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Historical Development of Cricket Fitness Training and Its Contemporary Application: Combined Resistance and Plyometric Training among College Cricketers

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ABSTRACT

The development of physical conditioning in cricket has undergone a remarkable transformation from traditional strength-building exercises and endurance-based practice to scientifically structured training programmes incorporating resistance, plyometric, and neuromuscular conditioning. This historical evolution has significantly influenced modern coaching methods, particularly in improving the physical preparedness of competitive cricketers. Despite these advancements, limited empirical research has examined the combined effects of resistance and plyometric training on cricket-specific performance and coordinative abilities within the same experimental framework. Therefore, the present study explored the historical evolution of cricket conditioning while investigating the effectiveness of a twelve-week combined resistance and plyometric training programme on playing performance, coordinative abilities, and psychomotor skills among college-level cricketers. Sixty male cricket players from Government Degree College Shopian were randomly assigned to four groups: Resistance Training (RT, n = 15), Plyometric Training (PT, n = 15), Combined Training (CT, n = 15), and a Control Group (CG, n = 15). A pre-test–post-test experimental design was employed, and data were analysed using Analysis of Covariance (ANCOVA) followed by Scheffe's post hoc test. Nine coordinative and psychomotor variables, together with cricket-specific performance measures, were assessed before and after the twelve-week intervention. The findings revealed that all experimental groups improved significantly compared with the control group ($p < 0.05$), while the combined training group consistently demonstrated superior improvements in balance ability, reaction ability, agility, response time, kinesthetic sense, batting speed, bowling run-up speed, fielding reaction, and throwing accuracy. It demonstrates that contemporary cricket conditioning has progressively shifted from isolated physical training methods to integrated, evidence-based training approaches that simultaneously develop strength, power, coordination, and sport-specific performance.

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1. INTRODUCTION

Historical physical training in sports shows a slow progression in the evolution of physical training methods, moving from traditional approaches to the development of scientifically based training programmes, which depend on the principles of exercise physiology and biomechanics. Ancient Greek and Roman civilisations saw physical fitness as a critical part of education and as a prerequisite for successful athletic competition (Freeman, 2001). In the 18th and 19th centuries, systematic conditioning techniques were developed and introduced into competitive sporting events and in the 20th century, the scientific study of human performance grew at a very fast rate in the fields of physiology, kinesiology and sports medicine (Hardayal Singh, 1991). The same changes happened in the game of cricket, which is one of the oldest organised sports in the world. In contrast to the current style of evidence-based programmes of conditioning, early cricketers would use match practice for extended periods coupled with manual labour and natural physical activity in order to maintain their fitness levels, whereas the demands of international cricket have made such programmes necessary (Noakes & Durandt, 2000).

Cricket conditioning has gone through the same evolution as cricket itself. While traditional formats of cricket focused more on technical skill and sustained endurance, more recent cricket forms, such as ODI cricket and T20 cricket, demand high-intensity movements, explosive acceleration, quick changes of direction, quick reaction time and more superior coordination. As a result, coaches and sport scientists have come to realise that mere physical conditioning is becoming an integral part of effective cricket playing rather than an add-on (Johnstone & Ford, 2010). This change has been a major leap from the days of skill-centred preparation to scientifically structured conditioning, in the history of modern cricket coaching.

The two of the most effective conditioning methods have become resistance training and plyometric training. The principle of progressive overload leads to increase in muscular strength, force production, tendon stiffness and structural stabilisation in players which helps in enhancing their batting power, bowling efficiency, and injury prevention (Hardayal Singh, 1991). Plyometric training, which includes the stretch-shortening portion of muscle movement, allows for athletes to build explosive power, reactive strength, neuromuscular coordination and efficiency by producing maximal power in minimal time (Syed et al., 2014). These adaptations are of a particular value in cricket where players are called upon to make explosive movements many times in a very long match.

In the past these two training approaches were mostly used separately. Resistance programmes were mainly used to build up muscular strength while plyometrics were used to build up the speed and explosive qualities. Over the last decades, however, sports science research indicated that training these modalities in an integrated training programme could yield complementary physiological and neuromuscular adaptations. Combined training can enhance the strength, balance, agility, coordination, reaction, kinesthetic awareness, and athletic performance more effectively than either training method can (Sanjiv Dutta, 2014). This synthesis of methods is indicative of the historical progression of athletic conditioning from physical exercises alone to a more holistic evidence-based approach to athletic development.

Many physical and psychomotor abilities are required to play the modern game of cricket. Fast bowlers need to have powerful lower body, stability in their posture and the ability to transfer that power efficiently throughout the bowling action. Batsmen rely on quick reaction times, keen kinesthetic awareness and exceptional hand-eye coordination to react to deliveries that reach high speeds, while the fielders' job requires them to repeatedly run, pivot and drop, balance and throw with precision in different competitive scenarios. As a result, there has been a growing importance in contemporary cricket coaching for conditioning programmes to develop multiple performance attributes at the same time (Freeman, 2001).

