

The Effect of Using Tae-bo Trainings on Specific Physical Variables, the Concentration of Inter- Leukin-6, Creatine - Phosphokinase Enzyme in Blood and the Effectiveness of Performance Skill in Kata for Karate Young Female Players.

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Abstract

The paper aims to identify the effect of using Tae _ bo exercises of Karate young female players on the levels of some specific physical Variable such as (distinct speed power, agility, speed power, agility, speed bearing and flexibility), The concentration of Inter -leukin -6 and Creatine – Phosphokinase in blood, skill performance Kata (Heian Sandan, Heian Yondan and Heian Godan).(

The researcher uses the experimental methodology because it is appropriate to the type and goals of the study. She uses the experimental methodology because it is appropriate to the type and goals of the study. She uses the experimental design of pre and post measurements for Two groups: experimental and control.

The research community is intentionally chosen of Karate young female players at Sharqia Sport Stadium in Zaqqaziq, Sharqia Governorate. Their ages range between 13-14 years old. They have the green belt as minimum and the brown one as maximum .

They are enrolled in Sharqia Karate District for the sport season 2013-2014. They are 26 young female players .

The researcher uses the following Taols and means :

The suggested Tae_bo exercises, timer1/100 second, Central exit set to separate serum. Its speed is 3000 cycle/ minute, special chemical material to find out inter- leukin -6 and Creatine phosphokinase in blood, Kata skill performance level measurement (under study), physical tests to measure the level of some specific physical variables such as (distinct speed power, agility, speed bearing, flexibility).(

The researcher main conclusions are :

The suggested Tae_bo exercises have a positive effect on improving some specific physical variables (under study). research conclusions prove that experimental group has higher improvement percentages than the control one. They also lead to the increase of inter-leukin -6 concentration and the decrease of creatine phosphokinase enzyme in blood of the Karate young female players. furthermore, the use of Tae_bo exercises positively improve physical and physiological variables. They also have positively affected the rising improvement in Kata skill performance level (under study) of the experimental group compared with the control one. .

Introduction:

The Tae-bo trainings are considered one of the methods of exercises that are similar in nature in terms of pauses, kicks, punches in addition to the basic movements of Karate. Together, They aim to develop and improve the elements of The individual's physical fitness and physiological efficiency. Moreover, they depend on using hands and feet to perform movements that will activate the efficiency of body parts and generally improve its Kinetic ability through tuned musical rhythms. The exercises would thus include the kicks and punches of Karate, movements of expansion and contraction of yoga and the fixed and continuous movements of aerobics (1).

The Karate includes two kinds of competitions which have different characteristics and requirements according to the nature of performance: the contest-terms and the international law organizing the Karate contests. For

example, there are the contests of actual fighting (Kumite) and virtual fighting (Kata). The Kata is a series of consecutive defensive and offensive methods in different directions in which the player imagines fighting with one or more players through adopting various equilibrium positions. The Kata also includes individual and collective competitions(2).

Due to The fact that the Kinetic movement (Kata) includes several defensive and offensive skills in addition to different equilibrium positions, the researcher thinks that it is important to consider the salient requirements and the special physical components necessary to perform the Kata. These elements have a pivotal role which is essential to acquire and perfect skilful performance. Moreover, they help players to reach the highest possible level of their capabilities and their physical and physiological readiness.

Physical preparation is one of the most important duties of physical training. It develops and improves the

individual's physical and kinetic state to fulfil the requirements of physical activity during the training and competition process with the least physical effort. Besides, it promotes quick recovery and regains the individual's natural state.(3)

On the other hand, physical training may cause remarkable troubles in physical equilibrium of cells. For the muscle contraction increases the levels of plasma in several cytokines such as inter-lenkin -6 which is a part of peptides known as cytokines. The main source of cytokines are macrophages, almmovist, bone marrow and esoteric cells which act as messengers such as some endocrine hormones in its secreted and nearby places (4).

The positive immune role of cytokines helps renewing muscle cells to act more effectively during physical effort (5). In spite of the fact that physical training might improve some physical and physiological changes and skills for karate young players, the level of such variables does not precisely express the efficiency of cell responses during training or improve the mechanism of muscle functions and the low level of the training harmful effects on some of the vital organs of the karate young player. Accordingly, it fails to show the real essence of development precisely, hence, the significance of blood enzymes in that field.

The Creatine – Phosphokinase enzyme stimulates biochemical reactions of ATP production anaerobically through the phosphogen system (ATP-PC) to support training highly intensive requirements for short periods of time. The muscle spasm and rupture leads to increasing the level of that enzyme in blood. It is also considered an accurate indicator of developing the phosphate ability when the anaerobic system during physical exercises (6).

Measuring some blood enzymes of athletics reflects the effect of training on cells metabolic changes and the adequacy of recovery. Moreover, it acts as indicator to discover the harmful effects of training on skeletal muscles and other vital organs of the athletic's body (7).

