



The effect of polymetric training on some selected skill related physical fitness improvement in the case of arara primary school male athletics project

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Abstract

The study was conducted in Amhara regional state in east Gojjam ,Enarji Enawuga woreda in the specific place of Arara primary school. The purpose of this study was to investigate the effect of plyometric training on some selected skill related physical fitness improvement in the case of Arara primary school male athletics project. The researcher was selected speed, agility and power from skill related physical related physical fitness variables. And the researcher was given 12-week plyometric training for the study groups. In Arara primary school, male athletes were the main target of the study. They were 18 in number. All 18 male athletes were selected by purposive sampling method. In order to assess the selected skill related physical fitness variables of male athletes in Arara primary school before and after 12-week plyometric training the main source of data collection was field tests. For all measures of speed with 60 meter running test, agility with Illinois agility test and power with vertical jump test were conducted. The data was analyzed through descriptive statistics (such as statistical procedures in which arithmetic mean, standard deviation and Paired-Samples T test). The results of this study showed that the plyometric training had statistically significant improvements in speed, agility and power at ($p < 0.05$). The results of this study showed that plyometric training improved athlete's speed, agility and power performance.

Keywords: agility, speed, power

Introduction

This section will present the background of the study, statement of the problem, scope of the study, hypothesis, significance of the study, general and specific objectives of the study.

Background of the Study

Plyometric are training techniques used by athletes in all types of sports to increase strength and explosiveness (Chu, 1998). Plyometric consists of a rapid stretching of a muscle (eccentric action) immediately followed by a concentric or shortening action of the same muscle and connective tissue (Baechle and Earle, 2000). Plyometric training (PT) has been proven to improve strength, agility and specific fitness performance. The main reason is because PT activates the stretch-shortening cycle (SSC) mechanism. The SSC can be best described as the lengthening of a muscle (eccentric phase) prior to an immediate shortening of a muscle (concentric phase). PT is mostly used when training athletes from pre puberty to late puberty. Due to building muscle mass and thus neural adaptations are easier to focus on (Sohnlein et. al., 2014).

Conditioning professionals have long depended on plyometric as one of the primary tools for developing athletic power, Strength and speed. That exercises such as plyometric, which are performed with high movement speeds, would improve the performance of activities requiring speed, such as jumping, running, and agility. The technical term for this idea is specificity. In other words, training that is specific or similar to the activity to be performed is believed to be optimal (William, 2007).

Power, the combination of speed and strength, is crucial for success in many sporting events. The purpose of plyometric work is the same as that of strength training, to develop greater physical power. Many athletes spend all their time in the weight room trying to increase power with barbell and dumbbell exercises. While these exercises have their place, they are not the most efficient means of developing power. Traditional weight room exercises do not allow the athlete to move at the speed, or use the movements needed, to develop sport specific power. While strength training can create the muscular and nervous system adaptations necessary for power development, plyometric focuses on the speed component of power and transforms the physiological changes into athletic ability (McNeely, 2007).

Plyometric, also known as "jump training" or "plyos", exercise in which muscle exert maximum force in short interval of time, with the goal of increasing power (speed-agility). This training focuses on learning to move from a muscle extension to a contraction in a rapid or "explosive" manner, such as in specialized repeated jumping. Study that indicate Plyometric are primarily used by athletes, especially martial artists, sprinters and high jumpers, to improve performance, and are used in the fitness field to a much lesser degree (k. Savithri,

2014). Additionally Plyometric training jumping, bounding, and hopping exercises that use the stretch shortening cycle of the muscle unit have consistently been shown to improve the production of muscle force and power. In particular, the fast force production of the trained muscle improves, coupled with smaller increases in maximum isometric force (www.nscj-jscr.org).

Research evidence suggests that plyometric training (PT) is a method of choice when aiming to improve vertical jump ability and leg muscle speed-strength and power and also the ground reaction time is decreased then after that plyometric training helps to improve reaction time and speed (Michael et al., 2006).

