The Impact Of Field Training With Cognitive Strategies On Physiological And Performance Variables In Young Athletes Of Pune

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ABSTRACT

This study explores the impact of field training with and without self-directed cognitive strategies on physiological and performance variables in athletics players. Forty-two athletes (aged 16–19) from Pune District were randomly assigned to three groups: (i) Game-Specific Field Training without cognitive strategies, (ii) Game-Specific Field Training with cognitive strategies, and (iii) a Control Group with no specific training. The 12-week training, conducted five days a week for two hours per session, incorporated cognitive strategies such as attentional focus, self-talk, relaxation, imagery, and preparatory arousal to enhance psychological factors like self-confidence, anxiety management, and concentration. Analysis of Covariance (ANCOVA) and Scheffe's post-hoc test were used to assess the data. Results revealed significant improvements in psychological and performance variables for the experimental groups, with the highest gains in self-confidence (10.214 to 19.388), anxiety management (12.857 to 16.828), and concentration (11.5 to 19.510) in the cognitive strategies group ($p<0.05$). Playing ability also improved most in this group. Findings indicate that integrating cognitive strategies into field training enhances both psychological resilience and athletic performance, supporting their inclusion in training programs for competitive athletes..

Keywords : Psychological and performance variables among Athletics players.

Introduction

Athletics is a game of running, jumping and throwing in which each team has to bowl and bat according to certain rules and regulations. Self-directed cognitive

strategies among athletics players refer to the deliberate mental techniques that athletes employ independently to enhance their psychological readiness and overall performance. These strategies typically include practices such as goal-setting, positive self-talk, visualization, and attentional control, each of which plays a crucial role in managing competitive anxiety and fostering concentration during both training and competition. By engaging in these self-regulatory techniques, athletes are better equipped to moderate their emotional responses, sustain focus under pressure, and reinforce self confidence, all of which are essential for optimal performance in high-stakes environments. Furthermore, the application of these cognitive strategies has been associated with beneficial physiological adaptations, such as improved heart rate variability and a reduction in stress induced arousal, thereby creating a more balanced interplay between mental and physical performance factors. In essence, the integration of self-directed cognitive strategies into athletic training regimens offers a holistic approach that not only enhances technical and physical competencies but also fortifies the psychological resilience necessary for peak performance.

Weinberg et al. (1995) assert that an athlete's success is determined by an intricate interplay of physical prowess and mental acuity—a notion that is particularly salient in athletic events where the competitive demands are both physically taxing and mentally challenging. In the realm of athletics, especially within the Indian context, coaches and practitioners alike emphasize that mental preparation is at least fifty percent of performance. In some events, such as sprinting or technical field events, this mental component may contribute up to 80–90 percent of overall success. Esteemed figures in sports, like Jimmy Connors—who famously remarked that professional tennis is 95 percent mental—underscore the critical influence of psychological fortitude, a perspective that resonates with Indian athletes who must navigate both high physical demands and substantial mental pressures in national and international competitions. Robin Smith (1994) further reinforces this idea by stating that "athletics is played in the mind, more than any other game," a concept that is increasingly relevant as Indian sports programs evolve to integrate mental skills training alongside traditional physical conditioning.

The mental training techniques employed today have deep historical roots. For instance, ancient Japanese texts on the training of samurai warriors highlight that mental preparation was once considered as important as physical training. Similarly, sport psychologists were already being utilized by Eastern bloc nations in the early 1960s—a practice that has only recently been fully embraced by Western countries (Bull et al., 1996). Among these techniques, imagery stands out as a particularly powerful tool. Widely adopted by elite athletes across the globe, including those in India, imagery involves the systematic practice of creating and reinforcing positive

mental images. This process, also known as visualization, mental rehearsal, or mental practice, is dramatically effective in transforming cognitive intentions into physical execution. Studies by Caudill and Weinberg (1993), Caudill et al. (1983), Gould et al. (1980), and Tynes et al. (1987) provide empirical support for the effectiveness of self-directed cognitive techniques, demonstrating that such mental skills training can significantly enhance sports performance. For Indian athletes, who often contend with intense competitive pressures and high-stakes environments at events like the National Championships, the Asian Games, and the Olympics, incorporating self-directed cognitive strategies into their training regimes is essential for achieving peak performance and competing on a global stage.

