Biological Forum – An International Journal **15(6): 138-141(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Effect of Strength Training and Combination of Plyometric-SAQ Training on Selected Lower Body Strength Parameter among Men Football Players

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(Received: 13 March 2023; Revised: 18 April 2023; Accepted: 26 April 2023; Published: 20 June 2023)
(Published by Research Trend)

ABSTRACT: SAQ, plyometric training, and strength training all have a major impact on athletic performance. SAQ, plyometric training, and strength training, or any combination of these three types of training, may improve soccer players' motor skills and performance, according to previous study. The aim of this study was to look at how the participants' lower bodies responded to eight weeks of strength training and a mix of SAQ and plyometric exercise. The researcher tried to eliminate the Avis Effect as maximum as possible. The findings of this study showed that after 8 weeks of training, the group that received strength training had significantly improved lower body performance compared to the groups who received SAQ and Plyometric training and the control group. This study recommended minimum 8 weeks of intervention is required for observable difference for improve lower body strength of soccer players.

Keywords: SAQ, Plyometric Training, Strength Training and Soccer.

INTRODUCTION

Soccer is a popular sport practiced all over the world. Soccer games are fun for both fans and athletes. Young people from all around the world are drawn to soccer because of its intensity. The origins of soccer are obscure. Soccer has, nevertheless, always enjoyed widespread appeal. Modern soccer originated in England. In 1863, the English Soccer Association established the regulations. Due to its widespread appeal, all more advanced scientific theories now include soccer as a component. To evaluate their soccer skill and make predictions about how they will play, a suitable evaluation technique is required.

The training specialization of young athletes has substantially improved. On fields, young athletes no longer kick balls. The growth strategy for young soccer academies varies from year to year and club to club. The youth of today need to be instructed on the proper time and method for learning new skills. "Timing is everything," they say.

The skills that separate great players from the rest should be the emphasis of a player's training. Elite athletes engaged in 28% more sprinting and % more high-intensity activity than their ordinary counterparts (Mohr *et al.,* 2003). Functional strength is prioritized during the off-season, followed by maximizing during the early pre-season, muscular power and endurance during the late pre-season, and maintenance throughout the regular season. A young soccer player's vertical leap, shooting ability, 30 meter sprint, and aerobic endurance may all be improved with strength and power training (Wong *et al.,* 2010).

Plyometric workouts are performed to enhance dynamic muscular function and include jumping, hopping, skipping, and bounding. Plyometric training is often practiced by athletes in high-intensity sports. Athletes from a wide variety of sports employ plyometric exercises to increase their strength and explosiveness. The same muscle and connective tissue are rapidly stretched in plyometrics before being constricted or contracted in a concentric action. Due to the elastic energy that has been stored inside the muscle, more force is produced than can be produced by a purely concentric action. Plyometric training, when paired with a periodized strength training program, can improve an athlete's vertical leap, acceleration, leg and muscle strength, joint awareness, and proprioception. Plyometrics are great for improving agility since they require quick starts, stops, and changes in direction. Improving balance and postural control while moving should lead to greater agility. Before incorporating plyometric training into their sport-specific skills, teenagers should start doing so during warm-ups. In order to get the desired results, an effective program will adjust the intensity, volume, frequency, and recuperation phases of the workout (Miller *et al.,* 2006) Rösch *et al.* (2000) discovered that professional soccer players, but not amateurs, were able to modify their body postures during SAQ training in order to gain more balance, strength, and control without slowing down. Coaches must therefore successfully teach their athletes to improve their sport-specific talents and get

them ready for competition (Rösch *et al.*, 2000). Among professional soccer players who play 6-8 sessions per week. Strength training is a crucial component of professional soccer players' development. Shane McDermott looked at the effects of plyometric, SAQ, and regular training on the speed, agility, leaping, and shooting of young soccer players (Reilly, 1997). According to various studies, plyometrics, and SAQ would improve soccer players' performance. The research examined the effects of 8 weeks strength training and combination SAQ and plyometric training on senior soccer players' leg strength.

