

"The effect of using Pilate's training on some physiological Variables for squash beginners"

*** Prof. Mohsen Ibrahim Ismail.**

**** Prof. Khalid Abdel Aziz Ahmed.**

*****Mustafa Nasser Al-Suwaifi**

Introduction and research problem:

Scientific research has become one of the most important factors relied upon in the development of societies in order to reach the highest levels in all fields in general and the sports field in particular, by identifying what God has endowed man with various abilities and energies in an attempt to achieve the greatest benefit from modern scientific theories In the sports field, physical education and sports are one of the areas that affect the human being as an important and essential element in building the individual and preparing him in an integrated manner on scientific bases.

Samia Khalil Muhammad (2008 AD) indicates that the physiology of sports aims to explore the direct and long-term effects caused by physical exercises, whether aerobic or anaerobic, on the functions of muscles, organs and various bodily systems, and the relationship of these activities to health and physical fitness. (11:7)

According to A.R. Hoogereen (1999), sport has a clear impact on its practitioners, as it is noted that those who exercise regularly have physiological changes related to the heart and blood. (16: 93)

And Raja Mahdi Tawfik (2014), citing Dennis Austin (2002), states that Pilates exercises work to strengthen all the muscles of the body through the full range of movement, and this combination of strengthening and Lengthening

It helps in obtaining strong, long, thin muscles. These exercises improve strength, muscle tone, flexibility and balance of the body. It also helps to reach the maximum performance of the athlete. These exercises

deal with the body as a single unit. The training starts from the inside and then moves upward and downward.

Pilates exercises focus on all parts of the body, the upper part of the body and the lower part of the body (the back and abdominal muscles represented by the rectus abdominis muscle, the internal oblique abdominal muscle, the external oblique abdominal muscle, the transverse abdominal muscle).

She also adds that these exercises target the deepest layer of the abdominal muscles (the transverse muscle), which a muscle is found in the depth that does not work in many other forms of exercises. These exercises help to strengthen and lengthen the muscles around the spine and thus keep it straight, and maintain the strength and flexibility of the trunk from the front and back, which is called the power house. (30:6) (29:18-96)

Abdul Rahman Abdul Hamid Zaher (2011 AD) mentions that there is in the human body a percentage of lactic acid during rest and without physical exertion. Rest at the rate of (1 m.mol / liter), but this percentage increases when performing high intensity sports activities, which range from one to three minutes. (9:55)

Squash in Egypt is one of the sports that has achieved remarkable achievements at the global level, which called for the attention of specialists and those interested in this sport to research and work on how to maintain and work on developing this level to achieve greater and better achievements. Unless this is related to the general and specific physical fitness of the squash player's progression of the level. (3:5)

Through the researcher's personal experience and observation, he found that beginners during the period of learning motor skills in squash face some difficulties, as squash skills are characterized by a high degree of compatibility and accuracy, which is difficult for beginners to achieve. To learn motor skills and perform them better, which prompted the researcher to search for the latest training methods that contribute to the development of physical and physiological fitness of players and follow-up training doses at the international level. The researcher found that there is a use of Pilate's exercises during training doses in order to raise the physical and physiological efficiency of the players what prompted the researcher to choose his research topic entitled "The effect of a program using Pilate's exercises on some physiological variables for squash beginners"

Search objective: The research aims to design a training program using Pilate's exercises to Lear:

- Its effect on some physiological variables represented in (vital capacity, maximum oxygen consumption, resting pulse rate, pulse rate after exertion) among squash beginners.

Research hypotheses:

- There are statistically significant differences between the averages of the pre- and post-measurements of the experimental group in the level of some physiological variables under discussion among squash beginners in favor of the post-measurement.

Search terms:

Pilates exercise

Michael King (2001) states that Pilates is “a series of movements that strengthen the muscles of the body through the full range of the body only, but change the way we feel and think” (607:20).

