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Effect of strength training on soccer playing ability

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Abstract
Strength training was found to have a significant relationship with sport performance. Previous studies have demonstrated the positive effects of strength training on motor abilities and soccer performance in athletes. It is the intent of this small review to carefully examine how this specific type of strength training affects soccer performance.

Keywords: Strength training, soccer, kicking and sprinting

Introduction

Soccer is often regarded as an endurance sport due to its 90-minute games. However, strength is also essential for preventing injury and boosting performance. Soccer is a physically demanding sport in which a player's success is determined by his or her ability to win tackles, overcome opponents one-on-one, and positions him to control a ball in the air. It's a huge benefit to be stronger than your opponents. Strong legs are essential, but so are a strong core and upper body.

Strength training has a number of other advantages for soccer players, including: Sitting and dead lifting work the muscles that support joints including hips and knees, which helps lessen the chance of injury. Stability improves as a player's strength increases. All of these skills need explosive power, which is defined as strength plus speed. Changing direction on the field, saving a goal, and heading the ball all need strength and speed [7]. In general terms strength can be defined as the ability to overcome resistance or act against resistance. Overcoming resistance can be understood as isotonic strength where as acting against resistance can be understood as isometric strength. Role of strength training in soccer player performance can be understood as the following process in Fig No. 1.

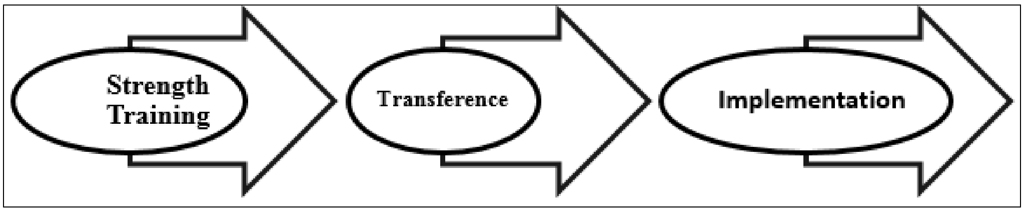

Fig 1: Strength training process

Strength Training

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

Transference

Exercises involving maximal or near-maximal muscular contractions are included in training (velocity-specific). Muscle-strengthening exercises will improve as muscle-strengthening improves. Exercises that concentrate on converting a considerable improvement in muscular strength into increased performance in particular fundamental motions (increased force in take-off, increased stride length, increased jumping ability, increased eccentric strength in braking etc.)

Implementation

Training that replicates (or comes close to replicating) the motions shown in the game. The training focuses on transferring the skills learned in transference training to game-relevant traits (Increase stride frequency, increased acceleration, increased running speed, deceleration-capacity, etc.)

Strength Training For Soccer Players

The importance of strength and strength training for football players has been thoroughly researched. De Proft and colleagues, for example, had one set of Belgian professionals do additional weight training throughout the season. The players increased their kicking power and leg strength when compared to a control group of colleagues who did not get any extra training. According to Reilly (1990), stronger players outlasted lesser players in terms of maintaining a regular position on the squad and had lower injury risks. He suggests that leg strength, particularly in the quadriceps and hamstrings, be developed to assist stabilise the knee joint, which is the most often injured joint in football [1]. Apor (1998), a Hungarian researcher who has worked on long-term studies of Hungarian professionals, agrees, stating that knee-extension torque has been associated to success in the game and that strong hamstring and quadriceps muscles are essential for knee injury prevention. From this brief review of the studies, we can conclude that strength and strength training, particularly in the legs and trunk, are vital for players who wish to increase kick performance and minimize the risk of injury [2].

Taiana *et al*. concluded that a 10-week leg-strengthening programme enhanced footballers' 10m and 30m sprint timings, as well as their vertical jump performance. This research, on the other hand, adopted a training regimen that aimed for maximal strength and strong resistance. Although this sort of training has been shown to improve sprint speed and leaping power, it is difficult to include into a football team's normal training schedule since the recovery time necessary after intense resistance training may interfere with regular season matches [3].

