

A training program using pilates and its effect on some physical variables And some kicks for taekwondo junior players

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Introduction & Research problem:

Attention to the physical, skillful, and planning requirements is one of the most important things that coaches must consider in preparing the players. This is due to the importance of these factors and the extent of their impact on the athletic performance of the players, as the extent of winning many sporting championships and competitions depends on the extent of the integrated interest with the athletic preparation of players in these various aspects.

Essam El-Din Abdel-Khalek (2003) also indicates that upgrading the level of skillful performance is through training, which is a process of repetition of the performance of skills in different circumstances to reach the player to the stage of competition. Each of the games and the level of mastery depend heavily on their basic skills. Skillful performance is an important factor for players, and this requires continuous and regular practice, while correcting what might hinder the reasons for the way of the right performance.(10:197.198)

Hatem Al- Shaloul et al (2008) believe that taekwondo is one of the martial arts that requires many physical capabilities that must be available in the junior and agree with the nature of performance. There is a great importance of the elements of physical fitness in the effectiveness of performance when meeting with the opponent, because the taekwondo game depends greatly on the physical fitness and its various elements, and for this, good physical fitness training is an integral part of skilled and tactical training in taekwondo, where coaches today use many methods of physical training and have even been interested in finding theories and scientific foundations for sports training to prepare an integrated player to face sports competitions.(8: 1195).

Amer Allah Albasaty(1996) states that mathematical training is characterized by the feature of relying on scientific research to achieve the highest levels of achievement, depending on theories and

knowledge extracted from the results of the scientific research for many sciences related to the sports field (3:6).

Yahia Alhawry notes that sports training science is one of the applied sciences that depends on science and its innovations, which aims to provide the sports coach with information and knowledge that helps him to achieve the best results with his players through his using for the best available methods, and means by a scientific way (20:39).

Ahmed Saeed Zahran(2004) also states that victory can only be achieved through the special physical preparation, which plays an important role in raising the level of the technical and planning performance of taekwondo players, because the lack of physical taekwondo players required for the game works impede him to perform the required skill and planning side(2:195.194).

Mechail King (2001) indicates that there is a type of aerobic exercise that has been reached and is known as Pilates exercises, which is an organized exercise for a group of exercises with an organization for the breathing process that depends on the various muscle groups together. This type of exercises aims to find a balance in the normal shape of the body, taking into account all factors involved in obtaining a healthy body(32:1).

Pilates's movements are attributed to the German Joseph H. Pilates who invented and developed this type of movement through his experiences in gymnastics, exercises, yoga and martial sports(33:280).

Pilates movements are one of the methods of modern physical preparation for training the muscles of the body as one unit. Pilate's movements are distinguished by the ability to exercise men and women of different ages, in addition to that it can be practiced anywhere with or without tools(28:32).

Kadry Morsy(2014) indicates that the success of the skill performance needs to develop the necessary special physical characteristics that contribute in its performance ideally. As the special physical characteristics do not appear separately when implementing the skillful performance of the game, as this contributes in developing the type and nature of work required in the performance Skillful (13:20)

Pilates movements are considered among the prevalent modern methods in the sports field, which aim to develop the muscle strength and the ability to control performance through the various muscles of the body in general and the muscles of the trunk in particular through compatibility and accuracy between both the nervous and muscular systems. As the Pilates movements mobilize the largest number of

muscle groups through continuous movement in a streamlined manner and the precise focus in the strength and balance of the various trunk muscles such as the abdominal and back muscles and the pelvic joint muscles.(25:318)(38).

