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The effect of compound exercises on some physical abilities of Samawa football club youth players

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Abstract

The first chapter included the introduction, the importance of the research, its problem, objectives, hypotheses, and fields. The importance of the research lies in preparing complex exercises to develop the speed and agility Ping-Pong qualities of the youth of the Samawa Football Club. The problem of the research was that there was a clear decline in some physical and skill variables. As for the research hypotheses, there were statistically significant differences between the pre- and post-tests in some physical abilities for the control and experimental groups, in favor of the experimental group for the Samawah Football Club youth players. The research community was determined by the youth players of the Samawa Football Club for the year (2023/2024), who numbered (20), and later the exercises were carried out according to the proposed training method for a period of (10) weeks, with three training units per week and in the repetitive training method. The researcher used the experimental program. A special form was prepared that included the tests for the research and it was presented to a group of experts who agreed that the tests were appropriate to achieve the research goal. After the program was fully implemented, the test results were collected, statistically processed, presented and discussed in a scientific manner in order to achieve the research goal.

From this, the researcher concluded a set of conclusions, including:-

Compound exercises showed clear development in agility and speed

The researcher recommended a set of recommendations, including:-

It is necessary to use the proposed exercises to develop the attributes of speed and agility in table tennis, as it has a positive effect on the players.

Keywords: Compound exercises, physical abilities, players, training method

1. Introduction

1.1 Research Definition

Positive changes in functional and physiological variables as a result of scientifically based physical activity are considered among the most important factors in maintaining the health of both the individual and the sports team. Sports training imposes external loads that trigger internal adaptations, which in turn contribute to improving the body's physiological and biochemical status. Football, like other sports, has witnessed continuous development in players' performance levels and match outcomes, which introduces additional training demands that must be addressed when designing training programs. The significance of this study lies in designing and implementing compound exercises to develop speed endurance and agility among young players of Al-Samawah Football Club.

1.2 Research Problem

Football has gained unprecedented attention compared to other sports, both officially and popularly. As a result of this interest, specialists have made significant efforts to advance the game. Technical skill is no longer the decisive factor, as it was more than half a century ago. Instead, physical fitness, encompassing motor and physiological variables as well as anthropometric measurements, plays a crucial role in the development of the game.

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Observations have revealed a noticeable decline in certain physical and technical attributes, along with reduced playing speed and effectiveness in achieving victories. This highlights the need for a specialized program incorporating compound exercises to enhance selected physical, functional, and fundamental technical abilities in football.

1.3 Research Hypotheses

- There are statistically significant differences between pre- and post-tests in speed endurance and agility for both the experimental and control groups, in favor of the experimental group of Al-Samawah Football Club youth players.
- There are significant differences between the experimental and control groups in the post-tests of speed endurance and agility, in favor of the experimental group.

1.4 Research Objectives

- To identify the impact of compound exercises on the variables of speed endurance and agility among youth players of Al-Samawah Football Club.
- To determine the differences between the experimental and control groups in speed endurance and agility.

1.5 Research Scope

- **Human Scope:** Youth players of Al-Samawah Football Club.
- **Temporal Scope:** The period from December 15, 2024, to April 1, 2025.
- **Spatial Scope:** Al-Samawah Olympic Stadium.

2. Research Methodology and Field Procedures

2.1 Research Method: According to the definition by Dhoukan Obeidat *et al.* (1988, p.105), “the research objectives, the procedures applied by the researcher, and the specification of the sample that represents the study population” determine the choice of methodology. Accordingly, the researcher employed the experimental method, given its suitability for addressing the problem, using the design of equivalent groups (control and experimental) with pre- and post-tests.

2.2 Research Population and Sample: The research population consisted of 23 youth players from Al-Samawah Football Club who participated in the First Division League for the 2023-2024 season. The research sample included 20 players, representing 87% of the total population. The sample was divided into two groups experimental and control using the random lottery method, with 10 players in each group.

Table 1: Illustrates the total research population, the selected sample, and the players excluded from the study

Variables	Number	Percentage
Research Sample	20	87%
Excluded Players	3	13%
Research Population	23	100%

Table 2: Normal distribution of the control group

T	Variables	Mean	Standard Deviation (SD)	Skewness	Variance	P-Value
1	Speed Endurance	32.701	1.104	-0.973	3.377	Homogeneous
2	Agility	2.988	0.202	0.308	6.746	Homogeneous

Table 3: Normal distribution-experimental group

T	Variables	Mean	Standard Deviation (SD)	Skewness	Variance	P-Value
1	Speed Endurance	33.549	1.483	-0.948	4.420	Homogeneous
2	Agility	2.646	0.439	0.335	16.601	Homogeneous

Table 4: Shows the homogeneity and equivalence of the research sample individuals

T	Variables	Control Group (Mean ± SD)	Experimental Group (Mean ± SD)	Levene	Significance Level	T-Value	Calculated Significance Level
1	Speed Endurance	32.701±1.104	33.549±1.483	0.174	0.682	1.57	0.13
2	Agility	2.988±0.202	2.646±0.439	1.845	0.191	0.18	0.85

2.3 Tools, Means and Devices used in the research

2.3.1 Means Data Collection

The researcher relied on the following research tools:

- Scientific references and sources.
- The Internet.

