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A Comparative Study on Effects of Sensbalance Exercises and Conventional Proprioception Exercises on Stability

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Abstract – A study was conducted by the researcher to find the effect of sensbalance exercises and conventional proprioception exercises on stability of soccer players in the u-14 age category and make a comparison as to which exercise is better in improving the stability of young soccer players. The subject selected for the study were LNIPE soccer academy players who trained regularly in the campus. The statistical technique used for the study was ANCOVA and data was collected on pre-test and post-test basis and six weeks of training was given to two groups with one group undergoing sensbalance exercise routine and other group undergoing conventional proprioception exercises and one group was selected as control group. The variable used in the study was CoP distance. The findings of the study showed that both sensbalance exercise and conventional proprioception exercises had significant difference than control group but there was insignificant difference between sensbalance exercise and conventional proprioception exercises.

Keyword: Sensbalance, Conventional proprioception exercises, CoP distance, ANCOVA, six-week training.

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INTRODUCTION

Soccer is a game which lasts for a minimum of 90 minutes and involves body contact. Number of goals decides the winner of the game. And to score a goal requires a lot of precision to it. Stability of a player might be a considerable factor in scoring of a goal. A major role in maintaining stability of an individual is played by the core strength of the individual. To develop the core strength there are numerous methods and exercises, but to choose as to which method would be suitable for athlete is a matter of concern. Specially, for youth players who are in developmental stage and cannot be trained same as a mature player. Technique for development of core strength in youth should be something which reduces the chances of injury in the developmental stage.

The study involved two different methods of core strengthening technique; Sensbalance exercises and conventional proprioception exercises for a period of six weeks. Training protocol were developed for both exercise program. Sensbalance exercise were performed on sensbalance in laboratory, while, conventional proprioception exercise was performed on playground. Meanwhile, a third group was selected as a control group and it didn't undergo any special treatment but were involved in soccer sessions where all other groups also were involved.

METHODOLOGY

For conducting these studies 15 players were selected randomly from the LNIPE soccer academy whose ages were below 14 years. For the collection of data BTS P-walk was used. The variable which was involved in the study were Centre of pressure (CoP) distance. A pre-test was done to take the data before the start of the training and then the training program followed up for a total of six weeks. The training was given in alternate days to the groups while undergoing normal soccer training sessions.

Fig.: Conventional proprioception exercises

Fig.: Sensbalance exercises

Following hypotheses were made for the present study

(i) There would be significant difference between Sensbalance exercise group and controlled group.

(ii) There would be significant difference between conventional proprioception exercise group and controlled group.

(iii) There would be significant difference between Sensbalance exercise group and conventional proprioception exercise group.

The statistical technique ANCOVA was used in analyzing the data.

RESULTS AND DISCUSSION OF FINDINGS

Analysis of Covariance method in SPSS was used in order to compare the pre-treatment and post-treatment effect of Sensbalance exercises and conventional proprioception exercise in stability of subjects. The level of significance was set at 0.05.

Table 1

Mean and standard deviation of CoP distance of different groups measured in post-testing

Treatment Group	Mean	Std. Deviation	N
Sensbalance Exercise	261.8800	43.98945	5
Conventional Proprioception Exercise	284.2000	82.59473	5
Controlled Group	296.2400	38.55772	5
Total	280.7733	56.07026	15

Table 2

ANCOVA table for the post-test data of CoP distance between subject effects after six week training programme

Source	Type I Sum of Squares	Df	Mean Square	F	(p-value) Sig.
Pre_Treatment	9159.064	1	9159.064	6.370	.028
Treatment_Group	19040.064	2	9520.032	6.622	.013
Error	15815.102	11	1437.737		
Corrected Total	44014.229	14			

Table 1 reveals that the mean and standard deviation of CoP distance after post-treatment test for Sensbalance exercise group was 261.88±43.99, Conventional proprioception exercise group was 282.20±82.59, controlled group was 296.24±38.56 and overall mean and standard deviation was 280.77±56.07.

It is evident from the above table that, the p-value (sig.) for the F-statistic of the three treatment group (Sensbalance, conventional proprioception and controlled) after 6-week training program is 0.013, which is less than 0.05, hence it is significant and thus, the scholar was able to reject the null hypothesis at 0.05 level of significance.

Table 3

Pairwise Comparisons Dependent Variable: CoP distance after treatment

(I) Treatment Group	(J) Treatment Group	Mean Difference (I-J)	Sig.
Sensbalance Exercise	Conventional Proprioception Exercise	-35.289	.172
	Controlled Group	-107.759*	.004
Conventional Proprioception Exercise	Sensbalance Exercise	35.289	.172
	Controlled Group	-72.471*	.025
Controlled Group	Sensbalance Exercise	107.759*	.004
	Conventional Proprioception Exercise	72.471*	.025
Based on estimated marginal means			
*. The mean difference is significant at the .05 level.			

Table 4

Post hoc comparison of adjusted means of the data on CoP distance obtained in post-measurement shown with graphics

Controlled group	Conventional proprioception Exercise group	Sensbalance exercise group
340.850	268.379	233.091

"____"represents no significant difference between means

Since F-statistic is significant, post hoc comparison has been made for adjusted means of the three treatment groups which is shown in table 4. It may be noted that p-value for the mean difference between Sensbalance and controlled group is 0.004 and conventional proprioception and controlled group is 0.025. Both these p-values are less than 0.05 and hence they are significant at 5% level.

In this study there was a significant difference between CoP distance and Sensbalance exercise group and controlled group as well as between conventional proprioception exercise group and controlled group.

The reason for the improvement in stability in both Sensbalance exercise group and conventional exercise group than controlled group may be due to the factor that both Sensbalance exercise and conventional proprioception exercise improves the strength of lower limbs and also the core strength. Both core strength and strength of the lower limb are determining factors in stability of an individual.

Previous studies by Paterno et al. (2004), Franco et al. (2012), Ljubojevic et al. (2012), Amat et al. (2013) and Franco et al. (2014) supports the findings of the study.

But there was insignificant difference between Sensbalance exercise group and conventional proprioception exercise group.

Hence, it may be inferred that Sensbalance and conventional proprioception exercises are equally effective in reducing the CoP distance among subjects in comparison to that of controlled group.

Based on the analysis and findings of the present study, the following conclusions were drawn.

- Sensbalance exercise programme showed improvement in the CoP distance and hence, improves the stability of subjects.
- Conventional proprioception exercise programme also showed improvement in the CoP distance and hence, improves the stability of subjects.
- Both Sensbalance exercise programme and conventional exercise programme are equally effective in improving the stability of subjects.
- On the basis of the results of the study, the hypotheses (i) there would be significant difference between Sensbalance exercise group and controlled group and (ii) there would be significant difference between conventional proprioception exercise group and controlled group were accepted at 0.05 level of significance because there was significant difference between both Sensbalance exercise group and controlled group and between conventional exercise group and controlled group after six weeks of training.
- The hypothesis (iii) there would be significant difference between Sensbalance exercise group and conventional proprioception exercise group was rejected at 0.05 level of significance because there was insignificant difference between Sensbalance exercise group and conventional proprioception group after six weeks of training.

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