

Article

The effect of Special Endurance Training Combined with Some Recovery Methods in Improving the Maximum Speed and Some Functional Indicators of Football Players

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Abstract: The study aims to find out the effect of special endurance training associated with some recovery methods on improving the maximum speed and some functional indicators, the researchers chose the sample by random method, the players of the youth team of the Baghdad Municipality Football Club and their number (18) players, and the researchers excluded the old ages of the team and their number (3) players as well as the young and new players in the team and their number (3), so that the final number of research sample members (12) players only and ages (17-18) years, representing (66%) of the original population. The results of this study showed that there were significant results between the pre-test and post-test for the maximum speed time in running a distance of (30) meters from the starting position of the bird, as well as in the maximum running distance for (5) seconds, as well as for the test of functional indicators in heart rate and respiratory rate frequency, and in favor of the post-test. The results also showed a positive effect of speed and strength training and massage on the maximum speed and some functional indicators of the sample, and there was a significant improvement in the post-tests of the tests of maximum speed, that speed and strength training led to an improvement in the time of maximum speed for a distance of (30) meters. It was recommended that special endurance training including speed and strength exercises has a positive effect on the maximum speed of the research sample, and that special endurance training should be used for strength and speed exercises on football players due to its effect on the development of maximum speed, the necessity of using recovery methods after training units and physical effort due to its positive effect on the speed of muscle recovery, and conducting similar studies on different samples with the use of other recovery methods for different training programmers, and conducting similar studies on different samples with multiple other recovery methods.

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1. Introduction

The game of football is the most famous game in the world from the beauty of performance and pleasure in watching, and modern football has taken a great reliance on speed through rapid play in attack and defense and surprise the opposing team, and thus the coaches have focused on developing the speed of their players and urging them to perform the tasks and plans assigned to them at full speed, as well as the introduction of some means that accelerate the possibility of recovery of players after the training unit load and Developing some functional indicators, so that the players are fully prepared to perform training or matches in an optimal manner, as winning the match has become almost impossible unless it is accompanied by maximum speed and rapid movement to move to

the opponent's goal to try to score a goal and return as quickly as possible to defend the goal in case the ball is cut off, all of which requires players to have high speed and rapid recovery to be able to perform the tasks assigned to them at full speed.

Maximum velocity is largely dependent on inherited characteristics, through parental genetics [9: 5-46]. But regardless of this, maximum velocity can be developed and increased by building advanced training curricula suitable for the players' abilities and potential.

The vocabulary of the training curriculum should include different types of special exercises and training methods with loads that have strong stimuli, as well as the use of some recovery methods that help to improve top speed and some functional indicators.

The importance of the research lies in the application of these methods, which include speed and strength exercises, as well as some recovery methods, such as massage, to improve maximum speed and some functional indicators in players.

Research Problem

Maximum speed is of great importance in most races and various sports events, without the development of maximum speed, many athletes will remain far from achieving all their ambitions in which they compete, and football is one of these events that require maximum speed, and in order for the player to be able to run at maximum speed, he must have some functional indicators that qualify him to do this effort, such as heart economy and lung efficiency, as the player struggles hard to reach the maximum speed that enables him to move to the goal of the other team to wash the goals and win the game. The player struggles hard to reach the maximum speed that enables him to move to the other team's goal to score goals and win the match, and quickly return to defend his goal when the opposing team launches a counterattack or counterattack to prevent his team from scoring a goal.

Hence the research issue came through following and watching the Iraqi teams and teams and found that there is a clear lack of maximum speed in the players through the slow passing of balls as well as in the transition from defense to attack and vice versa, and the researchers used special endurance training through some speed and strength exercises, and some recovery methods represented by massage, to solve their research issue and develop the maximum speed and some functional indicators.

Research Objectives

1. Identifying the level of maximum speed for the research sample.
2. Identify the level of some functional indicators.
3. Identify the effect of special endurance training and some recovery methods in improving the maximum speed and some functional indicators of the research sample.

Research Hypotheses

1. The existence of a positive effect of special endurance training and some recovery methods in improving the maximum speed of the research sample.
2. There is a positive effect of special endurance training and some recovery methods to improve some functional indicators of the research sample.

Fields of Research

- Human Subjects: Players of the Baghdad Amanah Sports Club's youth football team.

