisition of a more rapid and forceful contraction is the fundamental basis for engaging in plyometrics training. As with most forms of exercises there are varying degrees of difficulty of intensity. Muscles, along with bones, provide for posture and movement in the human body muscles are our only muscles selected structures that can lengthen and shorten. Unlike the other supporting structures, ligaments and tendons, muscles posses a unique ability to impart dynamic activity to the body [4].

METHODOLOGY

The purpose of the study was to find out the effect of plyometric training on muscular strength among university students. To achieve this purpose of the study, thirty men students were selected as subjects who were from the various faculties, Nagaland University, Lumami. The selected subjects were aged between 19 to 24 years. They were divided into two equal groups of fifteen each, Group I underwent plyometric training and Group II acted as control that did not participate in any special training apart from their regular sports and games practice. The experimental group underwent the training programme for three days per week for twelve weeks. The selected variable such as muscular strength was measuring by leg dynamometer. The data were collected at prior and immediately after the training programme for the selected variable. Analysis of covariance (ANCOVA) [5] was applied for analyze the data. In all the cases, 0.05 level was used to test this significance.

TRAINING PROGRAM

The eight plyometric exercises were given, in that sets/ reps variations in twelve weeks training are given below:

TABLE-I

Week	1 & 2	3 & 4	5 & 6	7 & 8	9 & 10	11 & 12
Sets/Reps	3× 6-8	3× 8-10	3× 10-12	3× 12-14	3× 14-16	3× 16-18

RESULTS

TABLE – II

MEAN STANDARD DEVIATION AND 'F' RATIO OF PLYOMETRIC TRAINING AND CONTROL GROUP ON MUSCULAR STRENGTH

		Plyometric Training Group	Control Group	F ratio
Pre Test	Mean	89.73	89.86	0.25
	S D	4.83	4.99	
Post Test	Mean	92.86	89.60	2.76
	S D	4.67	3.99	
Ad Post Test	Mean	92.82	89.44	52.35*

The table II shows that the pre-test means of plyometric training group and control group are 89.73 ± 4.83 and 89.86 ± 4.99 respectively. The obtained 'F' ratio of 0.25 for pre-test means of muscular strength was not significant at .05 levels indicating that the

two groups were no significant variation. The post-test means of plyometric training group and control group are 92.86 ± 4.67 and 89.60 ± 3.99 respectively. The obtained 'F' ratio of 2.76 for post-test means of muscular strength was not significant at .05 levels indicating that the two groups were no significant variation. The adjusted post-test means of plyometric training group and control group are 92.82 and 89.44 respectively. The obtained 'F' ratio of 52.35 for adjusted post-test means of muscular strength was significant at.05 level. The results of the study indicate that there is a significant difference among plyometric training group and control group on muscular strength.

DISCUSSION ON FINDINGS

Strength is key to success in modern athletics. It is much easier to improve than techniques. Strength may be defined as the neuromuscular capacity to overcome an external and internal resistance. It is fundamental for all sports and games. The basic principles of sports training in general are specificity, overload and reversibility. Sportsmen undergo various types of training to improve their performance and physical fitness. Plyometric training is a specific work for the enhancement of explosive power. It improves the relationship between maximum strength and explosive power. Toumi and others (2004) reported plyometric training performed with rapid stretch contraction, the CMJ jump height increase and the TR decrease. Khlifa (2010) found out loads added to standard plyometric training program may result in greater vertical and horizontal jump performances in basketball players. Trzaskoma, Tihanyi and Trzaskoma (2010) plyometric pendulum swing training combined with treadmill running can be an alternative, effective method to increase muscle strength and power during sport pre or in-season mesocycles.

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