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Effects of Position-Switching Training on Muscular Strength and Technical Performance in U-20 Football Players: An Experimental Study

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Abstract: This study aimed to design and implement position-switching exercises and examine their effects on muscular strength and fundamental football skills among under-20 players. An experimental approach with a one-group pre-test-post-test design was adopted. The sample consisted of 12 players from Al-Sinaa Sports Club (Baghdad, Iraq). The training program lasted eight weeks (three sessions per week), incorporating structured position-switching drills within the main part of each. training session. The results revealed statistically significant improvements ($p \leq 0.05$) in all physical and skill variables, including explosive power, speed-strength, strength endurance, passing accuracy, and dribbling performance. The magnitude of change across variables indicates a meaningful practical impact of the intervention. The study concludes that position-switching training represents an effective and practical method for developing youth football players, as it integrates physical and technical components within. realistic performance contexts.

Keywords: Position-Switching, Muscular Strength, Football Training, Technical Skills

Introduction

Football is widely recognized as one of the most complex and dynamic sports, requiring the integration of physical, technical, tactical, and psychological components to achieve optimal performance. Among these components, muscular strength plays a central role in enabling players to execute essential movements such as sprinting, jumping, and rapid directional changes, in. addition to supporting technical skills like passing, dribbling, and shooting.

In contemporary football, the rapid evolution of training methodologies has led to a growing emphasis on integrated training approaches that develop multiple performance aspects simultaneously rather than in isolation. One of the emerging approaches in this context is position- switching training, which involves players performing different positional roles within the same training unit. This method increases movement variability, enhances neuromuscular coordination, and exposes players to diverse technical and tactical situations that closely resemble real match. Conditions.

Despite these advancements, observations from practical field experience indicate that many youth coaches continue to rely on traditional training methods that emphasize fixed positional roles and repetitive drills. Such approaches may limit players' adaptability and reduce opportunities for comprehensive development. Therefore, there is a clear need to investigate training methods that. promote both physical and technical development in an integrated and efficient manner

The importance of this study lies in its attempt to provide a scientifically grounded training approach that combines physical and technical development through position-switching exercises. This contributes to enriching the field of sports training by offering practical solutions that can be applied directly by coaches working with youth players. Additionally, the study highlights the role of training variability in enhancing motivation and reducing monotony, which are critical factors in long-term. athletic development.

The study aims to: "Based on the above, the present study seeks to answer the following research question: To what extent do position-switching training exercises affect muscular strength and technical performance among U-20 football players?

The researchers hypothesize that;

- There are statistically significant differences between pre- and post-test results in muscular strength variables in favor of the post-test.
- There are statistically significant differences between pre- and post-test results in technical skill. performance in favor of the post-test

Scope of the Study:

- Human Scope: U-20 football players from Al-Sinaa Sports Club.
- Temporal Scope: November 2025 to January 2026.
- Spatial Scope: Municipal Youth Forum Stadium, Baghdad.

Methodology

Research Design

An experimental design with a one-group pre-test-post-test approach was employed to determine the effectiveness of the training intervention.

Participants:

The study sample consisted of 12 youth football players selected based on regular training attendance and physical readiness. The selection process ensured homogeneity in performance. levels to enhance the accuracy of the results

Training Program:

The training program lasted eight weeks (24 sessions), with three sessions per week. Each session lasted approximately 90 minutes, with 35-45 minutes dedicated to position-switching exercises. The exercises were performed at high intensity (90-100%) with carefully structured rest intervals to ensure optimal adaptation

Measurements

The following standardized tests were used:

- Vertical Jump Test (explosive power).
- second hopping test (speed-strength)-10.
- Strength endurance test.
- Passing accuracy test.
- Dribbling test.