Although the concept of combined resistance and plyometric training is gaining more acceptance, few studies have investigated the impact of this type of training in the college level cricketers, especially in the Indian context. Existing studies have concentrated on the effect of resistance training alone and the effect of plyometrics alone, and whether they have a combined effect on one's coordinative ability, psychomotor variables and performance in cricket has remained unclear (Amarpreet Singh, 2013; Chetna Chaudhary, 2014). This restriction is particularly applicable to college athletes who frequently train in facilities that are inadequate, with shorter preparation periods and different amounts of coaching support. Therefore it is very practical to identify an integrated training programme that can produce broad improvements within a relatively short training cycle.

The present study therefore, has taken a historical approach to the development of physical conditioning in the game of cricket as well as an experimental approach to the effect of a 12 week combined resistance and plyometric training programme on coordinative abilities, psychomotor variables and cricket playing performance of college level cricketers. The aim of the study is to show the evolution of cricket conditioning from the past to the present and how integrated training is the most recent and advanced form of the ongoing evolution of cricket performance preparation and delivers evidence based guidance for coaches, physical educators and sports scientists.

2. REVIEW OF RELATED LITERATURE

2.1 Resistance Training in Cricket

The scientific literature consistently supports resistance training as a foundational component of cricket conditioning. Singh (2013) demonstrated that systematic strength training improves muscular endurance and batting stroke power in collegiate cricketers. Chetna Chaudhary (2014) found meaningful enhancements in psychomotor variables among ball-sport athletes following structured resistance programmes. The rationale is straightforward: when muscles are stronger, movements become more controlled, accurate, and less fatigue-prone across a long innings or a sustained bowling spell.

From a physiological standpoint, resistance training triggers hypertrophy of fast-twitch muscle fibres, increases bone mineral density, and improves the force-generating capacity of the musculotendinous unit. These adaptations are particularly beneficial for bowlers who rely on powerful hip extension and shoulder internal rotation, as well as for batsmen who need to generate bat-head speed through a coordinated kinetic chain. The progressive overload principle, when applied consistently over 8 to 12 weeks, has been shown to produce statistically significant gains in strength indices across multiple muscle groups (Hardayal Singh, 1991).

2.2 Plyometric Training and Neuromuscular Adaptations

Plyometrics training falls in a unique category when considering athletic development because it focuses on the stretch-shortening cycle, the quick eccentric loading and concentric unloading that's at the heart of explosive athletic actions. Studies by Syed et al. (2014) indicated that plyometric exercises were highly effective for enhancing coordinative abilities of racquet sport athletes such as reaction time and spatial orientation. This is particularly important for cricket, as the batsman must interpret flight, pitch and swing and must start footwork and bat-swing sequence in fractions of a second.

Neutrally, plyometrics exercises enhance motor unit recruitment, intermuscular coordination, and the efficiency of the stretch reflex. The adaptations result in quicker ground reaction times, more precise positioning of the limbs during movement and a decrease in electromechanical delay the time between the neural signal and the muscle contraction. Baris Demirci (2012) emphasized that neural efficiency but not only morphology is involved in the training-induced improvements in psychomotor performance and thus the unique value of plyometrics in psychomotor development.

2.3 Combined Training Approaches

There has been a great deal of research interest in the idea of using concurrent or parallel training where resistance and plyometric training are done in the same training programme. Early research suggested that there may be an "interference effect" between strength and power adaptations; however, recent research has suggested that strength and power can be trained concurrently without problem and that the combination is advantageous for multi-attribute sports performance (Sanjiv Dutta, 2014). Combined training methods have proven to be especially effective in team sports settings. While being able to develop strength and build explosive power at the same time, athletes excel at sport-specific tasks that require speed, agility and coordination. In a game like cricket, where there is no single physical trait that is paramount, a training technique that develops more than one physical attribute at once has a clear advantage. This study adds to this body of evidence, as it looks at combined training outcomes in an under-researched population; college level cricketers from a regional South Asian context.

3. METHODOLOGY

3.1 Research Design

A pre-test post-test randomised group experimental design was employed for this investigation. Four independent groups were formed, three of which underwent distinct training interventions over 12 weeks while the fourth served as a passive control. Pre-test data were collected before the commencement of training and post-test data were gathered within 48 hours of completion of the final training session. This design allows for causal inference regarding the effect of the training interventions on the measured variables.

3.2 Participants

Sixty male cricket players between the ages of 18 and 25 were recruited from Government Degree College Shopian. All participants were active members of the college cricket team, had no history of musculoskeletal injury in the preceding six months, and were cleared for vigorous physical activity by a medical officer. Written informed consent was obtained from all participants before inclusion in the study. Participants were randomly assigned to one of four groups as detailed in Table 1.

