IMPACT OF SPECIFIC SKILL TRAINING WITH AND WITHOUT RESISTANCE TRAINING ON STRENGTH ENDURANCE AMONG COLLEGE SOCCER PLAYERS

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ABSTRACT

The aim of this study was to find out the effects of specific skill training with and without resistance training on strength endurance among college soccer players. To attain these objectives, 45 college men soccer players in the age of 18-25 years 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 resistance training, group-II was assigned resistance training in combination with soccer specific skill 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 strength endurance 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. Performing specific skill training leads to 15.12% of improvement in strength endurance whereas performing resistance with specific skill training leads to 25.59% of improvement in strength endurance of soccer players.

Key words**:** *Specific skill training, Resistance training, Strength endurance and Soccer players*

INTRODUCTION

Soccer is a physically demanding sport characterized by intermittent high-intensity activity, requiring players to perform sprints, accelerations, decelerations, changes of direction, and jumps over a prolonged duration (Reilly, 2007). Therefore, specific conditioning is crucial to optimize performance, prevent injuries, and enhance recovery. Conditioning programs tailored to the physiological and biomechanical demands of soccer ensure that players can cope with the sport's intensity and variability.

Soccer players cover 10–13 km per match on average, with 2–4 km performed at high-intensity sprinting (Bangsbo, 2015). Aerobic conditioning improves stamina and supports repeated bouts of high-intensity effort, while anaerobic conditioning enables explosive actions such as sprinting, jumping, and tackling. Combining both energy systems in training improves overall match performance and delays fatigue (Stølen et al., 2005).

Strength and power development is essential for soccer players to perform powerful kicks, win physical duels, jump effectively, and accelerate rapidly. Exercises such as squats, lunges, and plyometrics enhance lower-body strength and explosive power, which are directly associated with sprint speed, vertical jump height, and change-of-direction performance (Comfort et al., 2014).

Soccer involves repeated accelerations, decelerations, and multidirectional movements. Specific conditioning programs that include sprint drills, ladder drills, and cone drills improve agility, reaction time, and coordination, enhancing a player's ability to respond to game situations effectively (Little & Williams, 2005). Different positions in soccer demand unique physical qualities. For example, midfielders require high aerobic capacity for sustained running, forwards benefit from explosive speed for attacking runs, and defenders emphasize strength and power to win duels (Reilly & Thomas, 1976). Tailored conditioning ensures that players develop the attributes most relevant to their roles on the field.

Conditioning also plays a critical role in reducing injury risk. Strengthening muscles, tendons, and ligaments, along with improving core stability and flexibility, reduces the likelihood of hamstring strains, ligament injuries, and overuse problems (Ekstrand et al., 2011). Preventive conditioning enhances resilience to the physical stresses of the game. Specific conditioning is essential for soccer players to optimize performance, maintain physical fitness, and reduce injury risk. Comprehensive programs that integrate aerobic and anaerobic training, strength and power development, agility, and position-specific conditioning are crucial for sustaining high-level performance throughout the season.

Soccer is fitness dominating sports along with technical and tactical skills. The effect of specific skill training with resistance training on strength of soccer players are needful research goal and it has drawn the investigator's attention. Therefore, the intention of this study was to find out the effects of specific skill training with and without resistance training on strength endurance among college soccer players.

METHODOLOGY

Subjects and Variables

To attain these objectives, 45 college men soccer players from Centre for Physical Education, University of Calicut, Kerala in the age of 18-25 years 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 specific skill training, group-II was assigned resistance training in combination with specific skill training and group-III was control. All 3 groups were assessed before and immediately after 12 weeks of training period on strength endurance by bent knee sit-ups.

Training Protocol

The specific skill training and resistance training in combination with specific skill training group subjects took part in a 12-week training program performing a variety of exercises designed. Group-I was assigned specific skill training, group-II was assigned resistance training in combination with specific skill training. The resistance training program was a total body workout consisting of 3 sets of 7-10 repetitions on 6 exercises that trained all the major muscle groups. A percentage of each subject's one-repetition maximum for each exercise was used to determine the intensity of each week. The intensity and number of repetitions performed for each exercise was progressively increased.

The subjects of the experimental group performed soccer game related specific skills and drills practices, three alternative days in a week for 12 weeks during the morning session. They performed the following exercises namely inside foot kick, instep foot kick, close control dribbling, speed control dribbling, jump heading, dive heading, sole trap, thigh trap, chest trap, block tackle, poke tackle and slide tackle respectively. The training intensity was gradually increased as training progressed throughout the training period. The rest - work ratio of 1:1 in-between repetitions and 1:3 between sets was given.

Collection of the Data

The data on strength endurance was 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 strength endurance was 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 strength endurance due to the impact of experimental treatment. Further, the data

collected from the three groups prior to and post experimentation on strength endurance was 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 strength endurance data of specific skill training and resistance training with specific skill training & control groups are analyzed as in Table - I.

Table – I:Paired't' Test and % of Changes on Strength Endurance of Specific Skill Training and Resistance Training with Specific Skill Training and Control groups

(Unit: Count)

Group	Test	N	Mean	SD	DM	Std. Error Mean	't' - ratio	%
Specific Skill Training	Pre	15	29.5333	2.85023	4.4667	.73593	7.249*	15.12%
	Post		34.0000	2.29907		.59362		
Resistance Training with Specific Skill Training	Pre	15	28.4000	1.95667	7.2667	.50521	16.071*	25.59%
	Post		35.6667	3.19970		.82616		
Control	Pre	15	29.1333	2.69568	0.1333	.69602	0.292	0.46%
	Post		29.0000	2.92770		.75593		

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

The collected pre and post test mean values of two treatment (specific skill training and resistance training in combination with specific skill training) groups vary obviously as the found 't' values of specific skill training (7.249) as well as resistance with specific skill training (16.071) groups are more than table value (df14=2.15).