MATERIAL AND METHOD

Selection of Subject. One Twenty men football player of age between 18 to 25 years were selected randomly from the ICFAI University, Tripura, Holy Cross College, jubatara. Agartala. Ram Thakur College, badharghat Agartala, M.B.B College, College tila, Agartala.

The selected subjects were divided into three equal groups consisting of 40 each. Experimental Group I (n=40) acted as control group as not given any sort of specific training Group II (n=40) underwent Strength training and Group III (n=40) underwent combination of SAQ and Plyo metric training for 8 weeks respectively (Ref Table 1).

Table 1: Training Schedule.

Week	Combination of SAQ and Plyo-Metric Training						Strength training		
	SAQ Training			Plyo-Metric Training					
	Exercise	Rep	Intensity	Exercise	Rep	Intensity	Exercise	Rep	Intensity
Week 1&5	T-Drills Figure Drills Box Drills Agility Ladder Drills High Knee/Glut Kicker "A"Skips	3× 10	50%--60%	Standing Jump Reach Front Cone Hops Double Leg Barrier Jumps Lateral Jumps to Box Clapping Push–up Dumbbell Swings Standing	3×10	50%	Dumbbell Lunge. Dumbbell Shoulder Squat. Bulgarian Split Squat. Dead lift. Hip Thrusts. Lateral or Side Lunge. Weighted Step-Up. Good Morning.	3×10	50%
Week 2&6	Resisted Running Short Sprint Zig-zag Jump Drills Dot Drills or "X" Drills Lateral Agility Ladder	3× 12	60%--70%	Box Jump Split Squat Jumps Lateral Box Push Off Depth Push–up Side Throw M.B Chest Passes with M.B	3×12	65%-70%	Squats, lunges, deadlifts, hip thrusts	3× 12	60%--70%
Week 3&7	Single Leg Dot Drills Jump Turn 90 degree Shuttle Drills Sprint Lateral Shuffle Inclined Running	4×12	65%--75%	Bounding Bounding with Rings Lateral Hurdle Jumps Box Drills with Rings Explosive start Throw	4×12	70%- 75%	Dumbbell Lunge. Dumbbell Shoulder Squat. Bulgarian Split Hip Thrusts. Lateral or Side Lunge. Weighted Step-Up. Good Morning.	4×12	70%- 75%
Week 4&8	The Snake Run Zig-Zag Jump Drills Singleleg Dot Drillsor"X"drills "A"Skips Weighted Arm Swings	4×15	75%--80%	Box Jump Split Squat Jumps with dumbbells Lateral Box Push Off Clapping Push-up Dumbbell Swings Standing	4×15	70%-80%	Squats, lunges, dead lifts, hip thrusts	3× 12	60%--70%

Selection of Variables. Lower body strength was chosen as independent variables for the study, with various selected training methodology group as the dependent variable.

Administration of Test

Lower Body Strength

Purpose: To measure lower body maximum strength.

Equipment: Various free weights and a barbell.

Procedure: After an adequate warm up, the subject stands under the bar, with feet shoulder-width apart. The knees should be in line with the toes. Take the weight on your shoulders, then bend at the knees and hips to lower the body. Ensure the head and neck are in a neutral position with eyes facing forward (avoid rounding of the spine). Lower the body until the knees are at a right angle, then push back up to a standing position. Move in a slow, smooth and continuous movement.

Scoring: The maximum weight lifted is recorded.

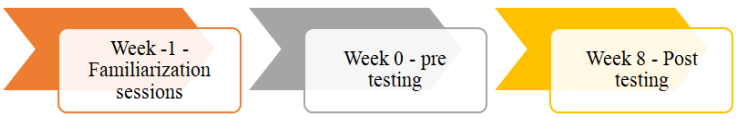

Fig. 1. Intervention schedule.

RESULT

The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significance difference, if any between the groups. The 0.05 level of confidence was fixed to test the level of significance difference, if any between groups (Verma, 2013).

