Journal of Sports Science and Nutrition

E-ISSN: 2707-7020
P-ISSN: 2707-7012
JSSN 2022; 3(2): 34-36
Received: 14-05-2022
Accepted: 21-06-2022

Pratik Dhankhar
M. P. Ed Scholar, Maharshi Dayanand University, Rohtak Haryana, India

Corresponding Author:
Pratik Dhankhar
M. P. Ed Scholar, Maharshi Dayanand University, Rohtak Haryana, India

Effect of resistance training on soccer performance

Pratik Dhankhar

Abstract
Research found a significant correlation between strength training and athletic performance. Previous studies have shown that strength training has a positive effect on both players' motor abilities and their performance on the soccer field. The purpose of this brief assessment is to do a hasty investigation into the ways in which the unique style of strength training affects soccer performances.

Keywords: Strength training, soccer, kicking and performance

Introduction
Soccer, with its 90-minute games, is sometimes seen as an endurance sport. Strength is necessary for improving performance and avoiding injury, however. Soccer is a physically demanding sport where a player's ability to win tackles, outmuscle opponents one-on-one, and position himself to control a ball in the air determines his or her success. Being more powerful than your adversaries has several advantages. A strong core and upper body are just as important as powerful legs.

Soccer players may also benefit from strength training in a variety of different ways, such as: Injury risk is reduced by exercising the muscles that support joints like the hips and knees when sitting and dead lifting. A player's stability becomes better as their strength rises. Explosive power, which is defined as strength plus speed, is necessary for all of these talents. Strength and quickness are necessary for heading the ball, changing direction on the pitch, and saving a goal [7]. Strength is often thought of as the capacity to act against or overcome opposition. Acting against resistance is equivalent to isometric strength, whereas overcoming it is equivalent to isotonic strength. The following procedure in Fig. No. 1 illustrates the role of strength training on soccer player performance.

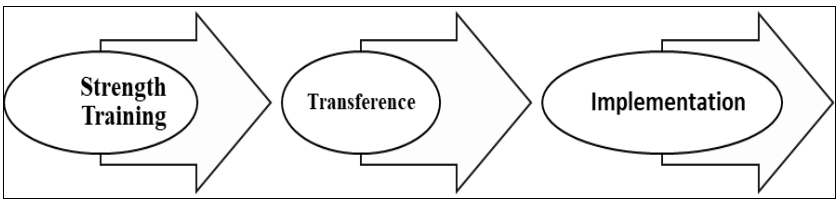

Fig 1: Strength training process

Strength Training
Strength training is a kind of exercise that efficiently generates a demonstrable improvement in strength and/or hypertrophy.

Transference
Training includes exercises that require maximum or almost maximal muscle contractions (velocity-specific). Exercises for building muscle will become better as muscle building gets better. Exercises that are focused on enhancing performance in certain basic movements by significantly increasing physical strength (increased force in take-off, increased stride length, increased jumping ability, increased eccentric strength in braking etc.)

Implementation
Training that closely resembles (or duplicates) the actions seen in the game. The training focuses on applying the knowledge gained through transference training to characteristics that are useful to games (Increase stride frequency, increased acceleration, increased running speed, deceleration-capacity, etc.)

Strength training for soccer players

There has been much studies on the value of strength and strength training for football players. For instance, De Proft and colleagues had one group of Belgian athletes lift more weights during the season. Comparing the players to a control group of coworkers who did not get any additional training, the players showed an improvement in their leg strength and kicking ability. Stronger players had fewer injury risks and outlasted weaker players in terms of holding down a regular role on the team, according to Reilly (1990) [21]. He advises developing leg strength, especially in the quadriceps and hamstrings, to help stabilise the knee joint, which is the football player's most often damaged joint [1]. According to Apor (1998) [2], a Hungarian researcher who has conducted extensive study on Hungarian pros, knee-extension torque has been linked to game success and that having strong hamstring and quadriceps muscles is crucial for preventing knee injuries. We may infer from this succinct assessment of the research that players who want to improve kick performance and lower their risk of injury must focus on building strength, especially in the legs and trunk [2].

According to Taiana *et al*., a 10-week leg-strengthening programme improved football players' 10 and 30 metre sprint times as well as their vertical leap ability. On the other hand, this study used a training plan that aimed for maximum strength and robust resistance. It is challenging to include this kind of training into a football team's regular training programme despite the fact that it has been demonstrated to increase sprint speed and jumping power since the recovery period required after severe resistance training may conflict with regular season games [3].

