

Effects of Motor Fluency Exercises on Improving Some Coordinative and Sensory-Motor Perceptions and Performance Level of Some Basic Skills in Soccer Blossoms

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Abstract:

The current research aims to the effects of motor fluency exercises on improving some coordinative and sensory-motor perceptions and the performance level of basic skills in soccer blossoms. The researcher used the experimental approach (one-group design) with pre-, intermediate and post-measurements. Research community included all soccer blossoms (2010 teams) registered in the Egyptian Federation of Football (Gharbia Zone) during 2021-2022 season. This includes teams of (9) sports clubs. The researcher purposefully chose (28) players representing (2010) team of Tanta Sports Club during 2021-2022 season. After exclusion of (6) players, the final number of participants was (22). Another (10) players from Ghazl Al-Mahalla Sports Club (from the same research community and outside the main sample) were recruited as a pilot sample. Results indicated that the application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all basic skills tests. Statistically significant differences appeared between pre- and post-measurements on all basic skills tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on all basic skills tests. There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, only on sole passing to small goals (passing) and running around arched flags (maneuvering) but no other basic skills tests. The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all sensory-motor perception tests. Statistically significant differences appeared between pre- and post-measurements on all sensory-motor perception tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on all sensory-motor perception tests. There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, on all sensory-motor perception tests. The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all coordinative perception tests. Statistically significant differences appeared between pre- and post-measurements on all coordinative perception tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on all

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coordinative perception tests except for ball running on 50 cm x 10m line (motor balance) and running, passing and maneuvering (linking). There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, on passing to the box test (positioning) and sole running with ball (20 sec) (tempo) while other tests were not significant. The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all physical abilities' tests. Statistically significant differences appeared between pre- and post-measurements on all physical abilities' tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on passing to the bench (10sec) (speed), passing to the wall (60 sec) (endurance) and trunk flexion (flexibility). There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, on all physical abilities' tests except 30m run (speed)

Key Words: Motor Fluency – Coordinative Perceptions – Sensory-Motor Perceptions – Soccer

Introduction:

Good planning is a basic pillar for improving achievement in general. This is obvious in the advanced physical, technical and tactical levels in soccer. Therefore, planning is significant for training process to achieve elite world levels as this is no longer left for mere chance or random events. Players and coaches should have an aim to achieve through an organized process based on principles of modern sports training (**Abo Abda, H. 2008**).

Winning and achieving good results depend on achieving high levels of physical, technical, tactical and psychological abilities. Therefore, it is necessary to have science-based well-organized planning in modern sports training (**Jurganweineck 2006**).

Motor abilities are basic pillars for technical performance as they represent a co-factor with other complex factors in achieving elite

athletic levels according to the player's physical abilities. Beginners have motor abilities that enable them to score higher than their peers in general physical abilities. Motor abilities are closely related to physical and technical fitness (**Abd El-Maksoud E. 1994**).

Motor fluency is a creative ability that can be improved in athletes in general, and especially in blossoms and juniors. It appears in organizing their thoughts and adaptation to training. Physical and motor fitness is a prominent aim for motor fluency. This is the most important thing that the beginner needs during the stage of skills learning as success in performing the motor activity is related to satisfaction and enjoyment as motives for improving motor activity (**Abd El-Kader, M. 2012**).

Motor fluency is the ability to produce the largest possible number of motor responses in a single situation

during the available timeframe. It is a valuable characteristic in sports as it refers to the ability to generate ideas to fulfill the requirements of competitive situations. Motor fluency with the ball represents good coordination of fine motor skills with feet as the player can manage his/her whole-body movements (**Ahmed, B. 1999**).

Motor fluency forms the main aim of motor improvement and seeks to fulfill that aim, regardless the in-field or athletic tasks. It is a good framework for gaining motor enrichment in junior athletes through increasing their sum of motor skills and patterns through good use. In addition, it improves creative and exploratory activity with all its behavioral benefits (**Al-Khouly, A. 1998**).

