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Original Article

Influence of Eccentric Resistance Training on Motor Fitness Components Among Fast Bowlers

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ABSTRACT

This study investigates the eccentric resistance training on motor fitness components among fast bowlers. Twenty-six male fast bowlers were selected from CDCA league cricket clubs Coimbatore, Tamil Nadu. The selected fast bowlers age ranged between 21 to 25 years. Twenty-six fast bowlers were divided into two groups the experimental group (n=13) and a control group (n=13). The experimental group underwent the progressive 8-weeks eccentric resistance training (in consisting of upper body explosive power, Lower body unilateral strength, speed, abdominal endurance) integrated into their technical session. While control group continued with daily physical training. Analysis of the data depended the (paired sample) T-test was used to determine the significance mean difference between pre-test and post-test scores. The level significance was set at 0.005 with 95% confidence level. The dependent t-test analysis indicated significant changes in selected motor fitness components and following eight weeks' eccentric resistance training ($p<0.005$). The study concluded that eccentric resistance training was an effectively improve the motor fitness components among fast bowlerss. Therefore, coaches and strength and conditioning professionals may incorporate eccentric resistance training into cricket-specific conditioning programs to optimize athletic performance and physical preparedness among fast bowlers.

Keywords: Resistance training, Upper body Explosive Power, Speed, unilateral strength

INTRODUCTION:

The game is a contest between the batter and the bowlers, with the batter aiming to score as many runs as possible while the bowlers aims to restrict the number of runs and take wickets. **Akhilesh** *et al.,* **(2022)** In cricket fast bowling, the release speed the bowlers generates has a strong influence on the outcome of the delivery. A faster release speed reduces the batsman's decision-making time and stroke-execution time and so limits the runs scored or increases the chance of dismissing the batsman **Katharine L. Wickington** *et al.,* **(2017)**. The bowlers, a player from the fielding team, hurls a hard, fist-sized, cock-centered, leather-covered ball from the vicinity of one wicket towards the other. The ball usually bounces once before reaching the batsman, a player from the opposing team. Ion defense of the wicket, the batsman plays the ball with a wooden cricket bat. Meanwhile, the other members of the bowlers's team stand in various positions around the field as fielders, players who retrieve the batted ball in an effort to stop the batsman scoring, and if possible, to get him or her out **R. Anandakumar** *et al.,* **(2021)**.

Test, One Day and Twenty20 In fact, this game is a deceivingly demanding sport; the physiological demands of cricketers vary considerably between batsmen, fast bowlers spin bowlers, wicketkeepers and fielders. The volume and duration of sprinting that a player in a particular position undertook appears to depend largely on the game circumstances, whereas the distances covered walking and jogging are more consistent from game-to-game **Deepak Kumar Dogra (2015).**

Eccentric loading has the potential to overload the muscular system at very low

energy cost This makes eccentric training an interesting training adjunct in strength and conditioning programs for performance enhancement or injury prevention purposes in elite sports Despite numerous reports on the effects of eccentric exercise in untrained subjects or clinical trials, there is a lack of investigations on training effects in highly trained

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athletes. Furthermore, differences in training and testing protocols make it difficult to draw generalized conclusions on the effect of eccentric training on strength and exercise performance. **Michael Vogt** *et al.,* **(2014).**

The governing bodies are influencing the growing focus on fitness in cricket, for example, the International Cricket Council have been pushing for a high-performance and professional approach to fitness among member countries **(ICC, 2018).** In today's era, with players like Virat Kohli, structured physical training has become the norm, showcasing the impact of rigorous fitness routines on batting consistency, fielding agility, and performance in a match **(Gupta & Sharma, 2020).** This has led to the perception that fitness has become more than an ancillary consideration and is now an essential part of successful international cricket performance. There are several fitness components that are involved in high fitness, such as strength, endurance, speed, agility, flexibility and injury resilience. Together these factors affect a player's capacity for maintaining performance in pressure situations, his capacity to play long innings, and his capacity to perform well in a match when it demands high-intensity. (Reilly et al. 2009; Stolen et al. 2005) Additionally, there has been a strong link between better fitness and better fielding, a key aspect of today's game. **Humayon Zaheer** *et al.,* **(2026).**

FAST BOWLERS

Fast bowling is often considered the most physically demanding role in cricket. Fast bowlers repeatedly perform run-ups, high-impact front-foot landings, rapid trunk rotation, and forceful arm acceleration. These actions generate significant mechanical load, particularly on the lumbar spine and lower limbs. Research has consistently highlighted that fast bowlers experience high, workloads and are at increased risk of both acute and overuse injuries, especially during congested match schedules. To maintain performance across spells and reduce injury risk, fast bowlers require high levels of muscular strength, explosive power, and aerobic conditioning. Strength and power, particularly in the lower body and trunk, contribute to effective force transfer through the kinetic chain, while aerobic fitness supports recovery between overs and spells.