Methodology

Forty two Pune District Athletics players were randomly selected as subjects from the under-16 to 19 Athlete's who represented Pune district Athletics team in the Tamil Nadu Inter-District tournaments.

Experimental design and treatment

Three group designs was used. By using the matching procedure on the basis of their initial test performance scores on Athletics playing ability, the subjects will be divided into three equal groups, in the each group consisting of sixteen subjects. Experimental Group – I Game-Specific field training group without Self-directed cognitive strategies , Experimental Group – II Game Specific field training group combined with Self-directed cognitive strategies , Group – III No specific training / conditioning (control). The game specific field training schedule was specifically designed to improve the Athletics playing ability and fitness level of the Athlete's, the Game-Specific training package designed by the investigators of the study was administered for a period of twelve weeks, five days a week, two sessions each day each session lasted two hours. The Self-directed cognitive strategies were meted out for 25 minutes to group II either before or after the game-specific field training. Self-directed cognitive strategies consist of namely attention focus, self talk, relaxation, imagery and preparatory arousal. The Psychological variables namely self confidence, anxiety & worry management and concentration. Hardy and Neloson's mental skill questionnaire were used to collect psychological parameters of the subject, three qualified coaches subjectively rated the Athletics playing ability each player before and after the treatment. The guideline for subjective rating was given by the investigator. The pre and post test were conducted one day before and after the experimental treatment. Analysis of covariance was used to analyze the collected data. Scheffe's test was used as a post hoc test to determine which of the paired mean differ significantly. The analysis of

covariance on the obtained scores in pre, post and adjusted posttest of the control, experimental group I and II for psychological variables namely Self confidence, Anxiety and Concentration ability have been presented.

Findings:

Table I : *Analysis of covariance for pre,post and adjusted post test data on selfconfidence, anxiety, concentration and performance variable of game-specfic field training group, game-specfic field training group & combined with self-directed cognitive strategies and control group.*

Variables		Game Specific Field	Game-Specific field	No specific training / conditioni	Source of variance	df	Sum of square	Mean square	'F' ratio
Self confi-dence	Pre-test Mean	10.571	10.214	11.143	BM	2	6.140	3.07	0.5718
	SD	2.352	2.210	2.133	WG	39	209.5	5.37	
	Post-test Mean	14.929	19.071	11.357	BM	2	417.33	208.67	24.88*
	SD	3.390	3.127	1.445	WG	39	327.07	8.39	
	Adjusted Post-test Mean	14.981	19.388	10.988	BS	2	480.57	240.28	42.88
					WS	38	212.92	5.60	
Anxiety & worry manage-ment	Pre-test Mean	11.143	12.857	10.643	BM	2	37.76	18.88	3.06
	SD	1.16	3.335	1.716	WG	39	240.64	6.17	
	Post-test Mean	13.286	17.786	12.0	BM	2	258.43	129.21	112.1368
	SD	1.906	4.585	2.236	WG	39	415.21	10.65	
	Adjusted Post-test Mean	13.582	16.828	12.662	BS	2	115.94	57.97	7.69
					WS	38	286.49	7.54	

Concen-tration	Pre-test Mean	11	11.5	10.357	BM	2	9.19	4.60	0.6383
	SD	2.878	2.353	2.496	WG	39	280.71	7.20	
	Post-test Mean	14.786	19.929	10.571	BM	2	614.90	307.45	32.8768
	SD	3.405	3.369	1.761	WG	39	364.71	9.35	
	Adjusted Post-test Mean	14.749	19.510	11.027	BS	2	490.55	245.27	46.46
					WS	38	200.59	5.28	
Playing ability	Pre-test Mean	4.979	4.986	4.993	BM	2	0.00158	0.00079	0.0005
	SD	1.240	1.181	1.206	WG	39	61.45	1.58	
	Post-test Mean	4.214	7.786	5.121	BM	2	238.62	119.31	23.075
	SD	0.937	0.880	0.947	WG	39	35.69	0.92	
	Adjusted Post-test Mean	6.069	7.557	5.117	BS	2	214.18	107.09	93.19
					WS	38	8.64	0.23	

