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INFLUENCE OF LADDER TRAINING ON SELECTED PHYSICAL FITNESS COMPONENTS AMONG FOOTBALL PLAYERS

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ABSTRACT

The purpose of the present study was to investigate the influence of ladder training on selected physical fitness components among football players. To achieve this objective, thirty football players from Bengaluru, Karnataka, aged between 18 and 21 years, were randomly selected as subjects. The participants were divided into two equal groups, namely an experimental group (n = 15) and a control group (n = 15). The experimental group underwent ladder training for a period of six weeks, while the control group did not receive any specific training intervention. The selected physical fitness components for the study were muscular endurance and speed. Pre-test and post-test measurements were taken for both groups. The collected data were analyzed using Analysis of Covariance to determine the significance of differences between the groups, with the level of significance set at 0.05. The results of the study revealed that there was a significant improvement in muscular endurance and speed among the experimental group compared to the control group. The obtained F-ratios for the adjusted post-test means were found to be higher than the required table values, indicating statistically significant differences. It is concluded that ladder training has a positive and significant influence on selected physical fitness components among football players. Therefore, ladder training can be effectively incorporated into training programs to enhance performance in football.

KEYWORDS: Ladder Training, Muscular Endurance, Speed.

INTRODUCTION

Football is a physically demanding sport that requires a high level of physical fitness components such as speed, agility, coordination, balance, and muscular endurance. Players are required to perform repeated bouts of high-intensity activities including sprinting, jumping, cutting, and rapid changes in direction during match play. Therefore, the development of these physical fitness components is essential for enhancing performance and reducing the risk of injuries in football players. In recent years, ladder training has emerged as an effective training method to improve footwork, agility, coordination, and overall athletic performance. Ladder drills are designed to enhance neuromuscular coordination by promoting quick and precise foot movements while maintaining balance and body control. These drills stimulate the central nervous system, leading to improved motor unit recruitment and movement efficiency (Bompa & Haff, 2009). Moreover, ladder training helps in developing rhythm, timing, and spatial awareness, which are critical for football performance.

Agility ladder training specifically focuses on improving agility and coordination through rapid foot placement patterns. According to Chu (1996) agility training enhances the ability to change direction quickly and efficiently, which is a key requirement in football. Additionally, ladder drills improve dynamic balance and body control, allowing players to maintain stability during complex movements (Miller et al., 2006). Previous research has indicated that structured agility and coordination training programs can significantly improve physical fitness components in athletes. For instance, Miller et al. (2006) reported improvements in agility and quickness following ladder-based training programs. Similarly, studies by Markovic (2007) highlighted the role of neuromuscular training in enhancing athletic performance variables such as speed and power. Despite the growing popularity of ladder training, limited research has specifically examined its influence on selected physical fitness components among football players. Understanding the effectiveness of ladder training can provide valuable insights for coaches and trainers in designing efficient training programs tailored to the needs of football players.

METHODOLOGY

The purpose of the study was to find out the effect of ladder training on selected physical fitness components among football players. To achieve the purpose of the present study, thirty football players from Bengaluru, Karnataka were selected as subjects at random and their ages ranged from 18 to 21 years. The subjects were divided into two equal groups at random. Group I acted as Experimental Group (Ladder Training) and Group II acted as Control Group. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study. The duration of experimental period was 6 weeks. After the experimental treatment, all the thirty subjects were tested on their physical fitness components. The pre test and post test scores were subjected to statistical analysis using Analysis of Covariance (ANCOVA) to find out the significance among the mean differences. In all cases 0.05 level of significance was fixed to test hypotheses.

RESULTS

TABLE – I: COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE OF MUSCULAR ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	27.86	26.66	BG	10.80	1	10.80	1.81
			WG	167.06	28	5.96	
Post Test Mean	37.80	28.00	BG	720.30	1	720.30	152.32*
			WG	132.40	28	4.72	
Adjusted Post Mean	37.83	29.97	BG	684.92	1	684.92	140.12*
			WG	131.97	27	4.88	

* Significant at 0.05 level Table value for df 1 and 28 was 4.20, 1 and 27 was 4.21

The above table indicates the adjusted mean value of muscular endurance of experimental and control groups were 37.83 and 29.97 respectively. The obtained F-ratio of 140.12 for adjusted mean was greater than the table value 4.21 for the degrees of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on muscular endurance. The above table also indicates that both pre and post test means of experimental and control groups differ significantly. The pre, post and adjusted post mean values of muscular endurance of both experimental and control groups are graphically represented in the figure-I.