The Problem and Significance of the Research:

The performance level is a basic requirement in all physical activities in general and karate sport in particular. That is why most researchers are interested in finding out the modern and most developed ways, means and methods of training field to improve the performance level and reach the highest physical levels. Many scientists maintain that annual training planning is vital due to the rising of the number of competition in which players take part and the expansion in using various training planning to ensure the speed of recovery processes in addition to acquiring specific qualities for the various preparation phases. That

is why, the researcher find it necessary to be acquainted with scientific references and information web to find out the recent ways and methods of modern training, particularly those which have specific goals pertaining to physical training in terms of physical and physiological fitness of the individual,e.g. the Tae-bo exercises.

Due to the significance of preparation and its various aspects which are essential to performing Kinetic clauses (Kata) with greater efficiency during competitions and the researcher's own following up of the young players of karate exercises at Sharqiás Stadium, she notices the decrease of their performance level at kata compared with the players's performance at the Republic Championship, in addition to the fact that some of them suffer from a rupture in the muscular fibers in some working muscles during training and competition. The researcher argues that the decrease of skill performance of kata is due to the fact that some trainers focus more on performance than developing the physical and functional abilities of the young player so that she can complete and achieve the highest possible level in kata performance. Because of the similarity between the Tae-bo exercises and karate sport, the researcher is urged to conduct this research to improve the level of young karate players through using the Tae-bo exercises which are similar, in their nature, to karate sport. She also aims to know their effect on some specific physical variables, the concentration of inter-lenkin-6 and Creatine – Phosphokinase enzyme in blood in addition to the effectiveness of skill performance of kata for young karate players.

The Research Goals:

The research aims to realize the effect of using the Tae-be exercises for young karate players on the following:

- 1) the level of some specific physical variables such as (the distinct speed power, agility, speed bearing and flexibility)
- 2) the concentration of inter – lenukin- 6 and Creatine-Phosphokinase enzyme in blood
- 3) the skill performance level of kata (Heian- Sandan, Heian -Youdan and Heian -Godan).

The Research Hypotheses:

According to the study goals, the researcher assumes the following:

- 1)There are significant statistical differences between pre and post measurements of the experimental group for sake of the post measurement at the level of some specific physical variables and the concentration of inter- leukin- 6 and Creatine – Phospho kinase enzyme in blood and the

skill performance of kata (under study) of the young karate players.

2) There are significant statistical differences between pre and post measurements of the control group for the sake of post measurement at the level of some specific physical variables, the concentration of inter-leukin – 6 and Creatine – Phosphokinase in blood and the skill performance level of kata (under study) of the young karate players.

3) There are significant statistical differences between pre and post measurement of both experimental and control group for the sake of the experimental group at the level of some specific Physical variables, the concentration of inter-leukin-6 Creatine-Phosphokinase enzyme in blood and the level of skill performance of kata (under study) for the young karate players.

The Research Terminology

1) The Tae – bo exercises: one of the exercises forms that depend on the movements of self – defense arts. They are divided into two parts: Tae, meaning foot, i.e. launching strikes by foot in the form of kicks, and bo, i.e., abbreviation of eli boxings which refers to moving arms in the form of direct punches (8).

2) Inter – leukin- 6: secreted in blood as a result of the contraction of skeleton muscles by the Ta and macrophages cell to stimulate the immune response. It is considered one of the anti – inflammations and aims to stimulate the mobilization of energy leading to increasing the body temperature degree (9)

3) The Creatine – Phosphokinase enzyme: an enzyme the Cytoplasm of the skeleton muscles cells, the brain and heart tissue. Its function is to break Creatine Phosphate to obtain enough energy necessary for muscles to work. It is also considered an indicator of muscles destruction or muscle injury (10).

4) The level of skill performance: the level of the players' perfection of the skills of the game. It refers to the ideal image of artistic performance and the effective method of performing a specific movement with little effort economy. (11)

5) Kata: is a kinetic series of basic skills of karate both defensive and offensive, which the player learns to apply in virtual fighting. They begin and end at the same place whether the movement is straight or multi-directional. (12)

The Research Procedures

Research Methodology:

The researcher uses the experimental methodology as it is suitable for the type and goals of this research. The

experimental design which includes pre and post measurements for two groups: experimental and control is used.

The Research Community and Sample:

The research community has been chosen intentionally of young karate female players at Sharqia Sport Stadium in Zaqaizq Governorate.

Their age varies between 13-15 year old. They have the green belt as minimum and brown belt as maximum. They are enrolled at Sharqia Karate District for the sport season 2013-2014. The research community consists of 26 female young players.

The researcher has chosen the research community for the following reasons:

1- The approval of the Karate trainer at Sharqia Sport Stadium on the application of suggested exercises on the players.

2- The approval on making the research measurements on the players and attending training regularly during the programme.

3- The players' continuity of training. Their training age should not be less than 4 years as minimum.

4- The availability of health safety for the players. They should not be subject to any medical treatment.

