COMBINED EFFECT OF STATIC AND DYNAMIC CORE STRENGTH TRAINING WITH SOCCER SPECIFIC TRAINING ON SKILL PERFORMANCE OF SOCCER PLAYERS

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ABSTRACT

The purpose of this investigation was to find out the combined effect of static and dynamic core strength training with soccer specific training on skill performance of soccer players. To attain these objectives, 45 college women soccer players in the age of 18-25 years from Lilong Haoreibi College, Lilong Manipur, India during the academic year 2023-2024 were preferred. The chosen subjects (N=45) were classified into three equivalent groups of fifteen participants each (n=15) at random. Group-I was assigned static core strength training in combination with soccer specific training, group-II was assigned dynamic core strength training in combination with soccer specific training and group-III was control. They did these 2 trainings for 12 weeks. All 3 groups were measured before and immediately after 12weeks of training period on dribbling and passing skills by using standardized test items. The data obtained were analyzed by paired 't' test to know the differences if any between the two testing periods. Additionally, magnitude of variation was also calculated. In addition, ANCOVA was also applied. When the adjusted 'F' was greater, Scheffe's test was applied. To test the obtained results the significance level 0.05 was chosen. As a result of static core strength training with soccer specific training and dynamic core strength training with soccer specific training the dribbling and passing skills of soccer players was significantly altered.

Key words: *Static and dynamic core strength training, soccer specific training,* dribbling and passing skills, *women soccer players*

INTRODUCTION

Soccer is the most popular sport globally (Witvrouw et al., 2003; Wong & Hong, 2005) and there is a growing interest in this sport in India. Indian playing standards need to be improved in line with three key areas previously reported to be related to successful soccer performance, namely physical, technical, and tactical skills (Hoff & Helgerud, 2004).

Soccer performance depends upon a myriad of factors such as technical/biomechanical, tactical, mental and physiological areas. One of the reasons that soccer is so popular worldwide is that players may not need to have an extraordinary capacity within any of these performance areas, but merely possess a reasonable level within

all areas. However, there are trends towards more systematic training and selection influencing the performance related fitness profiles of players who compete at the highest level. As with other activities, soccer is not a science, but science may help improve performance. Efforts to improve soccer performance often focus on technique and tactics at the expense of physical fitness. During a 90-minute game, elite-level players run about 10km at an average intensity close to the anaerobic threshold (80–90% of maximal heart rate). Within this endurance context, numerous explosive bursts of activity are required, including jumping, kicking, tackling, turning, sprinting, changing pace, and sustaining forceful contractions to maintain balance and control of the ball against defensive pressure.

The best teams continue to increase their physical capacities, whilst the less well ranked have similar values as reported 30 years ago. Whether this is a result of fewer assessments and training resources, selling the best players, and/or knowledge of how to perform effective exercise training regimens in less well ranked teams, is not known. As there do exist teams from lower divisions with as high aerobic capacity as professional teams, the latter factor probably plays an important role. The information may have important implications for the safety and success of soccer players and hopefully it will be understood and acted upon by coaches and individual soccer players.

Among the coaches in the sports field, there is more debate regarding the effectiveness of training technique that develops skill performance variables of soccer players. However the most excellent technique for attaining progress in skill performance variables of soccer players is uncertain. Static and dynamic core strength training in combination with soccer specific training workouts are well-known training protocol and fundamental requirement for players and athletes; though, insufficient information's available concerning static and dynamic core strength training in combination with soccer specific conditioning effectiveness.

METHODOLOGY

Subjects and Variables

To attain these objectives, 45 college women soccer players in the age of 18-25 years from Lilong Haoreibi College, Lilong Manipur, India during the academic year 2023-2024 were preferred. The chosen subjects (N=45) were classified into three equivalent groups of fifteen participants each (n=15) at random. Group-I was assigned static core strength

training in combination with soccer specific training, group-II was assigned dynamic core strength training in combination with soccer specific training and group-III was control. All 3 groups were assessed before and immediately after 12 weeks of training period on dribbling and passing skills by Mor-Christian General Soccer Ability Skill Test battery.

Training Protocol

A sufficient warm up was performed by the subjects before undergoing core strength and game specific training sessions. Warm down activities were completed after the completion of every sessions. Group-I was assigned static core strength training in combination with soccer specific training, group-II was assigned dynamic core strength training in combination with soccer specific training and group-III was control. The two experimental groups were trained at the similar time during the morning, weekly 3- days, throughout the study. The static and dynamic core strength training in combination with soccer specific training group subjects took part in a 12-week training program performing a variety of exercises designed. Following a series of familiarization sessions, all participants completed a battery of standardized physical fitness tests and laboratory tests in the same order for the subsequent analyses of generic training adaptations on dribbling and passing skills. The testing procedures were repeated at the conclusion of the 12 weeks training.

Collection of the Data

The data on the selected skill variables were collected prior to the commencement of experiment (pre test) and after twelve weeks of training period (post test). Both the pre and post tests were administered under identical conditions, with same apparatus, testing personal and testing procedures.