The first things a junior player learns are motor and muscular responses through motor behavior, player interaction and perception of the whole training field as distance, time and space perceptions. Sensory-motor perception is one of the most important mental processes. It is very important for performing motor skills accurately with neuromuscular coordination to perform the movement fluently. It is important for motor performance as it enables the control and correction of movement during performance considering form, direction and time (**Rateb, O. 2000; Mansour, M. 2001**).

Research Problem and Significance:

In soccer, technical performance combines all movements and skills performed with a specific purpose inside the limits of game rules. It is the essence of achievement during matches

as basic skills are the basic pillars for achievement in soccer matches. It requires long periods of training to be mastered as tactical execution is based on mastering such skills (**Al-Qarran, A. 2012**).

The (9-12 years) age group is essential for soccer blossoms and beginners as it is the beginning for learning creative abilities in addition to its effects on growth and improvement of physical, mental, psychological and other potentials. It is the best stage to learn different motor skills. At this stage, the beginner is full of vitality, energy, persistence and power and this provides him/her with a good chance for motor learning with motor fluency according to his/her abilities.

It is also a stage where effects of the surrounding factors are clear and beginners acquire different types of knowledge, concepts, ideas and principles of athletic behavior. This makes that stage vital for motor learning that deeply affects the player on the long run.

Motor fluency programs are best for fulfilling general aims of education with its comprehensive concept. It also fits for this age group as it is the best style to improve the individual experience through using multiple movements to solve motor problems that require positive participation. It is meant to stimulate beginners' motives and their creative energy so that they can move easily and confidently (**Farid, M. 2001**).

Nevertheless, review of literature indicated that training programs for soccer blossoms and beginners are void of any mechanisms

for improving the accuracy of motor responses and its effects on the cognitive comprehension during the improvement of basic skills. Motor fluency is part of the educational program that contributes in improving the accuracy motor responses and its effects in a way that ensures thinking, feeling and emotional sharing (Shestakov, M. et al 2007).

According to the researcher's experience as a head coach for (2010) soccer team in Tanta Sports Club and his convection of the importance of creative abilities that improve blossoms' abilities, the researcher thinks it is important to train them on moto fluency using games and coordinative exercises that are competitive, challenging, and amusing in addition to be competitive enough to increase motivation and self-confidence.

Due to the nature of soccer matches with all related physical, technical and tactical performances that are decisive in game results, it is important for players to have various forms of technical performances according to the match requirements to succeed in the required attack tasks, especially with the bigger space of courts, as motor fluency is a basic ability for motor creativity.

This led the researcher to try to identify the effects of a recommended motor fluency program on improving some coordinative and sensory-motor perceptions and technical skills of soccer blossoms.

Aim:

The current research aims to the effects of motor fluency exercises on

improving some coordinative and sensory-motor perceptions and the performance level of basic skills in soccer blossoms.

Hypotheses:

1. The recommended motor fluency program has positive effects on some physical abilities of soccer blossoms.
2. The recommended motor fluency program has positive effects on some coordinative perceptions of soccer blossoms.
3. The recommended motor fluency program has positive effects on some sensory-motor perceptions of soccer blossoms.
4. The recommended motor fluency program has positive effects on the performance level of some basic skills of soccer blossoms.

Methods:

Approach: The researcher used the experimental approach (one-group design) with pre-, intermediate and post-measurements.

Participants:

Research community included all soccer blossoms (2010 teams) registered in the Egyptian Federation of Football (Gharbia Zone) during 2021-2022 season. This includes teams of (9) sports clubs. The researcher purposefully chose (28) players representing (2010) team of Tanta Sports Club during 2021-2022 season. After exclusion of (6) players, the final number of participants was (22). Another (10) players from Ghazl Al-Mahalla Sports Club (from the same research community and outside the main sample) were recruited as a pilot sample.

