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The effects of core strength training on balance of soccer players

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Abstract

Aim of this study was to explore the effects of Core Strength Training on Balance of Soccer Players. Forty Five, University level male Soccer Players volunteered to participate in the study. The core training for stable and unstable surface was given thrice a week for six weeks. Prior to core training the subjects should warm up for at least 10 minutes. The Analysis of covariance (ANCOVA) was used for the purpose of analysis. The results among two experimental groups and control group with regard to the variable of Balance (RT) were found statistically insignificant. However with regard to the variable of Balance (LT) were found statistically significant.

Keywords: Core strength training, balance, soccer players etc.

Introduction

Soccer is a team sport. It is a game involving tackling and for this a strong central body is required. A good strength of the central area of the body reduces the risk of injuries. A strong core provides a solid platform for skilful execution of indices such as vertical jump, speed, and acceleration, agility, kicking of ball, turning and dribbling of ball [1, 2, 3, 4, 5].

Iacono, Padulo & Ayalon [6] conducted the study to find the effect of core stability training protocol on lower limb muscle asymmetries and imbalances in team sport. Their study incorporated twenty footballers which were divided into two groups, i.e., core stability training programme group and control group.

In another study conducted by Filipa, Byrnes, Paterno, Myer, and Hewett [7], the role of Neuromuscular training on balance was assessed.

Neuromuscular training program which is centred on core strength training has been advised in prevention programs such as lower extremity injury prevention programs.

The SEBT is a functional screening tool and this has been widely used to evaluate dynamic stability, to monitor the progress of rehabilitation program, to assess discrepancies following an injury, and to screen those athletes who are at high risk for lower extremity injury [7, 8, 9, 10].

The SEBT needs neuromuscular characteristics such as lower extremity coordination, balance, flexibility, and strength [11, 12].

Materials and methods

Selection of Subjects:

Forty Five, University level male Soccer Players of G. N. D. University, Amritsar between the age group of 18-28 years volunteered to participate in the study.

Group-I: Control (N₁=15)

Group-II: Experimental (N₂=15)

Group-III: Experimental (N₃=15)

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Table 1: Division of Subjects (N=45) (i.e., Control Group (N₁=15), Experimental Group-A (N₂=15) and Experimental Group-B (N₃=15).

Variable (s)	Sample Size (N=45)			
	Total (N=45)	Control Group (N ₁ =15)	Experimental Group-A (N ₂ =15)	Experimental Group-B (N ₃ =15)
Age (yrs)	21.22±2.21	21.86±2.19	21.2±2.30	0.6±2.09
Body Height (cm)	166.55±6.31	169.73±5.54	164.73±7.075	165.2±5.32
Body Mass (kg)	63.04±3.55	63.77±3.42	62.4±3.37	63.16±4.17

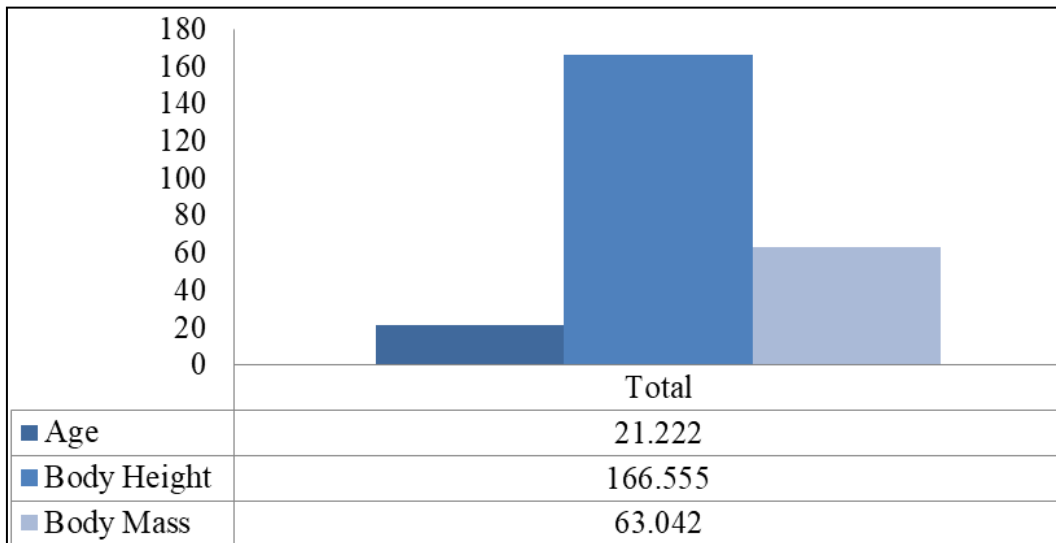


Fig 1: Distribution and Demographics of Subjects (N=45).