The Homogeneity of the Research community

The researcher attempts to make the members of the research community, who consist of 26 young karate player, homogeneous on Saturday and Sunday: 2/2/2014 based on the variables of age, tallness,

weight and training age. The sprain handlings of growth and training age rates of the research community ranges between. 647,1.88, i.e., they are confined between ± 3 which reflects the homogeneity among the members of the research community members in terms of these variables. She fulfils that homogeneity in some specific physical variables such as (distinguishing speed power, agility, speed bearing, flexibility), and level of skill performance in (kata) (Heian- Sandan, Heian -Yondan, Heian- Godan). The values of sprain dealings of the research community in some specific physical variables and the skill performance level of kata (under study) rang between...239 and 1.75/i.e., they are confined between ± 3 which reflects the homogeneity among the members of the research community in terms of there variables.

After making the homogeneity of the community research, the researcher drew the basic research sample out of a homogeneous community randomly. It consists of 20

female young players. They are divided into two groups: experimental and control, each consists of 10 young players. The researcher drew 6 young players randomly of the original community research and outside the basic research sample to conduct exploratory studies. Next, she attempted to create equivalence between both research groups: experimental and control during the period from 13/2/2014 to 15/2/2014 in the following variables: age, tallness, weight, training age and some specific physical variables (distinct speed power, agility, speed bearing, flexibility), inter-leukin-6 and Creatine Phosphokinase enzyme in blood and the skill performance level of kata (Heian Sandan, Heian Yondon, Heian Godan). The results show that there are no significant statistical data at the level of 0.05 between the experimental and control groups in the variables of age, total body tallness, weight and training age in addition to some specific physical variables (under study), the concentration of inter-leukin-6 and Creatine Phosphokinase enzyme in blood and the skill performance level of (kata) (under study) which reflects the equivalence of the research groups in these variables.

Tool and Means of Data collection

First: Used Equipment and Tools:

- Alrstamitre calibrated to measure the total body tallness
- Medical scale to measure weight
- 1/100 meter timer
- Musical rhythm
- Centrifuge to separate serum up to 3000 cycle per minute speed.
- Chemical substance to detect inter-lenkin-6 in blood
- Spectrophotometer (RA-50 Chemistry Analyzer)
- Cuvettes with light path of 1 cm.
- Pipette (listed) 5 mm
- Test tube to save blood samples
- Plastic syringes, clot blocker, medical cotton, disinfectant dettol, ice box, wound adhesives

Second: Form

- Survey form of experts' opinions to determine the most important physical variables of kata young female players in karate sport.

- Questionnaire of experts' opinions to determine the most important tests to measure some physical variables of kata young players in karate sport.

- Questionnaire of experts' opinions to determine katas of Heian group for karate young players.

- Questionnaire of experts' opinions to determine the most important Tae – bo exercises of karate young players.

- Questionnaire of experts' opinions to determine the period to do the suggested Tae – bo exercises for karate young players, the number of weekly units and the time average of their implementation during the module.

- Registration data and measurement form of every young female players.

Third: Special Physical Variables (Under Study):

A form has been displayed to determine the most important special physical variables of kata's young players in karate to some experts of karate sport. The researcher accepts the special physical variables which won % 80 and more of the total experts' opinions. They are: the distinct speed power, agility, speed bearing and flexibility.

Fourth: Physical Tests (Under Study):

A form has been displayed to experts of karate sport to determine the most important tests to measure some special physical variables of kata young female players. The researcher accepts the physical tests that won % 80 and more of the total number of experts' opinions. They are:

- Performance test of counter front straight punch in 10 second to measure the distinctive speed power of arms.

- Performance test of circular kick in 10 seconds to measure the distinct speed power of legs.

- Test of quartet leap in 10 seconds to measure agility

- Performance test of short front straight punch in 20 seconds to measure arms speed bearing.

- Test of measuring the pelvic angle to measure flexibility.

- Test of trunk draping from standing to measure flexibility.

Fifth: Physiological Measurements:

Blood samples were withdrawn by a medical test specialist in Ultra laboratory for medical tests in Zaqaq to measure the following variables

- Inter- leukin – 6 in blood. It's nature average in blood is 2.6 bicgram /mm during rest time.

- Creatine – Phosphokinase enzyme in blood. It 's natural value is between 10-85 international unit / liter.
- The following conditions were taken into consideration during making measurements:
- The members of the research sample fasted for at least 8 hours before making measurements.
- Relaxation and avoidance of nervous tension before measurements.

Sixth: Determining The Most Important Katas of Heian Group for Karate Young Female Players (Under Study):

The researcher reviews the katas that the young karate players learn at Shutokan school. Known as the kata Heian group, they are considered the basic group that young players should learn (12), (13). The researcher displays a form on the group for karate young female players (Under Study). Their ages are between 13-15 years old. The form also shows those who have won the green belt as minimum and the brown belt as maximum. The researcher accepts the katas that won %80 and more of the total number of experts ' opinions. They are:

- The third kata (Heian – Sandan), the fourth kata (Heian -Youndan), and the fifth kata (Heian- Godan).