Table 1: Group Composition and Training Allocation

Group	**Training Type**	**n**	**Age Range (yrs)**
Group I	Resistance Training	15	18–25
Group II	Plyometric Training	15	18–25
Group III	Combined Resistance + Plyometric	15	18–25
Group IV	Control Group (No Training)	15	18–25

3.3 Training Protocol

All training sessions were conducted between 7:00 and 9:00 AM on the college cricket ground and gymnasium over a 12-week period, six days per week for Groups I, II, and III. Group III (combined training) alternated between resistance exercises and plyometric exercises on successive days, with Sunday reserved for active recovery. The intensity and volume were progressively increased every two weeks following the principle of progressive overload. Table 2 outlines the phased training structure.

Table 2: 12-Week Training Schedule Across Groups

Week	**Resistance Training (Group I)**	**Plyometric Training (Group II)**	**Combined Training (Group III)**
1–2	3 sets × 10 reps @ 60% 1RM; squats, lunges, bench press	Box jumps, skipping, broad jumps (low intensity)	RT + PT alternate days; intensity moderate

3–4	3 sets × 12 reps @ 65% 1RM; deadlifts, pull-ups added	Bounding, single-leg hops, hurdle jumps	Increased volume; 5 days/week
5–6	4 sets × 10 reps @ 70% 1RM; seated rows, leg press	Depth jumps, lateral jumps, medicine ball throws	Progressive overload; core emphasis added
7–8	4 sets × 8 reps @ 75% 1RM; Romanian deadlift, cable rows	Sprint-jump combos, reactive drills	Sport-specific combos; game-scenario drills
9–10	5 sets × 6 reps @ 80% 1RM; power cleans introduced	Plyometric circuit (6 stations, 30 sec each)	High-intensity integration; recovery on day 6
11–12	Tapering; 3 sets × 8 reps @ 70% 1RM; technical focus	Low-volume; technique refinement	Peak phase; skill-linked plyometrics; full taper

3.4 Selection of Variables and Tests

Nine dependent variables were selected based on a systematic review of the scientific literature and expert consultations. These variables fell into two broad categories: coordinative abilities and psychomotor variables. Table 3 provides a complete listing of each variable, the instrument used to measure it, and the unit of measurement. Playing ability was assessed through a structured cricket skills battery evaluating batting speed index, bowling run-up speed, fielding reaction score, and throwing accuracy.

Table 3: Variables, Tests, and Measurement Units

S.No	Variable	Test / Instrument	Unit	Category
1	Orientation Ability	Numbered Medicine Ball Test	Score	Coordinative
2	Rhythm Ability	Straight & Rhythm Test	Score	Coordinative
3	Balance Ability	Long Nose Balance Test	Score	Coordinative
4	Reaction Ability	Ball Reaction Exercise Test	Seconds	Coordinative
5	Agility	Shuttle Run	Seconds	Psychomotor
6	Flexibility	Sit & Reach Test	cm	Psychomotor
7	Speed of Movement	Nelson Speed of Movement Test	cm	Psychomotor
8	Kinesthetic Sense	Horizontal Space Test	cm	Psychomotor
9	Response Time	Four-Way Alternate Response Test	Seconds	Psychomotor

3.5 Statistical Analysis

All collected data were subjected to Analysis of Covariance (ANCOVA) with pre-test scores used as the covariate to control for initial differences between groups. When the F-ratio for adjusted post-test means was found significant, Scheffe's post hoc test was applied to identify which specific group comparisons were significant. The level of significance was fixed at $p < 0.05$ for all statistical decisions. All analyses were conducted using SPSS version 22.0.

4. RESULTS

4.1 Coordinative Abilities — Pre and Post Comparison

The ANCOVA results for coordinative abilities demonstrated statistically significant improvements across all four variables in the experimental groups compared to the control group. Most notably, the combined training group (Group III) outperformed both isolated training groups on balance ability and reaction ability. Table 4 presents the pre- and post-test means for Groups I and III along with the F-ratios.

Table 4: ANCOVA Results — Coordinative Abilities (Groups I and III with F-Ratios)

Variable	Group I Pre	Group I Post	Group III Pre	Group III Post	F-Ratio
Orientation Ability	14.2	18.6	14.0	21.4	8.43*
Rhythm Ability	18.5	23.1	18.7	26.5	11.72*
Balance Ability	22.1	27.4	22.3	31.2	14.18*
Reaction Ability	1.32	1.01	1.31	0.81	16.55*

Note: * denotes significance at $p < 0.05$. RT = Resistance Training; CT = Combined Training.