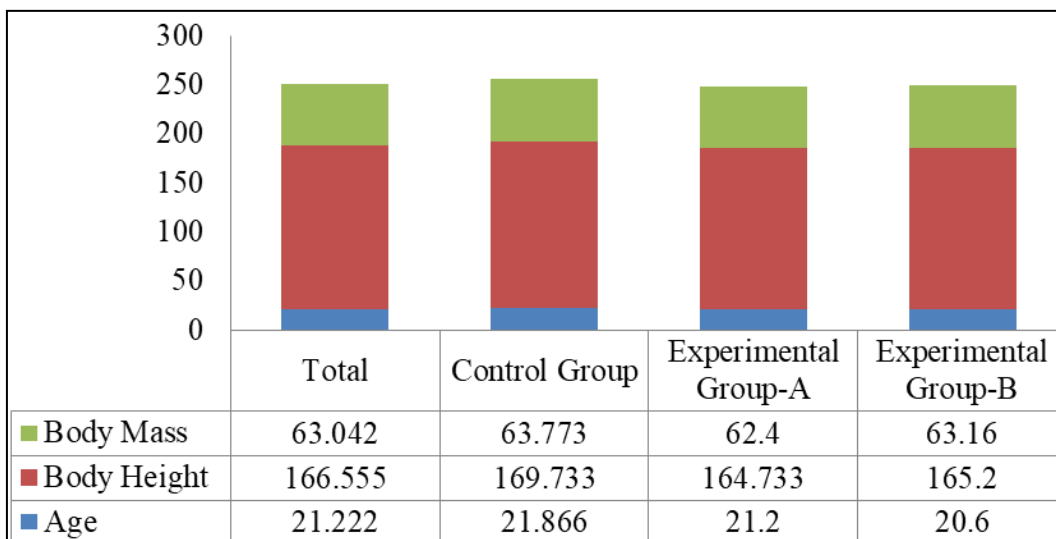


Fig 2: Distribution and Demographics of Subjects (N=45) (i.e., Control (N₁=15), Experimental Group-A (N₂=15) and Experimental Group-B (N₃=15).

Selection of Variable

Balance

Star Excursion Balance Test (SEBT) (Gribble *et al.*) [13]

The core training for stable and unstable surface was given thrice a week for six weeks. Prior to core training the subjects should warm up for at least 10 minutes

Experimental Group-A and B

Control Group	Experimental Group-A (Core Training on Stable surface)	Experimental Group-B (Core Training on Unstable surface)
Subjects will be advised to be carry out their regular exercise program under supervision of coach but reframed from intervention.	<ul style="list-style-type: none"> ▪ The plank was done on stable surface (ground). ▪ Left side plank without slings (3 repetitions with 15s hold) ▪ Right side plank without slings. (3 repetitions with 15s hold) ▪ Prone planks without slings. (3 repetitions with 15s hold) 	<ul style="list-style-type: none"> ▪ The plank was done with slings (TRX Slings) that provided unstable surface. ▪ Left side planks with slings (3 repetitions with 15s hold) ▪ Right side planks with slings. (3 repetitions with 15s hold) ▪ Prone planks with slings (3 repetitions with 15s hold)

Statistical Analyses

The Analysis of covariance (ANCOVA) was used for the

purpose of analysis.

Results

Table 2: ANCOVA for Two Experimental Groups and the Control Group with Regard Balance (RT).

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	11585.368	3	3861.789	66.803	.000
Intercept	2.519	1	2.519	.044	.835
Pre-Test	11442.347	1	11442.347	197.936	.000
Treatment-Group	150.740	2	75.370	1.304	.274
Error	10174.288	176	57.808		
Total	1587846.907	180			
Corrected Total	21759.656	179			

*significant at .05 F0.05 (3,176)

The P-value (Sig.) being .274 which was insignificant as it was greater than 0.05 ($p > 0.05$). Therefore, Post-hoc test was not required.

Table 3: ANCOVA for Two Experimental Groups and the Control Group with Regard Balance (LT).

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	9371.214	3	3123.738	1.7513	.000
Intercept	.912	1	.912	.511	.476
Pre-Test	8197.722	1	8197.722	4.5943	.000
Treatment-Group	43.581	2	21.790	12.212	.000
Error	314.048	176	1.784		
Total	1653623.061	180			
Corrected Total	9685.261	179			

*significant at .05 F0.05 (3,176)

The P-value (Sig.) being .000 which was significant as it was less than 0.05 ($p < 0.05$). As calculated F-value (12.212*) was found to be significant, hence LSD Post-hoc test was applied.

Table 4: Post-Hoc Test for Two Experimental Groups and the Control Group with Regard Balance (LT).

Means		Mean Difference	Sig
Experimental Group-A 94.99	Experimental Group-B 95.49	.50	.04
	Control Group 96.20	1.21	.00
Experimental Group-B 95.49	Experimental Group-A 94.99	.50	.04
	Control Group 96.20	.70	.00
Control Group 96.20	Experimental Group-A 94.99	1.21	.00
	Experimental Group-B 95.49	.70	.00

Level of Significant at 0.05

- Experimental Group-A showed significantly better Balance (LT) than in their counterpart Experimental Group-B.
- Experimental Group-A showed significantly better Balance (LT) than in their counterpart Control Group.
- Experimental Group-B showed significantly better Balance (LT) than in their counterpart Control Group.
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Conclusion

The core strength training group, i.e., both the experimental groups performed better than the control group for balance as shown by the scores of SEBT.

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