INVESTIGATION ON THE CHANGES ON LEG STRENGTH OF SOCCER PLAYERS DUE TO HIGH INTENSITY INTERVAL TRAINING IN HARD AND SAND SURFACE

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Abstract

This study was to find out the investigation on the changes on leg strength of soccer players due to high intensity interval training in hard and sand surface. To achieve the purpose of the study forty-five male soccer players was selected as the subjects from Annamalai University, Chidambaram, Tamil Nadu, India. The age of the subjects was ranged from 18 to 23 years. The selected subjects were assigned into three groups of fifteen each. Group-I (n=15) underwent HIIT in sand surface, Group-II (n=15) underwent HIIT in hard surface and group-III (n=15) was acted as control who did not participate in any training apart from regular play of soccer. Each group consisted of 15 subjects and training was given for three days a week for twelve weeks. Prior after the training period leg strength was measured by 1 RM test. Analysis of Covariance (ANCOVA) was applied as statistical tool for the present study. The Scheffé S test was used as post-hoc test at whatever point the 'F' - ratio of the adjusted post-test means were discovered to be significant at 0.05 level of significance. Both, high intensity interval training in hard and sand surface group influence on leg strength when compared with control group. From the results of the study, it was concluded that high intensity interval training in sand surface group was better than hard surface group for improve leg strength among male soccer players.

Keywords:, *High Intensity Interval Training in hard and sand Surface, Soccer and leg strength*

Introduction

Soccer is a game with both physical and mental obstacles. Football players must perform skilful manoeuvres in a generalised environment of limited space, time, physical and mental tiredness, and opposing players. During the game, each participant must run several miles, mainly at sprint-like speeds, and answer promptly to a range of two fast changing circumstances. Finally, one must have a good awareness of individual, group, and team tactics. The capacity to meet all of these hurdles defines one's performance on the football pitch. **(Beim, 1977)**.

Interval training is an exercise method that employs predetermined intervals to determine the intensity of training. Intervals can be measured in several ways, including time, distance, and heart rate. Interval training entails exercising at a high effort for a set distance or duration, followed by a short rest period before returning to the high intensity.

Sand and hard surfaces significantly affect football training, performance, and injury risk due to differences in shock absorption and stability. While hard surfaces allow for maximum speed, sand provides a more physically demanding workout and is often used for rehabilitation.

Intensity of training is critical to monitor your workout intensity throughout the regimen, particularly at the beginning. Because pulse palpating the when active is difficult, this requires practice taking the pulse, which is usually at the radial or carotid artery regions. After coming to a complete stop, begin counting the pulse from zero for ten seconds. To train effectively, increase the intensity level if the heart rate falls below the target

range and reduce it if it exceeds the target range. Cardiovascular training demands an intensity greater than 50-60% of functional capacity (VO2), which can be increased to 75%-80% for safety and comfort. This typically results in a heart rate training range of 70% to 80% of one's maximal heart rate.

Leg strength is vital in football for explosive power in sprinting, jumping, and kicking; enhanced agility for quick turns; better balance and stability; increased endurance to last the game; and crucial injury prevention, as strong legs support joints and absorb impact during high-intensity actions like tackling and changing direction. Strong quads, hamstrings, glutes, and calves power all key movements, from shooting to defending.

Statement of the problem

The purpose of the present study was to find out the investigation on the changes on leg strength of soccer players due to high intensity interval training in hard and sand surface.

Methodology

To achieve the purpose of the study forty-five male soccer players was selected as the subjects from Annamalai University, Chidambaram, Tamil Nadu, India. The age of the subjects was ranged from 18 to 23 years. The selected subjects were assigned into three groups of fifteen each. Group-I (n=15) underwent HIIT in hard surface, Group-II (n=15) underwent HIIT in sand surface and group-III (n=15) was acted as control who did not participate in any training apart from regular play of soccer. Each group

consisted of 15 subjects and training was given for three days a week for twelve weeks. Prior after the training period leg strength was measured by using 1 RM test.

Analysis of data

Leg strength

The mean values of leg strength of high intensity interval training in hard and sand surface group and control group at different stages of tests have been analyzed and submitted in table – I.

Table – I

ANALYSIS OF COVARIANCE ON LEG STRENGTH OF HIGH INTENSITY INTERVAL TRAINING IN HARD AND SAND SURFACE TRAINING GROUP AND CONTROL GROUP

	Hard Surface Group	Sand Surface Group	Control Group	SOV	SS	df	MS	'F'
Pre-test mean	86.2770	89.9624	89.1515	**B**	112.517	2	56.258	0.601
S.D	10.3181	9.50731	9.17060	**W**	3933.353	42	93.651	
Post-test mean	91.6314	100.8604	85.5719	**B**	1778.154	2	889.077	6.334*
S.D	13.5721	11.36050	10.38438	**W**	5895.379	42	140.366	
Adj. Post-Test mean	92.047	100.575	85.441	**B**	1723.329	2	861.664	6.141*
				W	5753.216	41	140.322	

**** Significant at 0.05 level of confidence***.

*(*The table value required for significance at 0.05 level of significance with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively*)*

Table-I shows that the pre-test mean scores of leg strength of HIIT in hard and sand surface training group and control group is 86.2770, 89.9624 and 89.1515 respectively. The obtained 'F' value on pre-test scores 0.601 is less than the required 'F' value of 3.22 to be significant at 0.05 level. This proves that there is no significant difference among the groups at initial

stage and the randomized assignment of the subjects into three groups are successful.