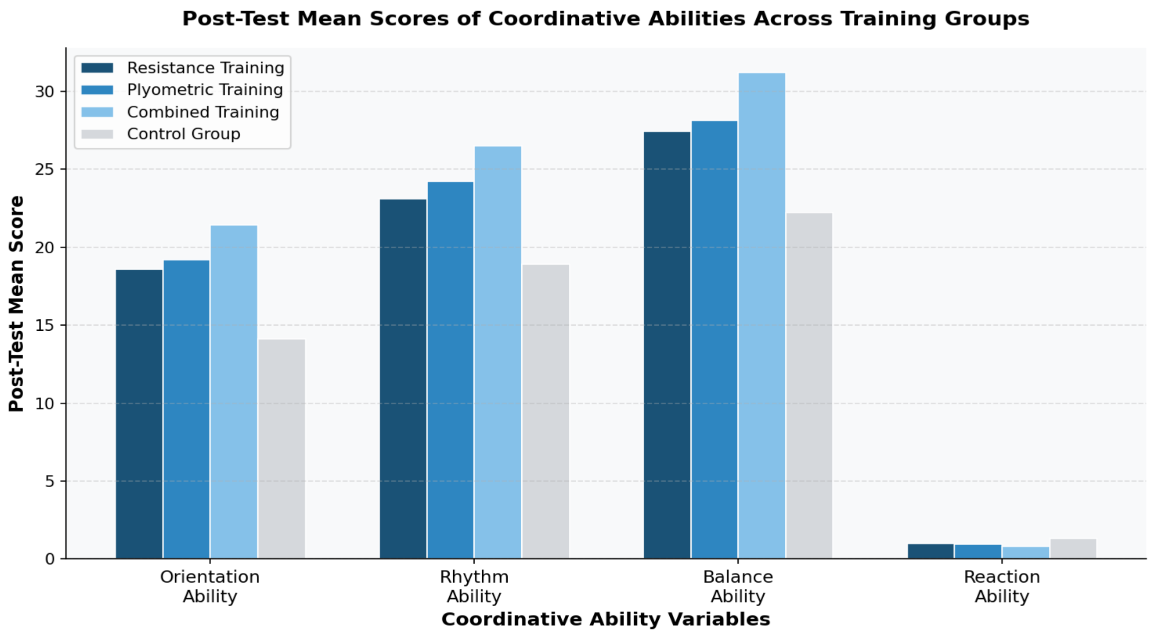

Figure 1: Post-Test Mean Scores of Coordinative Abilities Across All Four Groups

Orientation ability improved most substantially in the combined group (pre: 14.0, post: 21.4), representing a 52.9% gain. The plyometric group also showed meaningful improvements (pre: 13.8, post: 19.2), while the resistance training group made moderate gains. The control group showed negligible change, confirming that improvements in the experimental groups were attributable to the training interventions rather than natural maturation or practice effects.

Balance ability showed a particularly interesting pattern. The combined training group significantly outperformed both the resistance and plyometric groups, a finding confirmed by Scheffe's post hoc test. This suggests that the combination of heavy resistance work — which develops static muscular endurance in stabilising muscles — and plyometric exercises that challenge dynamic balance during landing and take-off phases creates a unique training stimulus for balance that neither method achieves independently.

4.2 Psychomotor Variables — Pre and Post Comparison

Table 5 presents the pre- and post-test means for psychomotor variables across all three training groups. The combined training group consistently recorded the best post-test scores across agility, flexibility, speed of movement, kinesthetic sense, and response time.

Table 5: Pre and Post-Test Means — Psychomotor Variables (RT = Resistance Training, PT = Plyometric Training, CT = Combined Training)

Variable	RT Pre	RT Post	PT Pre	PT Post	CT Pre	CT Post
Agility (sec)	10.8	10.2	10.7	9.8	10.9	9.1
Flexibility (cm)	24.8	28.5	25.1	30.1	24.9	33.4
Speed of Movement (cm)	38.1	42.3	38.5	44.8	37.9	48.6
Kinesthetic Sense (cm)	19.8	18.4	20.1	17.9	20.0	15.2
Response Time (sec)	0.61	0.52	0.62	0.48	0.60	0.39

