

Impact of Muscular Ability Development on the Collective Motor Performance for Soccer Juniors

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Abstract: This study is regarded a methodological attempt to identify the impact of weight training program to develop the muscular ability (MA) on the collective motor performance (CMP) for soccer juniors. Researcher has noticed the low and slow level in collective motor performance and their velocity to perform continue the performance in a good way particularly in matches that are approximately similar in level. So, researcher tended to use weight training program (WT) to develop the MA to identify their impact on the velocity of the CMP for soccer juniors. The experimental method was applied on a subject of 20 soccer juniors in Sharkia club in Egypt, their ages under 16 years old. One of the most important results of this research was an enhancement in MA level of leg push, chest push, vertical jump, abdomen muscle and medicine ball push by 32.14%, 29.83%, 37.50%, 28.73% and 43.99%, consequently in the post measurement than the pre one. Also, there is an enhancement of the (CMP) variables in the pre and post- measurements in Dobbell pass, open triangle, collective performance, overlap and playmaker by 27.73%, 58.96%, 64.74%, 38.85% and 26.97%, consequently for the post one.

Key words: Weight training • Muscular ability • The collective motor performance • Soccer juniors

INTRODUCTION

The physical preparation represents one of the important aspects of performance art in the soccer sport as it is based upon the ability of players to carry out the requirements and duties of performance, both defensive and offensive in training and competition requires upgrading the technical performance and development of training programs are codified according to the latest developments in the framework of the resulting legal changes and plans [1]. The different play modes for all what is happening in the sport of soccer. Strength training is a common component of sports and physical fitness programs for young people. Some adolescents and players may use strength training as a means to enhance muscle size and definition or to simply improve appearance. Strength training programs may include the use of free weights, weight machines, elastic tubing, or body weight. The amount and form of resistance used as well as the frequency of resistance exercises are determined by specific program goals [2]. Weight training

(WT) has an important role in most sports activities because of their significant influence in the development of muscular ability of the players [3]. WT has benefits including increasing the muscular strength of players and improvements in a player's muscular endurance, body composition and sports performance. Soccer involved various skills which to do different motor performances complex or whether individual or collective, which contribute to the implementation of tactics of offensive play, as is mastery important and necessary factor for the success of those tactics. The technical performance in soccer requires more cooperation in the work of muscles therefore coaches must work out a technique to train their players about the nature of muscular contraction diversity. The researcher was did this study as one of the methods or techniques to solve the problem of soccer players which is concentrated in the weakness of technical performance and the inability of players to perform different motor performance which require the ability to jump, run, face the resistances in the soccer field with shooting and developing muscular performance

level, this research is one of the attempts to find a technique through which we can improve muscular ability as one of the references to improve the players performance. This is done through development the muscular ability by using of WT [1]. The researcher finds that the collective motor performance (CMP) has an importance in the implementation of performance requirements and decide matches if it leads to quickly and accurately. Possession of the team players the ability to do motor performance speed and accuracy contribute to raising the level of performance which requires the need to focus on technical performance arising out of soccer and the problem is the low level of CMP in terms of speed and power, whether during training or competition, which affects the low rate of performance in games, in addition to the lack of muscle ability to carry out the requirements of the performance of that focus should be on the need for training on the development of motor performance group, which called for the researcher to try to conduct a scientific study of the use of WT to develop the muscular ability and its impact on the (CMP) for soccer juniors under 16 years. Strength training programs may be undertaken to improve sports performance, rehabilitate injuries, prevent injuries and/or enhance long-term health. Studies have shown that strength training, when properly structured with regard to frequency, mode (type of lifting), intensity and duration of program, can increase strength in preadolescents and adolescents [4, 5]. Gains in strength, muscle size, or power are lost after 6 weeks if resistance training is discontinued [6]. Maintenance exercises may offset these losses, but specific recommendations for maintaining strength gains have not been defined for preadolescents and adolescents. In preadolescents, proper resistance training can enhance strength without concomitant muscle hypertrophy. Such gains in strength can be attributed to neuromuscular "learning," in which training increases the number of motor neurons that will fire with each muscle contraction [7-9]. This mechanism helps explain strength gains from resistance training in populations with low androgen levels, including females and preadolescent males. Strength training can also augment the muscle enlargement that normally occurs with pubertal growth in males and females [8, 10-13]. Strength training can improve an adolescent athlete's performance in weight lifting and power lifting. Strength training is a common practice in sports like football in which size and strength are desirable. Despite theoretical benefits, scientific

studies have failed to consistently show that improved strength enhances running speed, jumping ability, or overall sports performance [8, 14]. Evidence that strength training programs help prevent Sports-related musculoskeletal injuries in preadolescents and adolescents is inconclusive [7]. Furthermore, there is no evidence that strength training will reduce the incidence of catastrophic sports-related injuries.