Statistical Technique

The data collected from the experimental and control groups on selected dependent variables were statistically analyzed by paired ‘t’ test to find out the significant differences if any between the pre and post test. Further, percentage of changes was calculated to find out the chances in selected dependent variables due to the impact of experimental treatment. Further, the data collected from the three groups prior to and post experimentation on selected dependent variables were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since, three groups were involved, whenever the obtained ‘F’ ratio value in the adjusted post test mean was found to

be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. The level of confidence is fixed at 0.05 for significance.

RESULT

The descriptive analysis of the data on dribbling and passing skills of experimental and control groups are presented in table-I.

Table – I: **Descriptive Analysis of the Data on Dribbling and Passing Skills of Experimental and Control Groups**

Variable	Group	Test	Mean	SD	MD	't' ratio	Improvement
Dribbling Skill	Static Core Strength with Soccer Specific Training	Pre	19.06	1.33	0.93	2.16	5.14
		Post	18.13	1.80			
	Dynamic Core Strength & Soccer Specific Training	Pre	19.13	1.35	2.09	3.25	11.71
		Post	17.06	2.71			
	Control Group	Pre	19.06	0.96	0.20	0.54	0.15
		Post	19.26	1.03			
Passing Skill	Static Core Strength with Soccer Specific Training	Pre	15.53	1.18	2.06	31.00	13.30
		Post	17.60	1.35			
	Dynamic Core Strength & Soccer Specific Training	Pre	15.46	1.24	3.99	42.11	25.86
		Post	19.45	1.25			
	Control Group	Pre	15.86	1.40	0.20	0.40	1.26
		Post	15.66	1.44			

*Table value for df 14 is 2.15(*Significant)*
**Significant*

The collected pre and post test dribbling (D) values of two treatment (static and dynamic core strength training with soccer specific training) groups vary obviously as the found 't' values of static core strength training with soccer specific training (2.16) as well as dynamic core strength training with soccer specific training (3.25) groups were more than table value (df14=2.15). Performing static core strength training with soccer specific training leads to 5.14% of improvement in dribbling (D) whereas performing dynamic core strength training with soccer specific training leads to 11.71% of improvement in dribbling ability.

The collected pre and post test passing values of static and dynamic core strength training with soccer specific training groups vary obviously as the found 't' values of static core strength training with soccer specific training (31.00) as well as dynamic core strength training with soccer specific training (42.11) groups were more than table value (df14=2.15).

Performing static core strength training with soccer specific training leads to 13.30% of improvement in passing (P) whereas performing dynamic core strength training with soccer specific training leads to 25.86% of improvement in passing skill of football players.

The pre and post test data collected from the experimental and control groups on dribbling and passing skills was statistically analyzed by using Analysis of Covariance and the results are presented in table–II.

Table-II: **ANCOVA on Dribbling and Passing Skills of Training and Control Groups**

Variable	Static Core Strength with Soccer Specific Training	Dynamic Core Strength with Soccer Specific	Control Group	S o V	Sum of Squares	df	Mean squares	'F' ratio
Dribbling Skill	18.16	17.04	19.28	B	37.59	2	18.79	12.86*
				W	61.52	42	1.46	
Passing Skill	17.65	19.57	15.50	B	122.06	2	61.03	56.50*
				W	45.73	42	1.08	

*(Table value for df 2 & 41 is 3.23)*Significant (.05 level)*

Table-II shows that the obtained adjusted post-test 'F' value of 12.86 and 56.50 on dribbling and passing skills of static and dynamic core strength training with soccer specific training groups and control groups are greater than the required table value of 3.23 for df 2 and 41 at 0.05 level of confidence. Hence, it is concluded that significant differences exist between the adjusted post test means of static and dynamic core strength training with soccer specific training groups and control groups on dribbling and passing skills.

Since, the obtained 'F' value in the adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test, and it is presented in table-III.

Table –III: **Scheffe's Post Hoc Test for the Differences among Paired Means of Experimental and Control Groups on Dribbling and Passing Skills**

