

Effect of Speed Endurance Training on Crossing Accuracy in Soccer

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Abstract

Background: The objective of the study was to develop a training programme that minimise the fatigue outcome as it may hamper the coordinative ability of a player which ultimately decreases passing accuracy.

Methods: For this purpose, 30 soccer players were selected in the age range of 17-22 years. They all were provided specifically designed speed endurance training for the duration of 2 months. The crossing accuracy of soccer players were measured by a self-designed test due to absence of test for the purpose. The data was collected on Repeated Measure Design in which measurement was done after every two weeks i.e. Pre-test, after 2 weeks, after 4 weeks, after 6 weeks and after 8 weeks. Other than descriptive statistics, Repeated Measure ANOVA was applied in order to analyse and interpret the result.

Results: The mean value of Pre-test was 2.10 ± 1.470 . Similarly, after two weeks performance was assessed as 2.733 ± 1.574 for the same. After 4th week test, the mean value and the SD was accounted 3.37 ± 1.351 . The performance for after 6th & 8th week was accounted as 5.40 ± 1.589 and 5.40 ± 1.867 respectively. The result obtained has shown the significant improvement in the performance as the post hoc values for all combination of groups were found to be statistically significant at $p = 0.05$ level. It was concluded that increase in speed endurance ability accompany the improvement in crossing accuracy. It was also concluded that the increase in crossing accuracy was the result due to enhanced coordinative ability.

Key words: Speed endurance, Crossing accuracy, Repeated measure ANOVA

INTRODUCTION

Soccer as it calls for strenuous, constant, vigorous action and therefore requires continuous adaption to changing situations by the team as a whole as well as by individual players. On the other hand, because of soccer a team game, there absolutely lies ample room for players to display and show their brilliance through individual performance with the ball as well as through team play involving its very improvisation, technical and tactical knowledge.

Human motor performance is a composite of many variables and there are also numerous factors which are responsible for the performance of the sportsmen. Hence, to count few excellences, physical fitness, physique and body compositions are known to have played a very significant role in this regard and, at the present time having considered all the factors for any superior performance in soccer yet, speed endurance is very highly demanded and considered to be one of the most priority concerned. Having attained in its excellent level which is most demanded and required for performing any technique effectively and efficiently the speed endurance plays very vital role in modern soccer. Modern soccer at

present time happen to be no longer a positional play and now concept of modern soccer has been comprehension to total play or more elaborately a speed play.

There are variety of crosses in soccer and each is unique and important as per the situation arises. Understanding the brilliant tactical applications of crossing the teams always try to attach effectively in the opponents goal by having with various forms of crossing which perhaps hope to create more chances of scoring the goal and it is very much visible, experience in the world of soccer. The accuracy of crosses is of high concerned in order to put difference in score board. A perfect and intelligent crossing always makes scoring the goal more easily and may put pressure and become dangerous to the opponent teams. Therefore, the coaches need to be considered this particular fitness component and crossing technique as a very important part of the game for high level of performance. It is also visible that in the total duration of the game number of crossing are being deliver by the players from different position and it is very frequently made to keep attack on the opponent goal. However, a precise and efficient cross is a rare phenomenon and common associates with highly skilful and advance players. A common hindrance to a fruitful cross is the highly demanded motor component of the game i.e. speed endurance. The present study investigates the role of speed endurance training in crossing accuracy.

Though many studies related to motor component training's outcome has been done on soccer performance, more in-depth studies need to be carried out revealing the same.

MATERIALS AND METHODS

Participants

Thirty male soccer players from Indira Gandhi Institute of Physical Education and Sports Sciences, University of Delhi were volunteered to participate in the study. All were active soccer players with playing at varying level of DSA League. The age of the selected subjects were ranged from 17 to 22 years.

Administration of Test

Due to absence of standardised skill test to measure crossing accuracy, a self-made test (shown in Fig. 1) was developed to collect data from 30 selected subjects on repeated measure design, i.e. pre-test, after 2nd weeks, after 4th weeks, after 6th weeks and after 8th weeks. The reliability of the test was developed by test-retest method.

Method of Administration of Test

The subject was asked to stand in the cross area. As the Time keeper blows the whistle, subject start running towards the ball area to get the ball. The subject brings the ball in the cross area and kick or cross the ball in the marked penalty area. The ball crossed from outside the cross area will not be given any point. The score is given as per the details provided the Figure 1 e.g. if ball drops in the section denoting "A", then the subject will be awarded 2 score points. The subject is asked to kick or cross as many ball in the marked penalty area as possible in one minute duration.