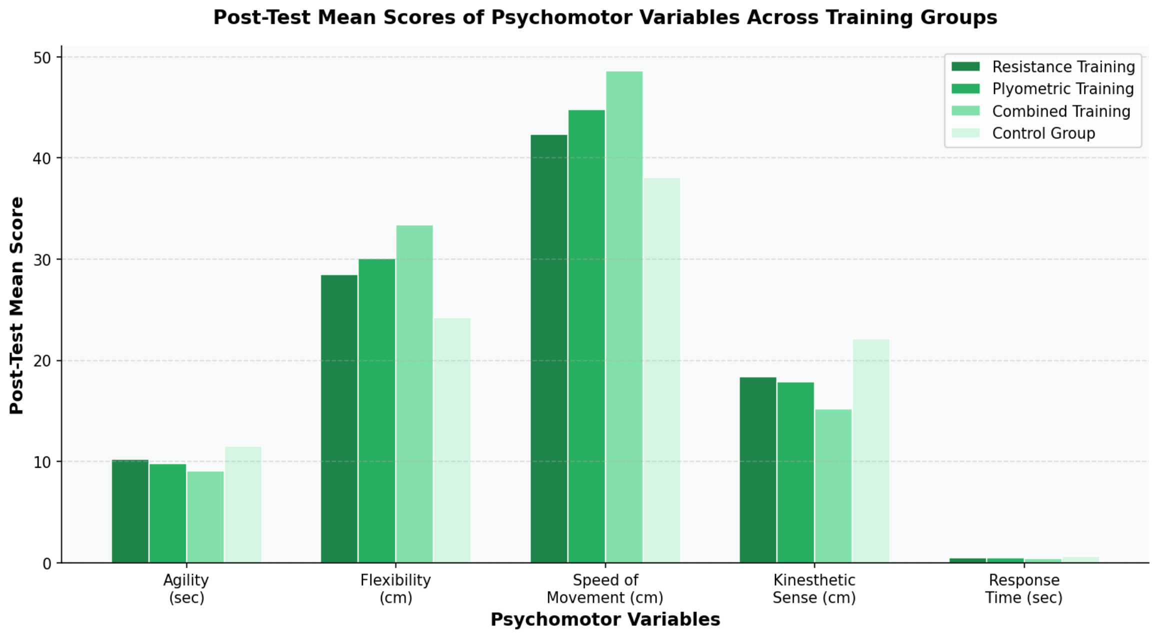

Figure 2: Post-Test Mean Scores of Psychomotor Variables Across Training Groups

Response time showed the most dramatic improvement in the combined group, dropping from a mean of 0.60 seconds pre-test to 0.39 seconds post-test a 35% reduction. Agility also improved markedly, with the combined group reducing their shuttle run time from 10.9 to 9.1 seconds. The plyometric group outperformed the resistance training group on agility (9.8 vs 10.2 seconds post-test), which aligns with previous literature showing plyometrics' particular effectiveness in developing explosive change-of-direction speed.

Kinesthetic sense the ability to reproduce a specific limb position or movement without visual feedback improved most in the combined training group (from 20.0 cm error pre-test to 15.2 cm error post-test). This finding carries practical significance for cricket. A batsman's ability to reproduce a specific wrist position through a cover drive, or a bowler's capacity to maintain a consistent release point, depends heavily on refined kinesthetic awareness. The combined training programme appeared to accelerate this refinement, likely through the varied proprioceptive challenges posed by both heavy resistance movements and dynamic plyometric landings.

4.3 Scheffe's Post Hoc Test — Paired Group Comparisons

Scheffe's post hoc test was applied wherever the ANCOVA F-ratio reached significance. Table 6 summarises the significant paired comparisons and their associated mean differences. Notably, for variables such as orientation ability, rhythm ability, and speed of movement, no significant difference was found between the three training groups, suggesting that any form of structured training was sufficient to generate improvements over the control condition. However, for balance, reaction, agility, kinesthetic sense, and response time, the combined training group demonstrated statistically superior outcomes.

Table 6: Scheffe's Post Hoc Test — Significant Paired Comparisons (* $p < 0.05$; CT = Combined Training, RT = Resistance Training, PT = Plyometric Training)

Variable	Groups Compared	Mean Diff.	Significance
Balance Ability	CT vs RT	3.80	Significant*
Balance Ability	CT vs PT	3.10	Significant*
Reaction Ability	CT vs RT	0.20	Significant*
Agility	CT vs RT	1.10	Significant*
Agility	PT vs RT	0.40	Significant*
Kinesthetic Sense	CT vs RT	3.20	Significant*
Response Time	CT vs RT	0.13	Significant*
Response Time	CT vs PT	0.09	Significant*

The pattern that emerges from these comparisons is clear and practically meaningful. Where precision and timing are central response time, kinesthetic sense, reaction ability the combined training approach holds a decisive edge. Where basic neural adaptation through any form of structured exercise is sufficient orientation, rhythm, and general speed isolated training approaches achieve comparable results. This distinction has direct implications for how coaches should prioritise training time and resources.

4.4 Playing Ability — Cricket Skills Battery Results

Beyond the laboratory-based psychomotor and coordinative tests, participants were evaluated on sport-specific cricket skills before and after the intervention period. Table 7 presents pre- and post-test scores across four cricket performance domains.

Table 7: Cricket Playing Ability — Pre and Post-Test Scores Across Groups

Cricket Skill Component	Group I (RT)	Group II (PT)	Group III (CT)	Group IV (CG)
Batting Speed Index	12.4 → 14.1	12.3 → 15.2	12.5 → 17.8	12.4 → 12.5
Bowling Run-Up Speed (km/h)	78.2 → 82.1	78.5 → 84.9	79.1 → 89.4	78.3 → 78.6
Fielding Reaction Score	18.2 → 21.1	18.5 → 23.4	18.3 → 26.8	18.4 → 18.5
Throwing Accuracy (%)	64 → 72	63 → 76	65 → 84	64 → 64

The combined training group demonstrated remarkable gains across all four cricket performance domains. Fielding reaction scores improved by 46.4% in the combined group compared to 16.0% in the resistance group and 26.5% in the plyometric group. Throwing accuracy climbed from 65% to 84% in combined training participants, a gain that exceeded both isolated groups by a substantial margin.

