

The effect of using qualitative training on some physical variables for squash players

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Introduction & research problem:

Modern sports training is considered one of the applied sciences that depend primarily on science and its innovations, which aims to provide the sports coach with a lot of information and knowledge that helps him achieve better results with his players by using the best available methods, styles and means in a scientifically studied way (26: 9)

Farouk Abdel Wahab (1995), Wagdy El Fateh, and Mohamed Lotfy (2002) agree that sports training aims to bring the player to the best physical and skillful level. This can only be achieved only through scientific planning of sports training programs. Reaching the highest sports levels in the field of training is not a coincidence, but rather the result of scientific planning and the searching for effective scientific methods and approaches (19: 13) (25: 215).

The success of the sports training process depends on the level of the trainer and the extent of his use of the gentleness of the means and methods specific to achieving the specific and desired goals of the sports preparation stages, which achieves a ba

lance between the different aspects of the individual and the nature of the sports activity that is being planned on the other hand. (18: 51)

Both Essam Abdel Khalek (1994) and Essam Abdel Razek (2005) agree that any sporting activity that the individual practices and hopes to achieve the highest possible level is what determines the type of physical qualities that are necessary and that should be developed and improved. Training to develop physical qualities should preferably be standardized to the type of muscle work prevalent in the movements performed on the equipment, in addition to developing physical qualities that have a positive effect on raising the level of performance and improving the skills of squash players.

(15: 4) (16: 20)

Brocherie et al. (2022) indicate that specific training may contribute to directing muscle capacity, and through it the muscle is able to reach maximum strength and produce it in a short period, and this comes through distinctive strength training. (27: 2243).

Ahmed Ezzat (2016) states that the element of muscular strength enables the athlete to overcome or confront external resistance. The types of external resistance vary according to the type of sport practiced. For example, in squash, the player must have sufficient strength in the leg muscles to enable him to push the body in different directions and quickly. He also needs good strength in the arms to be able to perform strong and fast strokes to increase pressure on the competitor. He also needs strength in the wrist muscles to control the racket while hitting the ball. Hence, it becomes clear that strength is relative in squash. (3: 30).

Squash requires special physical qualities and often distinguishes it from other games in that the outcome of the match depends largely on the player's special physical fitness on the court, the most important of which is the strength of the arms, torso and legs and the player's speed in performing various and multiple strokes. Having enough power to return the balls to the back of the squash court gives the player the opportunity to advance over the opponent by moving him away from the middle of the court. Hitting the ball very quickly puts pressure on the opponent, forcing him to perform weak and easy strokes, and this is done through fast flying

strokes. As the player's mastery of flying and straight strokes gives him greater chances of winning the match. (29: 33).

Squash requires a great deal of ability and strength characterized by speed, as this physical element represents great importance in this sport, which appears in the different types of strokes, as the ball is hit with maximum force and speed, which appears in the forehand, backhand, volley, and other strokes.(17:19)

Through the researcher's work in the academic field, as well as practical and training in the field of squash, she noticed a weakness in the physical level in general for many players, which may affect their level of skillful performance. This is clearly evident in the level of performance of players for forehand strokes, backhand strokes, and volley strokes, which requires the player to possess a great deal of physical qualities to execute these strokes with strength, accuracy, and speed that enables him to gain points repeatedly and win matches

Through the researcher's review of many studies such as the study of Tarek Desouky (2000) (12), Khaled Naeem (2000) (11), Mustafa Ahmed (2001) (22), Ahmed Hassan (2006) (2), Ahmed Adel (2009) (5), Ahmed Mohamed (2011) (6), Wael Ibrahim (2011) (24), Mahab Mohamed (2011) (23), Elliot – B Marshall – R Noffal – G (1996) (28), Marshall R – et. all (1996) (31), Julia Wells and others (2003) (30), the idea of the current research emerged.

Research objective

The current research aims to identify the effect of using qualitative training on some physical variables (agility - respiratory endurance - arm muscle capacity - leg muscle capacity - hand reaction - leg reaction) under study for squash players.