- Temporal domain: From (8/1/2023) to (20/3/2023).
- Spatial Domain: The hall and stadium of the Baghdad Municipality Football Club.

2. Materials and Methods

Research Methodology

The empirical approach was used as it suits the nature of the research problem.

Research Population and Sample

The research sample was selected by random sampling, a group of 18 youth football players from the Baghdad Amanah Football Club, and the researchers excluded the older ages of the team (3) players as well as the young and new players in the team (3), so that the final number of research sample members (12) players only with ages (17 - 18) years old, which represents 66% of the original population, and in order to homogenize the sample, the researchers extracted the values of the weight and height variables as in the table below, while in terms of the age variable, the sample is homogeneous in this variable.

Table 1. The homogeneity values of the research sample

Torsion coefficient	Standard Deviation	The arithmetic mean	Measurement Unit	Variable
1.893	4.1259	177.5480	Cm	Length
0.427	5.1486	67.4700	Kg	Weight

Methods, devices and tools used in the research

1. Time Clock
2. Tape measure
3. Whistle
4. Characters
5. Medical scale
6. OMEGA electronic stopwatch
7. Japanese massager
8. HP Laptop
9. Testing Arena
10. Support staff
11. Sources and references

Tests used in the research

Testing the time of maximum speed in running (30) meters: [5: 92-93]

The research sample was tested by running a distance of (30) from the flying start by running a distance of (50) meters divided into (20) meters for acceleration and (30) meters for maximum speed, each tester performed the test for the mentioned distance for two times and the measurement of the best achievement was taken.

Measuring the maximum running distance for a time of (6) seconds: [5: 90-91]

This test measured the distance of running for 6 seconds from the flying position for the research sample, and the maximum intensity of running (100%) was determined

through this test, so the intensity used in the training programme is determined in light of this.

Pulse rate test:

- Measurement unit: Stroke/minute.
- An electronic device (Healing) was used to measure the heart rate in minutes.
- The athlete sits down and the measuring device is attached to his left arm and then the device is switched on to read the pulse rate per minute.

Breathing Frequency Test:

- Unit of measurement: Minute.
- Immediately after completing the effort, the athlete sits down, places a hand on the chest area and measures the number of times the chest rises above the inhalation in one minute.

Exploratory experiment:

The exploratory experiment was conducted on 5/1/2023 for the purpose of confirming the validity of the equipment and tests used in the research, and to know the obstacles and conditions that may face the researchers and the supporting team and avoid them when conducting the main experiment.

Pre-testing the research sample:

The pre-tests were conducted on 8 January 2023 and the researchers endeavored to control all variables such as place, time and weather conditions, as well as the team and testing method.

Training Curriculum:

The researcher prepared a training curriculum for special endurance training through the use of some strength and speed exercises for a period of eight weeks in the form of three training units per week so that two training units for speed training and between them a training unit for strength development, that is, Sunday and Thursday of each week was dedicated to speed training and Tuesday for strength training, as 24 training units were applied, the researchers took into account the age and physical abilities of the research sample and using references and sources of sports training science in addition to the researchers' experience, the training units for speed training began in the first and second weeks at 70- 75% of the maximum speed and gradually increased in intensity to reach 100% of the maximum speed in the last two weeks, while the strength training modules started with light weights and few repetitions, and the researchers focused on training the lower limbs because of their importance for football players, and included Dabney exercises, front and back legs, as well as the seated and standing golf exercise. The weights were gradually increased in small proportions with increasing repetitions during the last weeks of the training programme, as well as focusing after the training units on the use of recovery methods such as pampering at the end of the exercises to help recovery and get rid of the residues of metabolic processes in the muscle and return to normal as soon as possible, as shown in appendix (1,2).

Post-tests of the research sample:

After the completion of the main experiment, the post-tests were conducted on 12/3/2023 under the same conditions as the pre-tests.