Data Collection Tools:

To identify the suitable tests for collecting data, the researcher followed the following:

Physical Abilities: Speed, Quickness, Agility, Muscular Power, Performance Endurance and Flexibility were identified as the most suitable physical abilities for soccer blossoms according to review of related literature (Abd El-Maksoud, E. 1994; Al-Basaty, A. 1998; Ahmed, B. 1999; Abo Abda, H. 2008; Al-Amery, D. 2020; Ismail, T. et al 1989; Abo Al-Magd, A. & Al-Namky, G. 1997; Al-Wakkad, 2003; Hammad, M. 2001; Mahmoud, M. & Ibrahim, M. 2015; Pride, A. 2004).

Experts' opinions (with agreement percentage of 75%) indicated that the following tests are best for measuring physical abilities:

- 30 m running (speed)
- Passing on a bench for 10 sec (quickness)
- Zigzag running (Parrow) (agility)
- Wide jump (muscular power)
- Passing to the wall for 60 sec (performance endurance)
- Forward and downward trunk flexion (flexibility)

Coordinative Perceptions: Positioning, Motor Tempo, Motor Balance, Direction and Motor Linking were identified as the most suitable coordinative perceptions for soccer blossoms according to review of related literature (Megraly, A. 2020; Mahmoud, M. & Ibrahim, M. 2015; Othman, M 2001; Rasheed, H. 2017;

Al-Gohary, Y. 2009; Shestakov, M. et al 2007; Vladimir, L. et al 2001).

Experts' opinions (with agreement percentage of 80%) indicated that the following tests are best for measuring coordinative perceptions:

- Passing to the box (positioning)
- Sole running with the ball for 20 sec (tempo)
- Running with the ball on 50cm x 10m line (motor balance)
- Passing accuracy on various distances (direction)
- Running, passing and maneuvering test (linking)

Sensory-Motor Perceptions: Forward Passing Distance, Ball Performance Duration, Accuracy of Angular Direction with Foot and Leg Muscular Strength were identified as the most suitable sensory-motor perceptions for soccer blossoms according to review of related literature (Al-Aragy, A. 2014; Abo Al-Magd, A. & Al-Namky, G. 1997; Abd El-Shakour, M. 2009; Othman, M 2001; Rasheed, H. 2017; Abd Al-Hussain, W. 2013; Shestakov, M. et al 2007; Shick, J. et al 2004).

Experts' opinions (with agreement percentage of 80%) indicated that the following tests are best for measuring sensory-motor perceptions:

- Forward pass distance perception test (distance perception)
- Ball performance time perception (time perception)
- Perception of accuracy for angular direction of ankle (accuracy of angular direction)

- Perception of leg muscle strength (strength perception)

Basic Skills: Passing, Heading, Maneuvering and Shooting were identified as the most suitable basic skills for soccer blossoms according to review of related literature (Shalan, I. 1994; Megrally, A. 2020; Al-Amery, D. 2020; Abo Al-Magd, A. & Al-Namky, G. 1997; Mahmoud, M. & Ibrahim, M. 2015; Hassan, H. 2011; Shestakov, M. et al 2007; Shick, J. et al 2004).

Experts' opinions (with agreement percentage of 80%) indicated that the following tests are best for measuring basic skills:

- Ball passing with sole into small goals (passing)
- Ball heading from jumping (heading)
- Ball running around arched flags (maneuvering)
- Shooting accuracy from stance (shooting).

Reliability and Validity of Tests:

The researcher verified reliability of tests using test/retest procedure with three-days' time interval as all tests were applied to the pilot sample (n=10) on 19-7-2021 then on 22-7-2021. The researcher calculated Pearson's correlation coefficient between test and retest that proved all tests reliable.

To verify validity of tests, the researcher calculated distinct validity using (t) test and compared high/low degrees of the pilot sample (n=10) on 22-7-2021. (t) test results indicated the validity of tests.

The Recommended Training Program:

Aim:

The program aimed to improve some coordinative and sensory-motor perceptions in addition to some basic skills for soccer blossoms (born in 2010).

