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Impact of plyometric sessions on agility for youth soccer players

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***Abstract*---**Soccer is the most popular game in the world. It combines several elements and abilities. Agility is one of the most important abilities to perform well. The study aimed to investigates impact of some plyometric sessions on developing agility for youth soccer players. Twenty-eight soccer youth players (age, 15 ± 0.2 years) were divided randomly into two groups an experimental group and a control group. Both groups were tested pre-test by Illinois agility test, and the experimental group has got their training for four weeks in the pre-competition period by two sessions per week, while the control group has kept their own training. The post-test was applied after four weeks and it showed significant results between pre and post-test for the Illinois agility test which showed 4% of improvement in the experimental group (p=0.11), The control group showed 1.5% of agility improvement (p=0.34). The results showed that 4 weeks of plyometric training in a pre-competition period does not highly improve agility for youth soccer players for the sport requires agility continuously by changing body positions each moment of play, Researchers recommend giving agility more sessions during the preparation period.

***Keywords*---**Plyometric, Agility, Soccer, Youth.

Introduction

Plyometric training is one of the modern training methods, which includes explosive exercises. It consist to two phases, first one is eccentric contraction of muscles by stretching vibers rapidly, then the second phase is concentric contraction by shortening vibers to produce high explosive power. A rapid stretch and shortening activity may lead to sensitivity of the muscle spindles and

desensitization of the golgi tendon organs during eccentric loading (Swanik KA, 2002).

Soccer is a game of variation; Elite players perform more than 1000 repetitive motor activities during a game, finding that highlights the need for a demanding soccer training (Nordsborg, Mohr, Pedersen, Nielsen, Langberg, & Bangsbo, 2003). soccer contains about 1350 activities by 220 high speed running which needs change of body position and direction (McMillan K, 2005). Players have to cover long distances as well as a high number of accelerations and deceleration, physical contacts, sprints, direction changes, throwing, catches, passes and kicks (Hoff, 2005). All these activities require muscles to contract concentrically and eccentrically so as to produce strength (Proske & Morgan, D. L, 2001).Without any doubt that Soccer is a physical game that demands high levels of strength, speed, balance, stability, flexibility, endurance, and agility (Bloomfield, Polman, O'donoghue, & McNaughton, 2007)

Agility is considered as a locomotor skill that enables the body to change its direction as quickly, fluently, easily and in a controlled manner while moving from one point to another (Cansu , Murat, Murat , Öznur , Fatih , & Atilla , 2020). Due to the characteristic feature of soccer sport, together with the flow of the game, the athlete needs the ability to move fast and change place-direction, that is, agility (Sonchan, Moungmee, & Sootmongkol, 2017). Agility is considered as an important parameter of soccer performance (Lloyd, Oliver, Radnor, Rhodes, Faigenbaum, & Myer, 2015). Agility is affected by many factors such as muscle strength and speed, It has been reported that agility increased on the evening more than morning (Emirzeoğlu M., 2021).

Training programs have an important and sensitive role in players preparation , especially young players, whereit is the possible way to Provide national preparations and playing plans, in addition to the technical capabilities and activities that work to raise their level to the fullest extent, this can only be done by the preparation of regulated and intact training plans. This was confirmed by Weineck, as he states, “The sports practice clearly showed that high results cannot be achieved unless there is a solid base building during childhood and adolescence, and this is what necessitates us to plan long-term organized in the field of training, the ability to Victory and achievement of results depends on obtaining the highest possible level of physical, skill, tactical and intellectual abilities which should be systematic planning in sports training (Weineck, 1997). This study aimed to reveal the effect of plyometric training on the agility of young soccer players, and to compare this effect with the results of the control group, and knowing the preference of the plyometric training program over the classic training program. The importance of this study lies in benefiting from its results in modifying the training image for youth, and following the appropriate scientific methods in building Training programs focused on developing physical fitness to the technical and planning side, in order to prepare well, comprehensive and balanced for youth according to the characteristics, growth requirements and physiological adaptations of the body organs for this age stage.

Considerations

Before beginning any form of plyometric training program, there are some factors that must be looked into to avoid complications to occur during the training. Such factors are age, body weight, strength prerequisite, sports requirements, experience, previous injury, jumping surface, warm-up, progressions, recovery and frequency (Jensen & Ebben, 2007).

