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Effect of Aerobic Conditioning with Technical Skill Drills on Selected Physical and Performance Parameters in Football Players

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Abstract:

The purpose of this study was to investigate the effect of aerobic conditioning combined with technical skill drills on selected physical fitness and performance parameters among football players. The study was conducted on male football players aged 18 to 25 years from colleges affiliated with Sri Venkateswara University, Tirupati. A total of 60 football players were randomly selected as subjects and divided into two groups: an experimental group and a control group, with 30 subjects in each group. The experimental group underwent a structured training programme consisting of aerobic conditioning exercises integrated with football-specific technical skill drills for a period of twelve weeks, while the control group continued their routine activities without any specialized training intervention. The selected physical fitness variables included speed, agility, cardiovascular endurance, and leg explosive power. The selected performance parameters were passing accuracy, dribbling ability, and shooting performance. Pre-test and post-test data were collected for all variables using standardized testing procedures. The collected data were statistically analyzed using mean, standard deviation, and paired and independent sample t-tests to determine the significance of differences between groups. The level of significance was fixed at 0.05. The results of the study revealed significant improvements in all selected physical fitness and performance variables among the subjects who participated in the combined aerobic conditioning and technical skill drill programme. The experimental group showed greater enhancement in speed, agility, endurance, passing accuracy, dribbling skill, and shooting performance compared to the control group. These findings indicate that the integration of aerobic conditioning with technical skill drills is an effective training approach for improving both fitness and football-specific performance among collegiate football players. The study concludes that a systematic programme of aerobic conditioning combined with technical skill drills can significantly enhance the physical fitness and playing performance of football players aged 18 to 25 years and may be recommended for coaches and trainers working with university-level football athletes.

Keywords: Aerobic Conditioning, Technical Skill Drills, Football Players, Physical Fitness, Performance Parameters, Speed, Agility, Endurance, Sri Venkateswara University, Tirupati

1. Introduction

Football is one of the most popular and physically demanding sports in the world, requiring players to possess a combination of physical fitness, technical proficiency, tactical awareness, and psychological preparedness. Success in football depends not only on the mastery of technical skills such as passing, dribbling, and shooting but also on the development of physical fitness components including speed, agility, endurance, strength, and explosive power.

Modern football is characterized by high-intensity movements, rapid transitions, and continuous activity throughout the match, making physical conditioning an essential aspect of player development.

Aerobic conditioning plays a vital role in enhancing cardiovascular endurance, enabling players to sustain performance levels during prolonged periods of play. Improved aerobic capacity helps football players recover more quickly between bouts of intense activity, maintain work rate throughout a match, and reduce the onset of fatigue. As football matches involve repeated sprints, changes of direction, and continuous movement, aerobic fitness forms the foundation upon which other physical and technical abilities can be effectively utilized.

In addition to physical conditioning, technical skill development is equally important for achieving success in football. Skills such as ball control, passing accuracy, dribbling efficiency, and shooting precision directly influence individual and team performance. Coaches and sports scientists increasingly advocate integrating physical conditioning with sport-specific technical drills to maximize training efficiency and produce more game-related adaptations. Combining aerobic exercises with technical skill drills allows players to improve fitness while simultaneously refining football-specific skills under conditions that closely resemble actual match play.

Previous research has indicated that integrated training programmes can produce significant improvements in both physical fitness and sport-specific performance variables. However, limited studies have examined the combined effects of aerobic conditioning and technical skill drills among collegiate football players in the Indian university context. Therefore, there is a need to investigate the effectiveness of such training programmes among football players belonging to colleges affiliated with Sri Venkateswara University, Tirupati.

The present study was undertaken to examine the effect of aerobic conditioning combined with technical skill drills on selected physical fitness and performance parameters among football players aged 18 to 25 years. The findings of this study may provide valuable information for coaches, physical education professionals, and sports trainers in designing effective training programmes that enhance both fitness and football performance at the university level.

Statement Of The Problem:

Hence, the problem of the present study is stated as follows: To determine the “effect of aerobic conditioning combined with technical skill drills on selected physical fitness and performance parameters among football players”.

Limitations of The Study:

1. The study was limited to male football players aged between 18 and 25 years from colleges affiliated with Sri Venkateswara University, Tirupati.
2. The influence of factors such as dietary habits, lifestyle patterns, sleep quality, and psychological motivation of the subjects could not be completely controlled.
3. The study considered only selected physical fitness variables and performance parameters; other variables that may influence football performance were not included.
4. The accuracy of the results depended on the subjects' sincerity, effort, and regular participation during the training programme and testing sessions.
5. Environmental conditions such as weather, playing surface, and daily physical condition of the participants might have affected performance during testing.
6. The findings of the study may not be generalized to football players of different age groups, competitive levels, or geographical regions.