There are several basic principles for Pilates exercises:

1- Focus: Pilates exercises work by recognizing each movement and controlling it through the mind, which must be in a state of permanent total focus on the goal of performance

2-Center: Pilates exercises help build a strong center for the body while reducing the waist circumference, flat abdomen and move easily with movement flowing from the inside to outside, as all movements start from the center as the center muscles support the spine and internal organs and improve performance

3-Breathing: Pilates exercises help control and continue breathing, which is reflected in improved performance and efficiency in the use of body energy, and breathing properly helps get rid of psychological stress, tension, energy enhancement, and increased body activity

4-precision : It is the use of muscles to be developed in a consistent and correct exercise, as Pilates exercises help to move more accurately and reveal the natural dimensions of the body

Control : In Pilates exercises, the practitioner learns to control the abdominal muscles first and then begins to learn more advanced serious movements, while controlling the body during the performance and the movements are performed slowly and controlled

Kinetic flow: It is an internal control through the mind in all the parts used in the exercise where the transition from one movement to another easily and easily without stopping during the performance until completing the movement.

The benefits of Pilates exercises are to improve both strength and elongation and muscle balance. Muscle balance on both sides of the body is the actual basis for a good strength. Pilate's exercises increase the awareness, awareness and sense of the individual of the ideal position of the muscles and joints of the body starting from the neck, spine and pelvis through the legs to the feet. Pilates training also adjusts the body shape from the current position to the ideal situation should to be (21:28).

The problem appears through the researcher's observation of the low level of kicks performance among students in the specialization of taekwondo, especially those that depend on strength and control of body parts during the performance. This is evident during the

performance of some kicks, such as "Bek Chagi", "Abtulio Chagie" and "Te Chagie", as these kicks require the player to control the performance during all parts of the body, and that the interest in the first place in the lectures on the skill side and learn different skills with Lack of focus on the physical side, especially exercises that are concerned with strengthening the trunk muscles that affect performance control. As the university semester does not allow large training periods and this is clearly consistent with Pilates training as you do not need a large time to influence the physical side of the player.

Both Christine Roman and Ben Roter (2006) have indicated that the Pilates method is an integrated program for training the muscles of the body through the performance of movements whose primary goal is to develop and increase the strength of the deep muscles of the trunk in particular such as the abdominal and back muscles and the pelvic joint muscles and responsible for control and muscular stabilization to improve the position, balance and compatibility of the body. Pilates movements depend on the neuromuscular compatibility between the hands, eyes and legs, as Pilates exercises using the gravity and body weight as resistance to increase the intensity of training during performance (22:149) (27:18).

Through the importance of Pilates exercises in developing strength and lengthening the abdominal, back and pelvic muscles, and it is commensurate with the short period of time during the semester, the researcher used these exercises in an attempt to develop some elements of physical fitness and improve the level of performance of some kicks, which is commensurate with the goal of Pilates exercises.

Research importance

It contributes in developing some of the physical variables of players and their impact on some kicks in taekwondo in the least time possible.

Research objective

The research aims to design a training program using "pilates" training for taekwondo players and know its effect on:

- 1- Some physical variables related to taekwondo (muscle strength - muscular endurance – flexibility).
- 2- Some kicks for taekwondo, including (DOLLYO chagi - Te Olgul Dollyo chagi - DWI Chagi).

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 some physical variables under consideration in favor of the post measurement.

2-There are statistically significant differences between the averages of the pre and post measurements in some kicks under consideration in favor of the post measurements.

Research Terms:

Pilates

It is a group of physical movements designed to develop flexibility, strength and endurance of the body and achieve balance accompanied by patterns of breathing. Its effect is not limited to the physical side only, but extends to the rehabilitation of the body in all respects (23:17).

Some previous studies

The researcher examined the studies and researches that were conducted on Pilates training, such as the study of Ghaidaa Abdel Shakour Mohamed(2009)(12), Nahid Khairy Abdullah(2010)(18), Atef Rashad Khalil(2008)(9), Muhammad Abulhamd Abdel Wahab(2019)(14), Maja Bučar Pajek(2009)(31), Ahmed Hussein Muhammad Ali(2016)(1), Amal Al-Sayed Salim Ibrahim(2016)(4), Ehab Ahmad Al-Metwally Mansour(2013)(5), Atef Rashad Khalil, Moushera Ibrahim Al-Ajmi (2008)(9), Manal Talaat Muhammed.

These studies have proven the effectiveness of Pilates training in developing the physical side of the player, which positively affects the skillful level.