Statistical Methods:

1. Arithmetic mean.
2. Standard Deviation.
3. T-test for symmetric samples.

3. Results

Presentation and analysis of results:

Table 2. The arithmetic means and standard deviations between the pre and post tests and the comparison between them with a t-test

Statistical significance	T value	T value	The test	The test	Landmarks	Tests
	Tabular	calculated	Dimensional	Tribal	Statistical	
Moral	2.20	6.21	3.30	3.82	The arithmetic mean	Maximum Speed Tim In a 30m run
			0.06	0.09	Standard Deviation	
Moral	2.20	6.87	40.75	40.50	The arithmetic mean	Maximum running di tance For a time of 6 seconds
			6.87	0.83	Standard Deviation	
Moral	2.20	13.277	132.7	155.4	The arithmetic mean	Pulse rate after exerci
			1.455	4.442	Standard Deviation	
Moral	2.20	12.114	32.8	40.8	The arithmetic mean	Respiratory rate after exertion
			2.854	1.260	Standard Deviation	

From what is shown in (Table 2) we can see the following results:

- Maximum speed time to run a distance of 30 meters from the flying position:

The arithmetic mean of the pre-test was (3.82) seconds with standard deviation (0.09), and the arithmetic mean of the post-test was (3.30) seconds with standard deviation (0.06). By extracting the calculated (T) value of (6.21), it was found that it is greater than the tabulated (T) value (2.20) under degree of freedom (11) and error probability (0.05), which indicates a significant difference.

- Maximum running distance of 6 seconds:

The arithmetic mean of the pre-test was (40.50) meters, with a standard deviation of (40.75), and the arithmetic mean of the post-test was (40.75) meters, with a standard deviation of (6.87). The calculated t-value of (6.87) was found to be greater than the tabulated t-value of (2.20) under degree of freedom (11) and probability of error (0.05) which indicates that there is a significant difference.

- Pulse rate after exertion:

The arithmetic mean of the pre-test was (155.4) pulse/min with standard deviation (4.442), and the arithmetic mean of the post-test was (132.7) pulse/min with standard deviation (1.455). By extracting the calculated (T) value of (13.277), it was found that it is

greater than the tabulated (T) value (2.20) under degree of freedom (11) and error probability (0.05), which indicates a significant difference.

- Respiratory rate after exertion:

The arithmetic mean of the pre-test was (40.8) number/min, with a standard deviation (1.260), and the arithmetic mean of the post-test was (32.8) number/min, with a standard deviation (2.854). By extracting the calculated T value of (12.114), it was found to be greater than the tabulated T value (2.20) under degree of freedom (11) and error probability (0.05), which indicates the existence of a significant difference.

4. Discussion

Table 2 shows that there were significant differences in the pre and post tests for the test of maximum speed time in running a distance of (30)m from the flying position, as well as the maximum running distance for a time of (6) seconds, and the researchers attribute the reason for this to the special loading of speed and strength exercises in the prepared training curriculum has a significant and positive role in the development of maximum speed in the players.

Strength training using light weights and gradual progression develops the capacity for speed, and strength is the main influence on motor output, which is related to the amount of speed produced [7: 214], as when an athlete runs at his maximum speed, he uses the highest possible power and motor frequency [7: 214].

Speed training also develops maximum speed by increasing the speed of each load, so the athlete starts with low speed loads until he reaches high speed [8: 331].

Table 2 for the variables of pulse rate and respiratory rate after exertion shows that there are significant and statistically significant differences between the pre and post tests and in favor of the post tests, and the researchers attribute the reason for this to the use of a recovery method (massage) that helps in the process of relaxing the muscles after training and physical exertion and eliminating metabolic residues in the muscles.

The process of recovery of physical and physiological efficiency after the performance of training loads and physical effort is one of the factors related to the curriculum during the training process in high-level sports.

Therefore, the relationship between training and recovery units is essential as it affects the player's ability to perform, as recovery processes lead the player to regain his vitality and increase his ability to perform his job as motor coordination improves and morphological reorganization occurs when the load on the player increases [9: 65].

5. Conclusion

1. There is an improvement in the results of the post-tests of the maximal speed tests.
2. Speed and strength training improved the maximum sprint time of 30 meters and the maximum sprint distance of 6 seconds.
3. Special load training including speed and strength training has a positive effect on the maximum speed of the research sample.
4. The use of massage for recovery leads to positive functional changes in the variables of pulse rate and respiratory frequency.

5. Recommendations

1. The necessity of applying special endurance training for strength and speed exercises on football players because of its effect on the development of maximum speed.

2. The necessity of using recovery methods after training units and physical exertion as they have a positive effect on the speed of muscular recovery.
3. Conducting similar studies on different samples with the use of other recovery methods to see the impact on future training methods.

