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Exploration study on isolated and combined effects of assisted and resisted sprint training on VO₂ max

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Abstract

The aim of the study was to find out the effects of combination of assisted and resisted sprint training on VO₂ max among male soccer players. To achieve this purpose of the study, sixty college male soccer players from Gondia District, Maharashtra, were selected at random as subjects. The age of the subjects was ranged from 18 to 23 years. The selected subjects were divided into four groups, Group - 1 those who underwent assisted sprint training (AST) Group - 2 those who underwent resisted sprint training (RST), Group - 3 those who underwent combined assisted and resisted sprint training (AST+RST) and Group - 4 was served as control participants. The VO₂ max was selected as dependent variable and it was measured by Queens's college step test. All the subjects of four groups were tested on VO₂ max prior and immediately after the study period of nine weeks. ANCOVA was used to find out significant adjusted post test mean difference of four groups. The results of the study revealed that VO₂ max of the male soccer players significantly differ and found high in combination of assisted and resisted training than other groups, similarly comparison with control group also showed significant changes consequent to nine weeks of selected training programme. It was concluded that combination of assisted and resisted sprint training significantly improves the VO₂ max of male soccer players.

Keywords: Assisted sprint, resisted sprint, VO₂ max

Introduction

Physical fitness is one of the core preconditions of health. We cannot imagine a person to be healthy without being physically fit. Physical fitness, therefore needs to be appreciated in full measure. The common perception of physical fitness is the absence of ailment. If individual is not suffering from any perceptible disease, then he is considered physically fit. Is it true? Another significant issue is whether there is a universal condition of physical fitness which is uniformly applicable to all. It is not so. Physical fitness of young people is different from that of the aged. The physical fitness of a sports person is different from that of the persons working in army factory or a layman. In fact, physical fitness means different things to different people.

Physical training is exposing the organism to a training load or work stress of sufficient intensity, duration and frequency to produce a noticeable or measurable training effect, that is, to improve the functions for which training is aimed (Astrand, 2003) ^[6] The game of Football demands a high level of fitness that will enable the players to run strongly, to move quickly off the mark in any direction to control, to pass accurately and to tackle efficiently throughout the game (Heyward, 2010) ^[7] Football requires a high standard of physical fitness along with skills. The faster player will succeed more often in soccer when compared with the slower one. Players can give themselves more chances for success by improving their sprinting ability, as it not only gets the player to more loose balls but also gives them the chance to create space. Players in open space will get more wide-open looks at the goal or more time to make productive passes (Jerrold, 2004) ^[8]. On defense, better sprinting ability will prevent the opposition from having space to make plays. In this study an attempt is made to find out the Isolated and combined effects of assisted and resisted sprint training on VO₂ max.

Methods

Sixty (60) college male soccer players from Gondia District, Maharashtra, were selected at

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programme for selected training was designed separately based on the performance in the pilot study. While constructing the training programme the basic principles of sports training were followed. Each day the training schedule was conducted only in the morning session that lasted for ninety minutes. Prior to and after every training session players of experimental groups had given each ten minutes of warm -up and ten minutes of warm down exercise involving jogging, mobility and stretching exercise.

Results on VO_2 max

Table 1: Analysis of Covariance on VO_2 max of Different Groups (Scores in ml/kg/min⁻¹)

Test	Group 1	Group 2	Group 3	Group 4	SV	SS	Df	MS	'F' Ratio
Pre Test									
Mean	47.27	48.00	47.40	48.00	Between	4.85	3	1.62	0.70
S.D.	1.75	1.51	1.40	1.40	Within	130.13	56	2.32	
Post Test									
Mean	49.20	50.00	50.40	46.80	Between	117.00	3	39.00	15.34*
S.D.	1.86	1.51	1.40	1.57	Within	142.40	56	2.54	
Adjusted Post Test									
Mean	46.96	49.50	50.52	46.92	Between	105.81	3	35.27	439.04*
					Within	4.42	55	0.08	

* Significant at .05 level of confidence.

Table 1A: Scheffe's Post Hoc Test Analysis on VO_2 max

Group I	Group II	Group III	Group IV	Mean Differences	Confidence Interval Value
49.46	49.50	-	-	0.04	0.37
49.46	-	50.52	-	1.06*	0.37
49.46	-	-	46.92	2.54*	0.37
-	49.50	50.52	-	1.02*	0.37
-	49.50	-	46.92	2.58*	0.37
-	-	50.52	46.92	3.60*	0.37

Pre - Test: The AM±SD pre-test VO_2 max scores of G1, G2, G3 and G4 were 47.27±1.75, 48.00±1.51, 47.40±1.40 and 48.00±1.40 respectively. The obtained pre test F value of 0.70 was lesser than the required Table F value of 2.76. Hence the pre test means value of assisted sprint; resisted sprint and combination of assisted and resisted sprint and control group on VO_2 max before start of the respective treatments were found to be insignificant at 0.05 level of confidence for the degrees of freedom 3 and 56. Thus this analysis confirms that the random assignment of subjects into four groups were successful.

Post - Test: The AM±SD post- test VO_2 max scores of G1, G2, G3 and G4 are 49.20±1.86, 50.00±1.51, 50.40±1.40 and 46.80±1.57 respectively. The obtained post test F value of 15.34 was greater than the required Table F value of 2.76. Hence the post- test means value of VO_2 max show significant at 0.05 level of confidence for the degrees of freedom 3 and 56. Thus the results obtained proved that the interventions namely assisted sprint, resisted sprint and combination of assisted and resisted sprint on VO_2 max produced significantly different improvements among the four groups.

Adjusted Post - Test: The AM±SD post - test VO_2 max scores of G1, G2, G3 and G4 are 49.46, 49.50, 50.52 and 46.92, respectively. The obtained adjusted post - test F value of 439.04 was greater than the required Table F value of 2.76. Hence the post - test means value of VO_2 max show significant at 0.05 level of confidence for the degrees of freedom 3 and 55. Since the observed F value on adjusted post test mean among the groups such as assisted sprint,

resisted sprint and combination of assisted and resisted sprint on VO_2 max produced significantly different improvements among the four groups.

Post-hoc test analysis: The significant difference of paired adjusted post test means of assisted sprint, resisted sprint, combination of assisted and resisted sprint and Control group on VO_2 . The obtained mean differences between assisted sprint group and resisted sprint groups were 0.04. No differences were found on these comparisons, because of the confidential values 0.37 was greater than the mean differences. Remaining all group comparisons was greater than the confidential interval value on VO_2 .

Discussions

The present study demonstrated an increase in VO_2 max of 0.01%, 0.02% and 0.03% for Assisted Training group, Resisted Training group and combination of assisted and resisted Training group respectively whereas the control group did not show any significant improvement on VO_2 max.

Conclusions

The three experimental training groups namely, assisted sprint training (AST) resisted sprint training (RST) and combined assisted and resisted sprint training (AST+RST) significantly improved on VO_2 max of the male soccer players. Among the training groups Combined sprint training (AST+RST) has greater influence on VO_2 max, among male soccer players, where as Resisted sprint training (RST) training has the next best level of performance on VO_2 max. However assisted sprint training also influenced to certain extent among the

soccer players.

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