Reference studies:

First: Arab reference studies:

- 1- Mahmoud Abdullah Abdullah's study (2020 AD) (12) entitled “The Effectiveness of Pilates Exercises on Cardio-Respiratory Fitness for Young Swimming.” This study aimed to identify the effectiveness of Pilate's exercises on the cardiorespiratory fitness of swimming juniors. The research sample included 15 learners of swimming players at Mansoura Sports Stadium, and the most important results were that Pilate's exercises positively affected the cardiorespiratory fitness of the experimental sample under research, superior in its results to the results of the control group.
- 2- The study of Majed Yaqoub Youssef (2020 AD) (11) entitled “The effect of using Pilates exercises and attachment on some special physical variables for Taekwondo players in the State of Kuwait.” The study aimed to know the effect of Pilates training and attachment on some special physical variables of Taekwondo players. The experimental design of two groups, one experimental and the other control, and the research sample included (30) young people who were randomly divided into the two groups.
- 3- Muntasir Bakhit Hamid's study (2020 AD) (13) entitled “The effect of Pilates training on improving the special physical abilities and the digital level of the 100-meter junior sprint and the triple jump.” The

study aimed to try to identify the effect of the effect of Pilates training on improving the special physical abilities and the digital level of the 100-meter juniors the sprint meter and the triple jump. The researcher used the experimental method with an experimental design for only one group. The research sample included (5) junior practitioners of the 100-meter sprint and triple jump in Sohag Governorate. The most important results that were reached were that the application of Pilate's exercises led to an improvement in special physical abilities and the digital level. For the variables under consideration.

- 4- Ahmed Abdullah Mahmoud (2019 AD) study (1) entitled "Pilates exercises to improve the center of strength and its effect on the throw-in for soccer buds." The study aimed to know the effect of Pilate's exercises to improve the center of strength and its effect on the throw-in. The researcher used the experimental method with an experimental design for only one group. The research sample included (20) football buds at the Academy of Physical Education in Damanhur. The most important results that were reached were that Pilate's exercises had a great impact on the development of throw-in.
- 5- The study of Nabil Hamid Shaheen (2018 AD) (14) entitled "The effect of Pilates exercises on improving the performance level of some offensive skills of Taekwondo players." The study aimed to know the effect of Pilate's exercises on improving the performance level of some offensive skills. The researcher used the experimental method with an experimental design for only one group. The research sample included (10) juniors from Al-Hiwar Club in Mansoura. The most important results that were reached are that Pilate's exercises have led to a statistical change rate in the physical variables and offensive skills under study.

Second: Foreign reference studies:

- 6- The study of Rogers K, Gibson AL, (2009 AD) (22) entitled "8 weeks of Pilates and its effect on the physical fitness of adults." The study aimed to know the effect of Pilate's exercises on the fitness of adults. The researchers used the experimental method and the research sample included (17) Individuals divided into two groups, one of which is experimental, consisting of (4) individuals, and the other is a control group of (13) individuals. The most important results were that Pilate's exercises significantly affected the thickness of the shoulder and back muscles, which led to an improvement in general fitness.
- 7- A study by Patrick J. Culligan et al. (2010 AD) (21) entitled "A comparative analytical study between the use of traditional training and Pilates exercises in improving the muscular strength of the trunk muscles." The study aimed to find out the difference between the use of traditional training and Pilates exercises in improving the muscular strength of the trunk muscles. Experimental Approach The research sample included 62 women and was divided into two groups: 30 Pilates exercises women and 32 women the traditional program. The most important results were that Pilate's exercises actually improved the muscular strength of the trunk muscles.
- 8- The study of Arian R. Aladro-et al (2012 AD) (17) entitled "The Effect of Pilates Exercises on Body Composition" The study aimed to identify the effect of Pilates exercises on the body composition of the research sample. The researcher used the experimental method. The sample included 15 individuals and was the most important Results: Pilate's exercises positively affected the body composition of the research sample.

Search procedures:**First, research methodology and sample:****1- Research Methodology:**

The researcher used the experimental method with the experimental design for one experimental group using the pre and post measurements, due to its suitability to the nature of the research.

2- Research community and sample:**A. Research community:**

All squash players in the Faculty of Physical Education, Minia University, numbered 35 students.

B. The research sample:

The research sample was chosen in a deliberate way from (16) players specializing in squash at the Faculty of Physical Education, Minia University. The players were distributed as follows (8) players in the experimental group representing the basic research sample and (8) players from within the research community and outside the basic research sample they represent the poll sample.