Seventh: Measuring the Skill Performance Level of Katas (Under Study):

The skill performance level of katas (under study) has been measured through the young player's performance of the chosen katas before a committee of three arbitrators. Every arbitrator gives the young player a mark out of ten for every kata after finishing her performance. The performance level is estimated according to kata performance standards of international arbitration rules in karate. The Three arbitrations 'marks are then gathered. The average of the total marks is taken as the young player's performance level mark in the chosen katas.

The First Exploratory study:

The researcher has conducted the first exploratory study from 3/2/2014 to 8/2/2014 on the members of the research sample (6 young female players) including the research community and outside the basic research sample. The aim is to make sure of the validity of the equipments and tools used in measurement and the scientific coefficients (truthfulness – steadiness) of the physical test and skill performance level of katas (Under Study)

Scientific Criterion (Truthfulness - Steadiness) of Physical and skill Test (Under Study):

First: Truthfulness

The researcher uses sincerity differentiation to calculate truthfulness factor on Wednesday 5/2/2014. She applies tests of some special physical changes and the skill performance level of kata (Under Study) on the members of the reconnoitering sample which consists of 6 young female karate players from both the research community and outside the basic sample as undistinguished group. The same tests are also applied on another sample of first – class players of karate with brown dan belt whose ages range from 13- 15 years old. They are 6 karate team players at Sharqia Stadium in Zaqaq as special group. The used tests in the research have been verified through significant statistical data at 0.05 level between the distinct and indistinct groups in some specific physical changes and the skill performance level of kata (Under Study) for the sake of the distinct group.

Second: Steadiness

In order to calculate the steadiness factor in the tests of some specific physical variables and the skill performance level of kata (Under Study), the researcher uses the method of applying tests and redistributing them on the members of exploratory sample from 5/2/2014 to 8/2/2014 with a time break of 3 days.

She also calculated the simple correlation coefficient between the first and second applications. The results show that there is correlative statistical relation mark at the level of 0.05 between the results of the first and second applications in the tests of some specific physical variables and the skill performance level of kata (Under Study) which reflects the stability of these tests.

Seventh: Determining Suggested Tae-bo Exercises

Reviewing the relevant scientific studies which deals with Tae-bo exercises programs such as those made by Sherein Ahmed Youssef (2004), Alia Adel Shams Eldeen (2004), Hala Nabil Yehya (2008) and Rasha Taleb Zeiab (2012). (14), (15), (16), (17) and the international web sites such as (18), (19), (20), (21), and (22), the researcher identifies a group of Tae-bo exercises. They have been displayed on experts of karate to determine the appropriateness of the suggested exercises to the age of the research sample. Experts determined 38 Tae-bo exercises to be carried out by the experimental group of the research in the main part of the daily training unit. The trainer will be responsible for implementing these exercises.

Determining the Aim of using the Suggested Tae-bo Exercises

The research aims to identify the effect of using Tae-bo exercises by karate young female players whose ages range between 13-15 years old and who have obtained the

green belt as minimum and the brown one as maximum on:

- The level of some specific physical variables such as (distinctive speed power, agility, speed bearing and flexibility)
- The concentration of inter-leukin -6 and Creatine-Phosphokinase in blood in addition to the skill performance level in kata (Heian- Yondan and Heian-Godan).

The Bases of Founding the Suggested Tae-bo Exercises:

- The exercises should fulfill the goals set for them in the research.
- The appropriateness of the exercises to the age phase of the research sample.
- Considering the individual differences and variation of exercises.
- Adopting standardized scientific approach during the planning and implementation of exercises to be suitable for the age of the research sample by determining the intensity of training loads and taking into account the test periods within exercises and among groups.
- Diversity of Tae-bo exercises of the upper and lower limbs.
- Gradation from easy to difficult exercises.
- Taking into account the correct way of performance during exercises.

Identifying the Suggested Elements for Using the Tae-bo Exercising and kata training during the Daily Training Unit:

Reviewing the reference survey of the relevant scientific studies of physical and skill training programmes in karate such as those of Emad AbdelFatah Elserly (2001), Mostapha Ibrahim Youssef (2001), Maida Mohammed Abdel Hamid (2003), Adel Ibrahim Ahmad (2008), Lide et-al(2008), Mohammed AbdelRahman Aly (2009), Moatz Helal Helal (2010) and Safaa Saleh (2010). (2), (23), (24), (25), (26), (27), (28) and (29), and exploring the opinions of physiology and karate experts to determine the suggested elements of using Tae-bo exercises and kata training, the researcher accepts the elements that won %80 and more of the total number of expert They include:

- The numbers of weeks to implement Tae-bo exercises: 10 weeks
- The number of training units in one weeks: 3 units

-The formation of weekly loading cycle: 10m.

-The intensity of the utmost repetition of doing the exercise: 70 -90 %

-Training loads: upper average pre maximum and maximum.