Research plan and procedures

Research Methodology

The researcher used the experimental method using one experimental group by conducting pre and post measurement as an experimental design due to its relevance to the nature of this research.

Research community

The research community included students of the Faculty of Physical Education for emerging Taekwondo students, whose number was (40) students, Table (1).

The research sample

The research sample was chosen intentionally among the students of the Faculty of Physical Education for Taekwondo for the academic year 2018/2019 and whose number was (15) students who are regular in attendance.

Table(1)
Characterization of the research population and sample

	Research community& sample	number	Why you choose it	percentage
1	Experimental group	15	The basic research sample	37.5%
2	Scientific coefficients for tests	20	To calculate the scientific coefficients for tests (honesty and stability)	50%
3	Exploratory sample	5	To ensure suitability of tools and equipment, to pilot training units and to codify the proposed program	
	total	40		12.5%

Table (1) show the research community and its number.

Homogeneity of the research sample

The researcher has made homogeneity to the research sample to ensure that the research sample is distributed fairly in all variables under consideration as shown in table (2).

Table (2)

Arithmetic mean, standard deviation, and torsion coefficient of variables (age, height, weight, and training age) of the sample members in question N=15

The variables	Measurement unit	Arithmetic mean	standard deviation	torsion coefficient
Age	Year	22.4	0.79	-0.04
Height	Cm	171.1	6.49	2.06
weight	kg	64.1	8.15	0.18

It is clear from table (2) that all the coefficients of the sample were confined between(-0.004 and 2.06) that is, they were confined between (3±), which means that there is homogeneity among the members of the research sample in variables (age, height and weight).

Data collection tools

The researcher relied on collecting research data and measurements on many tools, devices and forms, summarized as follows:

A- Tools and Devices:

Stopwatch to calculate time. - A medical scale for measuring weight-
-Rustemeter for measuring length. -Small and large hand tools (sponge bags).
Sandbag tools (sponge bags). -2Legal chest protectors.-
-Divided boxes
-elastic rubber . - Medical balls.

B- Data collection forms

-The anthropometric measurements and the special physical tests under consideration registration form.

Skillful tests under consideration registration form.-

-Data collection form (name - weight - length - training age) for the individuals of the research sample under consideration.

Results of a questionnaire to determine the most important kicks in taekwondo

The researcher designed a questionnaire containing the kicks in the sport of taekwondo extracted by analyzing the references and presenting them to experts in order to choose and determine the most important kicks that suit the stage of the research sample.

Table(3)

The percentage of expert opinions on the most appropriate kicks for a sample

	The kick	Exports opinions	percentage
1	DOLLYO Chagi	10	100%
2	Te Olgul Dollyo chagi	10	100%
3	Chagi DWI	9	90%
4	Naeryeo chagi	7	60%
5	Ap chagi	5	50%
6	HOORYO chagi	4	40%
7	360	3	30%

Table (3) clear the expert opinions in determining the most important kicks for taekwondo players. The researcher was satisfied with choosing the kicks that achieved a percentage (90%)and more, as follows: DOLLYO chagi, Te Olgul Dollyo Chagi DWI

Results of a questionnaire to determine the most important physical variables in taekwondo:

The researcher designed a questionnaire containing physical variables extracted by analyzing the references and presenting them to experts to choose and define the most important physical variables that fit with the research sample.

Table(4)
The percentage of expert opinions on the most important physical variables associated with kicks

Variables	Exports opinions	percentage
Physical variables		
Flexibility	10	100%
Muscular strength	9	90%
Muscular endurance	8	80%
Agility	6	60%
Balance	6	60%
Compatibility	5	50%
Kinetic speed	5	50%
Responsiveness	4	40%

Table (4) clear the expert opinions in determining the most important physical variables associated with kicks. The researcher was satisfied with choosing the physical variables that achieved (70%) and more, as follows:

Flexibility (100%)

Muscular strength (90%)

Muscular endurance (80%)