Research hypotheses

In light of the research objectives, the researcher sets the following hypotheses

1-There are statistically significant differences between the averages of the pre- and post-measurements in the physical variables under study and in favor of the post-measurement

2-The percentage of improvement in the physical variables under study between the pre- and post-measurements and in favor of the post-measurement

Research Terms :

Sports Training

A planned educational process based on sound scientific foundations that aims to bring the player to the best level of athletic performance. (14:11)

Research Procedures

Research Methodology

The researcher used the experimental method with an experimental design for one group following the pre- and post-measurement

Research Community and Sample

The research community is represented by the students of the racket games specialization who are registered in the Minia University team, whose number was 20 players. A sample of 10 players was chosen intentionally, with a percentage of 47% of the original community. The following table distributes the research sample.

Table (1)

Description of the research sample

Sample Description	Research Community	Primary Sample	Exploratory Sample
N	10	10	10

Sample moderation

The researcher verified the extent of the moderation of the distribution of the research sample individuals in light of growth (age, weight, and height) and physical variables, and the following table shows this:

Table (2)

**Arithmetic mean, median, standard deviation and skewness coefficient
in the growth variables and physical variables under study**

Variables	Measurement unit	Arithmetic mean	median	standard deviation	skewness coefficient
Age	Year	21.0	21.5	0.98	1.53-
Height	Cm	175	176	6.02	0.49-
Weight	Kg	73.0	74.0	8.95	0.34-
Agility	Sec.	7.50	7.40	0.52	0.58
Respiratory endurance	Min.	6.5	6.6	0.75	0.4-
Arm muscle power	M	8.5	8.00	1.35	1.11
Legs muscle power	Cm	1.8	1.75	0.26	0.58
Hand reflex	Cm	11.5	11.00	1.38	1.09
Legs reflex	Cm	13.00	13.5	1.45	1.03

Table (2) shows the following:

The coefficients of the growth variables and physical variables were limited between (zero, ± 3) (-1.53: 1.11), which indicates that they fall within the moderate curve; thus the sample is moderately distributed.

Data collection methods

A - Tools and devices

-Stopwatch - - Medical scale for measuring weight - Restameter device - Cones - Measuring tape - Wooden box- -Medicine balls - Iron bar - Rope for exercises - Hoops

B - Data collection forms Physical tests: - Attachment

The researcher conducted a survey of experts in the field of training and squash to determine the physical abilities of squash players and the physical tests that measure those abilities. The researcher reached the following tests:

Zigzag running test *

1500m running test*

3kg medicine ball push test for maximum distance*

Broad jump test from standing*

Wilson test to measure hand reaction*

*Wilson test to measure leg reaction

Scientific coefficients for the physical tests under study:

The researcher calculated the stability of the tests using the application and reapplication method on a sample of (8) eight players from the research community and outside the original sample, with a time interval of (3) days between the first and second applications, where the correlation coefficients ranged between 0.85 - 0.93, which are statistically significant coefficients, and their self-validity was calculated and ranged between 0.92 - 0.96

Pilot study

The researcher conducted the exploratory study in the period from 25/11/2022 to 28/11/2022 to calculate the scientific coefficients for the physical tests under study.

Prior measurement

The pre-measurement was applied on Saturday in the period from 3/12/2022 to Monday 5/3/2022 and physical tests were applied

Experiment application

The training program was applied in the period from 12/12/2022 to 12/3/2023 with 56 training units

Post-measurement

The post-measurement was applied starting from Sunday in the period from 12/3/2023 to Monday 13/3/2023 and physical tests were applied.

Presentation and discussion of the results

First: Presentation of the results

Table (3)

Significance of the differences between the pre- and post-measurements and the z value in the physical variables under study (n = 10)

variables	Measurement unit	Pre-measurement		Post-measurement		Z value	Significance level
		Average Rank	Average Rank	Average Rank	Average Rank		
Agility	Sec.	15.5	154.0	5.5	56.0	-3.542	significant
Respiratory endurance	Min.	14.5	144.0	6.5	66.0	-2.657	significant
Arm muscle power	M	6.5	62.0	14.6	145.0	-3.652	significant
Legs muscle power	M	9.5	96.0	14.0	140.0	-2.365	significant
Hand reflex	Cm	15.5	155.0	5.5	55.0	-3.425	significant
Legs reflex	Cm	15.5	155.0	5.5	55.0	-3.453	significant