Delimitations of the Study:

1. The study was confined to 60 male football players.
2. The age of the subjects ranged from 18 to 25 years.
3. The subjects were selected from colleges affiliated with Sri Venkateswara University, Tirupati.

4. The study was restricted to one experimental group and one control group.
5. The duration of the training programme was limited to twelve weeks.
6. The experimental group underwent aerobic conditioning combined with technical skill drills, while the control group followed their regular routine activities.
7. The selected physical fitness variables were speed, agility, cardiovascular endurance, and leg explosive power.
8. The selected performance parameters were passing accuracy, dribbling ability, and shooting performance.
9. The level of significance for testing the hypotheses was fixed at 0.05.

2. Methodology of the Study

The purpose of the study was to examine the effect of aerobic conditioning combined with technical skill drills on selected physical fitness and performance parameters among football players. For this purpose, sixty (60) male football players aged between 18 and 25 years were selected as subjects from various colleges affiliated with Sri Venkateswara University, Tirupati, Andhra Pradesh. The subjects were actively participating in intercollegiate football competitions and were medically fit to undergo systematic training.

Selection of Variables:

Independent Variable

The independent variable selected for the study was:

- Aerobic Conditioning Combined with Technical Skill Drills

Dependent Variables

Physical Fitness Variables

1. Speed
2. Agility
3. Cardiovascular Endurance
4. Leg Explosive Power

Performance Variables

1. Passing Accuracy
2. Dribbling Ability
3. Shooting Performance

Experimental Design

The study employed a pre-test and post-test randomized group design. The sixty subjects were randomly divided into two equal groups consisting of thirty subjects each.

- Group I: Experimental Group (Aerobic Conditioning with Technical Skill Drills)
- Group II: Control Group (No Special Training)

The experimental group underwent a systematic training programme, whereas the control group continued their regular daily activities and routine football practice without any additional training intervention.

Pre-tests were conducted before the commencement of the training programme to determine the baseline status of all subjects. After the completion of the twelve-week training programme, post-tests were administered using the same procedures and testing conditions. All tests were conducted under the supervision of qualified physical education professionals.

Statistical Technique

The collected data were analyzed using appropriate statistical techniques. The following statistical methods were employed: The level of significance was fixed at 0.05 for testing the hypotheses. The statistical analysis was carried out to determine the effectiveness of aerobic conditioning combined with technical skill drills on the selected physical fitness and performance parameters among football players.

Table-1: Mean and Standard Deviation of Selected Physical Fitness and Performance Variables of Experimental Group Before and After the Training Programme (N = 30)

Variable	Test Used	Pre-Test Mean ± SD	Post-Test Mean ± SD	Improvement (%)	t-value
Speed (sec)	50-Meter Dash Test	7.48 ± 0.31	6.92 ± 0.28	7.49	8.74*
Agility (sec)	Illinois Agility Test	16.85 ± 0.72	15.42 ± 0.64	8.49	9.28*
Cardiovascular Endurance (m)	Cooper 12-Minute Run/Walk Test	2418 ± 112	2765 ± 108	14.35	12.16*
Leg Explosive Power (m)	Standing Broad Jump Test	2.18 ± 0.12	2.41 ± 0.10	10.55	8.11*
Passing Accuracy (score)	Football Passing Accuracy Test	16.42 ± 2.08	22.63 ± 2.12	37.82	10.94*
Dribbling Ability (sec)	Football Dribbling Skill Test	18.26 ± 0.84	16.41 ± 0.73	10.13	9.87*
Shooting Performance (score)	Football Shooting Accuracy Test	14.55 ± 1.76	20.18 ± 1.92	38.69	10.53*

****Significant at 0.05 level of confidence. Required t-value (df = 29) = 2.045.**

The results presented in Table 1 indicate that the experimental group showed significant improvement in all selected physical fitness and performance variables following the twelve-week aerobic conditioning programme combined with technical skill drills. The highest percentage improvement was observed in shooting performance (38.69%), followed by passing accuracy (37.82%) and cardiovascular endurance (14.35%). The t-values obtained for all variables were greater than the critical value of 2.045, indicating statistically significant improvements at the 0.05 level of confidence. Therefore, it was concluded that aerobic conditioning combined with technical skill drills effectively enhanced both physical fitness and football-specific performance among football players.