Ulla A *et al.,* **(2026).**

METHODS AND MEASUREMENT:

The purpose of the study was to find out the influence of eccentric resistance training on motor fitness components among fast bowlers. To achieve the purpose of the study twenty-six male fast bowlers were selected from CDCA league cricket clubs Coimbatore, Tamil Nadu. The selected fast bowlers age ranged between 21 to 25 years and they were divided into two equal group's experimental group and control group consists of 13 each. Experimental group underwent the eccentric resistance training and the control group was not given any sort of training except their routine work. The training was given to the experimental group for 4 days per week for the period of 8 weeks. The selected variables namely, upper body explosive power was measured by seated medicine ball throw test, Lower body unilateral strength was measured by Single leg hop test and speed was measured by 20-meter sprint test and Abdominal Endurance was measured by Sit-up test. The data were collected from the subjects was statistically analysed with dependent t- test to find out significant improvement if any at 0.05 level of confidence.

CRITERION MEASURES:

It is evaluating fitness components variables were chosen as the criterion measures to this study for testing.

Table 1: Criterion Measures

S.no	Criterion Variables	Test items	Unit of Measurements
	Upper body explosive power	Seated Medicine Ball Throw Test	In meters
	Lower body unilateral strength	Single leg hop test	In meters
	Speed	20-meter Sprint test	In seconds
	Abdominal Endurance	Sit-up test	In seconds

Statistical Methods: The collected data before and after training period of eight weeks on the above said variables due to the influence of eccentric resistance training was statistically analysed with T test to find out the significant improvement between pre and post-test. In all cases the criterion for statistical significance was set at 0.05 level of confidence. (P<0.05).

Table 2: The T Ratio for Eccentric Resistance Training for Club Level Fast Bowlers

S.no	Variables	Group	Pre Mean	Post Mean	Std Deviation	t
	Upper explosive power	Experimental	3.58	3.69	0.05	6.81*
		Control	3.54	3.59	0.01	1.91
	Lower body unilateral strength	Experimental	1.76	1.85	0.03	10.55*
		Control	1.80	1.81	0.01	1.91
	Speed	Experimental	3.58	3.47	0.06	6.80*
		Control	3.58	3.57	0.01	2.02
	Abdominal Endurance	Experimental	33.66	41.75	6.49	15.71*
		Control	33.41	34.91	0.28	2.17

(Significance at 0.05 level of confidence for df of 14 is 2.14)

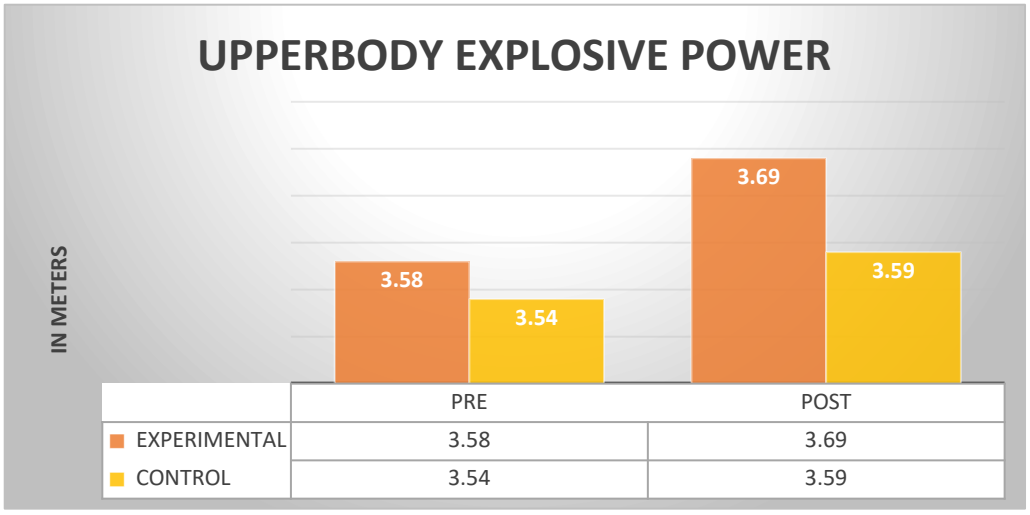


Figure 1: bar Diagram Shows the Mean Values of Upper Body Explosive powerBetween Club Level Fast Bowlers

