



A COMPARATIVE STUDY ON THE IMPACT OF PLYOMETRIC AND CIRCUIT TRAINING ON SELECTED SKILL PERFORMANCE VARIABLES IN FOOTBALL PLAYERS

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Abstract:

The purpose of the study was to find out the effect of plyometric training and circuit training on selected skill performance variables among football players. To achieve the purpose of the present study, forty five football players from Kozhikode, Kerala, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. Group I acted as Experimental Group I (Plyometric training), Group II acted as Experimental Group II (Circuit training) and Group III acted as Control Group. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their physical variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses. It was observed that the twelve weeks of plyometric training and circuit training have significantly improved the selected skill performance variables among football players than the control group.

Key Words: Plyometric, Circuit, Football.

Introduction:

Plyometric training is a specialised exercise method designed to enhance explosive power and neuromuscular efficiency, both of which are essential for football performance. Football players frequently engage in high-intensity, short-duration actions such as sprinting, jumping, tackling, and quick directional changes. Plyometric exercises characterised by rapid stretching (eccentric phase) followed by forceful contraction (concentric phase) of the muscles help develop the ability to generate maximal force in minimal time. This improvement translates directly to better jumping ability, acceleration, kicking power, and agility on the field (Chu, 1992; see also Marković & Mikulic, 2010).

Plyometric drills such as bounding, hopping, depth-jumps and medicine-ball throws are often incorporated into football conditioning programmes. When properly supervised and progressively structured, these exercises enhance the efficiency of the stretch-shortening cycle, reduce ground contact time, and improve reactive strength key attributes for football players who must perform explosive movements repeatedly throughout a match. Indeed, meta-analytical evidence demonstrates that plyometric training produces moderate improvements in jump, sprint and change-of-direction ability in adolescent soccer players (Sleivert et al., 2022; Chen et al., 2024).

Circuit training, on the other hand, offers a comprehensive approach to developing strength, endurance, and cardiovascular fitness all crucial components of football performance. It involves performing a sequence of exercises targeting different muscle groups with minimal rest between stations. This format not only improves muscular endurance and aerobic capacity but also mirrors the intermittent nature of football, where players must sustain high-intensity efforts interspersed with short recovery periods.

Circuit training can be tailored to football-specific movements, incorporating drills such as shuttle runs, push-ups, squats, sprints, agility ladder work, and core exercises. By combining resistance and aerobic elements, circuit training enhances both anaerobic and aerobic energy systems, improving players' ability to maintain performance levels throughout the game (Hardiansyah, Nasrulloh, & Sulistiyono, 2025). For example, recent research on collegiate football players showed significant gains in speed, endurance, flexibility and agility after a 12-week circuit training programme (Andrew et al., 2025).

In football, the integration of plyometric and circuit training contributes to improved strength, speed, agility, endurance, and overall skill performance. Together, these training methods support the physical demands of the sport, enhance functional movement efficiency, and ultimately contribute to superior athletic performance on the field.

Methodology:

The purpose of the study was to find out the effect of plyometric training and circuit training on selected skill performance variables among football players. To achieve the purpose of the present study, forty five football players from Kozhikode, Kerala, India were selected as subjects at random and their ages ranged from 18 to 25 years. The subjects were divided into three equal groups of fifteen subjects each. Group I acted as Experimental Group I (Plyometric training), Group II acted as Experimental Group II (Circuit training) and Group III acted as Control Group. The duration of experimental period was 12 weeks. After the experimental treatment, all the forty five subjects were tested on their physical variables. This final test scores formed as post test scores of the subjects. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences, whenever the 'F' ratio for adjusted test was found to be significant, Scheffe's post hoc test was used. In all cases 0.05 level of significance was fixed to test hypotheses.

Results:

Table 1: Computation of Mean and Analysis of Covariance of Passing of Plyometric Training and Circuit Training and Control Groups

	PTG	CTG	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	4	4.06	3.93	BG	0.13	2	0.06	0.11
				WG	23.86	42	0.56	
Post Test Mean	8.66	7.33	4	BG	173.33	2	86.66	287.36*
				WG	12.66	42	0.3	
Adjusted Post Test Mean	8.66	7.33	4	BG	172.4	2	86.2	281.61*
				WG	12.55	41	0.3	

* Significant at 0.05 level

Table value for df 2, 42 was 3.21 and 2, 41 was 3.22

The above table indicates the adjusted mean value of passing of plyometric training and circuit training and control groups were 8.66, 7.33 and 4.00 respectively. The obtained F-ratio of 281.61 for adjusted mean was greater than the table value 3.22 for the degrees of freedom 2 and 41 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on passing. The above table also indicates that both pre and post test means of experimental and control groups differ significantly. The pre, post and adjusted mean values of passing of both experimental and control groups are graphically represented in the figure 1.

Figure 1: Shows the Mean Values on Passing of Plyometric Training and Circuit Training and Control Groups



Table 2: Adjusted Mean and Differences between the Means of Plyometric Training and Circuit Training and Control Groups on Passing

PTG	CTG	Control Group	Mean Difference	CI Value
8.66	7.33	---	1.33*	0.5
8.66	---	4	4.66*	
---	7.33	4	3.33*	

Table 2 shows the adjusted means on passing and difference between the means of the plyometric training, circuit training and control groups. The mean differences of plyometric training and circuit training group, plyometric training and control group, circuit training group and control groups were 8.66, 7.33 and 4.00 respectively was greater than the CI value 0.50. Hence there exists significant difference.