2.3.2 Devices Used

- Handheld electronic stopwatch.
- Laptop computer (HP, Chinese-made).
- Standard football field.
- 20 balls.
- 20 plastic markers.
- Benches and boxes of varying heights.

2.3.3 Tools Used

- Tests and measurements.
- Personal interviews.

2.4 Field Research Procedures

2.4.1 Exploratory Experiment

To control the study variables, identify work obstacles, and verify the curriculum items, the researcher conducted an exploratory experiment before the main research experiment. The experiment is a mini version of the main experiment, and it should meet the conditions and circumstances of the main experiment as much as possible to allow the use of its results (Qais Naji & Bastawisi Ahmed, 1987, p.95) ^[9].

2.4.2 Description of speed endurance and agility tests

2.4.2.1 Test Name: Shuttle Run Test 25 m x 8, High Start (Abdul-Hamid & Hassanein, 1980, pp. 287-288) ^[1].

- **Purpose:** Measure speed endurance.
- **Test Tools:** Measuring tape, electronic stopwatch, flat surface (25 m), and whistle.
- **Test Procedure:** Two parallel points, 25 m apart, are marked. The player stands at one point using a high start. At the start signal, the player runs at maximum speed to touch the second point with his foot, then returns at the same speed to the first point. This is repeated 8 times, covering a total distance of 25 m x 8=200 m.
- **Conditions:** The recorded time starts at the beginning and ends when the player touches the starting point at the end of the eighth stage. The player must touch the marked point with the foot each time.
- **Recording:** The time to complete 25 m x 8 is recorded for each player.

2.4.2.2 Test Name: Zigzag Run Test

- **Purpose:** Measure agility.
- **Objective:** Assess the individual's ability to change the direction of body movement.
- **Tools:** Six cones, stopwatch.
- **Performance Specifications:** The participant stands behind the starting line. At the start signal, they follow the designated course, completing two laps. The second lap ends when they cross the starting line.

Guidelines

- Follow the designated path strictly. If an error occurs, the test is stopped and repeated after adequate rest. Do not touch the cones while running.
- Record the time taken to complete both laps.

2.4.3 Pre-tests

The researcher conducted pre-tests on the research sample (20 players). All test-related variables such as place, time, tools, execution method, and assisting staff were standardized to ensure conditions were as close as possible to those of the post-test.

2.4.4 Post-tests

After completing the specialized training, the researcher conducted the post-tests on the same sample (20 players). The conditions, tools, and timing were kept identical to those used in the pre-tests.

2.4.5 Statistical Tools

The researcher using SPSS v 27.1 statistical software to extract the results.

3.1 Presentation, analysis, and discussion of some physical abilities

3.1.1 Presentation, analysis, and discussion of some physical abilities for the control group

Table 5: Differences between post-tests and pre-tests in some physical abilities for the control group

T	Variable	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	ab (a, b)	T-Value	Calculated T-Value	P-Value
1	Speed Endurance	32.701±1.104	34.338±1.157	1.637, 1.782	3.047	3.047	0.012
2	Agility	2.988±0.202	2.494±0.525	0.495, 0.378	4.338	4.338	0.01

The table above shows that there are differences between the pre- and post-tests in favor of the post-test results because the sig value for the t-test is significant.

3.1.2 Presentation, analysis, and discussion of some physical abilities for the experimental group

Table 6: Differences between post-tests and pre-tests in some physical abilities for the experimental group

T	Variable	Pre-test (Mean ± SD)	Post-test (Mean ± SD)	ab (a, b)	t-value	Calculated T-Value	P-Value
1	Speed Endurance	33.549±1.483	32.649±1.487	0.900, 0.318	9.387	9.387	0.000
2	Agility	2.646±0.439	2.072±0.038	0.574, 0.424	4.491	4.491	0.001

The table above shows that there are differences between the pre- and post-tests in favor of the post-test results because the sig value for the t-test is significant.

3.1.3 Discussion of between group pre-test and post-test for physical abilities of experimental groups and the control

In light of the results obtained from Tables 5 and 6, it is evident that a clear improvement occurred in the physical abilities (speed endurance and agility) of both the control and experimental groups. For the control group, which followed the coach's standard training program, the table shows significant differences between pre-test and post-test in favor of the post-test. This improvement is attributed to the regular application of the exercises over an appropriate preparation period, which led to noticeable enhancement, as shown in the table above.