C. Description of the research sample:

Table (1)
The distribution of the sample members

No.	the sample		the number	percentage
1	Poll sample		8	50%
2	basic sample	experimental sample	8	50%
3	total sample		18	100%

Second: Statistical description of the basic sample

The researcher made sure of the moderation of the distribution of the members of the basic research sample in the light of the following variables: growth rates (height, weight, age, training age), physiological variables. Table (2-3) shows the moderation of the data distribution of the sample members.

Table (2)

Arithmetic mean, median, and deviation Standard and skew modulus of growth rates for the main research sample (n=8)

Variants		unit measurement	average	Mediator	standard deviation	torsion coefficient
Growth rates	height	cm	178.32	178.00	3.33	0.28
	the weight	kg	76.62	77.00	3.46	-0.32
	Chronological age	year	17.87	18.00	0.83	-0.46
	training age	month	3.00	3.00	0.00	0.00

It is clear from table (2) that:

The torsion coefficients of the sample under research ranged between (-0.46: 0.28) in the research variables, that is, they were limited between (-3, +3), which indicates that they are located within the moderation curve, and thus the sample is moderately distributed, which indicates the homogeneity of the sample members under consideration Search.

Table (3)
Arithmetic mean, median, and deviation The standard and torsion
coefficient of the physiological variables of the basic
research sample (n=8)

Variants		unit measureme nt	averag e	Mediat or	standar d deviatio n	torsion coefficie nt
Physiological measurements	vital capacity	Liter	3.68	3.85	0.43	- -1.18
	Maximum oxygen consumption	Liter	28.13	27.83	2.81	0.32
	Resting pulse rate	beats/min	73.12	73.50	3.18	-0.35
	Pulse rate after exertion	beats/min	112.00	111.00	3.42	0.87

It is evident from Table (3) that:

The torsion coefficients of the sample under study ranged between (-1.18: 0.87) for the physiological variables under study, that is, they were confined between (-3, +3), which indicates that they are located within the moderation curve and thus the sample is moderately distributed, which indicates the homogeneity of the sample members under consideration.

Third: Means and tools for data collection:

A- Devices and tools used in the research:

- 1- Medical scale to measure weight.
- 2- A rest meter to measure the length.
- 3- A dynamometer to measure the strength of the muscles of the legs and back.
- 4- Spirometer.
- 5- Digital pulse oximeter.

- 6- Squash court.
- 7- Squash balls.
- 8- Squash racket.
- 9- Stopwatch.
- 10- Training tools (cones, collars, plates, training ladder, medicine balls, Swiss balls) .
- 11- Resistance Bands (rubber belt).
- 12- tape measure.

A- Tests and metrics:

The researcher collected data by conducting tests and measures for the variables under study as follows:

● **Body measurements:**

1. Measurement of height using a rest meter.
2. Measuring weight using a medical scale.

● **Physiological measurements:**

1. Vital capacity test using a spirometer (liter).
2. Maximum oxygen consumption test (liters).
3. Pulse rate measurement at rest and after exertion using a pulse oximeter (pulses/min).

Fourth: basic measurements:

1- Pre-measurements:

The pre-measurements were made for the members of the research sample on Wednesday and Thursday, corresponding to 01/13/14/2021 AD.

2- Application of the program:

The training program was implemented for a period of 12 weeks, with 5 training units per week, from Saturday 16/1/2021 until Saturday 10/4/2021. The training program was implemented for a period of 12 weeks, with 5 training units per week, from Saturday 16/1/2021 until Saturday 10/4/2021.

3- Post measurements:

The dimensional measurements were carried out for the individuals of the research sample, with the same conditions and tribal measurement tools, on Wednesday and Thursday, corresponding to 14,15/10/2020 AD.

Sixth: Statistical treatments:

- Arithmetic average.
- Mediator.
- standard deviation.
- skew modulus.
- Mann-Whitney difference function (U).
- Spearman correlation values.
- • Wilcoxon difference function (Z)
- Percentage of improvement (%)

The researcher will satisfy the level of morale (0.05) in all stages of the research.