Table 3: Computation of Mean and Analysis of Covariance of Kicking of Plyometric Training and Circuit Training and Control Groups

	PTG	CTG	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	3.8	3.93	4.13	BG	0.84	2	0.42	0.84
				WG	21.06	42	0.5	
Post Test Mean	7.6	6.53	4.26	BG	86.93	2	43.46	34.92*
				WG	52.26	42	1.24	
Adjusted Post Test Mean	7.68	6.54	4.17	BG	92.23	2	46.11	40.46*
				WG	46.73	41	1.14	

* Significant at 0.05 level

Table value for df 2, 42 was 3.21 and 2, 41 was 3.22

The above table indicates the adjusted mean value of kicking of plyometric training and circuit training and control groups were 7.68, 6.54 and 4.17 respectively. The obtained F-ratio of 40.46 for adjusted mean was greater than the table value 3.22 for the degrees of freedom 2 and 41 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on muscular endurance. The above table also indicates that both pre and post test means of experimental and control groups differ significantly. The pre, post and adjusted mean values of kicking of both experimental and control groups are graphically represented in the figure 2.

Figure 2: Shows the Mean Values on Kicking of Plyometric Training and Circuit Training and Control Groups

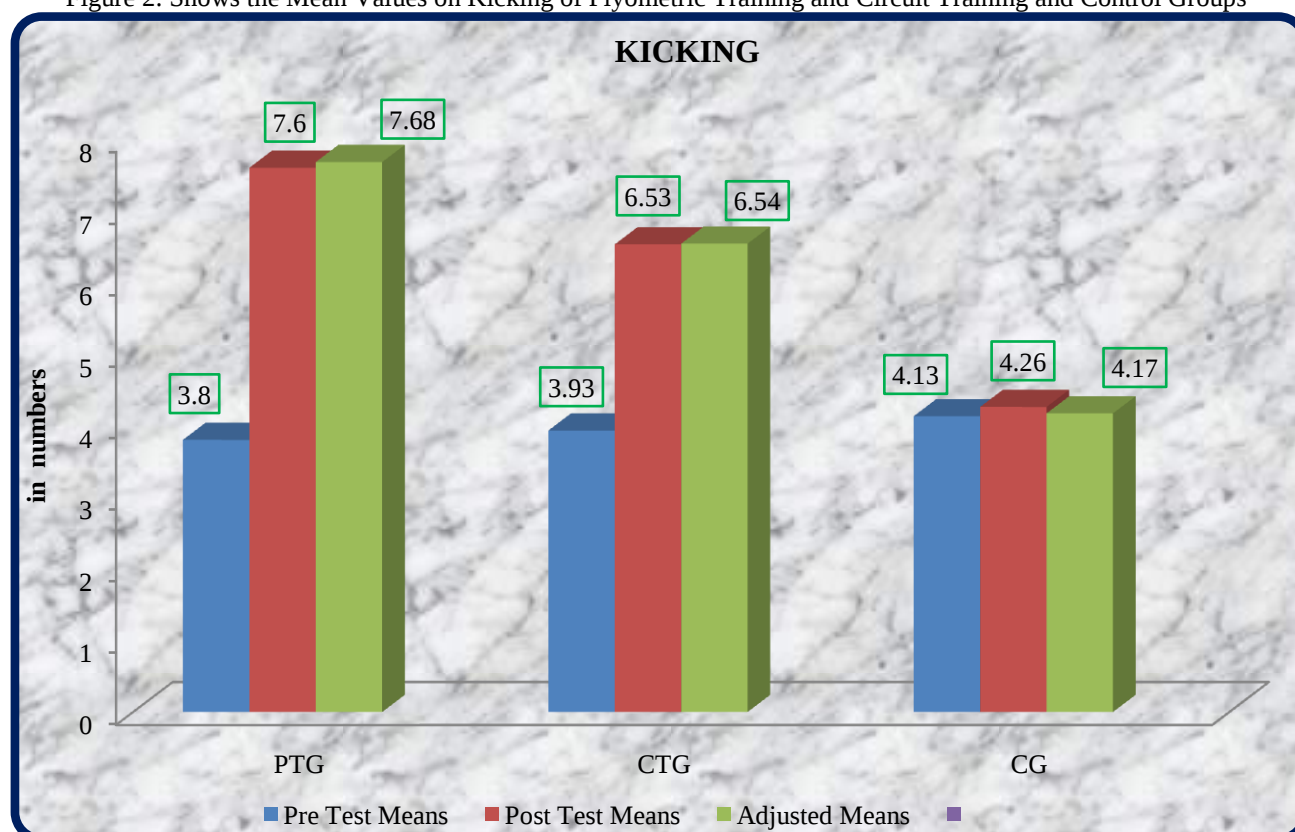


Table 4: Adjusted Mean and Differences between the Means of Plyometric Training and Circuit Training and Control Groups on Muscular Endurance

PTG	CTG	Control Group	Mean Difference	CI Value
7.68	6.54	---	1.14*	0.98
7.68	---	4.17	3.51*	
---	6.54	4.17	2.37*	

Table 4 shows the adjusted means on kicking and difference between the means of the plyometric training, circuit training and control groups. The mean differences of plyometric training group and circuit training group, plyometric training group and control group, circuit training group and control groups were 1.14, 3.51 and 2.37 respectively was greater than the CI value 0.98. Hence there exists significant difference.

Conclusion:

- It was observed that the twelve weeks of plyometric training have significantly improved the selected skill performance variables among football players than the control group.
- It was observed that the twelve weeks of yogic practices have significantly improved the selected skill performance among football players than the control group

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