Like the benefits of strength training, the importance of having good sprinting speed for football players has received widespread recognition. The absolute maximum speed shown during play was one of the characteristics that set elite players apart from those of inferior calibre, according to Ekblom (1986) [8]. This is supported by Kollath and Quade's (1993) study of German Division One players. They found that at distances of 10, 20, and 30 metres, pros were much quicker than amateurs. The acceleration from 0 to 10m was noticeably different. Better players need to accelerate and accelerate at faster speeds in order to play at a higher level. Surprisingly, regardless of position, the German professionals' 30m pace stayed constant [5].

A research by Bangsbo *et al*. (2006) [14] was done on 28 players from the Italian Serie A. During a game, a few players ran a 362 sprint (>21 km/h). The sprints had an average speed of 23 0.1 km/h and a peak average speed of 26 0.2 km/h. But what's more intriguing is that the sprints' top speed was 31.9+/-0.8 km/h. Usain Bolt hits the 30-meter mark in a test at around 39, 5 km/h. A quick soccer player moves beyond 30 metres in 35, 5 km/h. A typical soccer player travels 30 metres in 34, 0 km/h. Therefore, in competitive settings, players almost seldom run at their top speed. Fast acceleration may thus be more of a problem than high maximum running speed. Players' training schedules must thus reflect this need for swift acceleration and maximal speed. Apor (1998) [2] advises football players to develop the muscles of a sprinter when giving fitness advice [6]. It has been demonstrated that strength training, as developed through heavy resistance training, enhances initial acceleration and change-of-direction activities, H+ (hydrogen ion) regulation and buffering capacity, and repeated sprint ability. As a result, match play fatigue is postponed [8]. The best methods for boosting strength are outlined by Peterson *et al*. depending on the player's training age. The strong and favourable connection between peak power and maximal strength (r= 0.77–0.94) further supports heavy resistance training as a pre-requisite for power growth. Notably, compared to low resistance strength training, high load strength training (.80% 1 repetition maximum [RM]) results in larger improvements in maximal muscular power. Intermuscular and intramuscular coordination, maximum strength, and the numerous anatomical and neurological components of the stretch shortening cycle are all factors that affect power (SSC). Due to the complexity of power, training must take a diversified approach. These can be broadly divided into three types of exercise: plyometrics, Olympic-style weightlifting, and ballistic resistance training [9, 10, 11, 12, 13].

Ballistic Resistance Training

The unloading (projecting or releasing) of an external resistance at the conclusion of a concentric movement, such as a throw or leap, characterises this training technique. Because of this, the load accelerates for a longer duration, enabling higher velocities. Both eccentric-concentric and concentric-only ballistic resistance training are possible. On the other hand, it seems that rapid eccentric-concentric coupling exercises are crucial for boosting power. Cronin and Sleivert discovered that training at a range of loads, regardless of whether the load reflects peak power production, delivers better results. It has been recommended that each repetition should achieve 90% of peak power output or velocity [14, 15, 13, 16].

Weightlifting

In weightlifting, the development of concentrated power is prioritised (snatch and clean and jerk). They enable explosive handling of relatively large masses in the vertical plane. As a consequence, power generation is maximized at much larger relative external loads as compared to ballistic resistance training modes. In fact, it has been shown that some of the highest power outputs of any exercise come from Olympic-style weightlifting [17].

Plyometric

Increased jump and hopping height, decreased ground contact time (GCT) at all running speeds, increased rate of force generation, and increased rate of force development are all effects of plyometric training that help athletes change direction more quickly. Additionally, Voigt *et al*. and Verkhoshansky discovered that efficient sprinting that is, the effective application of the stretch-shortening mechanism can recover up to 60% of total mechanical energy, enhancing running economy. Even though these results were not limited to soccer, it is anticipated that they will still apply to a number of soccer-specific sports motions. By properly using plyometric exercises to optimise SSC mechanics, a player's reactive strength can be increased. According to Flanagan and Comyns, the steps should be completed in the following order: the proper mechanics of landing and eccentric loading (e.g., drop lands) rapid plyometric at low intensities that cause a transient GCT (e.g., ankling). The focus of hurdle and depth jumps is on short GCT and ideal jump height (e.g., drop jumps). Power and strength are undoubtedly necessary for

effective soccer play, and they also help to prevent injuries (Discussed in a later section). The best way to enhance these qualities is to combine vigorous resistance training with explosive exercises like ballistic resistance training, weightlifting, and plyometrics. Anecdotally, doing a maximum of 5 sets of 3 repetitions with a minimum of a 3-minute pause in between sets for power training is said to maximise results from training with a range of weights. This kind of training could benefit from being divided up into blocks (Traditional periodization, as described in the next section), with strength endurance exercises taking place during the off-season and strength and power exercises during the preseason [18-25].