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Appendices

Appendix 1. The curriculum that was used by the research sample for speed training

Rest period between repetitions	Intensity	(Number of Repeats (Size	Number of weeks Training
min(2)	%70	Warm-up (jog + flexibility + (acceleration	Week
min (2)		Sprint (30) meters (4) x times Rest between sets (5) minutes Sprint (30) meters x (4) times Cool down (5) minutes	First
min(2)	%75	Warm-up (same as the (previous two weeks	Week
min (2)		Sprint (40) meters (4) x times Rest between sets (5) minutes Sprint (40 meters) x (4) times (Cool down (5) minutes	Second
min(2)	%80	Warm-up (same as the (previous two weeks	Week
min(2)		Sprint (30) meters (4) x times Rest between sets (5) minutes	Third
min (2)		Sprint (30) meters x (4) times (Rest between sets (5) minutes Sprint (30 meters) x (4) times Cool down (5) minutes	
min (2)	%85	Warm-up (same as the (previous two weeks	
min(2)		Sprint (40) meters (4) x times Rest between sets (5) minutes	Week
min (2)		Sprint (40) meters x (4) times (Rest between sets (5) minutes Sprint (40 meters) x (4) times Cool down (5) minutes	Fourth

min (2)		Warm-up (same as the	Week five
min (2)		(previous two weeks	
min (2)	%90	Sprint (40) meters (4) x times	
min (2)		Rest between sets (5) minutes	
min (2)		Sprint (40) meters x (4) times	Week six
min (2)		(Rest between sets (5) minutes	
min (2)	%95	Sprint (40 meters) x (4) times	
min (2)		(Rest between sets (5) minutes	
min (2)		Sprint (40) meters x (4) cool	Week seventh
min (2)		downs (5) minutes	
min (2)		Warm-up (same as the previous	
min (2)		(two weeks	
min (2)		Sprint (40) meters (4) x times	Week eighth
min (2)		Rest between sets (5) minutes	
min (2)	%100	Sprint (40) meters x (4) times	
min (2)		(Rest between sets (5) minutes	
min (2)		Sprint (40) meters x (4) cool	Week ninth
min (2)		downs (5) minutes	
min (2)		Warm-up (same as the previous	
min (2)		(two weeks	
min (2)		Sprint (50) meters (4) x times	Week tenth
min (2)		Rest between sets (5) minutes	
min (2)	%100	Sprint (50) meters x (4) times	
min (2)		(Rest between sets (5) minutes	
min (2)		Sprint (50) meters x (4) times	Week eleventh
min (2)		(Rest between sets (5) minutes	

Sprint (50) meters x (4) cool
downs (5) minutes

Appendix 2. The curriculum that was used for the strength training research sample

Rest period between repetitions	Intensity (weight)	Number of Repeats (Size)	Number of weeks Training
min (2)	kg (10)	Warm up (jogging + flexibility (exercises (Dumbbell Workout (6x4 (Front Tri Legs (6 x 4 (Rear Leg Tri (6 x 4 (Standing Golf (6 x 4	Week First and second
min (2)	kg (10)		
min (2)	kg (10)		
min (2)	kg (10)		
min (2)	kg (15)	Warm up (jogging + flexibility (exercises (Dumbbell Workout (8x4 (Front Tri Legs (8 x 4 (Rear Leg Tri (8 x 4 (Standing Golf (8 x 4	Week Third and fourth
min (2)	kg (15)		
min (2)	kg (15)		
min (2)	kg (15)		
min (2)	kg (20)	Warm up (jogging + flexibility (exercises (Dumbbell Workout (10 x 4 (Front Tri Legs (10 x 4 (Rear Leg Treadmill (10 x 4 (Standing Golf (x 10 4	الاسبوع الخامس والسادس
min (2)	kg (20)		
min (2)	kg (20)		
min (2)	kg (20)		

min (2)	kg (25)	Warm up (jogging + flexibility	
min (2)	kg (25)	(exercises	
min (2)	kg (25)	(Dumbbell Workout (x 12 4	الاسبوع
min (2)	kg (25)	(Front Tri Legs (x 12 4	السابع والثامن
min (2)	kg (25)	(Rear Leg Treadmill (x 12 4	
min (2)	kg (25)	(Standing Golf (x 12 4	