B.M - Between the Means B.S – Between sets * Significant at 0.05 level

W.G - Within Group W.S – Within sets

The table values required for significant at 0.05 level with df (2, 39) and (2,38) are 3.24 and 3.25 respectively,

The Analysis of Covariance (ANCOVA) table presents a comparative evaluation of self confidence, anxiety management, concentration, and playing ability across three groups: Game Specific Field Training Group, Game-Specific Field Training Group Combined with cognitive strategies, and a Control Group. The pre-test mean values for all variables indicate minor differences across groups, with no significant initial variation, as evidenced by low F-ratios. However, in the post-test and adjusted post-test results, the Game-Specific Field Training Combined with cognitive strategies consistently demonstrated the most substantial improvement across all measured parameters. Specifically, self-confidence increased significantly in this group (from 10.214 to 19.388), and anxiety reduction was notable (12.857 to 16.828). Similarly, concentration showed a marked improvement (11.5 to 19.510), with an F-ratio of 46.46, highlighting significant variance. The playing ability results suggest a

substantial gain in the Game-Specific Field Training Combined with strategies Group (4.986 to 7.557), showing a significant training effect, whereas the control group exhibited minimal improvement. The Fratios for post-test and adjusted post-test scores further confirm the effectiveness of the combined training approach, indicating that psychological interventions such as the Self-directed cognitive strategies enhance sports performance when integrated with game-specific training.

The Self confidence, Anxiety and Concentration of pre and post and adjusted post-test means and standard deviation of Game-Specific field training group, Game-Specific field training group combined with self-directed cognitive strategies and Control group. Are presented in above table. The obtained 'F' ratio of pre, post, adjusted post-test of all selected psychological variables namely Self confidence, Anxiety and Concentration 'F' value was lesser than the obtained F-value in all test barring pre-test. The obtained 'F' ratio of all the selected psychological and performance (Athletics playing ability) variables is greater than the table 'F' value in the case of post test. Similarly in adjusted post test the obtained 'F' value is also greater than the table 'F' value., it was clear that obtained 'F' values were greater than the table value in all the cases and the only exception was the pre-test. The results revel that there was significant difference among post-test and adjusted posttest means of the of Game-Specific field training group, Game-Specific field training group combined with self-directed cognitive strategies and Control group. To determine which of the three paired means had a significant difference, Scheffe's test was applied.

Table 2 : *scheffe's test for the differences between the adjusted post test paired means of selfconfidence, anxiety and concentration*

Variable	Game-Specific field training group	Game-Specific field training group combined with self directed cognitive strategies	No specific training / conditioning control	Mean Difference	Critical value
self confidence	14.981	19.388		4.407*	2.249
	14.981		10.988	3.993*	
		19.388	10.988	8.4*	
anxiety management	13.582	12.662		0.92	2.160
	13.582		16.828	3.246*	
		12.662	16.828	4.166*	
concentration	14.749	19.5140		4.761*	2.184
	14.749		11.027	3.722*	
		19.510	11.027	8.483*	

playing ability	6.069	7.557		1.488*	0.456
	6.069		5.117	0.952*	
		7.557	5.117	2.44*	