Determining the Intensity of Training Load:

The Intensity of training load has been determined according to the following equation:

- 1st Equation to determine the maximum rate of heart beats

Maximum rate of heart beats = $220 - \text{age} = \text{pulse/minute}$

- 2nd Equation to determine the appropriate pulse for the required intensity:

Pulse value = load degree % x (the difference between maximum pulse during rest period) + pulse rate during rest time = $\text{pulse/minute} (30)$.

Determining the Training Load Degree

The training load degrees varies during the carrying of the programme and according to experts opinions between (upper average, pre maximum and maximum)

The Division of Load Degrees According to Heart Rate:

- Low load: lower than 130 beat/minute.
- Average load: from 131-150 beat/minute.
- Upper average load: from 151-165 beat/minute.
- Lower than maximum load: from 166-180 beat/minute.
- Maximum load: 180 beat/minute. (31).

Second Exploratory Study:

It has been applied in the time period from 9/2/2014 to 12/2/2014 on the same members of the research sample of the first exploratory study which includes 6 young players of the research community and outside the basic research sample. The results show the appropriateness of the used exercises by the experimental group of the research sample and the suitability of the training place to carry out the suggested exercises.

The Daily Training Unit:

The team trainer at Sharqia Stadium in Zaqqia applies a program to standardize training for both experimental and control groups. The only difference in the training of both groups was in the main part of the daily training unit of Tae-bo exercises which takes 20-40 minute. Both groups

were separated. The experimental group did The taе- bo exercises suggested by the researcher. The control group, on the other hand, continued the remaining conventional parts of the training unit with the team coach.

-The time period of doing taе - bo exercises in the daily training unit ranges between 20-40 minutes.

-The training time of katas in the daily training unit during the main part is 10 minutes. During that time, the artistic performance and perfection of kata has been improved. The economy of the movement has been promoted. The time period of its implementation is als developed. The training included performing offensive and defensive skills of katas (Under Study). It also emphasizes the speed of performance with consecutive training of skills of kata powerfully, at high speed and in different directions.

-Calming time in the daily training unit is 5 minutes. It includes exercises that aim to help karate players to recover after the exerted effort. It also includes relaxation, swinging, arms rotations, walking, light running and breath regulation exercises.

-The number of training units in the suggested programme:30 training units. It consists of 3 training units / per week (on Sunday, Tuesday and Thursday) for 10 weeks.

Pre Measurements

The researcher made pre measurements of the members of the research sample (both the experimental and control groups) in the period from 13/ 2/ 2014 to 15/2/2014) as the following:

-Measuring the concentration of inter-leukin -6 and Creatine -Phosphokinase enzyme in blood on Thursday 13/2/2014.

Displaying and Discussing Results:

First: Displaying Results:

Table (1)

The Significance of the Difference between Pre and Post Measurements and the Improvement Percentages of the Experimental Group in Some Specific Physical Variables (under study) of Karate Young Female Players. N=10

Physical Variables	Tests	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
			M1	$\pm P1$	M2	$\pm P2$		
Distinct Speed Power	Performing right reverse front straight punch in 10 second	Number	7.00	1.45	11.15	2.60	4.41*	59.28%
	Performing left reverse front straight punch in 10 second	Number	6.70	1.33	10.65	2.34	4.64*	58.95%
	Performing right circular kick in 10 second	Number	6.40	1.29	9.74	2.02	4.12*	52.18%

-Measuring some specific physical variables (under study) on Friday 14/2/2014.

-Measuring the skill performance level of katas (under study) on Saturday 15/2/2014.

Implementing the Suggested Taе bo Exercises through the Daily Training unit:

The suggested Taе _bo exercises have been implemented through the main part of the daily training unit on the members of the experimental group in the period from Sunday 16/2/2014 to Thursday 24/4/2014 at Sharqia Sport Stadium in Zaqaзиq for 10 weeks including 3 training modules per week: on Sunday, Tuesday and Thursday. The control group was trained in the conventional way by the karate team coach at Sharqia Sport Stadium in Zaqaзиq at the same previous time period like the experimental group. Time has been taken into account for both groups so that they will not be affected by time difference

Post Measurements:

The researcher conducted post measurements of the members of the research sample in the period from 25/4/2014 to 27/4/2014 in the same arrangement and conditions of pre measurements as the following:

-Measuring some specific physical variables (under study) on Saturday 26/4/2014.

- Measuring the skill performance level of katas (under study) on Sunday 27/4/2014.

Statistical Processors:

The researcher processed data statistically by using the following statistical methods: SMA, median, torsion modulus, standard deviation, Test (T) - simple correlation coefficient- percentages % (improvement percentages).