Table 2: Descriptive Statistics of Lower-body strength score (Squat) in kg.

Variables	Groups	Mean	Std. Deviation
SQ_RM_PRE	Control	83.0000	15.36486
	Strength Training Group	84.0000	17.36486
	Combination of Plyometric and SAQ	83.0000	16.24334
SQ_RM_POST	Control	84.0000	17.36486
	Strength Training Group	93.0000	21.14662
	Combination of Plyometric and SAQ	84.7500	15.97073

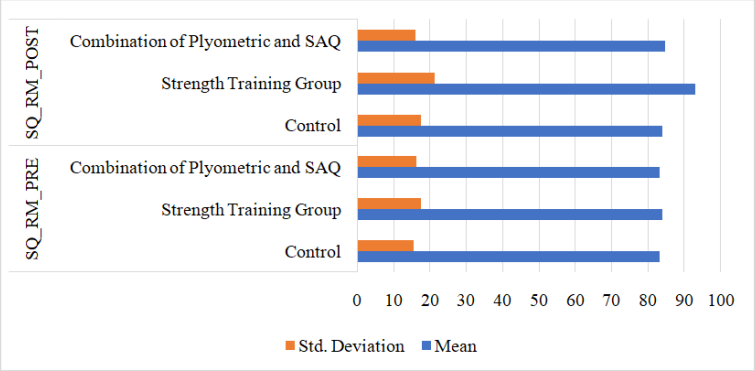

Fig. 2. Bar chart for descriptive statistics of Lower-body strength score (Squat) in kg.

Table 2 and Fig. 2 represents the descriptive statistics i.e., mean and standard deviation of squat score (lower body strength) before and after selected training intervention. The mean and standard deviation of squat score (lower body strength) for control group before and after intervention was 83.00±15.36 kg and 84.00±17.36 kg respectively. The mean and standard deviation of squat score (lower body strength) for strength training group before and after intervention was 84.00±17.36 kg and 93±21.14 kg respectively. The mean and standard deviation of squat score (lower body strength) for Combination of Plyometric and SAQ group before and after intervention was 83±16.24 kg and 84.75±15.90 kg respectively.

Table 3: Levene's Test of Equality of Error Variances for strength of lower body.

F	Df1	Df2	Sig.
.353	2	117	.877
Tests the null hypothesis that the error variance of the dependent variable is equal across groups.			
a. Design: Intercept + Pre-Test + Groups			

Table 3 represents the value of Levens test. The Levens is an assumption for ANCOVA test for determining homogeneity of group. The obtained value for Levens test is 0.877 which is more than 0.05 and hence the assumption of equality of variance is not violated. Thus, the null hypothesis of equality of population means of three groups is rejected and it may be concluded that the strength of lower body of control and experimental groups are different.

Table 4: Tests of Between-Subjects Effects for strength of lower body.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	35406.183[a]	3	11802.061	238.662	.000
Intercept	77.224	1	77.224	1.562	.214
SQ_RM_PRE	33411.183	1	33411.183	675.642	.000
Groups	1822.376	2	911.188	18.426	.000
Error	5736.317	116	49.451		
Total	954650.000	120			
Corrected Total	41142.500	119			
a. R Squared = .861 (Adjusted R Squared = .857)					

Table 4 shows the F-value for comparing the adjusted means of the criterion variable in three groups (Control Group, Strength Training Group, and Combination of Plyometric and SAQ Training Group). The F-statistic computed for selected groups is significant because p-value associated with it is 0.00 which is less than 05. Thus, the null hypothesis of no difference among the adjusted means for the data on criterion variable (strength of lower body) in three treatment groups may be rejected at 5% level.

Table 5: Pair wise Comparisons for strength of lower body.