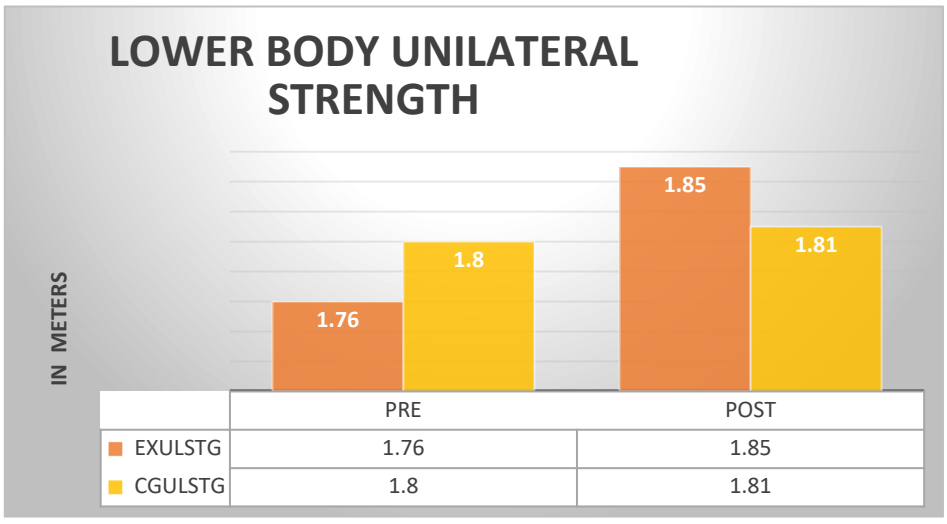


Figure 2: bar Diagram Shows the Mean Values of Lower Body Unilateral Between Club Level Fast Bowlers



Figure 3: bar Diagram Shows the Mean Values of Speed Between Club Level Fast Bowlers

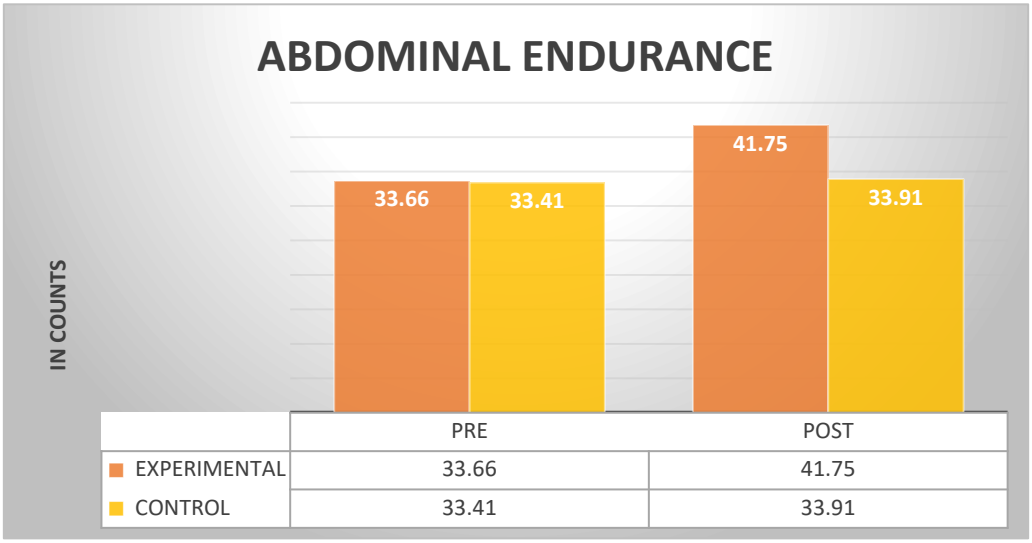


Figure 4: bar Diagram Shows the Mean Values of Abdominal Muscular Endurance Between Club Level Fast Bowlers

Mean standard deviation and t-value were calculated for each outcomes measure can be found in Table 2 result shows that the pre-test means values of experimental group and control group for upper body explosive power (2.35, 2.34) respectively and the post-test mean values are (2.55,2.36). The pre-test means values of experimental group and control group for lower body unilateral strength (1.76, 1.85) respectively and the post-test mean values are (1.08,1.81). The pre-test means values of experimental group and control group for speed (3.58,3.47) respectively and the post-test mean values are (3.78,3.86). The pre-test means values of experimental group and control group for abdominal muscular endurance (33.66,33.41) respectively and the post-test mean values are (41.75,33.91). The obtained dependent t-test value on upper body explosive power (t=6.81), lower body unilateral strength (t=10.55) speed (t=4.03) and abdominal endurance (t=15.71) of experimental group respectively. The table value required for significant difference with degrees of freedom 14 at 0.05 level of confidence is 2.14. The obtained "t" test value of experimental group was greater than the table value. The results clearly indicated that the fitness components of the experimental group improved due to influence of eccentric resistance training on motor fitness components among fast bowlers.