Physical Variables	Tests	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
			M1	$\pm P1$	M2	$\pm P2$		
	Performing left circular kick in 10 second	Number	6.60	1.17	10.08	2.19	4.43*	52.72%
Agility	Quartet leap in ten seconds	Number	5.34	0.99	8.06	1.16	4.64*	50.94%
Speed Bearing	Performing circular kick (right) in 25second	Number	14.06	4.22	21.25	3.17	4.33*	51.13%
	Performing circular kick (left) in 25second	Number	13.32	4.03	20.77	3.28	4.54*	55.93%
	Performing short right front straight punch in 20 seconds	Number	19.26	5.22	26.42	4.07	3.43*	37.18%
	Performing short left front straight punch in 20 seconds	Number	18.22	5.11	25.76	3.62	3.80*	41.38%
Flexibility	Measuring pelvic joint angle	CC	21.80	4.12	27.97	3.87	3.47*	28.30%
	Trunk draping from standing	CC	5.42	2.08	8.48	1.31	3.92*	56.46%

The Table T Value at 0.05 level = 2.262

*Mark at level 0.05

Table (2)

The Significance of Difference between Pre and Post Measurements and Improvement Percentages of the Experimental Group in the Concentration of Inter- leukin – 6 and Creatine – Phosphokinase Enzyme in Blood N=10

Physiological Measurements	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
		M1	$\pm P1$	M2	$\pm P2$		
Inter - leukin -6	Beco gram / mm. liter	2.73	0.27	3.99	0.44	4.6*	45.05%
Creatine – Phosphokinase Enzyme	Unit/ Liter	60.88	6.94	40.45	4.86	5.23*	33.56%

The Table T Value at 0.05 level = 2.262

*Mark at level 0.05

Table (3)

The Significance of Difference between Pre and Post Measurements and Improvement Percentages of the Experimental Group in the Skill Performance Level in Kata (Under Study). N=10

Skill Performance Level of Kata	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
		M1	$\pm P1$	M2	$\pm P2$		
Heian - Sandan	Mark	6.70	1.33	9.53	1.49	4.48*	42.24%
Heian - Youdan	Mark	6.60	1.17	9.16	2.03	3.46*	38.79%
Heian - Godan	Mark	6.25	0.97	9.19	2.11	4.01*	47.04%

The Table T Value at 0.05 Level = 2.262

*Mark at level 0.05

Table (4)

The Significance of Difference between Pre and Post Measurements and Improvement Percentages of the Control Group in the Physical Variables (Under Study). N=10

Physical Variables	Tests	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
			M1	$\pm P1$	M2	$\pm P2$		
Distinct Speeding Power	Performing right reverse front straight punch in 10 second	Number	7.06	1.24	8.50	1.52	2.32*	20.39%
	Performing left reverse front straight punch in 10 second	Number	6.40	1.29	7.82	1.34	2.41*	22.19%
	Performing right Circular kick in 10 second	Number	6.60	1.17	7.94	1.41	2.31*	20.30%
	Performing left Circular kick in 10 second	Number	6.20	1.14	7.57	1.22	2.59*	22.09%
Agility	Quartet leap in ten seconds	Number	5.22	0.82	6.17	0.93	2.42*	18.19%
Speed Bearing	Performing right circular kick in 25 second	Number	14.14	4.09	17.53	2.02	2.35*	23.97%
	Performing left circular kick in 25 second	Number	13.43	3.98	16.52	1.58	2.29*	23.00%
	Performing short right front straight punch in 20 seconds	Number	18.98	5.06	22.93	1.74	2.33*	20.81%
	Performing short left front straight punch in 20 seconds	Number	18.16	5.54	22.29	1.18	2.30*	22.74%
Flexibility	Measuring pelvic joint angle	CC	21.46	3.97	24.49	1.21	2.31*	14.11%
	Trunk draping from standing	CC	5.60	1.93	7.13	0.63	2.38*	27.32%

The Table T Value at 0.05 Level =2.262

*Mark at 0.05 level

Table (5)

The Significance of Difference between Pre and Post Measurements and Improvement Percentages of the Control Group in the Concentration of Inter- leukin – 6 and Creatine- Phosphokinase Enzyme in Blood N=10

Physiological Measurements	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
		M1	$\pm P1$	M2	$\pm P2$		
Inter – leukin -6	Beco gram / mm. litre	2.63	0.56	2.86	0.37	2.93*	8.75%
Creatine – Phospho kinase Enzme	Unit/ Litre	61.20	7.22	53.45	4.33	4.77*	12.66%

The Table T Value at 0.05 Level =2.262

*Mark at 0.05 level

Table (6)

The Significance of Difference between Pre and Post Measurements and Improvement Percentages in the Skill Performance Level of Kata (Under Study). N=10

Skill performance level of kata	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
		M1	$\pm P1$	M2	$\pm P2$		
Heian - Sanda	Mark	6.50	1.37	7.80	1.15	2.30*	20.00%
Heian - Youdan	Mark	6.20	1.14	7.43	1.23	2.41*	19.83%
Heian - Godan	Mark	6.10	1.03	7.35	1.16	2.55*	20.49%

The Table T Value at 0.05 Level =2.262

*Mark at 0.05 level

Table (7)
The Significance of the Difference between Pre and Post Measurements of both Experimental and Control Groups in Some Specific Physical Variables (Under Study). N1=N2=10

