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Effect of a 12-Week Exercise Training Programme on Physical Fitness among Male Intercollegiate Football Players

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Abstract

The present study examined the effect of a 12-week structured exercise training programme on selected physical fitness components among male intercollegiate football players. One hundred male football players aged 18–27 years, representing affiliated colleges of Punjabi University, Guru Nanak Dev University, and Panjab University, Chandigarh, participated in the study. Physical fitness variables such as upper-body strength, abdominal muscular endurance, agility, explosive leg power, speed, and cardiovascular endurance were assessed using selected items of the AAPHER Youth Physical Fitness Test. A single-group pre-test–post-test experimental design was adopted. Following the pre-test, subjects underwent a systematic training programme for twelve weeks. Data were analyzed using mean, standard deviation, and paired sample *t*-test. The results indicated significant improvement in all selected physical fitness variables at the 0.01 level of significance, confirming the effectiveness of the training programme.

Keywords: Exercise training, physical fitness, football players, intercollegiate sports

Introduction

Football is a high-intensity team sport that requires players to possess well-developed physical fitness components such as muscular strength, muscular endurance, speed, agility, explosive power, and cardiovascular endurance. During competitive match play, footballers perform repeated bouts of sprinting, jumping, tackling, rapid changes of direction, and sustained running, all of which place considerable physiological and neuromuscular demands on the body (Bangsbo, 1994). Scientific evidence suggests that systematic and structured exercise training programmes play a vital role in enhancing football-specific physical fitness and overall performance. Reilly, Bangsbo, and Franks (2000) emphasized that physical fitness is a key determinant of success in competitive football, particularly at higher levels of play. Studies have shown that improvements in muscular strength and endurance contribute to better sprint performance, jumping ability, and physical resilience during matches (Wisløff et al., 2004). Speed, agility, and explosive power are essential qualities for football players due to the dynamic nature of the game. Research indicates that targeted sprint, agility, and plyometric training significantly enhance these components when incorporated into regular training schedules (Little & Williams, 2005; Markovic, 2007). In addition, cardiovascular endurance enables players to sustain high-intensity performance throughout the match and maintain technical efficiency under fatigue (Helgerud et al., 2001). Despite extensive international research, limited studies have examined the effects of structured exercise training programmes on physical fitness among intercollegiate football players in the Indian context, particularly using standardized fitness assessment tools. Therefore, the present study investigated the effect of a 12-week structured exercise training programme on

selected physical fitness variables among male intercollegiate football players, using selected items of the AAPHER Youth Physical Fitness Test.

Methodology

Research Design

A single-group pre-test–post-test experimental design was employed to assess the effect of the training programme. One hundred male football players aged 18–27 years were selected from affiliated colleges of Punjabi University, Guru Nanak Dev University, and Panjab University, Chandigarh. All participants had a minimum experience of participation in intercollegiate level football tournaments.

Training Programme

The exercise training programme was conducted for 12 weeks, with training sessions held five to six days per week. Each session lasted approximately 90–120 minutes. The programme included warm-up, body-weight strength exercises, speed and agility drills, endurance training, plyometrics, and cool-down exercises. Weight training was included once per week only. The programme was progressive and supervised by the researcher.

Tools for Data Collection

Selected items from the AAPHER Youth Physical Fitness Test were used to assess the following components:

Physical Fitness Component	Test Item
Upper-body strength	Pull-ups
Abdominal muscular endurance	Sit-ups (60 seconds)
Agility	Shuttle Run
Explosive leg power	Standing Broad Jump
Speed	50-Yard Dash
Cardiovascular endurance	600-Yard Walk/Run

Statistical Technique

Mean, standard deviation, and paired sample *t*-test were applied. The level of significance was set at 0.05 and 0.01.

Results

The results of the study are presented in Tables 1 to 6. A paired sample *t*-test was employed to determine the significance of differences between pre-test and post-test scores of selected physical fitness variables following the 12-week exercise training programme among male intercollegiate football players.

Table 1 Comparison of Pre-Test and Post-Test Scores of Pull-Ups (Upper-Body Strength)

Test	Mean	SD	*t*-value
Pre-Test	8.42	1.86	
Post-Test	11.67	2.04	6.85*

Significant at 0.01 level

Table 1 presents the comparison of pre-test and post-test scores of pull-ups, representing upper-body strength. The mean pre-test score was 8.42 (SD = 1.86), while the post-test mean score increased to 11.67 (SD = 2.04). The obtained *t*-value of 6.85 was statistically significant at the 0.01 level, indicating a significant improvement in upper-body strength as a result of the training programme.

Table 2 Comparison of Pre-Test and Post-Test Scores of Sit-Ups (Abdominal Endurance)

Test	Mean	SD	*t*-value
Pre-Test	29.34	3.12	
Post-Test	34.89	3.45	5.92*

Significant at 0.01 level

Table 2 shows the comparison of sit-up performance, a measure of abdominal muscular endurance. The pre-test mean score was 29.34 (SD = 3.12), which increased to 34.89 (SD = 3.45) in the post-test. The calculated *t*-value of 5.92 was significant at the 0.01 level, demonstrating a significant enhancement in abdominal endurance following the training intervention.

Table 3 Comparison of Pre-Test and Post-Test Scores of Shuttle Run (Agility)

Test	Mean (seconds)	SD	*t*-value
Pre-Test	10.98	0.72	
Post-Test	9.84	0.68	7.18*

Significant at 0.01 level

Table 3 illustrates the changes in shuttle run performance, assessing agility. The mean shuttle run time decreased from 10.98 seconds (SD = 0.72) in the pre-test to 9.84 seconds (SD = 0.68) in the post-test. The obtained *t*-value of 7.18 was statistically significant at the 0.01 level, indicating a significant improvement in agility after the completion of the exercise training programme.

