

EFFECT OF PLYOMETRIC TRAINING ON SELECTED PHYSICAL VARIABLES AMONG MEN FOOTBALL PLAYERS

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Introduction

Ramirez-Campillo(2019) stated that football is a sport that demands a combination of cardiovascular endurance and explosive power from its players. In pursuit of enhancing the athletic performance of men football players, this study investigates the effects of plyometric training on selected physical variables Plyometric training, characterized by rapid muscle contraction and stretching, has gained recognition as a training modality capable of improving various aspects of physical fitness. The focus of this research is on two critical variables: Cardio-Respiratory Endurance and Explosive Power. These variables play pivotal roles in a football player's ability to sustain prolonged periods of activity and execute explosive actions such as sprinting, jumping, and tackling. Understanding the impact of plyometric training on these variables among men football players is crucial for coaches, trainers, and players themselves in optimizing training protocols for improved on-field performance.

Plyometric Training

Plyometrics, also known as jump training are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing speed-strength. 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. Plyometrics 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. Sebastian, M. M. D. P. (2018)

Research Gap

Despite the wealth of research on plyometric training in various athletic contexts, there remains a noticeable research gap concerning its specific effects on men football players. According by Ramirez-Campillo(2016) plyometric training has demonstrated efficacy in enhancing cardiovascular and muscular parameters in different sports, its application and outcomes within the unique demands of football are not extensively explored. The gap

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in existing literature prompts the need for a focused investigation into the effects of plyometric training on Cardio-Respiratory Endurance and Explosive Power among men football players. Additionally, considering the age range of 19 to 24 years in this study, it addresses a crucial developmental phase where players are refining their physical attributes. By identifying and filling this research gap, the study aims to contribute valuable insights to the field of sports science and provide practical implications for the training regimens tailored to men football players.

Hypothesis

F There was a significant improvement on selected dependent variable such as Cardio Respiratory Endurance and Explosive Power on effect of plyometric training on selected physical variables among men football players

Sample & Method

The purpose of this study was to effect of plyometric training on selected physical variables among men football players. To achieve the purpose of the study taken(N=30) men football players from Vadakudi football club and Veylangudi football club Karaikudi. The selection of Variables is Cardio-Respiratory Endurance and Explosive Power. The subject's age ranged from 19 to 24 years. The selected subject was divided into two Equal groups each group fifteen (N=15) subject Group-I Plyometric Training Group and Group -II Control Group. The Plyometric Training Group was treated with their respective training for one and a half hours per day weekly threedays for eight weeks.

Table -I

Selection of Variables and Criterion Measures

Sl.No	Criterion Variables	Test Items	Units of Measurement
1.	Cardio-Respiratory Endurance	12 Minutes Run	In Meters
2.	Explosive Power	Standing Broad Jump	In Meters

Statistical Analysis

All the subjects were tested on selected criterion variables. The data about the variables were examined by using paired sample 't' test cell mean differences. The level of significance was fixed at a 0.05 level of confidence for all the cases.

Table -II

The Summary of Mean and Paired Sample 'T' Tests for the Pre and Post-Test on Cardio Respiratory Endurance of Plyometric Training and Control Groups

Sl.No	Groups	Pre Test Mean	Post Test Mean	t' ratio	Table Value
1.	Plyometric Training Group	2890.00	3203.33	10.35*	2.15
2.	Control Group	3020.00	3000.00	0.56	2.15

*Significantat0.05level

Table -II shows that the obtained dependent 't' ratio values between the pre and post-testmean plyometric training group and control groups are 10.35*and 0.56 respectively. The table value required for significant differences with df 14 at 0.05 level is 2.15 Since theobtained 't' ratio value of experimental groups is greater than the table value, it is understood thatthe plyometric training group had significantly improved the cardiorespiratory enduranceperformance.

Pre and Post-Test on Cardio-respiratory Endurance onPlyometricTrainingandControlGroups