Physical Variables	Tests	Measuring Unit	Experimental Group		Control Group		T Value	Improvement Percentage %
			M1	$\pm P1$	M2	$\pm P2$		
Distinct Speed Power	Performing right reverse front straight punch in 10 second	Number	11.15	2.60	8.50	1.52	2.78*	23.76%
	Performing left reverse front straight punch in 10 second	Number	10.65	2.34	7.82	1.34	3.32*	26.57%
	Performing right circular kick in 10 second	Number	9.74	2.02	7.94	1.41	2.31*	18.48%
	Performing left circular kick in 10 second	Number	10.08	2.19	7.57	1.22	3.17*	24.90%
Agility	Quartet leap in ten seconds	Number	8.06	1.16	6.17	0.93	4.02*	23.45%
Speed bearing	Performing right Circular kick in 25 second	Number	21.25	3.17	17.53	2.02	3.15*	17.50%
	Performing left Circular kick in 25 second	Number	20.77	3.28	16.52	1.58	3.69*	20.46%
	Performing short right front straight punch in 20 seconds	Number	26.42	4.07	22.93	1.74	2.51*	13.21%
	Performing short left front straight punch in 20 seconds	Number	25.76	3.62	22.29	1.18	2.89*	13.47%
Flexibility	Measuring pelvic joint angle	CC	27.97	3.87	24.49	1.21	2.72*	12.44%
	Trunk draping from standing	CC	8.48	1.31	7.13	0.63	2.94*	15.91%

The Table T Value at 0.05 Level =2.262

*Mark at 0.05 level

Table (8)
The Significance of the Difference between Pre and Post Measurements of both Experimental and Control Groups in the Concentration of Inter- leukin – 6 and Creatine- Phosphokinase Enzyme in Blood N1=N2=10

Physiological Measurements	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
		M1	$\pm P1$	M2	$\pm P2$		
Inter – lenkin -6	Beco gram / mm. liter	3.99	0.44	2.86	0.37	6.24*	28.32%
Creatine – Phosphokinase Enzme	Unit/ Liter	40.45	4.86	35.45	4.33	6.31*	32.14%

The Table T Value at 0.05 Level =2.262

*Mark at 0.05 level

Table (9)
The Significance of the Difference between Pre and Post Measurements of both Experimental and Control Groups in the Skill Performance Level of Kata (Under Study) N1=N2=10

The Skill Performance Level of kata	Measuring Unit	Pre Measurement		Post Measurement		T Value	Improvement Percentage %
		M1	$\pm P1$	M2	$\pm P2$		
Heian - Sanda	Mark	9.53	1.49	7.80	1.15	2.91*	18.15%
Heian - Youdan	Mark	9.16	2.03	7.43	1.23	2.31*	18.89%
Heian - Godan	Mark	9.19	2.11	7.35	1.16	2.42*	20.02%

The Table T Value at 0.05 Level =2.262

*Mark at 0.05 level

Second: Discussing Results

The results of table (1) show significant statistical differences at level.,5 between pre and post Measurements of Experimental group in some specific physical variables (under study)of karate young female players for the sake of post measurement. The improvement percentages were as the following:

In distinct speed power, the percentage was 59.28 % in performing right adverse front straight punch in 10 seconds, 58.95 % in performing left reverse front straight punch in 10 seconds and 50.94 % in testing quartet leap in 10 seconds to measure agility. The speed bearing variable was 51.13 % in performing right circular kick in 25 seconds, 55.93 % in performing left circular kick in 25 seconds, 37.18 % in performing right short front straight punch in 20 seconds and 41.38 % in performing left short front straight punch in 20 seconds. The flexibility variable was 28,30 % in measuring pelvic joint angle and 56,46 % in draping trunk from standing.

The researcher argues that improvement in post measurement of the experimental group in some specific physical variables of karate players is due to the effectiveness of the suggested tae -bo exercises which are similar in nature to skilful performance in karate in terms of kicks, punches, kinetic movement, taking into account gradation in intensity loading and variation in exercises of both upper and lower limbs, the gradation from easy to difficult exercises, formation of in-between exercises rest between exercises and groups so that they will be appropriate to the nature of the research sample in terms of physical and skilful level in karate.

The researcher thinks that the positive improvement of distinct speed power variable of the experimental group is due to the suggested tae -bo exercises which enhances the speed of exciting many muscle receptors and the increase of blood flow during training. Consequently, there is an increase of feeding muscles with oxygen, muscle store of power and the length and thickness of muscle fibers. Moreover, such structural changes improve the capabilities of physiological muscles and increase the efficiency of cellular responses associated with training. They also promote the mechanism of muscle function and decrease the harmful effects of training in the body of karate young players. They also have a positive effect on the length of muscle fibers of the working muscles. Consequently, the flexibility and speed of muscle contraction also increase.