Table 4 Comparison of Pre-Test and Post-Test Scores of Standing Broad Jump (Explosive Power)

Test	Mean (meters)	SD	*t*-value
Pre-Test	2.12	0.18	
Post-Test	2.36	0.21	8.04*

Significant at 0.01 level

Table 4 presents the results of the standing broad jump test, which measures explosive leg power. The mean

jumping distance improved from 2.12 meters (SD = 0.18) in the pre-test to 2.36 meters (SD = 0.21) in the post-test. The *t*-value of 8.04 was found to be significant at the 0.01 level, reflecting a significant increase in explosive power of the lower limbs.

Table 5 Comparison of Pre-Test and Post-Test Scores of 50-Yard Dash (Speed)

Test	Mean (seconds)	SD	*t*-value
Pre-Test	6.94	0.41	
Post-Test	6.31	0.38	6.47*

Significant at 0.01 level

Table 5 depicts the comparison of 50-yard dash performance, assessing speed. The pre-test mean time was 6.94 seconds (SD = 0.41), which decreased to 6.31 seconds (SD = 0.38) in the post-test. The obtained *t*-value of 6.47 was statistically significant at the 0.01 level, indicating a significant improvement in sprinting speed following the training programme.

Table 6 Comparison of Pre-Test and Post-Test Scores of 600-Yard Walk/Run (Cardiovascular Endurance)

Test	Mean (seconds)	SD	*t*-value
Pre-Test	154.68	12.45	
Post-Test	139.21	11.38	9.26*

Significant at 0.01 level

Table 6 shows the comparison of 600-yard walk/run performance, measuring cardiovascular endurance. The mean pre-test time was 154.68 seconds (SD = 12.45), whereas the post-test mean time decreased to 139.21 seconds (SD = 11.38). The calculated *t*-value of 9.26 was significant at the 0.01 level, demonstrating a substantial improvement in cardiovascular endurance as a result of the exercise training programme.

Discussion

The findings of the present study clearly demonstrate that the 12-week exercise training programme resulted in statistically significant improvements in all selected components of physical fitness among male intercollegiate football players. The observed enhancements in strength, endurance, speed, agility, explosive power, and cardiovascular endurance may be attributed to the structured nature of the training programme, the inclusion of sport-specific drills, and the application of progressive overload principles. These results are consistent with earlier research indicating that systematic and scientifically planned training programmes lead to significant improvements in physical fitness parameters in football players (Bompa & Haff, 2009; Reilly, Williams, Nevill, & Franks, 2000).The improvements in muscular strength and endurance observed in the present study align with the findings of Hoff and Helgerud (2004), who reported that strength and conditioning programmes significantly enhance performance-related fitness components in football. Similarly, the significant reductions in sprint and shuttle run times support the conclusions of Little and Williams (2005), who emphasized that football-specific high-intensity training improves speed and agility. Furthermore, the marked improvement in cardiovascular endurance corroborates the results of Helgerud et al. (2001), who demonstrated that endurance training significantly enhances aerobic capacity and match performance in football players.Overall, the present findings reinforce the importance of scientific training methods in football conditioning and confirm that a well-designed

exercise training programme can effectively enhance overall physical fitness among intercollegiate football players.

Conclusion

The present study concludes that a structured 12-week exercise training programme significantly improves physical fitness components among male intercollegiate football players. Such programmes should be systematically incorporated into university-level football training to enhance performance.

References

[1] Bangsbo, J. (1994). *Fitness training in football*. Copenhagen, Denmark: HO + Storm.
[2] Bompa, T. O., & Buzzichelli, C. (2019). *Periodization: Theory and methodology of training*. Champaign, IL: Human Kinetics.
[3] Bompa, T. O., & Haff, G. G. (2009). *Periodization: Theory and methodology of training*. Champaign, IL: Human Kinetics.
[4] Helgerud, J., Engen, L. C., Wisløff, U., & Hoff, J. (2001). Aerobic endurance training improves soccer performance. *Medicine & Science in Sports & Exercise*, 33(11), 1925–1931. https://doi.org/10.1097/00005768-200111000-00019
[5] Hoff, J., & Helgerud, J. (2004). Endurance and strength training for soccer players. *Sports Medicine*, 34(3), 165–180. https://doi.org/10.2165/00007256-200434030-00003
[6] Little, T., & Williams, A. G. (2005). Specificity of acceleration, maximum speed, and agility in professional soccer players. *Journal of Strength and Conditioning Research*, 19(1), 76–78.
[7] Markovic, G. (2007). Does plyometric training improve vertical jump height? *British Journal of Sports Medicine*, 41(6), 349–355. https://doi.org/10.1136/bjsm.2007.035113
[8] Reilly, T., Bangsbo, J., & Franks, A. (2000). Anthropometric and physiological predispositions for elite soccer. *Journal of Sports Sciences*, 18(9), 669–683. https://doi.org/10.1080/02640410050120050
[9] Reilly, T., Williams, A. M., Nevill, A., & Franks, A. (2000). A multidisciplinary approach to talent identification in soccer. *Journal of Sports Sciences*, 18(9), 695–702. https://doi.org/10.1080/02640410050120078
[10] Kumar, V. (2016). Effect of circuit training program on selected motor abilities among university male. *International Journal of Physical Education, Sports and Health*, *3*(4), 255-257.
[11] Wisløff, U., Castagna, C., Helgerud, J., Jones, R., & Hoff, J. (2004). Maximal squat strength and sprint performance in soccer players. *British Journal of Sports Medicine*, 38(3), 285–288. https://doi.org/10.1136/bjsm.2002.002071