Research Methodology

The main objective of study was to investigate the effect of polymeric training on some selected skill related physical fitness improvements in Arara primary school male athletics project. The most appropriate methodology was purposive sampling technique. This chapter include subject of the study, study design, sample and sampling techniques, data collection instrument and procedure, training and testing procedure and data analysis techniques.

Area of the Study

The research was conducted in Amhara Regional State, in Enarj Enawga Woreda particularly in Arara primary school which is 140 km far from Debre Markos and 33 km far from Debrework (town of Enarj Enawuga Woreda).

Design of the study

The study was experimental research design that used to give information's to the researcher about the effect of polymeric training on some selected skill related physical fitness improvements in Arara primary school male athletics project. The researcher was used pre-test of speed, agility and power level of the athletes before taking the training. Next to pre-test the researcher was engaged in to the follow up of polymeric training for 12 weeks. After these the researcher was used posttests in order to decided that polymeric training had or not their own impact on speed, agility and power development of athletes after appropriate training.

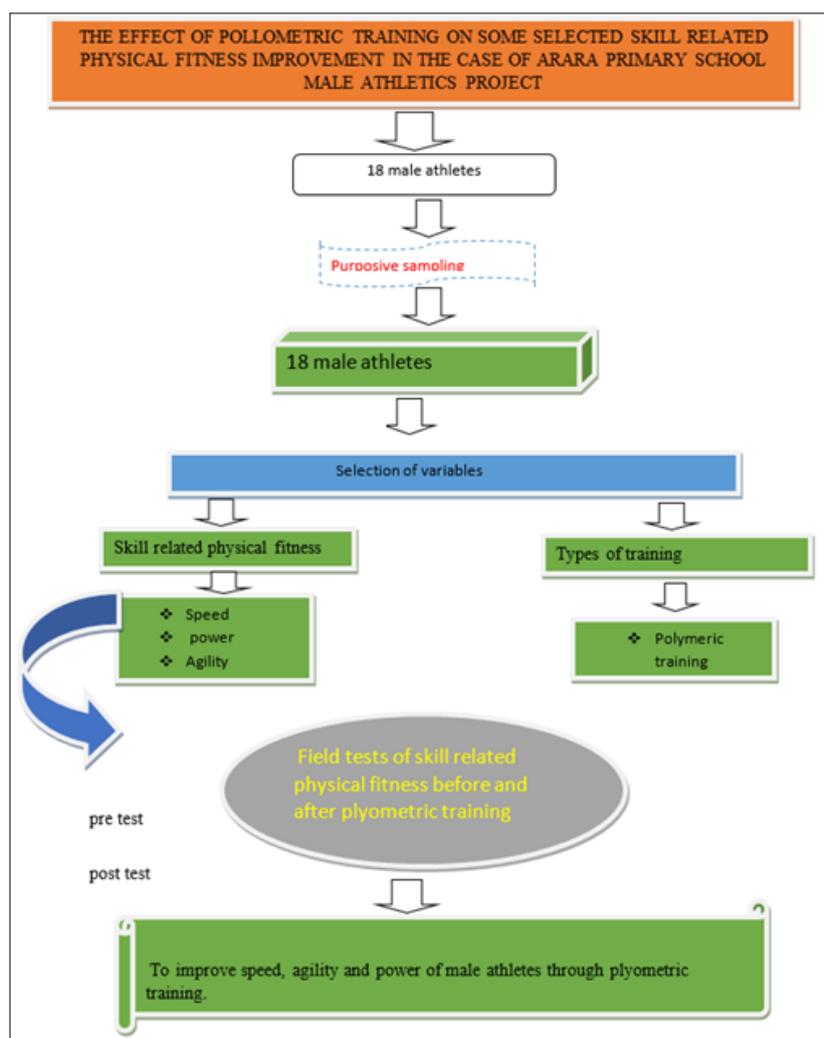


Fig 1

Target participants

There were only 18 male athletes in Arara primary school athletics project, so that the researcher was taken all male athletes as a target group for his study. The Participants were eligible, healthy, and volunteer, actively and frequently follow up the training for the study.