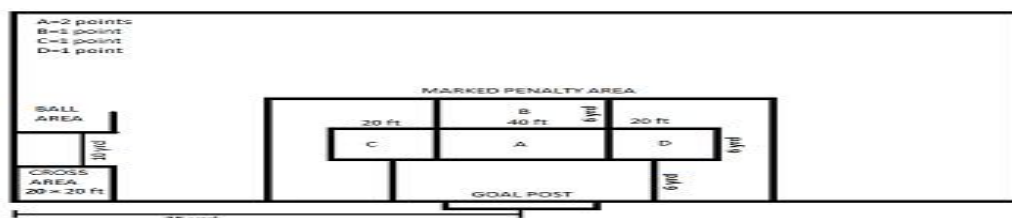


Figure 1: Marked Area for Crossing Accuracy Scoring

Administration of Training Programme

Speed endurance is considered to be one of the most pre-requisite components of fitness in modern football which perhaps means for high level of soccer performance. Attaining this at optimum, of course, enables the players to use their technical and tactical knowledge, as well as physical capabilities for most efficient and effective performance without any perceptible decline.

Hence, the researcher consecutively intended to develop and designed the speed endurance training programme undoubtedly after an extensive literature reviewing, basic accepted guidelines of science of training consultation with experts and scholar's own understanding. The training programme was developed and planned for 8 weeks with change in programme training after every two week. The training was administered 3 days a week i.e. Monday, Wednesday and Friday. Whereas, Tuesday, Thursday, Saturday and Sunday was observed as rest day from training.

Table 1: Detail of Administered Training Programme

EXERCISE	FIRST AND SECOND WEEK			THIRD AND FORTH WEEK			FIFTH AND SIXTH WEEK			SEVENTH AND EIGHTH WEEK		
	SETS	REPS/ DURATION	REST	SETS	REPS/ DURATION	REST	SETS	REPS/ DURATION	REST	SETS	REPS/ DURATION	REST
FARTLEK RUNNING	2	2	ACTIVE REST OF 2 MINS	2	4	ACTIVE REST OF 2 MINS	3	4	ACTIVE REST OF 2 MINS	4	4	ACTIVE REST OF 2 MINS
VARIABLE PACE RUNNING	2	2	ACTIVE REST OF 2 MINS	2	4	ACTIVE REST OF 2 MINS	3	4	ACTIVE REST OF 2 MINS	4	4	ACTIVE REST OF 2 MINS
INTENSIVE INTERVAL RUNNING	2	60 sec	120 sec	3	60 sec	90 sec	4	60 sec	60 sec	5	60 sec	30 sec
SHUTTLE RUN	2		120 sec	3		90 sec	4		60 sec	5		30 sec

Statistical technique

The data collected on repeated measure design were analysed by applying Descriptive Statistics and to assess the improvement in performance after two weeks, four weeks, six weeks and eight weeks in selected subjects Repeated Measure ANOVA was applied using the Statistical Package for Social Sciences software (SPSS Version 10.1 program for Windows) at 0.05 level of significance.

RESULTS

Data presented in Table No. 1 clearly shows that the mean value of Pre-test was 2.10 ± 1.470 . Similarly, after two weeks performance was assessed as 2.733 ± 1.574 for the same. After 4th week test, the mean value and the SD was accounted 3.37 ± 1.351 . The performance for after 6th & 8th week was accounted as 5.40 ± 1.589 and 5.40 ± 1.867 respectively.

Table 2: Descriptive Statistics

	MEAN	STANDARD DEVIATION
PRE-TEST	2.10	1.470

AFTER 2nd WEEK	2.73	1.574
AFTER 4th WEEK	3.37	1.351
AFTER 6th WEEK	4.13	1.456
AFTER 8th WEEK	5.40	1.589
TOTAL	3.55	1.867

Table No 2 indicates the value of one way ANOVA, which shows that there was a significant difference among the scores of the entire test conducted i.e. pre-test, after 2nd week, after 4th week, after 6th week, after 8th week as the value was found to be 22.161 against the tabulated value 2.43 which is statistically significant at 0.05 levels. Mauchly's test of sphericity indicated that the assumption of sphericity has not been violated as the significant value was obtained i.e. $\chi^2(9) = 38.514, p = 0.000$.

Table 3: Mauchly's Test of Sphericity

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon ^b		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Scoring	0.245	38.514	9	0	0.597	0.655	0.25

As the assumption of sphericity has not been violated which actually should be, the necessary correction were needed to make in order to fix the problem. The degree of freedom were corrected by using Greenhouse-Geisser estimates of sphericity ($\epsilon = .59$). The result shows that there was significant effect of time interval of regular speed endurance training on crossing accuracy in soccer, $F(2.389, 69.295) = 92.391, p = 0.05$. These result shows that there was significant difference in the crossing performance after every two weeks. However, to understand the tendency of improvement was later assessed by calculating Test of within subject contrast in table. The within subject contrast result proves that the crossing accuracy of soccer players improved progressively with time following specific speed endurance training as Linear and Quadratic values were found to be significant with F-value 171.85 and 20.01 respectively.