Scientific coefficients for tests used in research

Honesty

The researcher used the honesty of differentiation, by conducting tests on a distinct sample which is the exploratory research sample from the field of taekwondo. The most important thing that distinguishes them is the study of taekwondo course over the course of three academic years and the distinctive group who are students of the second year. The researcher has calculated the significance of the differences between the two distinct and non-distinct groups to ensure the validity of the tests. Table (5) shows this:

Table(5)
Significance of the differences between the averages for the individuals
of the distinct and non-distinct group for Physical variables tests and
kicks N=20

Table (T) value at a level 0.05= 1.86

variables		Measurement unit	Distinct group		Non-distinct group		Calculated(T) value	Significance level
Physical variables	Sit from lying down(30 Sec)	Time	29.60	6.97	16.00	2.73	6.30	signify
	Wide jump of stability	meter	2.11	7.41	1.81	29.02	2.23	signify
	Trunk lift test from flatness	Number	45.60	6.06	24.40	4.39	6.32	signify
	Bend the arms from oblique flatness	Number	33.20	4.43	20.00	4.61	3.34	signify
	Bend the torso forward to stand	Cm	18.80	3.03	7.80	5.26	4.04	signify
	Bend the back of the trunk Lift the arms out of flatness	Cm	25.60	3.64	13.40	4.21	4.89	signify
kicks	DWI Chagi, then DOLLYO Chagi, then Te Olgul Dollyo chagi.	degree	27.40	6.38	11.00	3.80	4.93	signify

Table (5) shows that there are statistically significant differences between the distinct and non-distinct groups in favor of the distinct group, which indicates the validity of the test in measuring what was set for it.

Stability

The researcher used the Re-Test method after (10) days from applying the first test on the non-distinct group to calculate the stability of the test by calculating the correlation coefficient between the two applications, on the same exploratory group, and this is shown in table (6).

Table (6)
The mean, standard deviation, and correlation coefficient for physical variables tests and kicks N=10

variables		Measurement unit	First application		Second application		(R) value	Significance level
Physical variables	Sit from lying down(30 Sec)	Time	29.60	3.97	29.40	4.39	0.985	Non-signify
	Wide jump of stability	meter	2.11	7.41	2.08	6.76	0.927	Non-signify
	Trunk lift test from flatness	Number	45.60	6.06	45.60	5.54	0.974	Non-signify
	Bend the arms from oblique flatness	Number	33.20	4.43	33.40	4.61	0.959	Non-signify
	Bend the torso forward to stand	Cm	18.80	3.03	19.00	3.08	0.882	Non-signify
	Bend the back of the trunk Lift the arms out of flatness	Cm	25.60	3.64	25.00	3.24	0.994	Non-signify
kicks	DWI Chagi, then DOLLYO Chagi, then Te Olgul Dollyo chagi.	degree	27.40	6.38	27.60	6.22	0.941	Non-signify

Table (T) value at a level 0.05= 0.549

Table (6) shows that the **correlation coefficient** between the first and second applications are statistically significance at significance level of 0.05 , which indicates the stability of the used test.

Time distribution of the program

Determine the total time for training during the program followed according to the following:

Number of weeks =8 weeks

The number of training units per week = 2 training units

Training unit time =120 minutes

The total time of the training program =8 weeks x2 training units x 120 minutes. Training unit time =1920 minutes

Pilates training time from the total time of the training program

Through the form that was presented to the experts, it was reached:

Pilates workout time = 15:30minutes during the program.-

The total time of Pilates training during the training program = 480 minutes.-

Steps to implement the training program

The researcher implemented the training program as follows

The researcher conducted the survey study on a survey sample from the original community whose number was (5) students, which includes students from outside the main sample, on Sunday 24/2/2019. The study targeted the following:

Selection and training of assistants to make measurements.-

Learn about available tools and devices and their suitability.-

-Accuracy of organization and workflow in measurement.

-Determine the timing and procedures of the tests and how they are serialized.

-Identify the difficulties that the researcher may face when applying tests and measurements and how to overcome them.

The study resulted in the following

-Validity of measuring instruments and devices for use:

Training assistants in applying tests-

-Knowing the time of the tests and their order

-Overcome some difficulties that may constitute a disability during applying.