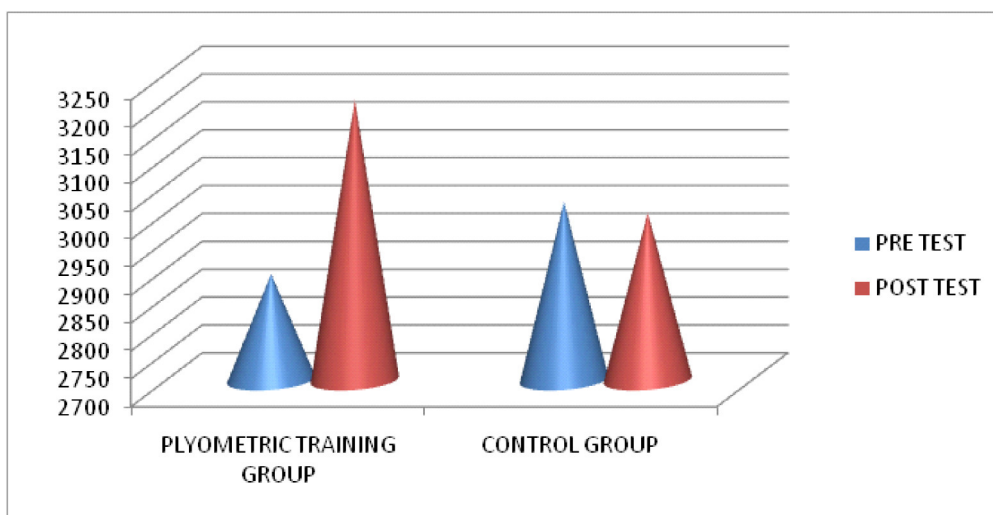


Table -III

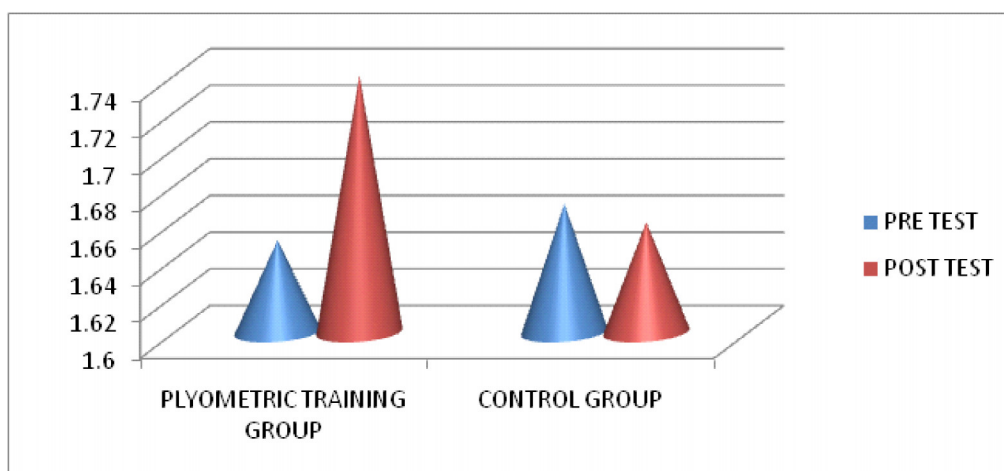
TheSummaryofMeanandPaired Sample'T'TestsforthePreandPost-TestonExplosivePower ofPlyometric TrainingandControlGroups

Sl.No	Groups	PreTest Mean	PostTestMean	' t'ratio	TableValue
1.	StrengthEnduranceTrainingGroup	1.65	1.74	7.16*	2.15
2.	ControlGroup	1.67	1.66	1.94	2.15

*Significantat0.05level.

Table- III shows that the obtained dependent 't' ratio values between the pre and post-testmean plyometric training group and control groups are7.16*and 1.94 respectively. The table value required for significant differences with df 14 at 0.05 level is 2.15 Since theobtained't'ratiovalueofexperimentalgroupsisgreaterthanthe tablevalue,it is understoodthat theplyometric traininggrouphadsignificantlyimprovedtheexplosivepower performance.

Pre and Post-Test on Explosive Power on StrengthEndurance TrainingandControl Groups



Discussion:

The findings of this study reveal a significant improvement in the selected physical variables, namely Cardio-Respiratory Endurance and Explosive Power, among men football players subjected to plyometric training. The study focused on players from Vadakudi and Veylangudi football clubs in Karaikudi, with participants aged between 19 to 24 years. The intervention consisted of one and a half hours of plyometric training per day, three days a week, over an eight-week period.

Cardio-Respiratory Endurance is a critical aspect of football performance, influencing players' ability to sustain aerobic activities throughout the match. The significant improvement observed in this variable suggests that plyometric training positively impacts the players' cardiovascular and respiratory systems. Plyometric exercises, which involve rapid stretching and contracting of muscles also, likely contributed to enhanced cardiovascular efficiency and endurance, enabling players to meet the demands of the sport more effectively.

Explosive Power is another crucial component for football players, influencing actions such as sprinting, jumping, and tackling. The study's findings indicate a noteworthy enhancement in Explosive Power among the group subjected to plyometric training. This improvement is consistent with the nature of plyometric exercises, which are designed to enhance the muscles' ability to generate maximal force in minimal time. Such improvements in explosive power can have direct implications for the players' agility, speed, and overall performance on the field.

