



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (RJIF): 5.38
IJPESH 2023; 10(1): 272-275
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www.kheljournal.com
Received: 01-12-2022
Accepted: 05-01-2023

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Isolated and combined effect of plyometric and parcourse training on agility flexibility and speed among college basketball players

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DOI: <https://doi.org/10.22271/kheljournal.2023.v10.i1d.2790>

Abstract

The purpose of the study was to find out the isolated and combined effect of plyometric and parcourse training on agility, flexibility, and speed among college basketball players. Forty female basketball players aged between 18 to 22 years were selected randomly. They were divided into four groups (three experimental and one control group). Isolated plyometric, isolated parcourse and a combination of plyometric and parcourse are the experimental groups. All three experimental groups were given training for 12 weeks and the control group was not allowed to participate in any training programme. The subjects were tested for dependent variables such as agility, flexibility, and speed; at the beginning (pre-test); in middle (6 weeks - mid-test), and, after the training (12 weeks- post-test). The data were analyzed by applying ANOVA and ANCOVA. The result divulges significant changes in dependent variables such as agility, flexibility, and, speed as a result of isolated and combined effects of plyometric and parcourse training.

Keywords: Plyometric, parcourse, agility, flexibility, and speed

Introduction

“It’s not how hard you train; it’s how smart you train” (O’ Donnell)

“The sports competitions are constantly expanding with a concentration of rivalry that heightens the methodical swot up of human being actions. Sports actions are fervent in nature and are progressive. It is not confined to "What has been", but its target is to fix new targets” (Ervin, 1967) ^[11].

In all areas, individuals are betrothed in combat to excel over each other. This is true in the field of sports competitions and sports as well. Methodical investigations on the routine of sportspersons play an increasingly more imperative role in the transmission and training of sportspersons in a methodical way with extremely sophisticated means for better achievement in the sport concerned.

Human beings are by nature, competitive and then ambitious in their governance of all athletic performance. All men or nations want to illustrate their supremacy by demanding other men or nations. Thus, this face stimulates, inspires, and motivates the entire nation to sweat, strive, run faster, jump higher, throw farther, and exhibit greater strength, endurance, and skills in the present competitive world. Logical knowledge has reformed the standard of sports.

“Sports activities are the most amazing human deeds that formulate us fit. Physical fitness has been an imperative intention of physical education ever since its progression. Throughout the year professional workers are challenging their best for the development of physical fitness. A lot of investigation effort is going on at hand that lay emphasis on improving physical fitness. Physical educators and sports scientists have been persistently exploring sports enactments in relative the individual skills and fitness standards. They try to discover the factors that contribute to high performance, o that they can be utilized in the sensible aspect of the training”.

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The intention of training is foremost to reveal the genetic potential of the athlete and then to develop that potential without causing damage. Training is obligatory for two elementary reasons that, to provide the knowledge and skills to use the routine appraisal system well. The responses to a specific type of training can vary considerably from athlete to athlete. The imperative of which includes factors, such as better training methods, improved nutrition, better equipment, a playfield, and a better selection of athletes. Of these factors, training methods and procedures to select sportspersons for sports competitions have been markedly revolutionized. The fast progress made in the understanding of the mechanism involved in the adaptation of sportspersons to different training procedures has significantly contributed to the development of interval training, continuous training, Plyometric training, aerobic training, plyometric training, par course training, yogic practices, plyometric training, and resistance training. Variations in these training methods have been introduced to make them appropriate and to achieve specific performance objectives. Therefore, training methods are generally used according to the degree of the involvement of different elements of fitness in various sports competitions. Plyometric training primarily concentrated on the speed and force of different movements to build muscle power. Plyometric training develops your physical performance and ability to do different activities. Plyometric training includes different types of exercises, like push-ups throwing, running, jumping, and kicking. Athletes often use plyometrics as part of their training, but anyone can do these workouts. People who are in physical rehabilitation, after an accident or injury use plyometrics to get back into good shape and physical function.

Parcourse is a French term and par-course in English means mid-way obstacle in course of training. Parcourse is a training technique that combines continuous training with the exercise done at stations along the course (Williams, 1984) [12]. It involves jogging a short distance from station to station and

performing a designed exercise at a station, according to guidance and direction on a board located at that station. It consists of a series of stations set up over a 1 to 2.5-mile path and 18 to 24 stations (Biju Lukose 2010) [2].

Methodology

This study, isolated and combined the effect of plyometric and parcourse training on agility, flexibility, and speed among college basketball players. For this purpose, forty female basketball players of Bishop Kurialacherry College for women; Amalagiri, Kottayam of age group 18 to 22 years (Mean 19.6 years); height 149 to 169 cm (Mean 159.8 cm) and weight 39.5 Kg. to 29 Kg. (Mean 48.9 Kg.). The criterion variables selected for the study are agility, flexibility, and speed and were assessed by the following standardized test items such as: shuttle run test, sit and reach and 50mtrs run/walk test respectively. Forty female basketball players were randomly divided into four groups of ten subjects each. Group I underwent plyometric training, group II underwent Parcourse training group III underwent a combination of plyometric and parcourse training and group IV acted as the control group. The training schedule was for a period of 12 weeks. The data collected were analysed by one-way repeated measures; one-way analysis of variance (ANOVA) with repeated measures for the variables in order to determine the significant differences if any among the group (pre, mid, and post-test). Whenever the F -ratio was found to be significant, the analysis of covariance (ANCOVA) was used in order to find which group is superior among the groups. In all the cases 0.05 level was fixed as a significant level.