Discussions of Findings

The result of the study indicates that the experimental group namely eccentric resistance training group had significantly improved the selected motor fitness variables namely upper body explosive power, lower body unilateral strength, speed and abdominal muscular endurance. When compared to the control

group. This confirms that 8 weeks of eccentric training is an effective method for developing motor qualities relevant to fast-bowling performance.

The finding of the study eccentric resistance improvement can be attributed to the training protocol, which included eccentric bench press slow 3–4 second lowering phase with explosive concentric return, plyometric push-ups, and medicine ball chest throws with an eccentric catch-and-decelerate component. These exercises overload the stretch-shortening cycle of the shoulder and arm musculature, increasing motor unit recruitment and rate of force development. According to **Douglas** *et al.,* **(2017)** state that eccentric resistance training improves muscular strength, power output, and neuromuscular function. **Timothy J. Suchomel** *et al.,* **(2016)** Athletes absolute and relative muscular strength can be developed with regular strength training. **Cormie** *et al.,* **(2011)** cricketers focusing on resistance training force production significantly improves upper body power for explosive sporting actions such as cricket bowling. The training due to this variable included single-leg eccentric squats, Nordic hamstring curls, and eccentric step-downs, all performed with a controlled, slow lowering phase 3–5 seconds to maximize time under eccentric tension and fast bowlers on unilateral strength during the delivery stride, especially the front leg ground reaction force at front foot contact. The vertical jump test is a valid and reliable method to assess lower limb power, reflecting the capability of the muscles to generate force rapidly **Shriaj Sharad Patil** *et al*., **(2025).** Similarly, **Shakti Shrivastava** *et al*., **(2015)** Lower body explosive power in male improved significantly as compared to male sportspersons of control group who did only regular routine exercises. **Sai Aditya Krishna** *et al*., **(2019).** Similar improvement was observed in this present study combined plyometric and strength lower-quadrant exercise training program can significantly improve jump performance as well as the isokinetic knee-strength profile. Fast bowlers generate large ground reaction forces during the delivery stride.

Training eccentric overload and lunges with short distance sprint acceleration drills to improved ground contact time. Given that fast bowlers must repeatedly cover a 15–20m run-up with minimal recovery between deliveries, the significant improvement in speed reflects enhanced repeated sprint capacity, which is critical for maintaining bowling pace across a spell. According to **Robin, V. M. (2022)** As a result, your speed is closely linked to your strength, or your ability to generate the greatest amount of force in the shortest amount of time**. Babar Bashir** *et al*., **(2018)** The results showed that the plyometric group registered better records in agility, speed and explosive power compared with the resistance group after eight weeks.

Abdominal muscular endurance eccentric-focused core exercises such as slow-eccentric plank rollouts, Pall of presses with a controlled eccentric return, and weighted eccentric sit-ups due to this training improvement. **Chandan Kumar Das** *et al*., **(2025)** State the Fast bowling requires high precision in the present study, trunk stabilization core endurance was associated with improved delivery accuracy, likely due to enhanced postural control and reduced compensatory movements during the bowling action. Despite this, the relationship between core muscle endurance and major bowling performance. **Rezwan Hossain** *et al*. **(2025).** In similar study indicates the Fast bowling in cricket involves repetitive, high-velocity trunk movements that increase lumbar spine stress, making core endurance critical for spinal stability, bowling efficiency, and injury prevention. **Ram Krishnan** *et al*. **(2025).**

CONCLUSION:

The finding of this study concludes that 8 weeks of eccentric resistance training significantly improved upper-body explosive power, lower-body unilateral strength, speed, and abdominal muscular endurance in club-level fast bowlers. Fast bowling is high intensity very repetitive skill that mechanical demands on the upper body, lower body, core and over all speed and eccentric loading consider the specific target to neuromuscular adaptation.