Table 4: Test of Within Subject Effect

Source		Type III Sum of Squares	Df	Mean Square	F	Sig.
Scoring	Sphericity Assumed	196.973	4	49.243	92.391	0
	Greenhouse-Geisser	196.973	2.389	82.434	92.391	0
	Huynh-Feldt	196.973	2.619	75.219	92.391	0
	Lower-bound	196.973	1	196.973	92.391	0
Error (scoring)	Sphericity Assumed	61.827	116	0.533		
	Greenhouse-Geisser	61.827	69.295	0.892		
	Huynh-Feldt	61.827	75.942	0.814		
	Lower-bound	61.827	29	2.132		

The post hoc test conducted later had shown the significant difference among various combination of scoring performance except difference between performance taken on 2nd week and 4th week of the training. Remaining all combinations were differed significantly at $p = 0.05$ level.

Table 5: Pair wise Comparison Showing Mean Difference among Various Scoring

	Pre-test	2 weeks	4 weeks	6 weeks	8 weeks
Pre-test	×	.633*	1.267*	2.033*	3.300*
2 weeks		×	.633*	1.400*	2.667*
4 weeks			×	.767*	2.033*
6 weeks				×	1.267*
8 weeks					×

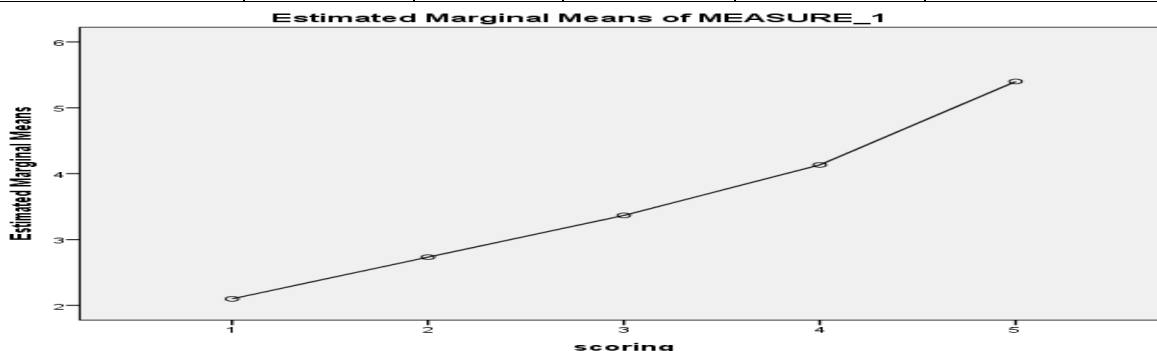


Figure 2: Linear Trend in Performance Improvement

Conclusion and Discussion

With the limitations of the study, the following conclusions were drawn based on the findings:

1. Significance difference was found between pre-test, 2nd, 4th, 6th and 8th week.
2. The result showed the importance of speed endurance in the game of soccer.
3. The training improved the crossing accuracy of soccer players.
4. The study will be a great significant for the coaches and trainers to enhance crossing accuracy which will result the improvement of soccer performance.
5. The significant improvement had enhanced the motivation level of team members with various aspects of performance.
6. The improvement in speed endurance will help the players to improve accuracy of long passes ultimately helping in order to improve the goal conversion ratio.
7. The improvement of speed endurance will improve the overall game.
8. The significant improvement develops the confidence in players.
9. The crossing accuracy in soccer may be used as one of the selective components.
10. This study will help the coaches and trainer in design the effective speed endurance training program.

On the basis of the findings of the study, the improvement in crossing accuracy performance, due to following a speed endurance training program, proves that speed endurance training resists the fatigue of soccer players which further helps them to maintain the coordination during the intensive playing situation.

Recommendation

On the basis of the result interpreted the research scholar would like to produce the following suggestion:-

1. Speed endurance training showed remarkable improvement during the 8 week training on Physiological Parameter, it can further be studied to find out the improvement level of Psychological Parameters like Motivation, Confidence, and Anxiety etc.

2. It is suggested that the training program can further be extended for the period of 10 to 12 weeks to find out the maximum improvement phase till then the improvement is visible.
3. The similar study may be undertaken on various age group and sex.
4. The similar study may be conducted on different body type people that are Mesomorphic, Ectomorphic and Endomorphic.
5. Sports trainers and coaches should implement speed endurance in their training program.
6. Application of speed endurance exercises should be applied at all level of sports, based on its requirement.

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