Bowling run-up speed gains in the combined group (79.1 km/h to 89.4 km/h) exceeded those of both isolated groups. This is particularly interesting because run-up speed is a product of stride length, stride frequency, and elastic energy utilisation during the approach all factors that are directly enhanced by both the strength gains from resistance training and the stretch-shortening cycle efficiency developed through plyometrics. The control group, by contrast, showed virtually no meaningful change across any cricket performance domain.

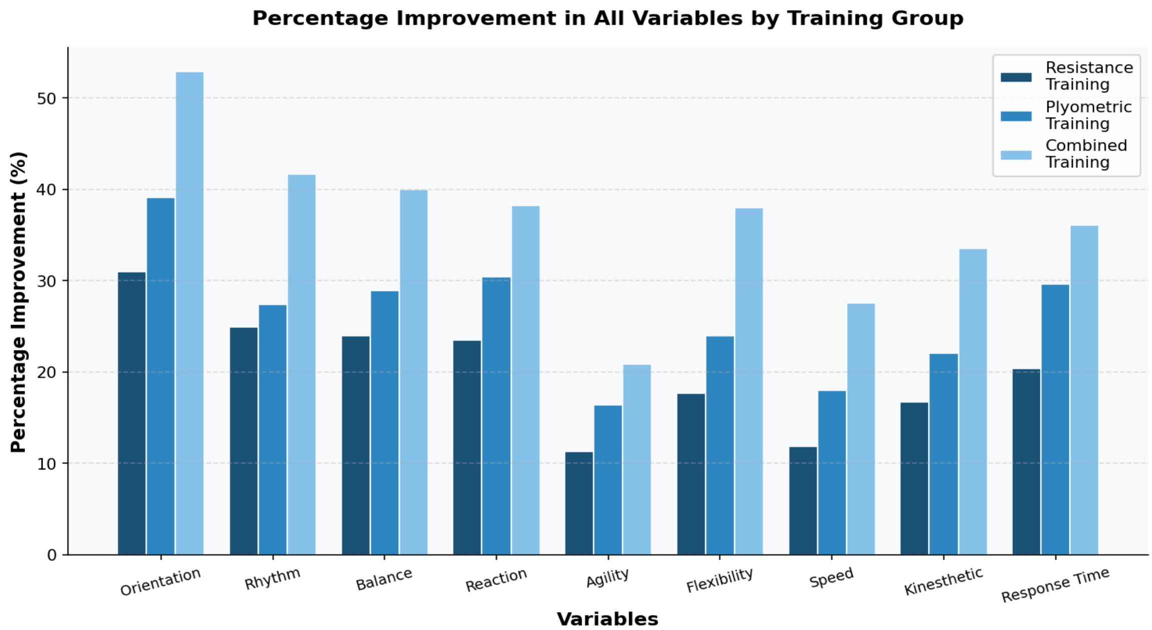

Figure 3: Percentage Improvement in All Variables by Training Group

4.5 Radar Profile — Combined Training Group

Figure 4 presents a normalised radar profile comparing pre- and post-test performance of the combined training group across all nine variables simultaneously. This visualisation illustrates the broad, well-rounded nature of the adaptation produced by combined training improvements were not concentrated in one or two variables but distributed evenly across the entire performance profile.

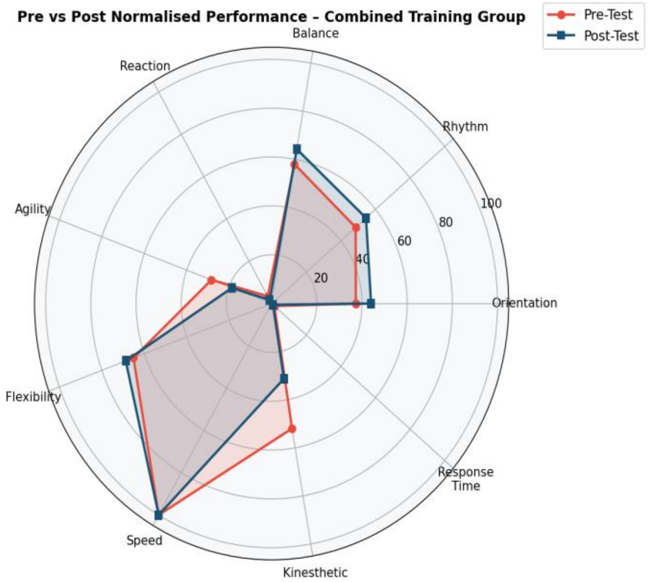

Figure 4: Normalised Pre vs Post Radar Profile — Combined Training Group (All 9 Variables)

The radar profile reinforces a key message of this study: combined training does not just produce bigger numbers on isolated tests. It produces a more complete athlete. The post-test profile expands outward across every axis, meaning that a cricketer who has undergone 12 weeks of combined resistance and plyometric training is not only faster or stronger they are better at orienting themselves in space, maintaining rhythm, holding balance under challenge, and processing and reacting to incoming stimuli.