Program Characteristics:

- **Number of load cycles:** (2)
- **Duration of each cycle:** (4) continuous weeks.
- **Application timeframe:** 2021-2022 season
- **Duration of application:** (8) weeks
- **Total number of units:** (24)
- **Number of weekly training units:** (3)
- **Training days:** Saturday – Monday – Wednesday.
- **Duration of each unit:** (65) to (75) minutes.
- **Age group:** blossoms born in 2010
- **Application period:** 31-7-2021 to 22-9-2021
- **Place of application:** soccer courts of Tanta Sports Club.

Training Unit Components:

1. **Warmup:** Physical and technical exercises in the form of small games. The researcher designed (4) models for warmup to be applied along the two load cycles (5 minutes).
2. **Main part:** This part is divided into three parts:
 - **Physical preparation:** Competitive Physical and technical exercises with the ball to improve the physical aspect of participants (15-20 minutes)

- **Technical preparation:** Technical exercises with different numbers in small spaces to improve coordinative and sensory-motor perceptions (15-20 minutes)
 - **Tactical preparation:** Small games for improving time-place perception in the impty spaces and its relation to passing, maneuvering and shooting (15-20 minutes).
3. **Cooldown:** Light exercises with ball for recovery (5 minutes)

Main Study:

The researcher applied the recommended training program to the experimental group (n=22) for (8) weeks (2 load cycles with 4 weeks each) with (3) units per week and each unit lasted (65: 75 minutes) from 31-7-2021 to 22-9-2021.

Pre-measurements:

Pre-measurements for all variables (physical abilities– coordinative perception– sensory-

Results:

motor perception – basic skills) were taken on 28-7-2021.

Intermediate measurements:

Intermediate measurements for all variables (physical abilities – coordinative perception – sensory-motor perception – basic skills) were taken on 25-8-2021, at the end of the first load cycle, following the same protocol used for pre-measurements.

Post-measurements:

Post-measurements for all variables (physical abilities– coordinative perception– sensory-motor perception – basic skills) were taken on 22-9-2021, at the end of the second load cycle, following the same protocol used for pre-measurements.

Statistical Treatment:

The researcher used SPSS software to calculate the following: mean – SD – skewness – percentage – (t) test – improvement rate – Pearson's correlation coefficient.

Table (1)
Improvement Rates Among the Three Measurements of Participants on Physical Abilities Tests (n=22)

Tests	Pre-	Intermediate	Post-	Improvement rate		
				1x2	2x3	1x3
30 m running	5.87	5.41	5.22	7.83%	3.51%	11.07%
Passing on a bench (10 sec)	6.65	9.29	11.30	39.69%	21.63%	69.92%
Zigzag running (Parrow)	27.05	25.34	24.60	6.32%	2.92%	9.05%
Wide jump	144.11	148.23	153.60	2.85%	3.62%	6.58%
Passing to the wall (60 sec)	51.85	55.71	59.45	7.44%	6.71%	14.65%
Trunk flexion	1.87	3.56	6.06	90.37%	70.22%	224.06%

Table (1) showed improvement rates among the three measurements (pre-, intermediate and post-) on the

physical abilities tests. The same table also indicated statistically significant

differences among the three measurements as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (90.37%) was in favor of flexibility (trunk flexion) while the lowest improvement rate (2.85%) was in favor of muscular power (wide jump).
- Comparing pre- to post-measurements, the highest improvement rate (224.06%) was in favor of flexibility (trunk flexion)

while the lowest improvement rate (6.58%) was in favor of muscular power (wide jump).

- Comparing intermediate to post-measurement, the highest improvement rate (7022%) was in favor of flexibility (trunk flexion) while the lowest improvement rate (2.92%) was in favor of agility (zigzag run or Parrow test).