For the experimental group, a clear improvement in physical abilities is also observed, which can be attributed to the specificity of the compound exercises applied by the researcher and the use of supporting tools. The development

of speed endurance resulted from exercises involving diagonal sprints from one marker to another and forward sprints from point to point. Football requires maintaining speed from the start of action, especially after reaching peak speed or motor fluidity during gameplay, and sustaining maximum speed throughout the match with minimal exertion. This is not random but a natural result of precise, effective, and well-timed training. Alaa Faleh (2008, p.19) ^[7] notes that after the peak speed phase, a critical stage occurs that affects performance due to a decline in speed. During subsequent stages of competition, the greater the distance and speed exerted, the more stress accumulates in the player's physiological systems, causing lactic acid buildup and fatigue, unless the player possesses a high physical preparation level that enables maintaining acquired speed until the end of the match. Football players must maintain their speed as much as possible throughout the match, which requires objective and targeted speed endurance exercises specific to football players.

Regarding agility, significant differences were observed between pre-test and post-test after applying the training

program. This difference is attributed to the nature of the agility exercises prepared by the researcher, performed symmetrically between the preferred and non-preferred limbs. These exercises included running between five markers, sprinting forward, performing ball drills such as passing from player 1 to player 2, jumping between two obstacles, and sprinting through red ground poles. These exercises improve body coordination and control, which are critical for motor skill performance in football. Repeating these exercises scientifically and systematically leads to better development of agility. Ahmed Bastawisi (1999, p.56) ^[4] also states that the best methods to develop motor abilities are through repeated skill exercises, which is consistent with the training units applied in this study targeting agility.

The researcher believes that these results are due to the specificity of training for this age group, which played an effective role in developing speed endurance and agility for the experimental group that followed the researcher-designed exercises. This principle is fundamental in sports training and should be considered by coaches in all types of training to improve the performance of football players within this age group. Emphasize that training specificity induces special adaptations arising from the particular effects of the training process.

3.1.4 Presentation, analysis, and discussion of some physical abilities for both control and experimental groups

Table 7: Shows the differences between the control and experimental groups in the post-test for some physical abilities

T	Variable	Control Group (Mean ± SD)	Experimental Group (Mean ± SD)	T-Value	Significance Level (p)
1	Speed Endurance	34.338±1.157	32.649±1.487	2.974	0.008
2	Agility	2.494±0.525	2.072±0.038	2.656	0.015

In light of the data obtained from the research sample, Table 7 shows the differences in the values of some physical abilities (speed endurance and agility) in the post-test. As shown in the table above, the characteristics of the individuals in both the control and experimental groups revealed variations in the post-test differences.

3.1.5 Discussion of differences between post-tests of physical abilities for both research groups

To discuss the results presented in Table 7, it is necessary to clarify the differences in the post-test between the control and experimental groups. There were no significant differences in some physical abilities (explosive strength, speed-strength for the right leg, and speed-strength for the left leg) between the two research groups.

The researcher believes that the improvement observed in the two variables (speed endurance and agility) is attributed to the structured training process, which plays a fundamental role in developing the performance level and aligns with the players' abilities to achieve positive outcomes. The results demonstrate the high effectiveness of the exercises in enhancing speed endurance performance. The goal of sports training is "to develop the individual to the highest levels in the practiced activity." Speed endurance for a player refers to "the muscles' ability to resist fatigue during muscular work requiring high-speed running over short and medium distances".

This ability is particularly important for football players, as the work performed during a match often relies on anaerobic energy systems, which simulate the requirements of training and match situations. It is not only the ability to resist fatigue but also "the ability to perform the required task effectively under specific demands or for a specified period." Therefore, programming training according to proper practical principles, with progressive exercises and structured training units regarding intensity, volume, rest periods, and duration, leads to the development of physical fitness, including speed and football-specific speed endurance for the research sample players. Training is a constructive process that develops physical abilities and achieves a certain performance outcome (Issam Abdul-Khaliq, 1990, p.187) ^[3].

Regarding agility, the researcher attributes the significant differences between the experimental and control groups in favor of the experimental group to the effectiveness of the compound, specialized exercises. Al-Hassan (2010, p.133) ^[2]

emphasizes that developing agility requires defining the performance space, introducing unusual positions or equipment, and linking motor skills in a varied sequence. This approach improved the agility of the experimental group more effectively than the control group. Scientifically designed physical exercises lead to the development of agility

4. Conclusions and Recommendations

4.1 Conclusions

- The compound exercises demonstrated a clear improvement in agility and speed endurance.
- The experimental group showed superiority in agility and speed endurance.

4.2 Recommendations

- Training with compound exercises contributes to improving agility and speed endurance.
- Conduct further studies to apply the exercises to determine their impact on football skills.

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