-Coordinate the appointments to implement the program with the players.

Pre measurements of the group in question:

Pre measurements were performed on the research group for some of the kicks variables, as well as the physical variables under investigation, on Mondays and Tuesday 25,26/2/2019.

Homogeneity of the research sample

The researcher has made homogeneity to the research sample in order to ensure that the research sample is distributed fairly in all variables under investigation.

Table(7)
Arithmetic mean, median, standard deviation, and torsion coefficient
value in Kicks and physical variables of the sample in question N=15

variables		element	Measurement unit	Arithmetic mean	median	standard deviation	torsion coefficient
Physical variables	Sit from lying down(30 Sec)	Muscle strength	Time	26.6	26	2.56	0.62
	Wide jump of stability	Muscle strength	meter	213.1	212.5	6.61	0.07
	Trunk lift test from flatness	Bearing strength	Number	32.8	30	9.45	0.31
	Bend the arms from oblique flatness	Bearing strength	Number	39.8	40	15.30	-0.24
	Bend the torso forward to stand	flexibility	Cm	15.3	16.5	9.05	-0.71
	Bend the back of the trunk	flexibility	Cm	21.0	20	5.29	0.51
	Lift the arms out of flatness	flexibility	degree	18.4	17.50	6.74	0.59
kicks	DWI Chagi, then DOLLYO Chagi, then Te Olgul Dollyo chagi.		Time	5.9	6	0.52	-0.39

Table (7) clear that all torsional coefficients have been confined between (± 3), which means that there is homogeneity among the members of the research sample in the kicks and physical variables.

Program implementation

The proposed training program was applied for(8) weeks on the research sample and implementing the training units in the hall of the Faculty of Physical Education, Assiut University in the period from 3/3/2019 until 22/4/2019

Post measurements of the group in question

The researcher made the post measurements of the variables under investigation on Sunday 28/4/2019 for all the tests under consideration (kicks and physical variables) in the same manner of applying the pre-measurement and under the same conditions, then the data was collected, classified, tabulated and then statistically processed

Statistical treatments used in the research

The researcher prepared, tabulated and analyzed the data statistically, with the results being extracted and interpreted for each of the following statistical methods: arithmetic mean, median, standard deviation, torsional coefficient, correlation coefficient and "T" test.

View and discuss the results

Show the results of the first hypothesis

Which states that there are statistically significant differences between the pre and post measurements in some physical variables of the research sample in favor of the post measurements.

Table (8)

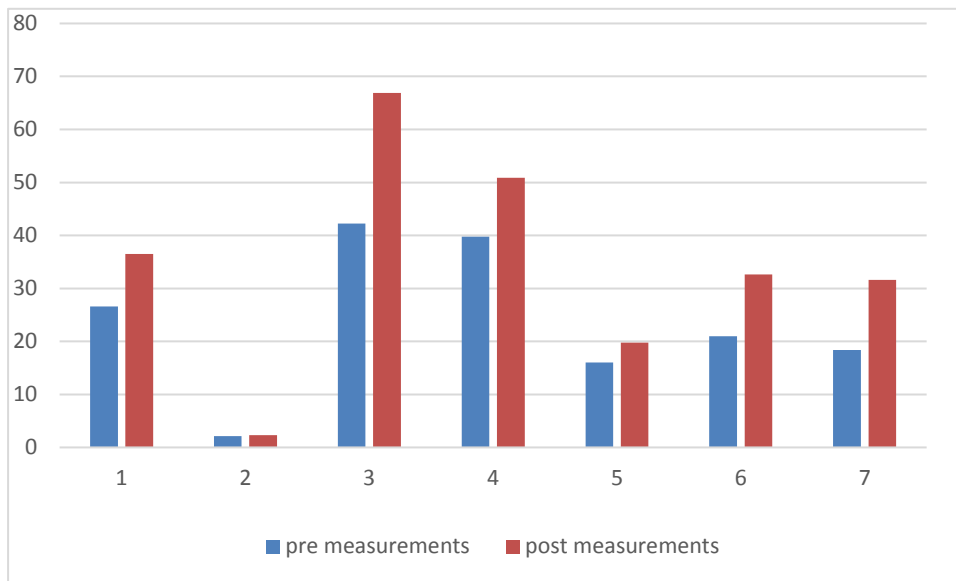
Significances of the differences between the averages of the pre and post measurements for the research sample in the physical variables