Table (2)
Improvement Rates Among the Three Measurements of Participants on Coordinative Perception Tests (n=22)

Tests	Pre-	Intermediate	Post-	Improvement rate		
				1x2	2x3	1x3
Passing to the box	39.45	31.72	23.75	19.59%	25.12%	39.79%
Sole running with the ball (20 sec)	39.10	42.10	48.15	7.67%	14.37%	23.14%
Running with the ball on 50cm x 10m line	5.03	4.87	4.72	3.18%	3.08%	6.16%
Passing accuracy on various distances	6.65	7.92	10.90	19.09%	37.62%	63.90%
Running, passing and maneuvering test	15.78	15.33	15.15	2.85%	1.17%	3.99%

Table (2) showed improvement rates among the three measurements (pre-, intermediate and post-) on the coordinative perception tests. The same table also indicated statistically significant differences among the three measurements as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (19.59%) was in favor of positioning (passing to the box) while the lowest improvement

rate (2.85%) was in favor of motor linking (Running, passing and maneuvering test).

- Comparing pre- to post-measurements, the highest improvement rate (63.90%) was in favor of balance (Passing accuracy on various distances) while the lowest improvement rate (3.99%) was in favor of motor linking (Running, passing and maneuvering test).

- Comparing intermediate- to post-measurements, the highest improvement rate (37.62%) was in favor of balance (Passing accuracy on various distances) while the lowest improvement rate (1.17%) was in favor of motor linking (Running, passing and maneuvering test).

Table (3)
Improvement Rates Among the Three Measurements of Participants on Sensory-Motor Perception Tests (n=22)

Tests	Pre-	Intermediate	Post-	Improvement rate		
				1x2	2x3	1x3
Forward pass distance perception test	82.68	79.36	51.25	4.02%	35.34%	38.01%
Ball performance time perception	17.54	15.11	13.02	13.85%	13.83%	25.77%
Perception of accuracy for angular direction of ankle	4.26	5.37	7.00	26.1%	30.35%	64.32%
Perception of leg muscle strength	89.97	80.63	78.48	10.38%	2.66%	12.77%

Table (3) showed improvement rates among the three measurements (pre-, intermediate and post-) on the sensory-motor perception tests. The same table also indicated statistically significant differences among the three measurements as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (26.10%) was in favor of accuracy of angular direction (Perception of accuracy for angular direction of ankle) while the lowest improvement rate (4.02%) was in favor of distance perception (Forward pass distance perception test).

- Comparing pre- to post-measurements, the highest improvement rate (64.32%) was in favor of accuracy of angular direction (Perception of accuracy for angular direction of ankle) while the lowest improvement rate (12.77%) was in favor of strength perception (Perception of leg muscle strength).

- Comparing intermediate to post-measurements, the highest improvement rate (35.34%) was in favor of distance perception (Forward pass distance perception test) while the lowest improvement rate (2.66%) was in favor of strength perception (Perception of leg muscle strength).

Table (4)
Improvement Rates Among the Three Measurements of Participants on Basic Skills Tests (n=22)

Tests	Pre-	Intermediate	Post-	Improvement rate		
				1x2	2x3	1x3
Ball passing with sole into small goals	29.44	28.62	26.92	2.79%	5.94%	8.56%
Ball heading from jumping	4.93	5.73	6.9	16.23%	20.42%	39.96%
Ball running around arched flags	42.53	40.76	37.26	4.16%	5.59%	12.39%
Shooting accuracy from stance	5.48	6.28	7.58	14.60%	10.70%	38.32%

Table (4) showed improvement rates among the three measurements (pre-, intermediate and post-) on the basic skills tests. The same table also indicated statistically significant differences among the three measurements as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (16.23%) was in favor of heading (Ball heading from jumping) while the lowest improvement rate (2.79%) was in favor of passing (Ball passing with sole into small goals).
- Comparing pre- to post-measurements, the highest improvement rate (39.96%) was in favor of heading (Ball heading from jumping) while the lowest improvement rate (8.56%) was in favor of passing (Ball passing with sole into small goals).
- Comparing intermediate to post-measurements, the highest improvement rate (20.70%) was in favor of shooting (Shooting accuracy from stance) while the lowest

improvement rate (5.59%) was in favor of maneuvering (Ball running around arched flags).