Significance level 0.05

It is clear from Table (3) the following:

There are statistically significant differences between the pre- and post-measurements in the physical variables under study, in favor of the post-measurement, as the calculated Z was greater than the tabular Z value at the significance level (0.05)

Second: Interpretation & discussion of the results

It is clear from Table (3) that there are statistically significant differences between the pre-measurement and the post-measurement in favor of the post-measurement in the physical variables represented in (agility - respiratory cyclic endurance - arm muscular capacity - leg muscular capacity - hand reaction - leg reaction).

The researcher attributes the reason for the increase in the agility component to the effect of the qualitative training and what it contains of training that depends on changing direction and zigzag running, whether forward, sideways or backward, as well as jumps with the legs, and also the use of different resistances from rubber elastic and forward and side rolling exercises and additional movement exercises that lead to difficulty in performance with using deception skill, which contributes to the development and growth of the agility component of the research sample.

This is consistent with what was indicated by the results of both "Mohammed Alawi" (1994) and "Adel Abdel Basir" (1999) that training programs that contain the agility component such as strength, speed, coordination, balance and accuracy combined make the player able to take different positions with his body as a whole or with the different parts of it until the required good performance is achieved and leads to the development and growth of the agility component (20: 200-201) (13: 111)

The researcher also attributes the improvement in respiratory endurance to it being a reflection of the effect of the training load on the vital organs as a result of the external load of the existing training represented by the respiratory system, especially the lungs and their ability to absorb the sufficient amount of oxygen. This is consistent with what was indicated by "Abu Al-Ala Abdel Fattah" (1997) where he indicates that repeating the performance during training leads to increasing endurance and raising the functional level of the circulatory and respiratory systems, which is reflected in the performance in general. (1: 487).

The researcher attributes this improvement to the qualitative training that aims to develop this element, whether it is training based on body weight or other resistances, taking into account individual differences in loads, as well as choosing training according to muscle contraction and the form and nature of performance, which contributed greatly to increasing the rate of muscle capacity. This is consistent with what was indicated by "Abdul Aziz Al-Nimr", "Nariman Al-Khatib" (1996), "Bastawisi Ahmed" (1999) that organized sports training leads to the efficiency of the muscular system, and this appears directly in the ability of the muscle to

contract at a faster and more explosive rate during the range of motion of the joint, whether this force is kinetic or fixed. (14:114) (7:159)

The researcher attributes this improvement to the fact that the qualitative training led to an increase in the speed of muscle contraction, which contributed greatly in developing the speed and the power element, which contributes greatly in developing the speed in its various types. This agrees with what was indicated by "Adel Abdel Basir" (1999) and "Abu Al-Ala Abdel Fattah" (1997) that training programs that aim to develop the physical components and use the high-intensity interval training method in these programs lead to the development of the speed component in its various types. (13: 134) (1: 496).

The results of the current research are consistent with the studies of "Khaled Abdel Aziz" (1998) (10), "Mahab Reda" (2011) (23), "Ahmed Samir" (2013) (4), Ahmed Abdel Sattar "(2011) (6), Mustafa Ahmed" (2001) (22), which indicates that the qualitative training under study has had a positive impact on the elements of physical fitness under study; thus the first hypothesis of the research is achieved, which states that "there are statistically significant differences between the averages of the pre- and post-measurements in the physical variables under study, in favor of the post-measurement".

First: Conclusions

Within the limits of the research methodology used and the sample on which the research was applied, and the results that resulted from this research, we conclude the following:

- The specific training with its content and characteristics of forming its loads had a positive and statistically significant effect on the development of the physical variables under study.

Second: Recommendations

In light of the research objectives and results and what was concluded, the researcher recommends the following:

1-Applying specific training to develop the physical variables represented in (agility, respiratory endurance, arm muscular capacity, leg muscular capacity, hand reaction speed, leg reaction speed) on other samples.

2-Focusing on the selected physical tests due to their importance in raising the level of the squash player from a physical point of view.

3-Interest in conducting scientific studies to develop the rest of the physical and skillful variables in the sport of squash.

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