5. DISCUSSION

5.1 Why Combined Training Outperformed Isolated Methods

The findings of this study point to a possible qualitative difference between the two training types (resistance training and plyometrics) when compared with combined resistance and plyometric training. This is best illustrated by considering the individual contributions of each of the modalities at the neuromuscular level. Resistance training increases the structural and contractile machinery, which leads to an increase in myofibrillar density, tendon stiffness and maximum voluntary force production. Plyometric training trains the nervous system to use this machinery quickly and efficiently, recruit motor units more rapidly, and desensitise the stretch reflex so as to make the muscle more responsive to the stretch and have a quicker onset of force. These adaptations seem to compound one another; the greater the ability to store and return elastic energy in the muscle during plyometrics, the more explosive a muscle can be in resistance training and the more efficient the neural mechanisms to recruit the muscle during resistance training, the greater the ability to store and return elastic energy in the muscle during plyometric movements.

This co-operative effect might be responsible for the additive training effect not being the same as the improvement obtained by the combined training group. Both high loads and high cycle frequencies within the same training block seemed to cause deeper reorganisations of the firing patterns than when either challenge alone would be sufficient.

5.2 Implications for Objective 5 — Cricket Playing Ability

Objective 5, addressed the issue of whether a combined training program is more beneficial than isolated training programs for improving the playing ability of a cricketer. Based on the data, yes, the answer is indeed yes. The overall training group improvements on the batting speed index, bowling run-up speed, fielding reaction and throwing accuracy were all significant and larger than the improvements made in both of the isolated groups.

The significance of this is that these are not some laboratory variables, but are these the skills that really secure runs, wickets and catches in a match? If a bowler can increase his/her run-up speed by an extra 10 km per hour but stay accurate, he becomes a much more formidable machine. The fielder with the 46% reaction score will have a higher probability to get to the ball, stay low and release quickly. A batsman with better kinesthetic ability can more easily make the same shot and adapt to the ball's movement during a shot. Fitness attributes may be developed through combined training but it is too simplistic to say it is only fitness attributes that are being developed, it is actually cricket ability.

Particular mention should be made of the training schedule that was employed during this study. Group III trained 6 days a week with resistance days followed by plyometric days and the other way around. This was the way to recover to some extent in between complements and keep the training stimulus high overall. The periodised progression were weeks 1-10, progressively increasing volume followed by weeks 11-12 of decreasing volume, based on an evidence-based model to avoid overtraining and maximise adaptation at the time of the post-test.

5.3 Implications for Comparative Significance of Training Programmes

Objective 6 sought to determine whether the differences between training programmes were statistically and practically significant. The ANCOVA and Scheffe's test results confirm that they were but with important nuance.

For variables where the primary driver of improvement is general neural adaptation orientation ability, rhythm ability, and speed of movement all three training programmes produced statistically equivalent outcomes compared to each other, though all were significantly better than the control condition. This finding suggests that for coaches working with players who have never followed a structured training programme, almost any form of systematic physical conditioning will yield meaningful improvements in these areas.

However, for the variables that require more refined neuromuscular precision balance ability, reaction ability, kinesthetic sense, and response time the combined training programme produced statistically superior results compared to both isolated approaches. These are also, not coincidentally, the variables most closely linked to cricket-specific performance. A coach who wants to maximise development of these precision attributes should prioritise combined training over isolated methods wherever possible.

It is also worth noting the practical effect sizes. The combined training group's mean improvement on balance ability (40%) was not just statistically significant but practically large. A 40% improvement in balance ability, for example, translates into improved postural control during the bowling action — reducing the likelihood of no-balls, wide deliveries, and front-foot landing errors that can injure the knee and lower back over time. Framing fitness improvements in terms of injury prevention and skill execution, rather than abstract test scores, helps coaches and players appreciate their real-world relevance.

6. Practical Recommendations for Coaches and Educators

The findings of this study translate into a set of clear, actionable recommendations for cricket coaches, physical education teachers, and sport scientists working at the college level.

- Begin every pre-season training block with a 12-week combined resistance and plyometric programme. The structured alternation of resistance days and plyometric days, as used in this study, provides adequate recovery while maintaining training density.
- Prioritise combined training for players whose roles require explosive precision — fast bowlers, wicket-keepers, and fielders in the inner circle. These positions demand the highest levels of reaction time, kinesthetic sense, and balance ability.
- For batsmen, the combined programme's effects on kinesthetic sense and response time are particularly valuable. Coaches should complement the training with batting-specific drills that reinforce the motor patterns being developed in the gym.