*Significant at 0.05 level of confidence

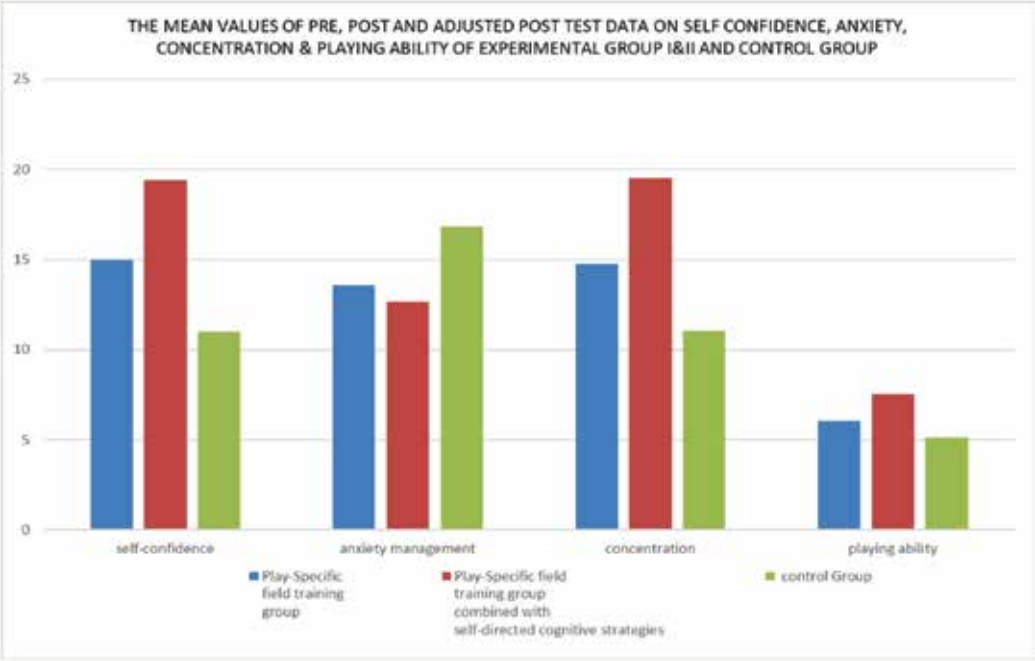
Discission

The table provides the adjusted post-test means for each group and computes the mean differences for every paired comparison alongside a critical value that serves as the threshold for statistical significance. For example, in the self-confidence category, the difference between the field training group and the combined group is 4.407, and between the field training and control groups is 3.993; both exceed the critical value of 2.249, indicating significant differences, while the difference of 8.4 between the combined and control groups further underscores the superior effect of integrating the self-directed cognitive strategies. In anxiety management, a mean difference of 0.92 between the first two groups does not exceed the critical value of 2.160, suggesting that this particular comparison is not statistically significant, whereas the other paired differences (3.246 and 4.166) are significant. Similarly, for concentration, all pairwise differences (4.761, 3.722, and 8.483) surpass the corresponding critical value of 2.184, affirming the robust influence of the interventions on concentration enhancement. Lastly, in playing ability, even relatively small mean differences (1.488, 0.952, and 2.44) exceed the provided critical value of 0.456, implying that the differences among groups are statistically significant. Overall, the table elucidates that combining the self-directed cognitive strategies with game-specific field training generally yields greater improvements in self-confidence and concentration, with mixed outcomes for anxiety management and consistently significant enhancements in playing ability compared to the control condition.

From the table- II, it is clear that the adjusted post test means scores of self confidence, anxiety and concentration are presented. The mean differences in all the selected psychological and performance variables are numerically presented in the above table, which were significant at 0.05 level of confidence. The analysis revels that there was considerable difference between adjusted post test means of Game-Specific field training group, Game-Specific field training group combined with self-directed cognitive strategies and control group in all the selected variables among Athletics players. From the results obtained, it may be concluded that both the experimental groups improved their level after the respective experimental treatment. The group II (Game specific field training group combined with self-directed cognitive strategies) showed noticeable improvement in psychological and performance variables after 12

weeks of field training with self-directed cognitive strategies training. The data of self confidence anxiety & worry management, concentration and Athletics playing ability of Game specific field training group, Game specific field training combined with self-directed cognitive strategies group and Control group are presented in Figure -1 to 4