Presentation and discussion of results:**First, show the results:****Table (4)**

Significance of differences between the two measures of the Wilcoxon test Pre and post for the basic research sample in the physiological measurements under study (n=8)

Tests	measuring unit	Direction	Number	Average Rank	Sum Rank	Z-value
vital capacity	Liter	-	0	0.00	0.00	2.53*
		+	8	4.50	36.00	
		=	0			
Maximum oxygen consumption	Liter	-	0	0.00	0.00	2.52*
		+	8	4.50	36.00	
		=	0			
Resting pulse rate	beats/min	-	8	4.50	36.00	2.52*
		+	0	0.00	0.00	
		=	0			
Pulse rate after exertion	beats/min	-	8	4.50	36.00	2.54*
		+	0	0.00	0.00	
		=	0			

* (Z) value at the level of significance $0.05 = 1.96$

It is evident from Table (4) that:

There are statistically significant differences for Wilcoxon's test between the tribal and remote measurements of the physiological variables under study in favor of the dimensional measurement, where the calculated (Z) value came greater than its tabular value at a significant level (0.05), which indicates an improvement in the dimensional measurement of the physiological variables under research with a significant degree of significance.

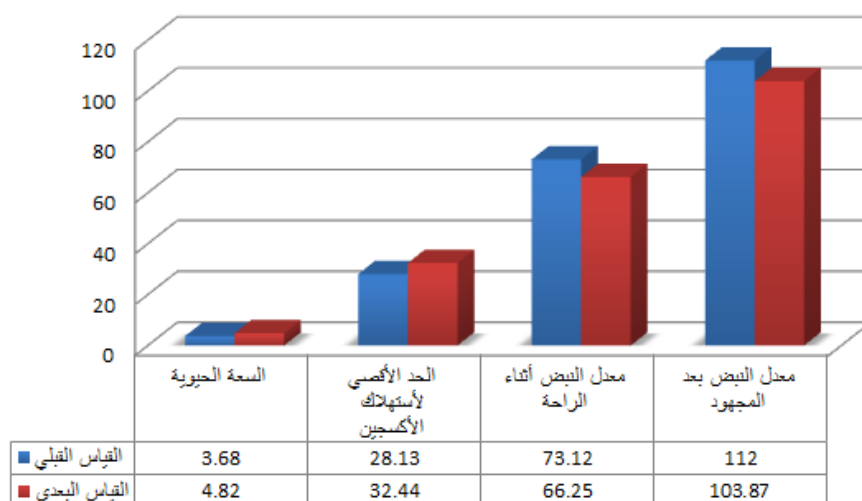
Table (5)

Percentage of improvement rates between the two measures
Pre and post for the basic research sample of the physiological
variables under research(n=8)

Tests	measuring unit	Pre-measurement		Post-measurement		The difference between the two averages	Improvements (%)
		م	ع	م	ع		
vital capacity	Liter	3.68	0.43	4.82	0.22	1.14	30.97 %
Maximum oxygen consumption	Liter	28.13	2.81	32.44	2.56	4.31	15.32 %
Resting pulse rate	beats/min	73.12	3.18	66.25	1.58	6.87	9.39 %
Pulse rate after exertion	beats/min	112.00	3.42	103.87	3.44	8.13	7.25 %

It is evident from Table (5) that:

The percentage of improvement rates between the pre and post measurements of the physiological variables under study ranged between 30.97% as the largest value, and 7.25% as the smallest value.



shape (1)

Percentage of improvement rates between the two measures

Pre and post for the basic research sample of the physiological variables under research

Second: Discussing the results:

- Discussing the results of the first hypothesis which states that “there are statistically significant differences between the mean of the pre and post measurements of the experimental group in the level of the physiological variables under research represented in (vital capacity, maximum oxygen consumption, resting pulse rate, heart rate after exertion) for squash beginners in favor of telemetry.

Table (4) shows that there are statistically significant differences for the Wilcoxon test between the tribal and remote measurements of the physiological variables under discussion in favor of the dimensional measurement, where the calculated (Z) value was greater than its tabular value of 1.96 at a significant level (0.05), which indicates an improvement in the post-measurement of the variables. Physiological under study, with a significant degree of significance.