Sample size and Sampling techniques

U-17 male athletics project, athletes were the main subject of the study. The study was conducted in Enarj Enawga Wereda specifically in Arara primary school. The main focus of the study was on the effect of polymetric training on some selected skill related physical fitness improvements of Arara primary school male athletics project. For this purpose, 18 (eighteen) U-17 male athletes were selected. The researcher was selected athletes by using purposive sampling techniques. The reason was due to the observation of Arara primary school athletes project have a problem, like lack of speed run, agility and power to demonstrate in deferent events.

Source of Data

Data sources in the study was primary data. The primary data was collected from experimental variables through pre and post tests on selected physical fitness and skill performance parameters. The researcher was used different books, journals, internets and observation types of data collection tools were used for the purpose of gaining appropriate evidence from the targeted populations.

Method and Procedure of Data Collection

The data was collected through a pre and post treatment fitness tests of speed, agility and power; therefore, quantitative data collection method was used for this study. 60-meter run test for speed, zigzag test for agility and vertical long jump test for power was used to examine the effect of plyometric training on the above physical fitness components. The data was collected and recorded by the investigator with one assistance in Arara primary School in Arara primary school sport field.

Training Protocol

The subject for this study was engaged in the selected plyometric exercise program as experimental groups the training program was consisted of a selected plyometric exercise variables for 12 weeks (consecutive three month) of study. Frequency and duration of the exercise should be 3 days per week and up to 30 minutes per session the weekly exercise was conducted on Monday, Wednesday and Friday in the morning 12:00-1:00 local time from the binning up to the end of the program. All the participants were organized and selected based on their interest and their family consensus. While the participants joined in to the team, the researcher was preparing questionnaire for the identification of their current health status. And the athletes were followed warming up and taken serious of selected skill related fitness tests.

Tests

The relevant evidence data was gathered by using experimental pre & post field test of u-17 Arara male athletics project.

Muscular power Test**Vertical jump**

The objective of sergeant jump test was used to measure the development of the athlete's elastic leg strength and power. Chalks the end of his fingertips stands side onto the wall, keeping both feet remaining on the ground, reaches up as high as possible with one hand and marks the wall with the tips of the fingers (M1) from a static position jumps as high as possible and marks the wall with the chalk on his fingertips (M2). Three trials would be given and the highest distance would be record as a score in meter (Dessales, 2014).

Agility Test**Zigzag Test**

The objective of the zigzag test was used to monitor the athlete's speed and agility.

Required resources

To undertake this test, you will require: 5 cones, on slip surface, Stop watch and Assistant.

How to conduct the test

The Zigzag Test was conducted as follows

Marked out the course with four cones, placed on the corners of a rectangle 10 by 16 feet, with one more cone, placed in the center, The athlete was followed the grey route identified on the diagram. The athlete completes one circuit of the course starting and finishing at the Start/finish cone. The assistance was recorded the time for the athlete to complete the course.

Analysis

Analysis of the result was by comparing it with the results of previous tests.

It was expected that, with appropriate training between each test, the analysis would indicate an improvement in the athlete's agility.