Figure 1 : *The Mean Values Of Pre, Post And Adjusted Post Test Data On Self Confidence, Anxiety, Concentration & Playing Ability Of Experimental Group I&Ii And Control Group*



The analysis revels that the field training with and without yogic groups showed significant improvement in all the selected Psychological variables when compared with control group. Hence, the Athlete's of experimental groups showed noticeable improvement in Self confidence, anxiety & worry management, Concentration and performance (Athletics playing) which may be due to 12 weeks of field training with and without self-directed cognitive strategies. At the same time, when the experimental groups were compared, the field training with self-directed cognitive strategies group showed improvement in Self confidence. The other variables namely Anxiety and Concentration had also gained some improvement, when it was compared to the field training without self-directed cognitive strategies group. These results by and large in conformity with the findings of Kalidasan (1996).

Conclusion:

This study demonstrates that incorporating self-directed cognitive strategies into game specific field training significantly enhances psychological resilience and athletic performance. Athletes who utilized cognitive strategies showed marked improvements in self-confidence, anxiety management, concentration, and overall playing ability compared to those who trained without them. These findings highlight the importance of integrating cognitive techniques into athletic training programs to optimize both mental and physical performance, ultimately benefiting competitive athletes.

Recommendations

Coaches and sports trainers should integrate cognitive strategies such as attentional focus, self-talk, relaxation, imagery, and preparatory arousal into field training programs to enhance athletes' psychological resilience and performance. Future research should explore the long-term effects of these strategies across different sports and competitive levels to further validate their effectiveness.

References

Ajmeer Singh et al. (2005), Essential of Physical Education, Kayaani Publication, New Delhi.

Amaranth, Mohinder. Learn to Play Good Athletics. New Delhi: UBS Publishers, 1996.

Anshel, M. H. (2016). Sport Psychology: From Theory to Practice. Fitness Information Technology.

Bera, T.K. (1991). Development of Training Schedule for Improving Physical Performance in Athletics, Based on the Science of Yoga, Psychology, and Physical Training. NIS Scientific Journal, 14 (4), 22-34.

Botham, Ian. Ian Botham on Athletics. London: Cassell Ltd., 1980.

Brouham, Lucien et al. (1994). Studies in Physical Efficiency of College Students. Research Quarterly 15:3.

Clarke, D.H. & Clarke, H.H (1972). Research Process in Physical Education, Research and Health. Englewood Cliffs: Prentice Hall, New Jersey.

Cox, Richard H., Yijun Qiu, and Zhan Liu. "Overview of Sports Psychology." Handbook of Research on Sports Psychology. New York: MacMillan Publishing Company, 1993.

Feltz, D. L., & Lirgg, C. D. (2001). Self-Efficacy Beliefs of Athletes, Performance, and Competition Anxiety. Journal of Applied Sport Psychology, 13(2), 196-206.

Hardy and Nelson. Mental Skill Questionnaire as cited in Bull et al. The Mental Game Plan: Getting Psyched for Sports. East Bourne: Sports Dynamics, 1996.

Jaisimha, M.L. (1984). "Forward." Sunny Days. Calcutta: Rupa & Co. 12. Kalidasan, R. et al. (1998). "Influence of Training with and without Selected Yogic Practices on Technical Skill Level among Athletes."

SAI Scientific Journal, 23 (1), January.

Singh, Hardayal. (1991). Science of Sports Training. New Delhi: D.V.S. Publications.

Sisodiya, Amansigh et al. (2005). "Effect of Physical Fitness Training Programme on Selected Athletics Playing Ability." Research Bi-Annual for Movement, 21(2), April.

Sivaramkrishnan, S., and R. Kalidasan. Behind the Wickets. Karakudi: Sathya and Saju Publication, 1998.

Vealey, R. S. (2007). Mental Skills Training in Sport. In G. Tenenbaum & R. C. Eklund (Eds.), Handbook of Sport Psychology (3rd ed., pp. 287-309). Wiley.

Weinberg, R., & Gould, D. (2014). Foundations of Sport and Exercise Psychology. Human Kinetics.