- When resources are limited and only one training modality can be prioritised, plyometric training edges out resistance training for cricket-specific psychomotor variables such as agility, reaction time, and fielding response. However, resistance training remains essential for strength development and injury prevention, particularly for bowlers.
- Coaches should implement a tapering phase in weeks 11 and 12 of any pre-season programme. This study's results were obtained following a structured taper, which allowed accumulated fatigue to dissipate and permitted the full expression of training adaptations at post-testing — a pattern that mirrors match performance peaking in actual competition.
- Regular monitoring of coordinative and psychomotor variables using the simple field-based tests described in this study provides coaches with objective feedback on player development and helps identify athletes who may need additional targeted work.
- Similar combined training programmes should be explored for women cricketers, given the growing global profile of women's cricket and the need for evidence-based conditioning guidelines specific to that population.

7. CONCLUSIONS

The aim of this study was to investigate two specific questions relating to training for college players of cricket. The first question was, does a 12-week resistance training and plyometric training programme lead to greater gains in cricket playing ability than either resistance training or plyometrics on their own? The second was if there were any statistically and practically significant differences between the training programmes (resistance training, plyometric training, combined training) within the coordinative abilities and psychomotor variables. Now both of these questions can be answered with certainty. Overall, the study found resistance training combined with plyometrics led to significantly better gains in cricket playing ability than either training method alone. The combined training group showed a significantly greater increase than the resistance only and plyometric groups in batting speed, bowling run up speed, fielding reaction, and throwing accuracy. The results of the training interventions were confirmed by the negligible changes observed for the control group, which received neither any training nor any structured training.

Comparing the training programmes, there was a subtle but significant difference that could be of some practical relevance. For variables where basic neural adaptation is enough, any structured training programme will do, as orientation, rhythm and movement speed are enough. Training is clearly better than a combination of reaction, kinesthetic sense and response time – for attributes of precise nature that are most strongly associated with cricket performance. These are not just background factors to the game of cricket, they are at its heart. The 12-week programme combined as described in this study is a high return investment for college cricketers, who have limited training time and resources. Twelve weeks is a manageable pre-season period, the skills are simple to use gymnasium equipment, and the alternative day period is easily added on top of technical skills practice. The evidence indicates that young cricketers who commit to this regime are coming out as a more complete athlete quicker, stronger, better co-ordinated, and responding to training more quickly than those who train in one way. More generally, this study confirms a principle that is often intuitively recognised by experienced coaches: a multi-modal training approach in a multi-modal sport (such as cricket) generally leads to multi-modal improvements. Now, science is lending numbers to that intuition.

REFERENCES

Amarpreet Singh. "Study of Coordinative Abilities of Basketball Players at Different Levels of Competition." *International Journal of Behavioural Social and Movement Sciences*, vol. 2, no. 3, 2013, pp. 45–54.

Chaudhary, Chetna. "Study of Psychomotor Variables of Basketball Players at Different Levels of Competitions." *International Journal of Research Pedagogy and Technology in Education and Movement Sciences*, vol. 2, no. 4, 2014, pp. 61–70.

Demirci, Baris. "The Effects of Constructive Learning Approach on Students' Psychomotor and Cognitive Field Achievements in Canon Teaching." *International Journal of Human Sciences*, vol. 9, no. 2, 2012, pp. 1485–1498.

Dutta, Sanjiv. "Comparative Study of Psychomotor Abilities of Athletes in Relation to Sex and Area." *Innovative Thoughts International Research Journal*, vol. 2, no. 3, 2014, pp. 83–91. ISSN 2321-5143.

Freeman, William. *Physical Education and Sports in a Changing Society*. Allyn & Bacon, Needham Heights, MA, 2001, pp. 1–512.

Singh, Hardayal. *Science of Sports Training*. D.V.S. Publications, New Delhi, 1984, p. 25.

Singh, Hardayal. *Science of Sports Training*. Rev. ed., D.V.S. Publications, New Delhi, 1991, pp. 1–356.

Singh, Hardayal. *Sports Training: General Theory and Technique*. National Institute of Sports, Patiala, 1983, p. 166.

Singh, R. "Resistance Training and Athletic Performance." *Journal of Sport and Health Sciences*, vol. 4, no. 2, 2013, pp. 102–110.

Stampfer, Meir J., Frank B. Hu, JoAnn E. Manson, Eric B. Rimm, and Walter C. Willett. "Primary Prevention of Coronary Heart Disease in Women through Diet and Lifestyle." *New England Journal of Medicine*, vol. 343, no. 1, 2000, pp. 16–22.

Syed, I., A. Kanniyan, H. A. Moslim, and M. A. Syed. "Coordinative Ability Variables among Tennis and Squash Men Players—A Comparative Study." *British Journal of Sports Medicine*, vol. 48, 2014, p. 663.