The value of excellent sprinting speed for footballers, like that of strength training, has been widely supported. Ekblom (1986) established that one of the factors that distinguished top players from those of lower calibre was the absolute maximum speed shown during play [4]. Kollath and Quade's (1993) research with German division one players backs this up. They discovered that professionals were much faster than amateurs across distances of 10 metres, 20 metres, and 30 metres. The difference in acceleration from 0 to 10m was notably noticeable. To play at a higher level, better players must have stronger acceleration and maximum speed. Surprisingly, the German pros' 30m speed remained consistent independent of position [5].

Bangsbo *et al*, (2006) conducted a study on 28 players from the Italien Serie A. selected players performed 36±2 sprint (>21 km/h) during a match. The average speed of the sprints were 23±0.1 km/h, with a peak average speed of 26 km/t ±0.2 km/h. but more interestingly the peak velocity reached in the sprints was 31.9±0.8 km/h. Comparison, in a test, Usain Bolt passes 30 m in ~39,5 km/h.Fast soccer-player passes 30 m in ~35,5 km/h. Avarage soccer-player passes 30 m in ~34,0 km/h. Therefore, the players will very seldom reach their maximal running velocity in match situations. Thus, Fast acceleration may be a more important issue than a high maximal running speed. As a result, players' training regimens must match this demand for quick acceleration and maximum speed. In giving fitness advice for footballers, Apor (1998) suggests that players should build the musculature of a sprinter [6].

Strength training, as developed by means of heavy resistance training, has been shown to improve initial acceleration and change-of-direction activities, H+ (hydrogen ion) regulation and buffering capacity, and repeated sprint ability; it subsequently delays the fatigue experienced in match play [8]. Dependent on the player's training age, the most effective strategies for enhancing strength are summarized by Peterson *et al*. The high and positive correlation that exists between maximum strength and peak power (r= 0.77– 0.94), further advocates heavy resistance training as a precursor for power development. Notably, strength training that involves high loads (.80% 1 repetition maximum [RM]) leads to greater increases in maximum muscle power compared with low resistance strength training. Factors that influence power include both intramuscular and intermuscular coordination, maximal strength, and the various structural and neural elements that comprise the stretch shortening cycle (SSC). Therefore, the multidimensional nature of power requires a multifaceted approach to training. These can broadly be categorized into 3 modes of training: ballistic resistance training, Olympic-style weightlifting, and plyometrics [9, 10, 11, 12, 13].

Ballistic Resistance Training

This training method is defined by the unloading (projecting or releasing) of an external resistance at the end of a concentric movement, such as a throw or jump. As a consequence, the load is accelerated for a longer period of time, allowing for greater velocities. Ballistic resistance training may be done in both concentric-only and eccentric-concentric forms. Exercises with a quick eccentric-concentric coupling, on the other hand, seem to be essential for increasing power. It has been suggested that each repeat should accomplish 90 percent of peak power output or velocity; however, Cronin and Sleivert found that training at a variety of loads, regardless of whether load represents peak power production, produces greater outcomes [14, 15, 13, 16].

Weightlifting

Concentric force development is emphasised in weightlifting (snatch and clean and jerk). They make it possible to handle relatively large masses in the vertical plane in an explosive way. As a result, compared to ballistic resistance training modes, power production is maximised at substantially higher relative external loads. Olympic-style weightlifting, in fact, has been shown to provide some of the greatest power outputs of any workout [17].

Plyometrics

Plyometric training improves an athlete's ability to change direction by increasing jump and hopping height, reducing ground contact time (GCT) at all running speeds, increasing rate of force generation, and increasing the rate of force development. Furthermore, Voigt *et al*. and Verkhoshansky found that effective sprinting (i.e., efficient use of the stretch-shortening mechanism) may recover up to 60% of total mechanical energy, resulting in increased running economy. Despite the fact that these findings were not confined to soccer, it is expected that the findings are immediately transferrable to a variety of soccer-specific sports motions. The reactive strength of a player may be improved by optimising SSC mechanics via proper plyometric activities. The following steps, according to Flanagan and Comyns, should be completed in order: Correct landing mechanics and eccentric loading (e.g., drop lands). Low-intensity rapid plyometrics that induce a brief GCT (e.g., ankling). Short GCT and optimal jump height are the emphasis of hurdle and depth jumps (e.g., drop jumps). Strength and power are clearly factors of effective soccer play and also contribute in injury prevention (discussed in a later section). Combining heavy resistance training with power exercises in the form of ballistic resistance training, weightlifting, and plyometrics is the greatest way to improve these traits. It is indicated that training at a variety of loads would maximise outcomes, which may be done anecdotally by executing a maximum of 5 sets of 3 repetitions with a minimum of 3-minute break between sets for power training. This form of training may be best structured in blocks (conventional periodization, as outlined in the following section), such as strength endurance in the off-season followed by strength and power in the preseason [18-25].

