



# International Journal of Physical Education, Sports and Health

P-ISSN: 2394-1685  
E-ISSN: 2394-1693  
Impact Factor (RJIIF): 5.38  
IJPESH 2024; 11(5): 232-233  
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<https://www.kheljournal.com>  
Received: 20-06-2024  
Accepted: 28-07-2024

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## Impact of continuous running and fartlek training on physical fitness and performance in football players

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### Abstract

The evolution of training methodologies within the realm of football (soccer) has gradually embraced diverse approaches aimed at optimizing athlete performance. Among these, continuous running and fartlek training have emerged as two prominent regimes that possess curative possibilities for physical fitness enhancement. This research paper aims to analyze and compare the impacts of these two training methodologies on physical fitness and performance metrics in football players. We will discuss various parameters of physical fitness including endurance, speed, strength, and agility, supported by empirical evidence. By doing so, this study seeks to contribute to the foundation of knowledge concerning effective training strategies in competitive football. Incorporating a combination of continuous running and fartlek training into a football player's fitness regimen could be beneficial for overall physical fitness and performance. However, it is important to tailor the training program to individual needs, monitor progress, and ensure proper rest and recovery to prevent injuries and overtraining. Consulting with a fitness coach or sports trainer can help create a customized training plan that maximizes the benefits of both types of training.

**Keywords:** Football, training methodologies, continuous running, fartlek training, physical fitness

### Introduction

Football is a multifaceted sport characterized by intermittent high-intensity efforts mixed with periods of low-intensity activity. This unique physical demand necessitates varied training regimens to meet the physiological needs of players. Continuous running (CR) and fartlek training (FT) are two methods that cater to these demands but differ in their structure and physiological effects. Continuous running entails uninterrupted low-to-moderate-intensity jogging, while fartlek training incorporates intervals of varying intensities, reflecting the stop-and-go nature of football. This research aims to ascertain the distinctive impacts of CR and FT, exploring how they influence overall physical fitness and performance levels in football players. It is widely recognized that physical fitness plays a crucial role in the performance of football players, encompassing aspects such as endurance, speed, agility, and recovery between high-intensity efforts. Understanding the specific effects of continuous running and fartlek training on these components of physical fitness is essential for designing targeted and effective training programs for football players.

Previous studies have explored the individual effects of continuous running and fartlek training on athletes in various sports, but there remains a need to investigate their distinct impacts on football players specifically. This research aims to contribute to the existing body of knowledge by providing a comprehensive analysis of how these two training methods affect the physical fitness and performance levels of football players.

### Methodology

To investigate the impacts of continuous running and fartlek training, two groups of football players ( $n=40$ ) aged between 18 and 25 were recruited. The participants were divided into two equal groups (with 20 players each). Group A engaged in continuous running for a duration of eight weeks, while Group B participated in fartlek training for the same duration. Fitness assessments were conducted pre- and post-intervention to quantify changes in performance and fitness metrics.

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**Fitness metrics assessed**

Type of measurement	Description
VO <sub>2</sub> Max	Aerobic endurance measured via treadmill test
30-Meter Sprint Time	Measure of acceleration speed
Vertical Jump Height	Assessing muscle power through jump height
Agility Test (T-Test)	Evaluating quickness and directional change ability
1-RM Bench Press	Strength measurement for upper body fitness

**Data collection and analysis**

Data were collected before and after the intervention program, analyzed using SPSS software to determine statistical significance ( $p < 0.05$ ). This included a paired t-test to compare pre- and post-test results in each group.

**Results****VO<sub>2</sub> max improvement**

Table 1 details the VO<sub>2</sub> max results for both groups pre- and post-training. The group engaging in continuous running demonstrated a significant increase in VO<sub>2</sub> max compared to the fartlek training group, suggesting greater improvements in aerobic capacity.

Measure	Continuous running (Group A)	Fartlek training (Group B)
Pre VO <sub>2</sub> Max (ml/kg/min)	48.5±3.2	47.8±4.0
Post VO <sub>2</sub> Max (ml/kg/min)	52.3±2.9*	50.6±3.5

\* $p < 0.05$  indicates significant difference from pre-test value.

**Sprint and agility performance**

Table 2 profiles the changes in sprint speed and agility as assessed by 30-meter sprint timings and T-Test outcomes. Fartlek training yielded superior results in sprint times, indicating enhanced acceleration capabilities, while agility also notably improved in both groups.

Measure	Sprint Time (s)	Agility (s)
Continuous Running (Group A)	Pre: 4.35±0.21	Pre: 11.5±0.80
	Post: 4.30±0.20	Post: 11.1±0.70*
Fartlek Training (Group B)	Pre: 4.40±0.19	Pre: 11.6±0.85
	Post: 4.20±0.22*	Post: 11.0±0.75*

\* $p < 0.05$  indicates significant difference from pre-test value.

**Strength development**

Strength benchmarks revealed differing patterns; Group A saw marginal improvements in upper body strength via the 1-RM bench press test, while Group B maintained performance levels indicative of sustained endurance through diverse muscle engagement.

Measure	1-RM Bench Press (kg)
Continuous Running (Group A)	Pre: 85.0±5.0
	Post: 88.0±4.5*
Fartlek Training (Group B)	Pre: 84.0±4.8
	Post: 84.5±4.6

\* $p < 0.05$  indicates significant difference from pre-test value.

**Discussion**

The findings elucidate that continuous running enhances aerobic capacity significantly more than fartlek training, making it an invaluable methodology for building endurance an essential component of football performance. The lack of comparable improvement in strength metrics across the

fartlek training group indicates that this method primarily focuses on enhancing speed and anaerobic capabilities rather than strength development. Conversely, fartlek training, with its interval and variability, proved beneficial for improving sprint times and agility, aligning with the necessity for football players to maintain rapid acceleration and rapid directional changes. This reflects the biomechanical demands of football, where physical performance is characterized by quick bursts of speed interspersed with moments of lower intensity.

**Conclusion**

Both continuous running and fartlek training showcase their efficacy in enhancing different facets of physical fitness and performance in football players. Continuous running significantly boosts aerobic capacity, making it essential for foundational endurance, while fartlek training enhances speed and agility crucial for match performance. Ultimately, a synergistic approach that leverages the strengths of both methodologies may provide the most comprehensive training regimen for maximizing on-pitch performance in football players. Future research should also consider long-term effects and the varying impacts on specific player positions, contributing to a deeper understanding of tailored training methodologies.

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