Table (5) also shows that the percentage of improvement rates between the two measurements before and after the physiological variables under consideration ranged between 30.97% as the largest value, 7.25% as the smallest value, where the largest value was for the share of the vital capacity variable, while the smallest value was for the share of the pulse rate variable after the effort.

The researcher attributes this improvement in the level of the physiological variables under research to the proposed training program using Pilates exercises, where the program was codified according to the scientific foundations and principles for planning sports programs, which had a positive impact on the physiological variables under research and contributed to the improvement and development of the sample members in question from a physiological point of view.

This is consistent with the study of Mahmoud Abdullah (2020 AD), where he found in the results of his study that Pilates exercises contribute to developing the level of cardiorespiratory fitness. (12)

This is consistent with the results of the studies of Muntaser Bakhit Hamid (2020 AD) (13), Ahmed Abdullah Mahmoud (2019 AD) (1), Asmaa Taher Nofal (2019 AD) (2), Nabil Hamid (2018 AD) (14), Emile Saad Gerges (2017) (3), Fatima Nasser Ahmed (2017) (10), Wataniya Ahmed Mahmoud (2014) (15), Iman Askar Ahmed (2011) (4), Alia Adel Shams Al-Din (2009) (8), Kloubec ja et al (2010m) (19), Rogers, Gibson, Rogers k. Gibson al (2009) (22), Patrick J. Colligan (2005) (21).

The results of those studies indicated that Pilates exercises improve and develop the functional aspects of the body, which has a great impact on the physical and skill aspects of the athlete.

- Thus, the validity of the research hypothesis which states that "there are statistically significant differences between the mean of the tribal and remote measurements of the experimental group in the level of the physiological variables under research represented in (vital capacity, maximum oxygen consumption, resting pulse rate, pulse rate after exertion) has been validated) for squash beginners in favor of telemetry.

Conclusions:

In light of the objectives and nature of the research, within the limits of the research sample and the method used, and based on the data collected and the results of the statistical analysis, the researcher reached the following conclusion:

- 1) Pilates exercises positively affected the physiological variables under study, and the statistical results showed that there were statistically significant differences between the pre and post measurements.
- 2) The percentage of improvement rates ranged between the pre and post measurements of the physiological variables under discussion, ranging between 30.97% as the largest value, 7.25% as the smallest value, where the largest value was for the vital capacity variable, while the smallest value was for the share of the pulse rate variable after exertion.
- 3) Pilates exercises significantly improved and developed the cardiorespiratory fitness variables, which had a great impact on the development of the physiological efficiency of the players.

Recommendations:

In light of the procedures carried out in this study and within the limits of the selected research sample and based on the previous results and conclusions, the following can be recommended:

1. Using the proposed Pilates training program to improve the cardio-respiratory abilities of squash beginners.
2. Using Pilates exercises to develop and improve the physiological variables for squash beginners.
3. Conducting more studies of Pilates exercises for different age groups.
4. Conducting more studies on different sports activities.

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"The effect of using Pilate's training on some physiological Variables for squash beginners"

*** Prof. Mohsen Ibrahim Ismail.**

**** Prof. Khalid Abdel Aziz Ahmed.**

***** Eng. Mustafa Nasser Al-Suwaifi.**

Research Summary:

search objective:

The research aims to design a training program using Pilates exercises to learn:

- Its effect on some physiological variables (vital capacity, maximum oxygen consumption, resting pulse rate, heart rate after exertion) in squash beginners.

Research Methodology:

The researcher used the experimental method with an experimental design for one experimental group using the pre and post measurements for its suitability to the nature of the research.

The research sample:

The research sample was chosen in a deliberate way from (16) players specializing in squash at the Faculty of Physical Education, Minya University. The players were distributed as follows (8) players in the experimental group representing the basic research sample and (8) players from within the research community and outside the basic research sample. They represent the poll sample.

The most important results:

1. Pilates exercises positively affected the physiological variables under study, and the statistical results showed that there were statistically significant differences between the pre and post measurements.
2. The percentage of improvement rates between the two measurements before and after the physiological variables under discussion ranged between 30.97% as the largest value, 7.25% as the smallest value, where the largest value was for the share of the vital capacity variable, while the smallest value was for the share of the pulse rate variable after exertion.