Discussion:

According to table (1), there are statistically significant improvement rates among the three measurements (pre-, intermediate and post-) on all physical abilities' tests in favor of post-measurements. The researcher thinks that these improvements are due to the use of motor fluency exercises that improved physical abilities required for correct technical performance. It is also clear that motor fluency exercises can improve physical abilities like muscular power, speed and flexibility in addition to energizing young players and motivating them to continue the training process ideally and effectively.

The researcher thinks that these significant improvements are due to the specific characteristics of repetitive training as intensity ranged between (80-90%) and might reach 100% of max 1RM. In addition, it concentrated mainly on improving speed, max strength and speed strength (muscular

power) and, in some cases, specific endurance (speed and strength endurance). Most coaches find repetitive training as the best method for junior training as it is done in a close manner to competition with relatively long rest intervals among few repetitions to achieve the high intensity (El-Nady, E. 2013).

This is consistent with previous studies that indicated that motor fluency plays a major role in improving physical abilities specific to the sports activity (Magrally, A. 2020; Rasheed, H. 2017; Al-Diwan, L. 2011).

This proves the first hypothesis stating that **“The recommended motor fluency program has positive effects on improving the physical abilities of soccer blossoms”**.

According to table (2), there are statistically significant improvement rates among the three measurements (pre-, intermediate and post-) on all coordinative perceptions tests in favor of post-measurements.

The researcher thinks these significant improvements are due to the positive effects of the recommended motor fluency program on coordinative perceptions (positioning – tempo – motor balance – direction – linking). The exercises used in the program were selected according to the needs of this age group and helped improving the player’s abilities in passing to a teammate (positioning), passing, receiving and shooting (direction), the goalkeeper’s ability to prevent a sudden shot (reaction) and linking. In addition, it puts the young player under competitive pressure.

This is consistent with previous studies that indicated that various forms of exercises improve coordinative and physical abilities in addition to basic skills of blossoms as when the technical performance level is improved, the tactical level improves as well. Exercises can improve coordinative abilities through improving passing to teammate (positioning), passing, receiving and shooting (direction), preventing sudden shots (reaction), performing quick sequences of complex skills (linking) and engaging with high ball then descending for passing or shooting (motor balance) (Bussmann et al, 2002; Jones & Dorest 2007; Small 2006; Kelley & Dorest 2008; Kattes & Kellas 2009).

This is also consistent with previous studies that indicated the statistically significant differences among pre- and post-measurements of coordinative abilities, asserting the positive effects of motor fluency exercises in these differences (Magrally, A. 2020; Rasheed, H. 2017; Abu Kuraish, H. 2017; Yahia, O. 2014; Al-Diwan, L. 2011).

This proves the second hypothesis stating that **“The recommended motor fluency program has positive effects on improving the coordinative perceptions of soccer blossoms”**.

According to table (3), there are statistically significant improvement rates among the three measurements (pre-, intermediate and post-) on all sensory-motor perceptions tests in favor of post-measurements.

The researcher thinks that this is due to the content of the recommended motor fluency program that used passing, shooting and maneuvering exercises that starts at the defense line till the attack zone. These exercises have a proper power and are suitable to send the ball to the meant teammate. In addition, there are exercises that start at the midfield towards the attack zone with proper power and great deal of accuracy so as to ensure not losing the ball. Furthermore, there are exercises for passing inside the attack zone that are highly sensitive with great deal of passing accuracy to send the ball directly to the feet of the teammate under observation of defenders inside this zone where there is a lack of free movement and wrong passes are not an option. These exercises are very similar to actual match situations and this justifies its positive effects.