N=15

variables	Measurement unit	Pre measurements		Post measurements		Calculated (T) value	Improvement percentage%	
Physical variables	Sit from lying down(30 Sec)	Time	26.62	2.55	36.50	8.97	-3.46	37.11
	Wide jump of stability	meter	2.13	9.61	2.30	10.50	-4.78	7.98
	Trunk lift test from flatness	Number	42.25	6.25	66.87	14.90	-4.95	58.27
	Bend the arms from oblique flatness	Number	39.75	16.31	50.87	16.03	-4.32	27.97
	Bend the torso forward to stand	Cm	16.00	7.87	19.75	7.70	-11.96	23.43
	Bend the back of the trunk	Cm	21.00	5.29	32.62	4.27	-6.75	55.33
	Lift the arms out of flatness		18.4	6.74	31.62	10.30	-4.43	72.12

Table (T) value at a level 0.05= 1.86

It is clear from table (8) that there are statistically significant differences between the mean scores of the pre and post measurements in some physical variables of the research sample in favor of the post measurement, where the calculated value of (T) was greater than its tabled value at significance level of 0.05 in all the variables. As the calculated value of (T) ranged between(3.46: 11.96). Also the improvement rate ranged between (7.98: 72.12%).



Show the results of the second hypothesis

Which states that there are statistically significant differences between the averages of the pre and post measurements in some kicks under consideration in favor of the averages of the post measurements.

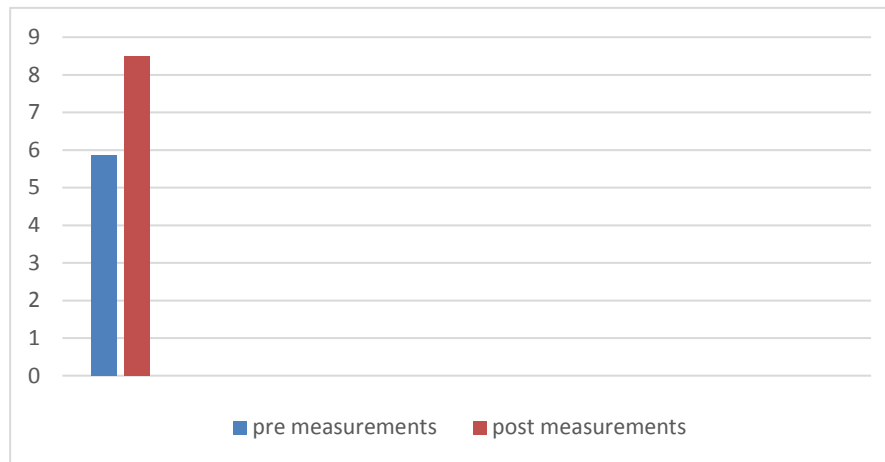
Table (9)

Significances of the differences between the averages of the pre and post measurements for the research sample in kicks N=15

variables		Measurement unit	Pre measurements		Post measurements		Calculated(T) value	Improvement percentage%
kicks	DWI Chagi, then DOLLYO Chagi, then Te Olgul Dollyo chagi.	degree	5.87	0.517	8.50	0.755	-16.75	44.80

Table (T) value at a level 0.05= 1.86

It is clear from table (9) that there are statistically significant differences between the mean scores of the pre and post measurements in the level of kicks of the experimental group in favor of the post measurements. As the calculated value of (T) was greater than the tabled value of (T) at the significance level of 0.05. As the calculated value of (T) was (16.75) and the rate of improvement was (44.80).