MATERIAL AND METHODS

The Subject: The subject was 20 male soccer juniors mean age (15.29±0.19 years), weight (65.8±1.14 kg), height (174.68±1.70 cm) and training experience (4.11±0.28 years), volunteered to participate. The subject were informed about the experimental procedures and signed informed consent statement and medical history. The subject consisted of 2 goalkeepers, 6 defenders, 6 midfield and 6 strikers. All players were members of El-Sharkia sports club in Egypt and participated in the best local league within their age group in the Egyptian national league. The physical characteristics of the subject are given in Table 1.

There are no significant differences in the following variables: age, height, weight and Training experience ($P < 0.05$) which indicates the harmony of sample's research as well as the possibility of conducting such an experiment in such a sample (Table 1). This study has been conducted of three steps: (1) doing the pre- measurement on Sunday 31/10/2010 by measuring height, weight, muscular ability tests and CMP tests. (2) Applying a training course from Sunday 7-11-2010 to Thursday 9/1/2011, using WT in this training course. (3) Third step: post- measurements on Tuesday 11/8/2010 are performed on all variables we already performed in pre-measurements. The content of the training course being used:

- Duration of training course is Ten week an consists of two period:

Table 1: The physical characteristics of the subject

Variable	Mean	SD	Median	Kurtosis	Skewness
Age(y)	15.29	0.19	15.30	0.32	0.40
Height(cm)	174.67	1.70	174.5	0.30	0.21
Weight(Kg)	65.8	1.14	66.00	0.93	0.25
Training experience(y)	4.11	0.28	4.15	0.35	1.04

Mean ±SD standard deviation

Basic period continued 4 weeks aimed to increase the muscle trophy

- Exercises number is 10.
- Training intensity: 65%to 80%.
- Training load 3 groups and repetition from 8-10.
- Rest 3 minutes.

Specific period continued 6 weeks aimed to develop the muscle ability of legs and arms.

- Exercises number is 4.
- Training intensity: 85% to 100%.
- Training load 3 groups and repetition from 3-6.
- Rest 2 minutes.
- Weekly training units are four.
- Warming-up before the beginning of every training unit.
- Slowdown at the end of every training unit.
- Warming-up in all training units:
- Doing 10 laps around the playground.
- Running with rotating arms forward around the playground.
- Jump with rotation arms backward around the playground.
- Jump aside the face towards around the playground.
- Jump aside the face outside around the playground.
- Running with high lifting of the knees around the playground.
- Running with the touch of rump with heels around the playground.
- Forward jump around the playground.
- Forward jump without bending knees around the playground.
- Running with pushing legs forward.
- Stretching for whole body muscles

These results made clear that there are significant differences between the first and the second application of the test ($P < 0.05$), which stresses stability of tests. This indicates the reliability of the tests (Table 2).

These results indicate that there are significant differences between the two distinctive (Sharkia club under 18 years old) and non-distinctive groups ($P < 0.05$). This indicates the validity of tests under study of tests. This indicates the reliability of tests under study (Table 3).

Table 2: The Reliability of the tests

Variable	Pre- measurements	Post-measurements
Leg Push	48.80±2.10 kg	50.5±3.10 kg
Chest push	34.50±3.68 kg	35.5±3.69 kg
Vertical jump	27.60±2.07 Cm	27.80±2.25 Cm
Abdomen muscle	28.10±1.37 No	28.80±1.75 No
Medicine ball push	2.85±0.11 M	2.90±0.09 M
Dobell pass	2.01±0.08 Sek	1.99±0.09 Sek
Open Triangle	2.06±0.09 Sek	2.04±0.11 Sek
Collective Performance	1.95±0.08 Sek	1.93±0.09 Sek
Overlap	1.55±0.12 Sek	1.53±0.13 Sek
Playmaker	1.89±0.03 Sek	1.88±0.05 Sek

*n=10

Table 3: The Validity of the tests

Variable	Pre- measurements	Post-measurements
Leg Push	48.80±2.10 kg	70.00±2.36 kg
Chest push	34.50±3.68 kg	45.00±2.36 kg
Vertical jump	27.60±2.07 Cm	41.00±1.83 Cm
Abdomen muscle	28.10±1.37 No	38.10±2.28 No
Medicine ball push	2.85±0.11 M	4.99±0.31 M
Dobell pass	2.01±0.08 Sek	1.67±0.12 Sek
Open Triangle	2.06±0.09 Sek	1.02±0.05 Sek
Collective Performance	1.95±0.08 Sek	1.39±0.22 Sek
Overlap	1.55±0.12 Sek	0.94±0.11 Sek
Playmaker	1.89±0.03 Sek	1.44±0.11 Sek

*n=10

Statistical Analysis: Data analysis was performed using SPSS version 13.0. Where the researcher analyzed the results using the mean, Standard deviation, median, kurtosis, skewness, Person correlation, t.test and change ratio.