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FIGURE – I: SHOWS THE MEAN VALUES ON MUSCULAR ENDURANCE OF EXPERIMENTAL GROUP AND CONTROL GROUPS

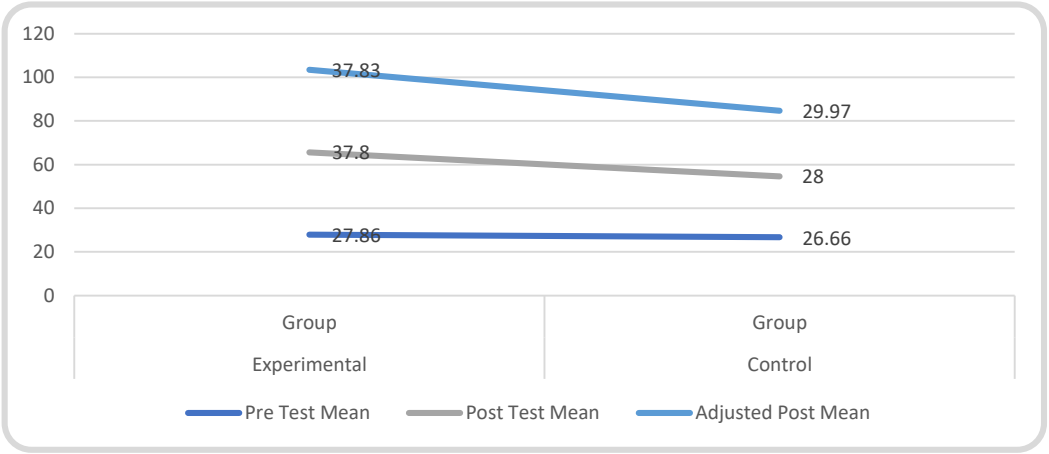


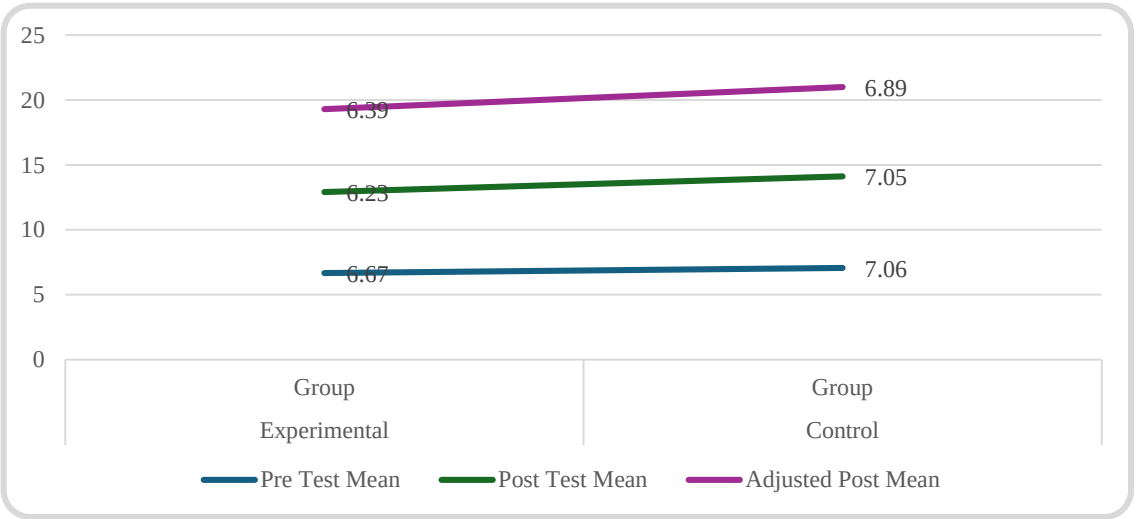
TABLE – II: COMPUTATION OF MEAN AND ANALYSIS OF COVARIANCE OF SPEED OF EXPERIMENTAL AND CONTROL GROUPS

	Experimental Group	Control Group	Source of Variance	Sum of Squares	df	Mean Square	F
Pre Test Mean	6.67	7.06	BG	1.09	1	1.09	0.92
			WG	32.87	28	1.17	
Post Test Mean	6.23	7.05	BG	5.00	1	5.00	6.07*
			WG	23.04	28	0.82	
Adjusted Post Mean	6.39	6.89	BG	1.80	1	1.80	25.71*
			WG	2.12	27	0.07	

* Significant at 0.05 level, Table value for df 1 and 28 was 4.20, 1 and 27 was 4.21

The above table indicates the adjusted mean value of speed of experimental and control groups were 6.39 and 6.89 respectively. The obtained F-ratio of 25.71 for adjusted mean was greater than the table value 4.21 for the degrees of freedom 1 and 27 required for significance at 0.05 level of confidence. The result of the study indicates that there was a significant difference among experimental and control groups on speed. The above table also indicates that both pre and post test means of experimental and control groups differ significantly. The pre, post and adjusted post mean values of speed of both experimental and control groups are graphically represented in the figure-II.

FIGURE – II
SHOWS THE MEAN VALUES ON SPEED OF EXPERIMENTAL GROUP AND CONTROL GROUPS



DISCUSSION

The findings of the present study reveal that ladder training had a significant effect on selected physical fitness components, namely muscular endurance and speed, among football players. The Analysis of Covariance (ANCOVA) results indicated that the adjusted post-test mean values of the experimental group were significantly higher than those of the control group. With regard to muscular endurance, the experimental group showed a substantial improvement compared to the control group. The obtained F-ratio (140.12) for the adjusted post-test mean was much higher than the required table value at 0.05 level of significance, indicating a statistically significant difference. This improvement may be attributed to the repetitive and dynamic nature of ladder drills, which enhance muscular endurance through continuous movement patterns and increased neuromuscular efficiency.