Result and Discussion:

Data were analyzed using paired sample t-tests to compare pre- and post-test results. Statistical significance was set at ($p \leq 0.05$)

Table 1. Means, Standard Deviations, and (T) Values for the Pre- and Post-tests of the Research Sample

Test	Pre-test (Mean)	Pre-test (SD)	Post-test (Mean)	Post-test (SD)	T-Value	Sig	Significance
Explosive Power (Legs)	15.875	4.518	19.125	4.523	12.567	0.00	Significant
Speed-Strength (Legs) - Left Leg (3 Hops)	4.230	0.433	5.110	0.234	8.196	0.00	Significant
Speed-Strength (Legs) - Right Leg (3 Hops)	4.150	0.538	6.679	0.310	7.339	0.00	Significant
Strength Endurance (Legs)	16.250	4.159	20.375	4.349	10.775	0.00	Significant
Passing Test	6.600	0.699	10.800	1.032	8.020	0.00	Significant
Dribbling Test	11.08	0.839	14.918	0.826	8.505	0.00	Significant

- **Significant at (0.05) level with (11) degrees of freedom**

The findings revealed statistically significant improvements in all measured variables in favor of the post-test. These results indicate that the training intervention had a positive and measurable effect on both physical and technical performance.

Discussion

The results of the present study revealed significant improvements in both muscular strength and fundamental football skills following the implementation of position-switching exercises. These findings can be explained in light of modern training theories that emphasize the importance of integrating physical and. technical components within dynamic and variable training environments.

From a physiological perspective, the observed development in muscular strength can be attributed to neuromuscular adaptation mechanisms. Such adaptations involve improvements in motor unit recruitment, coordination between muscle groups, and the efficiency of movement execution. This interpretation is consistent with the findings of Panagoulis et al. (2020), who reported that integrative neuromuscular training significantly enhances physical performance variables in young football players when applied systematically.

Moreover, the nature of position-switching exercises, which require players to perform under continuously changing conditions, likely contributed to improving speed-strength and explosive power. These findings are supported by Roso-Moliner et al. (2023), who emphasized that structured neuromuscular training programs enhance performance outcomes such as jumping ability, sprinting efficiency, and overall physical readiness in soccer players.

In addition to physical development, the improvement observed in technical skills can be explained by the integration of skill execution within physically demanding tasks. This approach aligns with contemporary training principles that advocate for specificity and contextual learning, where skills are practiced under conditions similar to real match situations. According to Belamjahad et al. (2024), combining physical conditioning with skill-based exercises leads to more effective transfer of training outcomes to competitive performance.

Furthermore, the variability inherent in position-switching exercises plays a crucial role in enhancing motor learning and adaptability. Training in variable environments promotes better decision-making and skill execution under pressure, which are essential components of football performance. This is in line with the conclusions of Stanković et al. (2024), who highlighted the importance of proprioceptive and variable training methods in improving coordination and performance consistency among football players.

Another important aspect of the results is the observed increase in player motivation and engagement. The diversity and dynamic nature of the exercises reduce monotony and create a more stimulating training environment. This factor is critical for maintaining long-term participation and improving training effectiveness, particularly among youth players.

However, it is important to consider that the effectiveness of position-switching training may vary across different contexts. Players with lower skill levels may require gradual adaptation to variable training conditions. Additionally, differences in coaching styles and competitive levels may influence the effectiveness of such training programs.

Overall, the findings of this study are consistent with modern trends in football training, which emphasize integrated, high-intensity, and variable training methods as effective strategies for developing both physical and technical performance.

From a theoretical perspective, this study supports the concept of integrated training, emphasizing the simultaneous development of physical and technical components. The findings provide empirical evidence that variability-based training enhances neuromuscular performance and skill execution.

Despite the positive findings of this study, several limitations should be acknowledged. The sample size was relatively small (n=12), and the absence of a control group limits the ability to attribute changes solely to the intervention. Additionally, the study focused on a single team, which may affect the generalizability of the results.

Conclusion

The findings of this study demonstrate that position-switching training exercises have a significant positive effect on both muscular strength and technical performance

among U-20 football players. The observed improvements in explosive power, speed-strength, strength endurance, passing accuracy, and dribbling performance highlight the effectiveness of integrating physical and skill-based training within dynamic practice conditions.

These results support the application of variable and integrated training approaches in youth football, as they contribute to enhancing overall performance and better prepare players for real match situations.

It is recommended that coaches incorporate position-switching exercises into their training programs to promote comprehensive player development.

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