Analysis of the data and result of the study

The data on agility, flexibility, and speed before and after the training of experimental and control groups were analysed and presented in the following tables.

Agility

Table 1: One Way Repeated Measure Anova on Agility of Experimental and Control Groups

Group	Source of Variance	Sum of Squares	d.f	Mean Squares	F-ratio
Plyometric group	Test (Between)	0.38	2	0.19	7.13
	Error	0.74	28	0.03	
Parcourse group	Test (Between)	1.02	2	0.51	18.39
	Error	0.78	28	0.03	
Combined group	Test (Between)	1.97	2	0.99	44.85
	Error	0.62	28	0.02	
Control group	Test (Between)	0.00	2	0.00	0.00
	Error	0.01	28	0.00	

*Significant at 0.05 level of confidence.

Table 1 reveals that all the three experimental groups had shown significant improvement in agility within the group. The obtained one way repeated measure ANOVA (F- ratio)

values are 7.13, 18.39 & 44.85 of plyometric, parcourse and combination training groups respectively are higher than the table value 2 and 18 is 2.051387.

Table 2: Analysis of covariance of experimental and control groups on agility

Adjusted Post-test Mean				Source of variance	Sum of squares	d.f	Mean squares	F - ratio
Plyometric group	Parcourse group	Combined group	Control group					
9.456	9.544	9.368	9.685	Between	2.19	3	0.73	8.43*
				Error	3.03	75	0.09	

*Significant at 0.05 level of confidence.

Table 2 reveals that all three experimental groups had shown significant improvement in agility among the groups. The

obtained ANCOVA (F- ratio) value is 8.43 which is higher than the table value of 3 and 35 is 2.01678.

Flexibility**Table 3:** One Way Repeated Measure Anova on flexibility of experimental and Control Groups

Group	Source of variance	Sum of squares	d. f	Mean squares	F-ratio
Plyometric group	Test (Between)	85.31	2	42.66	51.51
	Error	23.19	28	0.83	
Parcourse group	Test (Between)	25.93	2	12.96	19.03
	Error	19.07	28	0.68	
Combined group	Test (Between)	158.15	2	79.08	77.64
	Error	28.52	28	1.02	
Control group	Test (Between)	5.25	2	2.63	0.70
	Error	105.75	28	3.78	

*Significant at 0.05 level of confidence.

Table 3 reveals that all three experimental groups had shown significant improvement in Flexibility within the group. The obtained one-way repeated measure ANOVA (F- ratio) values

are 51.51, 19.03 & 77. 64 of plyometric, parcourse, and combination training groups respectively are higher than the table value 2 and 18 is 2.051387.

Table 4: Analysis of Covariance of experimental and control groups on Flexibility

Adjusted post-test mean				Source of variance	Sum of squares	d. f	Mean squares	F – ratio
Plyometric group	Parcourse group	Combined group	Control group					
36.98	35.93	37.73	35.02	Between	166.11	3	55.37	9.77*
				Error	198.43	35	5.67	

*Significant at 0.05 level of confidence

Table 4 reveals that all three experiments had shown significant improvement in Flexibility among the groups. The obtained ANCOVA (F- ratio) value is 9.77 which is higher

than the table value of 3 and 35 is 2.01678.

Speed**Table 5:** One-Way Repeated Measure Anova on the speed of experimental and Control Groups

Group	Source of Variance	Sum of Squares	d.f	Mean Squares	F-ratio
Plyometric group	Test (Between)	0.46	2	0.23	2.32
	Error	2.79	28	0.10	
Parcourse group	Test (Between)	2.41	2	1.21	37.12
	Error	0.91	28	0.03	
Combined group	Test (Between)	2.07	2	1.03	96.74
	Error	0.30	28	0.01	
Control group	Test (Between)	0.00	2	0.00	0.67
	Error	0.02	28	0.00	

*Significant at 0.05 level of confidence.

Table 5 reveals that all three experimental groups had shown significant improvement in Flexibility within the group. The obtained one way repeated measure ANOVA (F- ratio) values

are 2.32, 37.12 & 96.74 of Parcourse, plyometric and combination training groups respectively are higher than the table value 2 and 28 is 2.051387.

Table 6: Analysis of Covariance of Experimental and Control Groups on Speed

Adjusted Post test Mean				Source of variance	Sum of squares	d.f	Mean squares	F – ratio
Plyometric group	Parcourse group	Combined group	Control group					
6.98	6.78	6.81	7.14	Between	3.22	3	1.07	6.24
				Error	6.02	35	0.17	

*Significant at 0.05 level of confidence

Table 7 reveals that all three experimental had shown significant improvement in speed among the groups. The obtained ANCOVA (F- ratio) value 6, 24 which is higher than the table value of 3 and 35 is 2.01678.

2. Among the three experimental groups, the combined training group (plyometric and parcourse) showed better improvement in all dependent variables. The isolated plyometric training group showed better improvement in all dependent variables than the isolated parcourse training group.

Discussion of findings

1. There are significant changes in all the subjects of isolated plyometric, isolated parcourse training and combined plyometric and parcourse training experimental groups; due to the experimental training programme in the training schedule. From the tables, it is clear that all dependent variables such as significant changes were noticed within the group and among the groups.

Conclusions

On the basis of the findings, it was concluded that

1. Combined training group (Plyometric and Parcourse) showed better significant improvement than isolated Plyometric and Parcourse in all dependent variables such as agility, flexibility, and speed.

2. Isolated parcourse training group showed better significant improvement than the isolated plyometric in all dependent variables such as agility, flexibility, and speed.

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