This study focused a highly connected with fast bowlers can increase in run -up stride, back foot contact, trunk rotational to bowling performance. Due to this exercises such as slow-tempo bench press and plyometric push-ups for the upper body, single-leg squats and Nordic hamstring curls for unilateral lower body strength, eccentric-overloaded squats, lunges combined with sprint drills for speed, and eccentric core work such as slow rollouts and Pallof presses for abdominal strength, proved effective in developing the specific neuromuscular and force-absorption

qualities demanded by the fast-bowling action. Eccentric resistance training on motor fitness components of club level fast bowlers and there was a difference between experimental group and control group. Based on finding and within the limitation of the study it is concluded that there was a significant improvement in Upper body explosive power, lower body unilateral strength, speed and abdominal muscular endurance of club level fast bowlers because utilizing external resistance, including training can be an effective way to improve the motor fitness. The current analysis has shown resistance training to beneficial for club level fast bowlers with the age between 21 to 25 years in the period of 8-week training. The findings of the present study are in line with investigator referred in this study. developed due to the eccentric resistance training after 8-week training period.

REFERENCES

1. Ramachandran, A. K., Singh, U., Connor, J. D., & Doma, K. (2024). Biomechanical and physical determinants of bowling speed in cricket: A novel approach to systematic review and meta-analysis of correlational data. Sports Biomechanics, 23 (3), 347-369.
2. Wickington, K. L., & Linthorne, N. P. (2017). Effect of ball weight on speed, accuracy, and mechanics in cricket fast bowling. *Sports*, *5*(1), 18.
3. Anandakumar, R., Rameshkumar, S., & Saraboji, S. Impact of Strength and Conditioning Training on Selected Physical, Physiological and Psychomotor Variables among College Level Fast Bowlers.
4. Dogra, D. K. (2015). Effect of 12 weeks specific conditioning programme on motor fitness of tripura cricketers. *Journal Impact Factor*, *6*(1), 706-714.
5. Vogt, M., & Hoppeler, H. H. (2014). Eccentric exercise: mechanisms and effects when used as training regime or training adjunct. *Journal of applied Physiology*, *116*(11), 1446-1454.
6. Zaheer, H., & Ikram, M. Impact of Fitness Standards on Player Performance in International Cricket.
7. Ullah, A., & Mustafa, G. (2025). Comparison of Selected Physical Fitness Variables Between Fast Bowlers and Batsmen. *Research Consortium Archive*, *3*(4), 2294-2310.
8. Douglas, J., Pearson, S., Ross, A., & McGuigan, M. (2017). Eccentric exercise: physiological characteristics and acute responses. Sports Medicine, 47 (4), 663-675.
9. Suchomel, T. J., Nimphius, S., & Stone, M. H. (2016). The importance of muscular strength in athletic performance. *Sports medicine*, *46*(10), 1419-1449.
10. Cormie, P., McGuigan, M. R., & Newton, R. U. (2011). Developing maximal neuromuscular power: Part 1—Biological basis of maximal power production. *Sports medicine*, *41*(1), 17-38.
11. Patil, S. S., & Somade, O. A. (2025). Assessment Of Lower Limb Explosive Strength in Professional Versus Recreational Cricketer. *Vascular and Endovascular Review*, *8*(14s), 289-295.
12. Shrivastava, S., & Dudhale, S. (2015). Effect of Specific Physical Fitness Programme on Lower Body Explosive Power of Male Cricketers. Research Journal of Physical Education Sciences ISSN, 2320, 9011.
13. Krishna, S. A., Alwar, T. K., Sibeko, S., Ranjit, S., & Sivaraman, A. (2019). Plyometric-based training for isokinetic knee strength and jump performance in cricket fast bowlers. *International journal of sports medicine*, *40*(11), 704-710.
14. Robin, V. M. (2022). Effect of plyometric and resistance training on speed among collegiate level cricket players. *Journal of Sports Science and Nutrition*, *3*(1), 16-18.
15. Bashir, B., SulehHayyat, F., & Shafi, S. (2018). The effect of 8 weeks of plyometric and resistance training on agility, speed and explosive power in cricket players. *Online Journal of Multidisciplinary Subjects*, *12*(2), 586-590.
16. Hossain[1], R., Khatun, H., & Das, C. K. Relationship between core muscle endurance and bowling performance metrics in university fast bowlers.
17. Sudha, G., Raman, S. A., Varghese, J. G., Thiagarajan, K. A., & Chelladurai, A. (2025). Core Endurance in University-Level Fast Bowlers: A Cross-Sectional Study. *Cureus*, *17*(8).

18. Callaghan, S. J., Lockie, R. G., Tallent, J., Chipchase, R. F., Andrews, W. A., & Nimphius, S. (2024). The effects of strength training upon front foot contact ground reaction forces and ball release speed among high-level cricket pace bowlers. Sports Biomechanics, 23(9), 1193-1209.

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