Material and Methods

Twenty eight young soccer players (age, 15 ± 0.2 years) who play to Al Bat'ha football club which play in the second division in Iraqi league, The players were divided randomly into two groups as experimental group and control group. Both groups were tested pre-test by Illinois agility test by setting four cones in area of 10 meters length and 5 meters width, another four cones were set in the center with 3.3 meters apart of each, the subjects should do appropriate warm up before test, and they should finish the test as speed as possible without stopping until the finish cone, The timing starts with the timer whistle and stops when the subject crosses the finish cone, The results are collected for statistical processing.

The experimental group performed plyometric training for four weeks in pre-competition period by two sessions per week in addition to their sessions, while the control group performed their own training without plyometric sessions. The researchers used plyometric exercises to apply on sessions for four weeks for the experimental group as shown in (table 1), which shows:

Table 1. Plyometric exercises

week	Exercises	Sets x Reps
1	Long jump Lateral bench hops Single leg bounding Front cone hops Side to side ankle hops	5x5 3x8 5x5 each leg 5x5 3x10
2	Bench hop ups Hexagon drill Jump squats Side to side ankle hops Single leg bounding	4x5 3x10 3x8 3x10 6x5 each leg
3	Side lunge bench hop 180° Air squats Front cone hops Long jump Jumping lunge	3x10 5x5 5x5 5x5 5x5
4	Lunge with knee tuck Hexagon drill Burpee with jump Curtsy lunge hop Front cone jump	5x5 3x10 3x8 3x8 5x5

Statistics

The package of statistical Package for the Social Sciences (SPSS) version 22.0 was used to analysis data of paired sample t-test for each group, And comparing differences between the experimental and control groups in pre and post- tests were analyzed with independent t-test.

Results

The following table shows descriptive statistics of both groups whence Age, height and weight (table 2).

Table 2 Descriptive statistics

Anthropometrical	N	experimental		control		p
		M	SD	M	SD	
Age	28	15.4	0.2	15.3	0.4	0.31
Height		164	5.51	166	5.46	0.79
Weight		56.05	11.03	54.2	10.07	0.36

Table 2 shows that there is not significant differences between both groups on the variables of age, height and weight (p>05).

Table 3 Pre post-test of both groups in agility test

test	group	pre		post		p	Progression ratio
		M	SD	M	SD		
Illinois agility test	Control	23.02	±1.11	22.91	±1.54	0.009	0.48
	experimental	23.05	±1.17	21.44	±1.51		7.50

Table 3 shows that the mean for control group in pre-test was (23.02) and the Standard deviation was (±1.11), While the mean for post-test was (22.91) and the Standard deviation was (±1.54). The mean for experimental group in pre-test was (23.05) and the Standard deviation was (±1.17), while the mean for post-test was (21.44) and the Standard deviation was (±1.51). TheProbability value (p) for pre post-test was (0.009<0.05). Progression ratio for the control group was (0.48) and for the experimental group was (7.50).

Discussion & Conclusion

Movement of body and implements such as running directionally, running with changing direction,acceleration and long list of movements are occur as a result of reflexing recruitment of vibers of skeletal muscle, It can be classifies as eccentric, concentric or isometric, But the most movement occur with combination of these three types.

Plyometric training sessionsinclude deceleration of mass then acceleration of mass in opposite direction, It is similar to movement of power activities such as jumping, sprinting, soccer movements especially body changing direction which is important in soccer game.Agility is a critical component of success in soccer as

well as in many other sports, some definitions described it as a rapid and changing of body direction including acceleration and deceleration.

The study showed that plyometric training sessionsare effective and useful to develop agility for youth soccer players, the data showed superiority of experimental group who trained with plyometric sessions during pre-competitive period of season by two sessions per-week, while the control group trained without plyometric special sessions, but their approach included some plyometric exercises as their coaching stuff planed. The progressive of test results may came from neuromuscular compatibility and adaptation of those sessions and correlation of body movement pattern, also the attribution of these results to the fact that the advantages of plyometric training affected the effective in affecting the elasticity of muscles and joints, especially their flexibility, and that the exercises were done in some variations on performance in the full range of motion, Which positively affected the increase in flexibility and strength for the muscles, ligaments and joints.