Conclusion

Based on the results of multiple prior research, it can be determined strength training have significant effect on soccer players kicking, jumping and sprinting ability. The results on the association between strength training and soccer performance will be beneficial because they will give a better knowledge of how vital it is to establish structural adaptations for performance improvement.

References

1. Reilly T. Football. In: Reilly, T. *et al*. (Eds) Physiology of Sports, London: E. And F. N. Spoon; c1990.
2. Apor P. Successful Formulae for Fitness Training. In: Reilly, T. *et al*. (Eds) Science and Football, London: E. And F. N. Spoon; c1998.
3. Mackenzie B. Strength Training for Football Players; c2005. [Www] Available From: Https://Www.Brianmac.Co.Uk/Football/Strength.Htm [Accessed 9/2/2022]
4. Ekblom B. Applied Physiology of Football. Sports Science. 1986;3:50-60.
5. 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; c1993.
6. Jens Bangsbo. Physical and Metabolic Demands of Training and Match-Play in The Elite Football Player Journal of Sports Sciences; p. 665-674
7. Www.Totalsoccer.Us/Why-Strength-Training-Is-Important-For-Soccer Players/#:~:Text=Better%20balance.,Power%20is%20strength%20plus%20speed.
8. 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;38:2004-2011.
9. 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;19:950-958.
10. Asci A, Acikada C. Power production among different sports with similar maximum strength. J Strength Cond Res. 2007;21:10-16.
11. 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;69:382-386.
12. Gamble P. Training for Sports Speed and Agility: An Evidence-based Approach. Oxon, United Kingdom: Routledge; c2012. p. 7-19.
13. Cronin JB, Sleivert G. Challenges in understanding the influence of maximal power training on improving athletic performance. Sports Med. 2005;35:215-234.
14. 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;17:148-155.
15. Newton R, Kraemer W. Developing explosive muscular power: Implications for a mixed method training strategy. Strength Cond J. 1994;16:20-31.
16. Newton R, Kraemer W. Developing explosive muscular power: Implications for a mixed method training strategy. Strength Cond J. 1994;16:20-31.
17. 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.
18. Arampatzis A, Schade F, Walsh M, Bruggemann GP. Influence of leg stiffness and its effect on myodynamic jumping performance. J Electromyogr Kinesiol. 2001;11:355-364.
19. 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). 1991;191:2127-2132.
20. Farley CT, Morgenroth DE. Leg stiffness primarily depends on ankle stiffness during human hopping. J Biomech. 1999;32:267-273.
21. Gabbett TJ, Kelly JN, Sheppard JM. Speed, change of direction speed, and reactive agility of rugby league players. J Strength Cond Res. 2008;22:174-181.
22. Komi PV. Training of muscle strength and power: Interaction of neuromotoric, hypertrophic, and mechanical factors. Int J Sports Med. 1986;7(1):10-15.
23. Young WB, James R, Montgomery I. Is muscle power related to running speed with changes of direction? J Sports Med Phys Fitness. 2002;42:282-288.
24. Verkhoshansky YV. Quickness and velocity in sports movements. IAAF Quart: New Stud Athlet. 1996;11:29-37.
25. Voigt M, Bojsen-Moller F, Simonsen EB, Dyhre-Poulsen P. The influence of tendon Young modulus, dimensions and instantaneous moment arms on the efficiency of human movement. J Biomech. 1995;28:281-291.