(I) Groups	(J) Groups	Mean Difference (I-J)	Std. Error	Sig.[b]
Control	Strength Training Group	-9.000*	1.572	.000
	Combination of Plyometric and SAQ	-1.744	1.573	.809
Strength Training Group	Control	9.000*	1.572	.000
	Combination of Plyometric and SAQ	7.256*	1.573	.000
Combination of Plyometric and SAQ	Control	1.744	1.573	.809
	Strength Training Group	-7.256*	1.573	.000
Based on estimated marginal means				
*. The mean difference is significant at the .05 level.				
b. Adjustment for multiple comparisons: Bonferroni.				

Table 5 represents post hoc analysis, for selected groups. There was significant ($p<0.05$) Since F-statistic is significant, post hoc comparison has been made for the adjusted means of the three treatment groups, which is shown in Table 5 It may be noted here that p-value for the mean difference between Control group and Strength Training Group as well between Control group and Combination of Plyometric and SAQ training group is .000. Since p value is less than .05, both these mean differences are significant at 5% level value obtained for all the pair wise comparison. There was significant difference between means of selected groups. Strength Training Group (93 kg) mean was highest when compared to control and Combination of Plyometric and SAQ Group which was 84.0 kg and 84.75 kg respectively.

Discussion on findings. The purpose of the experiment was to determine the most efficient technique of training for a group of senior soccer players in order to improve lower body strength. Selected combination of SAQ and plyometric group doesn't reflect increased lower body strength might be because of selected exercise in table 1a focused on whole body a few were related with strength application in other words all were own body weight exercises whereas, strength training group showed best result with increased lower body strength when compared to control and combination of SAQ and plyometric groups. Various physiological literature also stated the same of increased strength after 8 weeks of training by Coyle *et al.* (1979); Miller *et al.* (2006); Singh (1991). The results of this study were critically aligned to Wong *et al.* (2010) as he also claimed minimum 8 weeks of strength training improves lower body strength.

CONCLUSIONS

From the results obtained above these conclusions were made that there was insignificant effect of combination of plyometric and SAQ training on Lower body strength of selected soccer players. It was also concluded that there was a significant difference between the adjusted means of Lower body strength in strength training group and Control group and there was a significant difference between the adjusted means of criterion variable (squat performance) in Strength Training group and Combination of Plyometric and SAQ group.

FUTURE SCOPE

The promising results of this study can help soccer coaches to focus on 8 weeks or more strength training for improves lower body overall strength.

Acknowledgement. The researcher acknowledges the support of Vice-chancellor and HOD, Physical Education for constant motivation and providing best research environment.
Conflict of Interest. None.

REFERENCES

Coyle, E. F., Costill, D. L. and Lesmes, G. R. (1979). Leg extension power and muscle fiber composition. *Med Sci Sports*, *11*(1), 12-15.

Miller, M. G., Herniman, J. J., Ricard, M. D., Cheatham, C. C., & Michael, T. J. (2006). The effects of a 6-week plyometric training program on agility. *Journal of sports science & medicine*, *5*(3), 459.

Mohr, M., Krustrup, P. and Bangsbo, J. (2003). Match performance of high-standard soccer players with special reference to development of fatigue. *Journal of sports sciences*, *21*(7), 519-528.

Reilly T. (1997). Energetics of high-intensity exercise (soccer) with particular reference to fatigue. *Journal of Sports Sciences*, *15*(3), 257–263.

Rösch, D., Hodgson, R., Peterson, T. L., Graf-Baumann, T. and Junge, A. C. J. (2000). Assessment and evaluation of football performance. *The American Journal of Sports Medicine*, *28*(5), 529-539.

Singh Hardyal. (1991). *Science of sports training*.

Verma, J. P. (2013). *Data analysis in management with SPSS software*.

Wong, P. L., Chamari, K. and Wisloff, U. (2010). Effects of 12-week on-field combined strength and power training on physical performance among U-14 young soccer players. *The Journal of Strength & Conditioning Research*, *24*(3), 644-652.

How to cite this article: Konark Roy and Dulal Debnath (2023). Effect of Strength Training and Combination of Plyometric-SAQ Training on Selected Lower Body Strength Parameter among Men Football Players. *Biological Forum – An International Journal*, *15*(6): 138-141.