The post test scores analysis proves that there is significant difference among the groups, as obtained 'F' value 6.334 is greater than the required 'F' value of 3.22. This proves that there is significant difference among the post-test means of the subjects.

Taking into consideration of pre and post-test scores among the groups, adjusted mean scores are calculated and subjected to statistical treatment. The obtained 'F' value of 6.141 is greater than the required table 'F' value of 3.23. This proves that there is significant difference existed among the adjusted means due to twelve weeks of HIIT in hard and sand surface training on leg strength.

Since the significant improvements are recorded, the results are subjected to post hoc analysis using Scheffe's Confidence interval test. The results are presented in table II.

TABLE-II
SCHEFFE'S CONFIDENCE INTERVAL TEST SCORES ON LEG STRENGTH

Adjusted post-test means			Mean Difference	Confidence Interval Value
Hard Surface Group	**Sand Surface Group**	**Control Group**		
92.047	100.575		8.528*	2.0051
92.047		85.441	6.606*	
	100.575	85.441	15.134*	

**** Significant at 0.05 level of confidence.***

As the confidence interval required to be significant at 0.05 level is 2.0051 and the obtained values are greater than the required value. It is observed that the significant difference is found to be existed.

The ordered adjusted means on leg strength are illustrated through bar diagram for better understanding of the results of this study in figure-I.

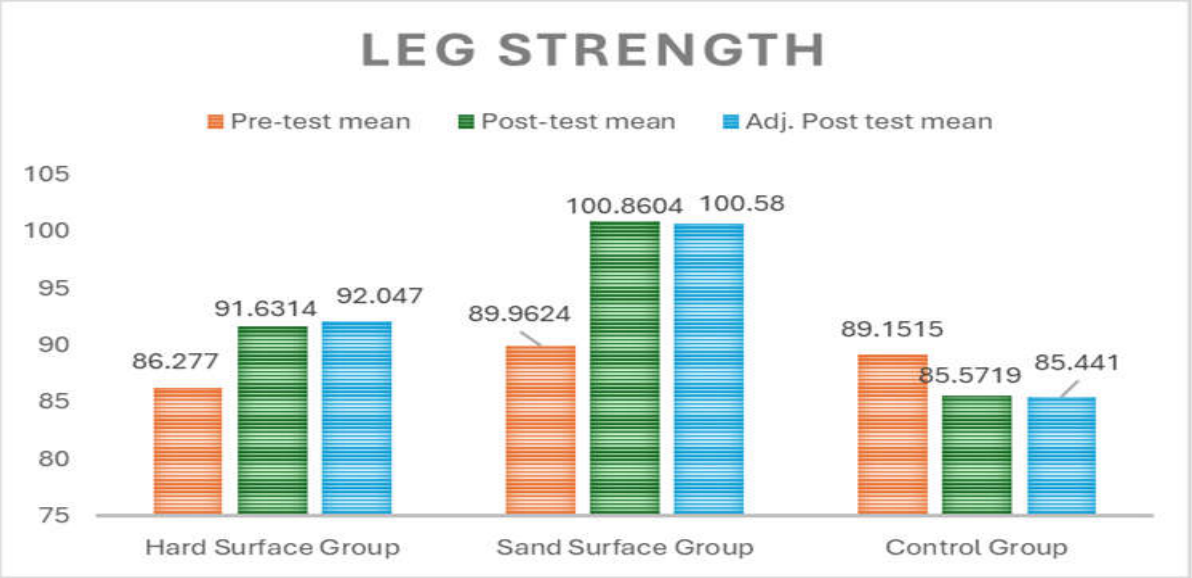

Figure I – Pre, Post and Adjusted post-test mean values on leg strength of high intensity interval training in hard and sand surface group and control groups

Results

1. It is concluded that due to the effect of high intensity interval training in hard and sand surface on leg strength was significantly improved among male soccer players.

2. It was also concluded that high intensity interval training in sand surface group was better than hard surface training group in increasing leg strength among male soccer players.

Conclusion

Both, high intensity interval training in hard and sand surface group influence on leg strength when compared with control group. From the results of the study, it was concluded that high intensity interval training in sand surface group was better than hard surface training group in

increasing leg strength among male soccer players. Also concluded that there was significant difference between experimental and control groups.

Recommendations

The following recommendations were drawn, from the results of the present study:

1. It is recommended high intensity interval training in hard and sand surface training may be introduced in schools and colleges curriculum so that all the soccer players could be benefited.
2. It is recommended to the fitness trainers, coaches and physical educators to include high intensity interval training in hard and sand surface training for making positive changes on game related fitness and striking variables among male soccer players.
3. The government and the educational authorities may come forward to include soccer game along with physical exercises in schools and colleges for the benefit of players.

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