Plyometric exercises are considered one of the types of exercises that contribute to improving some special physical abilities, the most important of which is muscular strength(Ela, 1997). This result is consistent with what Al-Khatib indicated that deep jump training increases the ability of the muscles of the legs to explosive performance, and the use of deep jump has an important impact on the development of agility, which is represented in the decrease in the time of change of direction in the air and on the ground and the importance of the link between the element of agility and what the body requires to change its direction inair(Al-Khatib & Abdel-Aziz, 1996).

Plyometric exercises aim to produce greatest force in the shortest possible time, it contributes to increasing the push upward as resulting from the speed of stretching muscles resulting from their training and adaptation to reduce the time of shortening and lengthening while pushing upward, Also, the training program by plyometric exercises improved the speed of muscle contraction and relaxation, and this indicates that plyometric exercises improve explosive power for the legmuscles. Also, plyometric exercises are an effective training method for developing strength characterized by speed and contribute effectively to improving achievement in activities that need speed like jumping and jogging. This means that plyometric exercises led to an improvement in reaction speed for the experimental sample.

References

Bloomfield, J., Polman, R., O'donoghue, P., & McNaughton, L. (2007). Effective speed and agility conditioning methodology for random intermittent dynamic type sports. *Journal of Strength and Conditioning Research, 4*, p. 1093.

Cansu , Ç., Murat, T., Murat , A., Öznur , A., Fatih , Ç., & Atilla , O. (2020). A Comparison of Reaction and Agility Tests of Female Soccer Players in Different Leagues. *International Journal of Sport Culture and Science, 4*, pp. 211-222.

Emirzeoğlu M., K. M. (2021). COMPARSION OF THE RUNNING PARAMETRS IN MORNING AND EVENING TRAINING OF ELITE SOCCER PLAYERS. *Turkish Journal of Physiotherapy and Rehabilitation, 3*, pp. 15-21.

Hoff, J. (2005, 23(6),). Training and testing physical capacities for elite soccer players. *Journal of sports sciences.*, pp. 573-582.

Jensen, R., & Ebben, W. (2007). Quantifying plyometric intensity via rate of force development, knee joint, and ground reaction forces. *The Journal of Strength & Conditioning Research, 3*, pp. 763-767.

Lloyd, R., Oliver, J., Radnor, J., Rhodes, B., Faigenbaum, A., & Myer, G. (2015). Relationships between functional movement screen scores, maturation and physical performance in young soccer players. *Journal of Sports Sciences, 1*, pp. 11-19.

McMillan K, H. J. (2005). Physiological adaptations to soccer specific endurance training in professional youth soccer players. *Br J Sports Med.*, pp. 39:273-277.

Miller, M., Herniman, J., Ricard, M., Cheatham, C., & Michael, T. (2006). The effects of a 6-week plyometric training program on agility. *Journal of Sports Science and Medicine, 3*, pp. 459-465.

Nordsborg, H., Mohr, M., Pedersen, L. D., Nielsen, J. J., Langberg, H., & Bangsbo, J. (2003). Muscle interstitial potassium kinetics during intense exhaustive exercise : effect of previous arm exercise. *American journal of Physiology-Regulatory, Integrative and comparative physiology., 285*, pp. 143-148.

Proske, U., & Morgan, D. L. (2001). Muscle damage from eccentric exercise:mechanism, mechanical signs, adaptation and clinical applications. *The Journal of Physiology.*, pp. 333-345.

Kurtieva, S. (2021). Adaptation capabilities of functional systems of the body of adolescents with vegetative dystonia syndrome. International Journal of Health & Medical Sciences, 4(1), 129-135. https://doi.org/10.31295/ijhms.v4n1.1622

Sonchan, W., Moungmee, P., & Sootmongkol, A. (2017). the effects of a circuit training program on muscle strength, agility, anaerobic performance and cardiovascular endurance. *International Journal of Medical, Health, Biomedical, Bioengineering and Pharmaceutical Engineering, 4*, pp. 170-173.

Suryasa, I. W., Rodríguez-Gámez, M., & Koldoris, T. (2021). Get vaccinated when it is your turn and follow the local guidelines. International Journal of Health Sciences, 5(3), x-xv. https://doi.org/10.53730/ijhs.v5n3.2938

Swanik KA, L. S. (2002). The effect of shoulder plyometric training on proprioception and selected muscle performance characteristics. *Journal of shoulder Elbow Surgery,, 6*, pp. 579-586.

Weineck, J. (1997). *Manuel d'entrainement* (Vol. 4 ed). Paris: Edition Vigot.