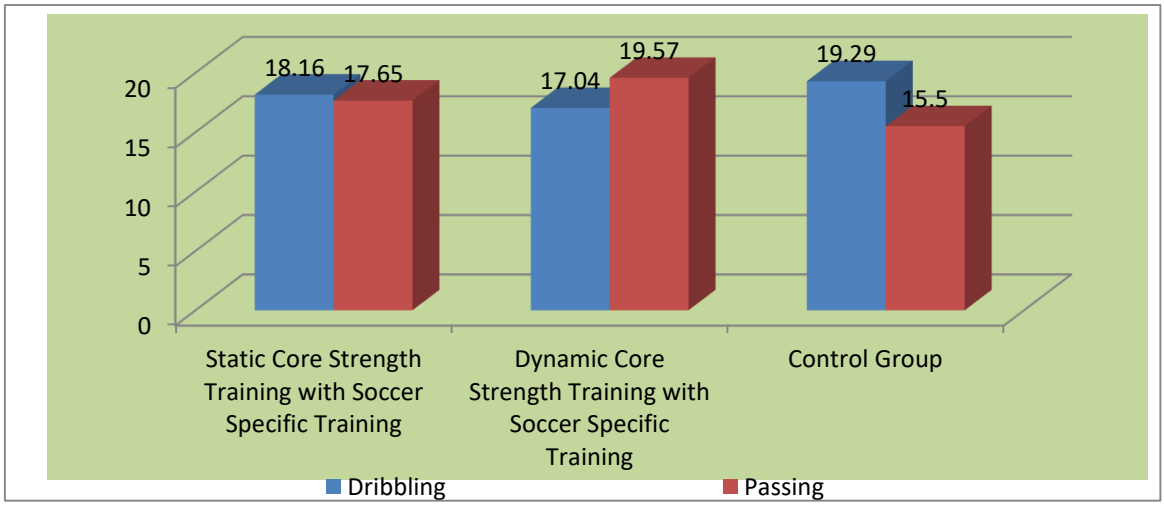
Variable	**Static Core Strength with Soccer Specific Training**	**Dynamic Core Strength with Soccer Specific Training**	**Control Group**	**Mean Difference**	**Confidence Interval**
Dribbling Skill	18.16	17.04		1.12*	1.12
	18.16		19.29	1.13*	1.12
		17.04	19.29	2.25*	1.12
Passing Skill	17.65	19.57		1.92*	0.97
	17.65		15.50	2.15*	0.97
		19.57	15.50	4.07*	0.97

**Significant at .05 level*

The applied Scheffe's statistics confirmed that due to static core strength training with soccer specific training (1.13), as well as dynamic core strength training with soccer specific training (2.25) the football player's dribbling ability was improved to a great extent. Though, dynamic core strength training with soccer specific training was much better than static core strength training with soccer specific training since the mean difference (1.12) is more than 1.12 (CI value).

The applied Scheffe's statistics confirmed that due to static core strength training with soccer specific training (2.15), as well as dynamic core strength training with soccer specific training (4.07) the football player's passing (P) was improved to a great extent. Though, dynamic core strength training with soccer specific training was much better than static core strength training with soccer specific training since the mean difference (1.92) is more than 0.97 (CI value).

Figure-I: **Diagram Showing the Mean Values on Dribbling and Passing Skills of Experimental and Control Groups**



DISCUSSION

Dribbling and passing are fundamental technical skills in soccer that require coordination, balance, body control, and efficient force transfer. Core strength plays a pivotal role in facilitating these biomechanical and neuromuscular functions. Incorporating both static and dynamic core strength training with soccer-specific practice can significantly enhance these technical abilities by improving postural control, neuromuscular coordination, and stability during complex, high-speed movements.

Dribbling requires continuous adjustment of body position, rapid changes of direction, and control of the ball under dynamic conditions. Dynamic core strength training, which involves movement-based exercises (e.g., rotational throws, medicine ball twists, and stability ball movements), improves neuromuscular efficiency and trunk rotation, thereby enhancing the athlete's ability to execute dribbling with greater precision and balance (Reed et al., 2012). By improving dynamic balance and coordination, players can maintain better control of the ball during quick movements and under pressure from opponents (Prieske et al., 2016). Static core training, involving isometric holds such as planks and bridges, enhances trunk stability and endurance, which supports a stable base for limb movements during dribbling. This stability minimizes unwanted torso sway, allowing for more effective control and footwork during quick, multi-directional movements (Kibler, Press, & Sciascia, 2006). When combined with sport-specific dribbling drills, these core enhancements translate into better performance on the field.

Passing, especially under dynamic match conditions, requires accurate force production, balance, and postural alignment. Dynamic core training facilitates efficient energy transfer from the trunk to the lower limbs during the passing motion, especially in longer or more powerful passes. Improved core control allows players to generate more precise and forceful passes even when off balance or under time pressure (Ozmen & Aydogmus, 2016). Static core training enhances postural endurance, which supports technical consistency over the duration of a match. A stable core enables players to maintain alignment of the hips and shoulders while performing repeated passing actions, reducing technical fatigue and maintaining accuracy throughout gameplay (Sato & Mokha, 2009). When this type of training is paired with soccer-specific passing drills, it reinforces skill under conditions of stability and control.

Both training modalities offer distinct benefits, and when combined with soccer-specific skill training, they provide a comprehensive approach to technical development. Dynamic training improves skill execution under movement and instability, while static training builds foundational stability that supports sustained technical quality. The significant improvements observed in dribbling and passing can thus be attributed to enhanced core integration, neuromuscular function, and kinetic chain efficiency, all of which are crucial for technical proficiency in soccer.

CONCLUSION

Due to static core strength training with soccer specific training (5.14%), as well as dynamic core strength training with soccer specific training (11.71%) the soccer player's dribbling skill was improved to a great extent. Though, dynamic core strength training with soccer specific training was much better than static core strength training with soccer specific training. Due to static core strength training with soccer specific training (13.30%), as well as dynamic core strength training with soccer specific training (25.86%) the soccer player's passing skill was improved to a great extent. Though, dynamic core strength training with soccer specific training was much better than static core strength training with soccer specific training.

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