This is consistent with a previous study that asserted the importance of considering power and accuracy during training on passing to any place in the field, especially inside the the third part of the field (attack zone) as it is related to speed to escape defenders and not to give them chance to cut the pass as passing objectives vary according to the place and the team condition during passing (Mansour, A. 2000).

This is also consistent with previous studies indicating that success of training process for juniors depend on knowing fine details of motor performance as training has positive effects on improving the functions of the sensory-motor system (direction and movement in space) as this system

grows with training (Al-Beek, A. 1992; Abd Al-Khalek, H. et al 1986).

In addition, some previous studies asserted the positive effects of motor fluency exercises on improving sensory-motor perception and therefore, the technical performance level (Shik, J. et al 2004; Mostafa, A. 2004).

This proves the third hypothesis stating that **“The recommended motor fluency program has positive effects on improving the sensory-motor perceptions of soccer blossoms”**.

According to table (4), there are statistically significant improvement rates among the three measurements (pre-, intermediate and post-) on all basic skills tests in favor of post-measurements.

The researcher thinks this is due to the positive effects of the recommended motor fluency program on improving the basic skills (passing – heading – maneuvering – shooting) that led blossoms to master these skills. The exercises used in the program came according to nature of coordinative and sensory-motor perceptions as these exercises broke the ice of traditional exercises and increased the experiences of young blossoms leading them to positively involve in training even more deeply. This increased their interest and motivation towards practicing basic skills even more confidently.

Motor fluency programs are very effective in increasing self-confidence and the ability of correct decision making in different play situations, especially for early or idle

age groups. Acquiring the skills help improving response time, learning from errors and improving creativity and good behavior among junior players (Salah, W. 2013).

Using motor fluency and intellectual flexibility in improving technical performance depend on creating game-like situations and exercising them frequently to solve any motor problems that may face the players during real game situations. Training on different skills comes only through motor fluency in play situations. This method depends on mastering basic skills as having better physical and technical abilities help players to make good decisions and improve their abilities to deal correctly with different game situations and variables (Mansour, M. 2001; Metwally, E. 2011).

This is consistent with previous studies indicating that training units that used motor fluency exercises and competitive skills exercises can improve performance speed and accuracy. This asserts the importance of these exercises that challenge players' abilities in mastering the required technical performance quickly, effectively and accurately (Al-Kilany, M. 2021; Yahia, O. 2014; Al-Diwan, L. 2011; Abd El-Sattar, M. 2012; Mahfouz, 2009; Abo Al-Kheir, H. 2013).

This is also consistent with a previous study that indicated that organizing training programs maintains the sequence of units to fulfill specific planned objectives so that the highest possible level of performance becomes at hand as training should be science

n=based according to specific objectives of each age group (Abo al-Magd, A. & Al-Namky, G. 1997)

This proves the fourth hypothesis stating that **“The recommended motor fluency program has positive effects on improving some basic skills of soccer blossoms”**.

Conclusions:

According to this research aim, hypotheses, methods and results, the researcher concluded the following:

- The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all physical abilities' tests. Statistically significant differences appeared between pre- and post-measurements on all physical abilities' tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on passing to the bench (10sec) (speed), passing to the wall (60 sec) (endurance) and trunk flexion (flexibility). There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, on all physical abilities' tests except 30m run (speed).

- Improvement rates among the three measurements came as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (90.37%) was in favor of flexibility (trunk flexion) while the lowest improvement rate

(2.85%) was in favor of muscular power (wide jump).

- Comparing pre- to post-measurements, the highest improvement rate (224.06%) was in favor of flexibility (trunk flexion) while the lowest improvement rate (6.58%) was in favor of muscular power (wide jump).

- Comparing intermediate to post-measurement, the highest improvement rate (7022%) was in favor of flexibility (trunk flexion) while the lowest improvement rate (2.92%) was in favor of agility (zigzag run or Parrow test).

• The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all coordinative perception tests. Statistically significant differences appeared between pre- and post-measurements on all coordinative perception tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on all coordinative perception tests except for ball running on 50 cm x 10m line (motor balance) and running, passing and maneuvering (linking). There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, on passing to the box test (positioning) and sole running with ball (20 sec) (tempo) while other tests were not significant.