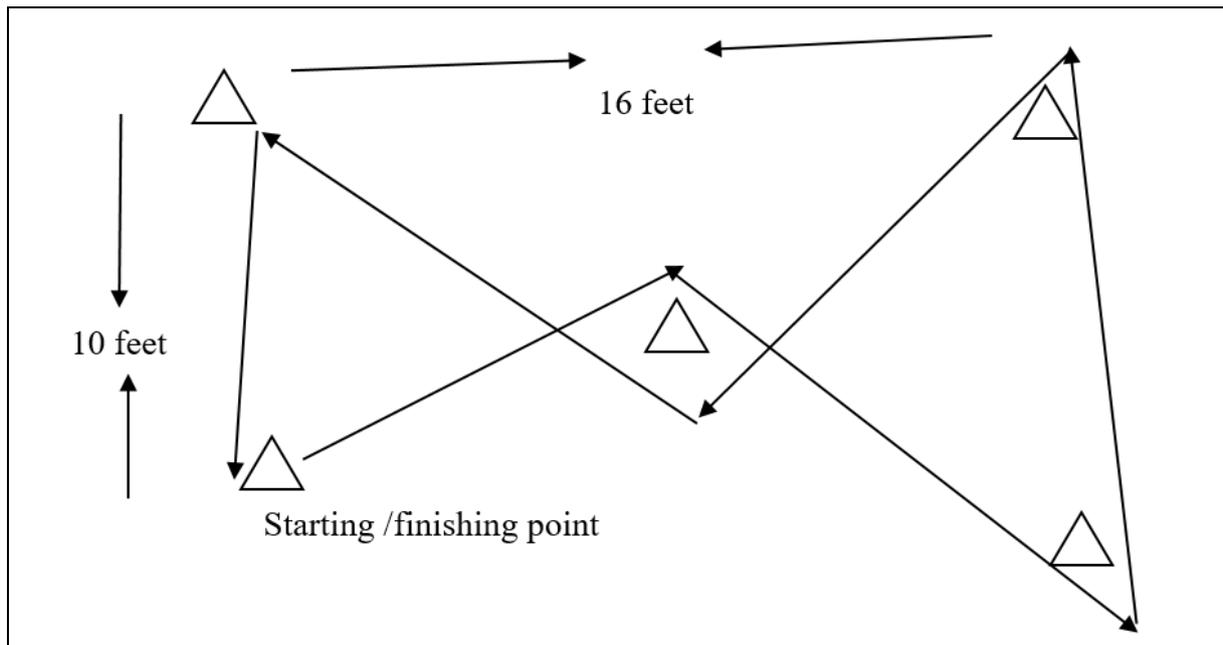


Fig 2

Speed Test

60m Speed Test

The Objective was to monitor the development of the athlete's maximum speed. The assistant marks out a 60-meter straight section (AC) with cones and places a cone at the 30-meter point (B). From a sprint start with appropriate start commands (on your marks, set, "GO") from the assistant the athlete sprints the 60m. The assistant starts the stopwatch on the command "GO". The assistant recorded the time the athlete torso crosses the 30-meter point (B) and the 60-meter point (C) (Davies, 2000).

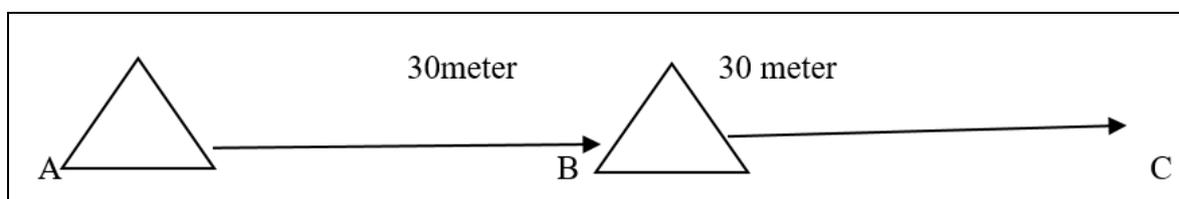


Fig 3

Scoring system

The data was recorded by using stop watch in second. The researcher was analyzed the data based on the result of 60 meter acceleration test of Arara primary school male athlete's performance before and after training.

Method of Data Analysis

The data collected through physical fitness test was analyzed, interpreted and I was tabulated in to meaningful idea by using descriptive statistical and was analyzed by using computerized Statistical Package software for Social Sciences (SPSS version 20) was present as a group mean value and standard deviations. The paired sample t-test was used to compare the data between pre- test and post-test. With the level of significance at $p < 0.05$.

Conclusions

Based on the major findings and limitation of the study, the researcher concludes the following points;

- Based on the results of 60-meter run pre and posttests, the present research demonstrated those 12 weeks of plyometric training had a beneficial impact on speed of male athletes in Arara primary school athletics project.
- Plyometric raining had appositve effect on the improvement of agility of male athletes in Arara primary school athletics project after taking 12-week trainings.
- The study showed that 12 weeks plyometric training program significantly improved power of male athletes based on vertical jump performance of pre and posttest results of male athletes in Arara primary school.

Generally, the results of this study showed that plyometric training had a great improvement of male athletes in Arara primary school athletics project with related to speed, agility and power performance.

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