RESULTS AND DISCUSSION

The results indicate that there are significant differences between pre and post- measurements in muscular ability testes in favor of post- measurement as there was an improvement in all variables of the post-measurement than in pre- one. Results have also showed there are an enhancement between pre and post - measurements in the all variables range between 28.73% and 43.99% (Table 4).

Results show that there are significant differences between pre - and post measurements in leg push, chest push, vertical jump, abdomen muscle and medicine ball push for the post one (Table 4). The results show also there are an enhancement and changes between the pre- and post measurements in leg push, chest push, vertical jump, abdomen muscle and medicine ball push

Table 4: The pre and post measurements for muscular ability

Variable	Pre- measurements	Post-measurements	%Change
Leg Push	48.90±2.61 kg	72.25±4.44 kg	32.14%
Chest push	31.75±4.67 kg	45.25±2.55 kg	29.83%
Vertical jump	27.50±2.09 Cm	44.00±2.58 Cm	37.50%
Abdomen muscle	28.40±1.64 No	39.85±2.66 No	28.73%
Medicine ball push	2.89±0.18 M	5.16±0.34 M	43.99%

*n=20

Table 5: The pre and post- measurements for collective performance motor (CMP)

Variable	Pre- measurements	Post-measurements	%Change
Dobell pass	1.19±0.03 Sek	0.86±0.03 Sek	27.73%
Open Triangle	2.12±0.10 Sek	0.87±0.03 Sek	58.96%
Collective Performance	1.90±0.53 Sek	0.67±0.03 Sek	64.74%
Overlap	1.57±0.02 Sek	0.96±0.04 Sek	38.85%
Playmaker	0.89±0.03 Sek	0.65±0.02 Sek	26.97%

*n=20

(32.14%, 29.83%, 37.50%, 28.73%, 43.99%, consequently) for the post one. The researcher refer that to influence of the WT exercises which led to an enhancement of muscular work among back and abdominal muscles in motor control of limbs Which matches what was mentioned in previous studies that trunk area is the control area in motor performance especially if this performance depends on the strength of limbs through keeping the balance in improving forward and backward trunk muscles [15, 16]. This refers that WT exercises led to improving the nervous system ability in increasing the harmony of muscular work between upper and lower limbs muscles. And this matches with what mentioned that soccer player mostly needs during motor performance in matches, to considerable harmony between body's parts during performance. And this correlated with muscle tone or muscles tension which suits the nature of target performance. Also, reflexes help achieving the required balance between stimulation and refraining processes within working muscles set inside motor performance and that is called motor harmony [17].

The Results made clear that there are significant differences between pre and post- measurements in CMP testes in favor of post- measurement as there was an enhancement in all variables of the post- measurement than in pre- one. Results have also showed that there are an enhancement between pre - and post measurements in the all variables range between 26.97%and 64.74% (Table 5). Results show that there are significant differences between pre - and post measurements in CMP

variables (Dobell pass, open triangle, collective performance, overlap and playmaker for the post one) (Table 5). The results show also there are an enhancement and changes between the pre and post- measurements in Dobell pass, open triangle, collective performance, overlap and playmaker (27.73%, 58.96%, 64.74%, 38.85% and 26.97%, consequently) for the post- one. The researcher refers that WT exercises led to an enhancement of muscular work among back and abdominal muscles in motor control of limbs. These results match with results of previous researchers that the use of weight exercises led to decrease in weight, that there is an enhancement valued (27.73%) as the pass is regarded the most important basic skills in soccer which may determine final result in soccer matches, they also express the extent of enhancement in players abilities related to increase of speed of skills performance after they perfect them. This also refers to the fact that WT exercises led to improving nervous system ability in increasing harmony of muscles work between muscles of lower and upper limbs. These matches with other studies which assure that technical performance will not be perfect without improving work of muscles in storing and releasing energy matching to orders and neural signs coming from central nervous system. It also led to improving ability to resist change in form under effect of external forces related to amount, direction and timing through work of both stimulants and inhibitors. Consequently, these produce appropriate amount of muscular power. This improvement shows extent of improving players their abilities to function their muscular ability during motor performance [18]. The use of WT led to strength of abdominal and middle muscles, flexibility of trunk muscles and raising level of biological capacity efficiency, The use of WT exercises led to strength of abdominal and middle muscles, flexibility of trunk muscles and raising level of biological capacity efficiency [19].

CONCLUSION

- Regular use of WT exercises leads to enhancement in muscular ability variables leg push, Chest push, Vertical jump, Abdomen muscle and Medicine ball push (32.14%, 29.83%, 37.50%, 28.73% and 43.99%,consequently).
- Regular use of WT exercises leads to enhancement in (CMP) variables Dobell pass, open triangle, collective performance, overlap and playmaker (27.73%, 58.96%, 64.74%, 38.85% and 26.97%, consequently).

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