Performing specific skill training leads to 15.12% of improvement in strength endurance whereas performing resistance with specific skill training leads to 25.59% of improvement in strength endurance of soccer players.

The chosen soccer player's strength endurance of specific skill training and resistance training in combination with specific skill training & Control groups were analyzed by ANCOVA statistics, and exhibited in Table – II.

Table – II: ANCOVA Results on Strength Endurance of Specific Skill Training and Resistance Training with Specific Skill Training and Control Group's

	Specific Skill Training	Resistance with Specific Skill Training	Control	SoV	SS	df	MS	'F' ratio
Adjusted Mean	33.582	36.175	28.909	B	403.133	2	201.567	52.487*
				W	157.452	41	3.840	

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

The applied ANCOVA calculation established that the adjusted (post test) means (specific skill training group=33.582, resistance with specific skill training group = 36.175 & CG=28.909) of soccer player's strength endurance of all three chosen groups differs from each other, because the resultant adjusted (post test) mean 'F' value (52.487) is better than 3.23 (Table value for *df 2 & 41* =3.23).

As the specific skill training and resistance training in combination with specific skill training & Control group's adjusted (post test) means 'F' value (F= 52.487) is significant, **Scheffe's** statistics was also used as in Table - III.

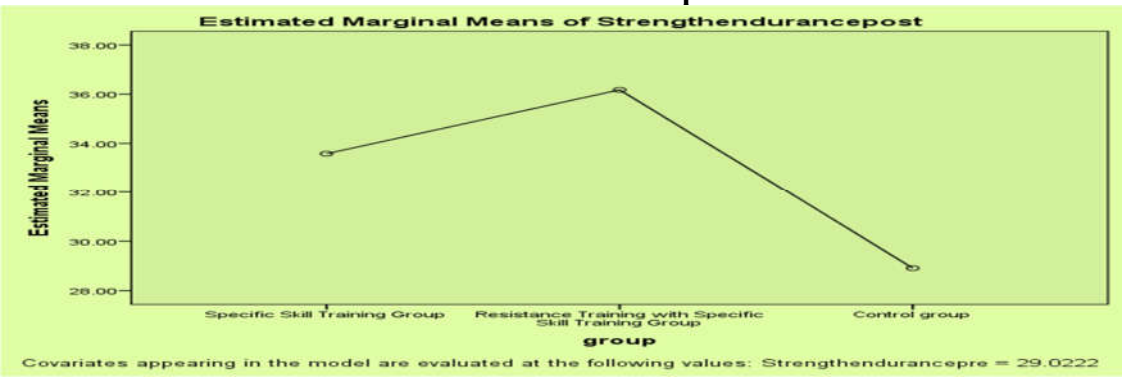
Table – III: Scheffe's Test Conclusion on Strength Endurance of Specific Skill Training and Resistance Training with Specific Skill Training and Control group's

Variable	Specific Skill Training	Resistance with Specific Skill Training	Control	MD	CI
Strength Endurance	33.582	36.175		2.593*	1.819
	33.582		28.909	4.673*	1.819
		36.175	28.909	7.266*	1.819

**Significant (.05)*

The applied Scheffe's statistics confirmed that due to specific skill training (4.673), as well as resistance with specific skill training (7.266) the soccer player's strength endurance was improved to a great extent. Though, resistance with specific skill training was much better than specific skill training alone since the mean difference (2.593) is more than 1.819 (CI value).

Figure- II: Estimated Marginal Means on Strength Endurance of Specific Skill Training and Resistance Training with Specific Skill Training and Control Groups



DISCUSSION

Strength endurance is the ability to exert force repeatedly over time while resisting fatigue. In soccer, this capacity is critical because players repeatedly perform high-intensity actions sprinting, tackling, kicking, and jumping throughout a 90-minute match. Players with higher strength endurance sustain performance longer, recover faster between bouts, and are less prone to late-game performance decline (Stølen et al., 2005).

Resistance training improves muscle strength, hypertrophy, and endurance capacity by enhancing oxidative enzyme activity, capillary density, and fatigue resistance in muscle fibers (Bompa & Buzzichelli, 2019). However, without sport-specific integration, these adaptations may not optimally transfer to soccer demands. When resistance training is combined with soccer-specific skill drills such as repeated sprints with the ball, resisted dribbling, or small-sided games with overloads players not only improve their muscular endurance but also learn to apply it under technical and tactical conditions. This integrated approach trains both physiological adaptations and skill-specific efficiency, leading to superior outcomes.

The superior improvements from combined resistance + skill training are explained by Skill-based endurance drills ensure that physiological gains from resistance training transfer to match conditions (Bompa & Buzzichelli, 2019). Resistance training enhances fatigue resistance in Type II fibers, while skill training improves coordination, reducing energy cost per action (Rønnestad et al., 2011). Combined programs improve phosphocreatine recovery and lactate clearance, directly supporting strength endurance in

soccer-specific tasks (Gomes et al., 2010). Practicing soccer skills under fatigue conditions develops efficiency, allowing players to sustain high-intensity actions longer.

The conclusion that resistance training combined with specific skill training enhances strength endurance more than either method alone is supported by strong evidence. This combined approach maximizes physiological adaptations while ensuring transferability to soccer performance, allowing players to sustain high-intensity actions throughout a match.

CONCLUSION

Performing specific skill training leads to 15.12% of improvement in strength endurance whereas performing resistance with specific skill training leads to 25.59% of improvement in strength endurance of soccer players. Though, resistance with specific skill training was much better than specific skill training alone.

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