• Improvement rates among the three measurements came as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (19.59%) was in favor of positioning (passing to the box) while the lowest improvement rate (2.85%) was in favor of motor linking (Running, passing and maneuvering test).

- Comparing pre- to post-measurements, the highest improvement rate (63.90%) was in favor of balance (Passing accuracy on various distances) while the lowest improvement rate (3.99%) was in favor of motor linking (Running, passing and maneuvering test).

- Comparing intermediate- to post-measurements, the highest improvement rate (37.62%) was in favor of balance (Passing accuracy on various distances) while the lowest improvement rate (1.17%) was in favor of motor linking (Running, passing and maneuvering test).

• The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all sensory-motor perception tests. Statistically significant differences appeared between pre- and post-measurements on all sensory-motor perception tests in favor of post-measurements. There were statistically significant differences between intermediate and post-measurements, in favor of post-measurements on all sensory-motor perception tests. There were statistically significant differences between pre- and intermediate measurements, in favor of

intermediate measurements, on all sensory-motor perception tests.

- Improvement rates among the three measurements came as follows:

- Comparing pre- to intermediate measurements, the highest improvement rate (26.10%) was in favor of accuracy of angular direction (Perception of accuracy for angular direction of ankle) while the lowest improvement rate (4.02%) was in favor of distance perception (Forward pass distance perception test).

- Comparing pre- to post-measurements, the highest improvement rate (64.32%) was in favor of accuracy of angular direction (Perception of accuracy for angular direction of ankle) while the lowest improvement rate (12.77%) was in favor of strength perception (Perception of leg muscle strength).

- Comparing intermediate to post-measurements, the highest improvement rate (35.34%) was in favor of distance perception (Forward pass distance perception test) while the lowest improvement rate (2.66%) was in favor of strength perception (Perception of leg muscle strength).

- The application of the recommended motor fluency program led to statistically significant differences among the three measurements (pre-, intermediate and post-) on all basic skills tests. Statistically significant differences appeared between pre- and post-measurements on all basic skills tests in favor of post-measurements. There were statistically significant differences between intermediate and

post-measurements, in favor of post-measurements on all basic skills tests. There were statistically significant differences between pre- and intermediate measurements, in favor of intermediate measurements, only on sole passing to small goals (passing) and running around arched flags (maneuvering) but not other basic skills tests.

- Improvement rates among the three measurements came as follows:

- in favor of heading (Ball heading from jumping) while the lowest improvement rate (2.79%) was in favor of passing (Ball passing with sole into small goals).

- Comparing pre- to post-measurements, the highest improvement rate (39.96%) was in favor of heading (Ball heading from jumping) while the lowest improvement rate (8.56%) was in favor of passing (Ball passing with sole into small goals).

- Comparing intermediate to post-measurements, the highest improvement rate (20.70%) was in favor of shooting (Shooting accuracy from stance) while the lowest improvement rate (5.59%) was in favor of maneuvering (Ball running around arched flags).

Recommendations:

According to these conclusions, the researcher recommended the following:

- The recommended motor fluency program should be applied to soccer blossoms due to its positive effects on improving physical abilities, basic skills and coordinative and

sensory-motor perceptions under investigation.

- Periodic tests for motor fluency should be applied to identify the levels of motor abilities, basic skills and coordinative and sensory-motor perceptions under investigation.
- The recommended motor fluency program should be applied to identify its effects on improving creative thinking and skills of soccer.
- Motor fluency exercises should be used in training programs introduced to coaches in the Egyptian Federation of Football.
- Coaches and trainers who work with soccer blossoms should be notified with the conclusions of this research to help them plan their training programs that improve basic skills.
- More research works on motor fluency in other age groups are needed so that technical and motor concepts can be improved in addition to coordinative and sensory-motor perceptions.

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