Discuss the results

It is clear from table (8) that there are statistically significant differences between the mean scores of the pre and post measurements in some physical variables of the research sample in favor of the post measurement, where the calculated value of (T) was greater than its tabled value at significance level of 0.05 in all the variables. As the calculated value of (T) ranged between (3.46: 11.96). Also the improvement rate ranged between (7.98: 72.12%).

The researcher attributes the reason for these differences in the physical variables to the effect of codified exercises according to the modern scientific methods used by the researcher during the proposed training program, which had an effective effect in improving the physical variables.

"Ehab Ahmed Al-Metwally's study" (2013)(5) also confirms that the program, which included Pilates exercises, led to a noticeable improvement in some elements of fitness (muscle strength – flexibility).

And "Caron Carter " (2001)notes that pilates training is characterized by its ability to develop muscle strength without the appearance of muscle mass of the various muscles of the body and without the clear increase of the physiological section of the muscles ; thus it gives a better shape and strength to the body.(28.21)

This is confirmed by "Scott " (2007) (34) that Pilates training improves the rate of muscle stretch when performing the required image and by following its training principles.

It also indicates the study of both "Manal Talaat" (2014)(17) and "Ahmed Hussein Mohamed" (2016)(1) that pilates exercises increase the muscular strength, especially the muscles of the onyx, because when controlling the pilates exercises, they mobilize the largest amount of muscle fibers in the area that performs the exercise, which increases the

muscle strength of this region.

The researcher believes that Pilates exercises work to improve the muscle strength of the onyx muscles better than regular exercises, especially in the onyx area. This is evident through the results of the tests where the improvement rate was noticeable in some tests such as lifting the onyx from flatness (58.27%), as well as a marked improvement in the degree of flexibility of the joints where some exercises were applied on it, including the shoulder joint, as the improvement rate reached (72.12).

Thus, the first hypothesis is achieved. "There are statistically significant differences between the averages of the pre and post measurements in some physical variables (muscle strength - muscular endurance - flexibility) for the individuals of the sample in question, in favor of the averages of the post measurements.

It is clear from table (9) that there are statistically significant differences between the mean scores of the pre and post measurements in the level of kicks of the experimental group in favor of the post measurements. As the calculated value of (T) was greater than the tabled value of (T) at the significance level of 0.05. As the calculated value of (T) was (16.75) and the rate of improvement was (44.80).

The researcher attributes the improvement in the level of kicks performance in question to the training program using Pilates exercises, where these results are consistent with the study "Nahid Khairi" (2010)(18), as the training program is based on scientific foundations that suit the level and capabilities of female students and works to improve the level of their performance.

Ghaida Abdel Shakour's study (2009)(12) also confirms that the training program using Pilates exercises has a positive effect in improving the level of motor skills, as a result of strengthening the large muscles, including the muscles of the legs, abdomen, back, and arms, which are the most important muscles working in the motor performance of the skills.

Aml Alsayed Seleem (2016)(4) has reached that the proposed Pilates training program has a positive role in improving the skill level.

Therefore, the researcher believes that the Pilates training has had an effective impact on developing the level of kicks under consideration as it does not need long periods of training and this is what fits with the time allocated to students during the semester.

Thus, the second hypothesis is achieved. "There are statistically significant differences between the averages of the pre and post

measurements in some kicks for the individuals of the sample in question, in favor of the averages of the post measurements.

Conclusions and recommendations

Conclusions

In light of the research objectives, hypotheses and statistical treatments used by the researcher and based on what the research results showed, the researcher reached the following conclusions

1-The training program using Pilates exercises led to an improvement in the level of muscle strength, muscular endurance and flexibility, and this was demonstrated by the difference between the pre and post measurements

2-The training program using Pilates exercises led to an improvement in the level of kicks performance, as demonstrated by the difference between the pre and post measurements.

Recommendations

Within the limits of the research community and the selected sample, in light of the research objectives and hypotheses, and through the results, the researcher recommends the following:

1-Conducting similar studies to use Pilates exercises on different age stages and on other kicks.

2-The necessity of using Pilates training for juniors in taekwondo to develop fitness elements, especially muscle strength and flexibility

3- Conducting similar studies to compare pilates training with other training programs.

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