The significance of these findings lies in the practical application for coaches and trainers working with football players. Incorporating plyometric training into the regular

training regimen can be a valuable strategy for enhancing both Cardio-Respiratory Endurance and Explosive Power, contributing to overall improved athletic performance.

Conclusion

In conclusion, the present study provides evidence supporting the positive effects of plyometric training on selected physical variables among men football players. The improvements observed in Cardio-Respiratory Endurance and Explosive Power over the eight-week intervention period signify the potential benefits of incorporating plyometric exercises into the training routines of football players. Coaches and trainers should consider implementing plyometric training as a targeted and effective means of enhancing the cardiovascular and muscular aspects crucial for football performance. The findings of this study contribute to the growing body of literature supporting the efficacy of plyometric training in optimizing physical performance in football, emphasizing the importance of a well-structured training program for athletic development.

References

1. Diallo, O., Dore, E., Duche, P., & Van Praagh, E. (2001). Effects of plyometric training followed by a reduced training programme on physical performance in prepubescent soccer players. *Journal of sports medicine and physical fitness*, 41(3), 342.
2. Gregory C. Bogdanis, Olyvia Donti, et.,al (2019) Effect of Plyometric Training on Jumping, Sprinting and Change of Direction Speed in Child Female Athletes, May; 7(5): 116. Published online 2019 May 17. doi: 10.3390/sports7050116
3. Marcin Maciejczyk, Renata B?yszczuket.,al (2021) Effects of Short-Term Plyometric Training on Agility, Jump and Repeated Sprint Performance in Female Soccer Players, Mar; 18(5): 2274. Published online 2021 Feb 25. doi: 10.3390/ijerph18052274.
4. Mengesh, M., Sangeeta, R. A. N. ?, & Deyou, M. (2015). Effects of plyometric training on soccer related physical fitness variables of intercollegiate female soccer players. *Turkish Journal of Kinesiology*, 1(1), 20-24.
5. Mina Ahmadi, Hadi Nobariet.,al (2021) Effects of Plyometric Jump Training in Sand or Rigid Surface on Jump-Related Biomechanical Variables and Physical Fitness in Female Volleyball Players, Dec; 18(24): 13093. Published online 2021 Dec 11. doi: 10.3390/ijerph182413093.
6. Ramirez-Campillo, R., Alvarez, C., García-Pinillos, F., Gentil, P., Moran, J., Pereira, L. A., & Loturco, I. (2019). Effects of plyometric training on physical performance of young male soccer players: potential effects of different drop jump heights. *Pediatric exercise science*, 31(3), 306-313.

7. Ramirez-Campillo, R., Alvarez, C., Gentil, P., Loturco, I., Sanchez-Sanchez, J., Izquierdo, M., ... & Granacher, U. (2020). Sequencing effects of plyometric training applied before or after regular soccer training on measures of physical fitness in young players. *The Journal of Strength & Conditioning Research*, 34(7), 1959-1966.
8. Ramírez-Campillo, R., Vergara-Pedrerros, M., Henríquez-Olguín, C., Martínez-Salazar, C., Alvarez, C., Nakamura, F. Y., ... & Izquierdo, M. (2016). Effects of plyometric training on maximal-intensity exercise and endurance in male and female soccer players. *Journal of sports sciences*, 34(8), 687-693.
9. Ribeiro, J., Teixeira, L., Lemos, R., Teixeira, A. S., Moreira, V., Silva, P., & Nakamura, F. Y. (2020). Effects of plyometric versus optimum power load training on components of physical fitness in young male soccer players. *International journal of sports physiology and performance*, 15(2), 222-230.
10. Rodrigo Ramirez-Campillo, Jason Moranet., al(2022) Programming Plyometric-Jump Training in Soccer, Jun; 10(6): 94. Published online 2022 Jun 10. doi: 10.3390/sports10060094.
11. Sebastian, M. M. D. P. (2018). Effects of plyometric with functional training on selected physical fitness physiological and skill performance variables of intercollegiate male football players. *International Journal of Physical Education, Sports and Health*, 5(6), 22-25.
12. Yosser Cherni, Mohamed Chedly Jlidet., al (2019) Eight Weeks of Plyometric Training Improves Ability to Change Direction and Dynamic Postural Control in Female Basketball Players, ; 10: 726. Published online 2019 Jun 13. doi: 10.3389/fphys.2019.00726