Conclusion

According to the findings of several earlier studies, strength training has a considerable impact on soccer players' kicking, leaping, and sprinting abilities. The correlation between strength training and soccer performance study's findings will be helpful since they will help us understand how important it is to create structural adaptations for performance enhancement.

References

1. Aagaard P, Simonsen EB, Trolle M, Bangsbo J, Klausen K. Effects of different strength training regimes on moment and power generation during dynamic knee extension. Eur J Appl Physiol Occup Physiol. 1994;69(5):382-386.
2. Apor P. Successful Formulae for Fitness Training. In: Reilly, T. *et al*. (Eds) Science and Football, London: E. and F. N. Spoon. 1998.
3. Arampatzis A, Schade F, Walsh M, Bruggemann GP. Influence of leg stiffness and its effect on myodynamic jumping performance. J Electromyogr Kinesiol. 2001;11(5):355-364.
4. Asci A, Acikada C. Power production among different sports with similar maximum strength. J Strength Cond Res. 2007;21(1):10-16.
5. Cronin JB, Sleivert G. Challenges in understanding the influence of maximal power training on improving athletic performance. Sports Med. 2005;35(3):213-234.
6. Cronin JB, McNair PJ, Marshall RN. Force-velocity analysis of strength training techniques and load: Implications of training strategy and research. J Strength Cond Res. 2003;17(1):148-155.
7. Edge J, Hill-Haas S, Goodman C, Bishop D. Effects of resistance training on H+ regulation, buffer capacity and repeated sprints. Med Sci Sports Exerc. 2006;38(11):2004-2011.
8. Ekblom B. Applied Physiology of Football. Sports Science. 1986;3(1):50-60.
9. Farley CT, Morgenroth DE. Leg stiffness primarily depends on ankle stiffness during human hopping. J Biomech. 1999;32(3):267-273.
10. Farley CT, Blickhan R, Sato J, Taylor CR. Hopping frequency in humans: A test of how springs set stride frequency in bouncing gaits. J Appl Physiol. 1985;191:2127-2132. 1991.
11. Gabbett TJ, Kelly JN, Sheppard JM. Speed, change of direction speed, and reactive agility of rugby league players. J Strength Cond Res. 2008;22(1):174-181.
12. Gamble P. Training for Sports Speed and Agility: An Evidence-based Approach. Oxon, United Kingdom: Routledge. 2012, 7-19.
13. Garhammer J. A review of power output studies of Olympic and powerlifting: Methodology, performance prediction, and evaluation tests. J Strength Cond Res. 1993;7:76-89.
14. Jens Bangsbo Physical, Metabolic Demands of Training And Match-Play In The Elite Football Player Journal of Sports Sciences. 2006;24(7):665-674.
15. Kollat E, Quade K. Measurement of Sprinting Speed of Professional and Amateur Soccer Players. In: Reilly, T. *et al*. (Eds) Science and Football, London: E. and F. N. Spoon, 1993.
16. Komi PV. Training of muscle strength and power: Interaction of neuromotoric, hypertrophic, and mechanical factors. Int J Sports Med. 1986;7(suppl 1):10-15.
17. Mackenzie B. Strength Training For Football Players [Www], 2005. Available From: Https://Www.Brianmac.Co.Uk/Football/Strength.Htm [Accessed 9/2/2022]
18. Newton R, Kraemer W. Developing explosive muscular power: Implications for a mixed methods training strategy. Strength Cond J. 1994;16(5):20-31.
19. Peterson MD, Rhea MR, Alvar BA. Applications of the dose-response for strength development: A review of metaanalytic efficacy and reliability for designing training prescription. J Strength Cond Res. 2005;19(4):950-958.
20. Reilly T. Football. In: Reilly, T. *Et al*. (Eds) Physiology of Sports, London: E. and F. N. Spoon, 1990.
21. Verkhoshansky YV. Quickness and velocity in sports movements. IAAF Quart: New Stud Athlet. 1996;11:29-37.
22. Voigt M, Bojsen-Moller F, Simonsen EB, Dyhre-Poulsen P. The influence of tendon Youngs modulus, dimensions and instantaneous moment arms on the efficiency of human movement. J Biomech. 1995;28(3):281-291.
23. Www.Totalsoccer.Us/Why-Strength-Training-Is-Important-For-Soccer Players/#:~:Text=Better%20balance.,Power%20is%20strength%20plus%20speed.
24. Young WB, James R, Montgomery I. Is muscle power related to running speed with changes of direction? J Sports Med Phys Fitness. 2002;42(3):282-288.