Similarly, in the case of speed, the experimental group demonstrated significant improvement as evidenced by the obtained F-ratio (25.71), which exceeded the table value. Ladder training emphasizes quick foot movements, coordination, and rapid acceleration, which contribute to enhanced speed performance. The drills stimulate fast-twitch muscle fibers and improve stride frequency, leading to better sprinting ability. The absence of significant improvement in the control group confirms that regular activities without structured ladder training are insufficient to bring about notable changes in physical fitness components. The results of this study are in line with previous research,

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which suggests that agility ladder training improves speed, coordination, and muscular endurance through neuromuscular adaptations and improved motor control (Miller et al., 2006; Bompa & Haff, 2009).

CONCLUSION

Based on the results of the study, it is concluded that ladder training significantly improves muscular endurance and speed among football players. The experimental group, which underwent six weeks of ladder training, showed marked improvement compared to the control group, which did not receive any specific training intervention.

Therefore, ladder training can be considered an effective and practical training method for enhancing physical fitness components and can be incorporated into regular training programs of football players to improve performance.

REFERENCES

1. Babu, K. J., Edwin, A. P., Gladina, I. D., Mahalakshmi, G., Jabakumar, K. I., & Suresh Kumar, M. (2026). Effect of micro-breaks on attention, mental fatigue, and cognitive performance among college students. *International Journal of Multidisciplinary Research and Modern Education, 12*(1), 40–42.
2. Bompa, T. O., & Haff, G. G. (2009). *Periodization: Theory and Methodology of Training*. Human Kinetics.
3. Chu, D. A. (1996). *Explosive Power and Strength*. Human Kinetics.
4. Febin Jebaraj, A & Dr. C Robert Alexandar (2016). Effect of aerobic exercise and ladder training on obesity among school students. *International Journal of Physical Education, Sports and Health.* 3, 1.
5. Freitas, Tomas T.; Calleja-Gonzalez, Julio; Alarcon, Francisco; Alcaraz, Pedro E. (2015). Acute effects of two different resistance ladder training protocols on performance and perceived exertion in semi-professional football players. *Journal of Strength & Conditioning Research:* Post Acceptance: August 13, 2015.
6. Gladina, I. D., Edwin, A. P., Mahalakshmi, G., Jabakumar, K. I., & Suresh Kumar, M. (2025). Analysis of stress level among football players at various playing positions. *International Journal of Engineering Research and Modern Education, 10*(2), 156–158.
7. Malathy, C. & Dr. C Robert Alexandar (2016). A study of the influence of physical exercise, ladder training and yogic practice on strength among college girls in Tamilnadu state. *International Journal of Physical Education, Sports and Health.* 3, 1.
8. Markovic, G. (2007). Does plyometric training improve vertical jump height? *British Journal of Sports Medicine*, 41(6), 349–355.
9. Mate-Munoz, J.L., Anton, A.J. M., Jimenez, P. J., and Garnacho-Castano, M. V. (2014).“Effects of Instability versus Traditional Resistance Training on Strength, Power and Velocity in Untrained Men”,*Journal of Sports Science and Medicine*;13, 460-468.
10. Matthew, B. M., Gregory, E. P. P., Farrell, C., McCarthy, H.,Shane, B. D. S., Jennifer, C. N., Oftall, S. B., Fabien, A. B.,Guang, S., and Duane, C. B. (2014).“The Effect of a Short-Term High-Intensity Ladder Training Program on Work Capacity, Body Composition, and Blood Profiles in Sedentary Obese Men”, *Bio Medicined Research International Volume Article;*ID 191797, 10 pages.
11. Miller, M. G., Herniman, J. J., Ricard, M. D., Cheatham, C. C., & Michael, T. J. (2006). The effects of a 6-week plyometric training program on agility. *Journal of Sports Science & Medicine*, 5(3), 459–465.
12. Shiv Kumar Diswar, Swati Choudhary and Dr. Sentu Mitra (2016). Comparative effect of SAQ and ladder training programme on selected physical fitness variables of school level football players. *International Journal of Physical Education, Sports and Health.* 3, 5.
13. Vikesh Kumar (2016). Effect of ladder training program on selected motor abilities among university male. *International Journal of Physical Education, Sports and Health,* 3(4): 255-257.
14. Vishal Kumar (2016). Impact of yogic practices and ladder training on power production and health care. *International Journal of Physical Education, Sports and Health,* 3, 1.
15. Vrachimis, A., Hadjicharalambous, M. & Tyler, C. (2016. The Effect of Ladder Training on Resting Heart Rate Variability, Cardiovascular Disease Risk Factors and Physical Fitness in Healthy Untrained Adults. *Health*, 8, 144-155.