3. Discussion of the Study

The purpose of the present study was to investigate the effect of aerobic conditioning combined with technical skill drills on selected physical fitness and performance parameters among football players aged 18 to 25 years from colleges affiliated with Sri Venkateswara University, Tirupati. The study's findings revealed significant improvements in all selected physical fitness and football performance variables following the twelve-week training programme.

The results demonstrated a significant improvement in speed among the subjects of the experimental group. The reduction in 50-meter dash time indicates that the aerobic conditioning programme, when combined with football-specific skill drills, enhanced the players' ability to accelerate and move efficiently during football activities. Improved speed is essential for successful performance in football, particularly during attacking and defensive transitions.

A significant improvement was also observed in agility. Football requires frequent changes of direction, quick body movements, and rapid reactions to game situations. The integrated training programme improved neuromuscular coordination and movement efficiency, resulting in better agility performance among the players.

The findings further revealed a marked increase in cardiovascular endurance. Aerobic conditioning exercises such as continuous running, interval training, and endurance-based football drills contributed to enhanced cardiovascular efficiency and oxygen utilization. The improvement in endurance enabled players to sustain a higher level of performance throughout the duration of play while delaying fatigue.

Leg explosive power also showed significant improvement following the training programme. Football-specific drills involving sprinting, jumping, kicking, and dynamic movements likely contributed to the development of lower-body muscular power. Enhanced explosive power is beneficial for actions such as shooting, heading, tackling, and jumping during competition.

About performance variables, passing accuracy improved significantly among the experimental group. The repeated execution of technical drills under aerobic training conditions may have enhanced motor learning, concentration, and skill execution, leading to greater passing efficiency during football activities.

The results also indicated a significant improvement in dribbling ability. The combination of aerobic conditioning and ball-control exercises enabled players to maintain technical proficiency while performing under physical stress. Improved dribbling ability is particularly important in maintaining possession and creating scoring opportunities during matches.

Similarly, shooting performance demonstrated substantial improvement after the training period. The systematic practice of shooting drills combined with enhanced physical fitness may have contributed to better shooting accuracy, power, and consistency. These improvements are essential for achieving success in competitive football.

Overall, the findings of the study suggest that aerobic conditioning integrated with technical skill drills is an effective training method for improving both physical fitness and football-specific performance. The statistically significant improvements observed in all selected variables support the effectiveness of the training programme. The results are consistent with previous research studies that have reported positive effects of combined physical conditioning and skill-based training on athletic performance.

Therefore, it may be concluded that a well-planned aerobic conditioning programme combined with technical skill drills can serve as an effective training strategy for university-level football players and contribute significantly to their overall athletic development and competitive performance.

4. Conclusion of the Study

The present study was undertaken to examine the effect of aerobic conditioning combined with technical skill drills on selected physical fitness and performance parameters among football players aged 18 to 25 years from colleges affiliated with Sri Venkateswara University, Tirupati. Based on the analysis and interpretation of the data collected before and after the twelve-week training programme, the following conclusions were drawn.

The experimental group that participated in the aerobic conditioning programme combined with technical skill drills demonstrated significant improvements in all selected physical fitness variables, namely speed, agility, cardiovascular endurance, and leg explosive power. These improvements indicate that the integrated training programme effectively enhanced the overall physical preparedness of the football players.

Significant improvements were also observed in the selected performance variables, including passing accuracy, dribbling ability, and shooting performance. The findings suggest that combining aerobic conditioning with football-specific technical drills not only improves physical fitness but also contributes to the development of essential football skills required for successful performance during competition.

The statistical analysis revealed that the obtained values were significant at the 0.05 level of confidence, confirming the effectiveness of the training intervention. The results clearly indicate that players who underwent the combined training programme achieved greater improvements than those in the control group who followed their regular activities.

Therefore, it is concluded that aerobic conditioning integrated with technical skill drills is an effective training method for enhancing both physical fitness and football-specific performance among university-level football players. The study supports the use of scientifically planned and systematically administered training programmes to improve athletic performance in football.

In conclusion, coaches, physical education teachers, and sports trainers may adopt aerobic conditioning combined with technical skill drills as a regular component of football training programmes to achieve optimal improvements in fitness, skill execution, and overall playing performance among collegiate football players.

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