Accordingly, both Saad Kamal Taha and Ibrahim Yehya Khalil (2005) argue that regular and scientifically planned training which is appropriate to the individual's state has at positive effect on muscle capability through several

changes such as increasing the muscle size, thickness and length of muscle fibers, muscle blood feeding and the myogen amount and its stored energy. (32)

There is also positive improvement in the agility variable of the experimental group of karate young players. The researcher argues that this is due to using tae-bo exercises which are similar in the nature of their performance to karate skills particularly in kicks and punches. Such improvement is a result of repeating exercises in various directions and training on performing katas which includes changing positions and directions on the different axes of movement.

The researcher attributes the progress of post measurement of speed bearing variable of the experimental group to considering the employed intensity, time gradation and repetition of suggested tae- bo exercises. Moreover, they should be carried out continuously with high speed for karate young players. These results are also similar to those of the studies of Emad Abdel Fatah Alsersy (2001), Maida Mohammad Abdel Hamid (2003), Sherein Ahmad Youssef (2004), Mohammad Saad Ali (2005), Mohammad Said Mohammad Salem (2007), Hala Nabil Yehya (2008) Mohammad Abdel Rahman Ali (2009) and RashaTalebZeiab (2012). (2), (24), (14), (33),(34), (16), (27) and (17).

The second table shows that there are significance statistical differences at 0.05 level between pre and post measurements of the experimental group in the concentration of inter-leukin-6 and Creatine-Phosphokinase enzyme in blood for the sake of post measurement. The improvement percentages of the post measurements ranges between 33.56% in the variable of Creatine Phosphokinase enzyme in blood and 45.5% in the variable of inter - leukin - 6 in blood.

The researcher attributes the increase in the concentration of inter - leukin - 6 to regulating the metabolic processes of skeleton muscles as the exit of inter - leukin - 6 out of the skeleton muscles is associated with several factors related to special metabolic processes such as the muscle store of mylogen.

Iman Mohammad AbdeRaouf (2012) points out that there is a decrease of energy inside the muscle during training. Consequently, inter-leukin-6 is formed of the muscles going to the liver. It takes some of liver Glycogen store which turns in to Glucose in blood and goes to the muscle. Thus, The inter-leukin-6 produced from muscles by live Glucose necessary to preserve equilibrium of Glucose percentage in blood during physical training. (35)

Pedersen et.al (2004) also argue that muscle contraction liberates inter-leukin-6 from working muscles compared

with unworking muscles. The intensity of muscle contraction is considered one of the stimulating factors of inter-leukin-6 production. Moreover, inter-leukin-6 production during training depends on the intensity of training and the power of muscle contraction.(4)

The researcher attributes the decrease in the concentration level of Creatine – Phosphokinase enzyme in blood of the experimental group in post measurement to the nature of special adaptations of that enzyme which results from the effect of the suggested Tae-bo exercises. Because of these exercises, the enzyme is in its ideal state. Its efficiency promotes the biochemical processes of energy production which are necessary to continue performance during tae - bo exercises and katas performances in karate. Besides, the rise of physical variables level of karate young players is due to the suggested tae - bo exercises. The decrease of harmful muscle effects level is also due to training. The improvement of muscle fiber flexibility results in decreasing muscle rupture.

Both Viru,A. and Viru,M. argue that the basis of enzyme adaptations does not lie in the increasing number of enzyme molecules, but rather in the rise of the enzyme's sensitivity of quick responses of the training effects. Consequently, the training that increases the sensitivity of enzyme molecules reflects its own response through decreasing enzyme concentration and increasing its efficiency. (36)

The previous results are similar to those of Sabry Ali Qutb (2002), Pedersen et.al (2004), Yoshiok, et.al (2005), Mohammad Medhat (2007), Sana Mageed Mohammad (2009), Donges and Duffield (2010) and Iman Mohammad Abdel Raouf (2012), kohan pour et- al. (7), (4), (10), (37),(38),(9) (35) and (39).

The third table shows that there are statistically significant differences at 0.05 level between pre and post measurements of the experimental group in the skill performance level of kata (under study) of karate young players for the sake of post measurements. The improvement percentages of the post measurements ranges between 38.79 % in skill performance level of kata Heian – Yondan and 47.04% in skill performance level of kata Heian – Godan. The researcher argues that the improvement in the skill performance level of katas (under study) is due to the biochemical variables in skeleton muscles which result in physical changes due to the effects of the suggested tae – bo exercises which are similar to the kinetic and time path of karate skills in terms of kicks and punches that are appropriate to the capabilities and readiness of age (under study). Consequently some physical characteristics of karate young players are developed. This is reflected in the development of skill

performance of katas (under study) to a great extent in terms of strength, speed and required movement range in different levels and directions.

Emad AbdelFatahAlsersy (2001), Mostapha Ibrahim Youssef (2001), Maida Mohammad Abdel Hamid (2003), Mohammad Saad Ali (2005), Mohammad Said Mohammad Salem (2007), Adel Ibrahim Ahmad (2008), Mohammad Abdel Rahman Ali (2009), Moataz Helal (2010) and Safaa Saleh (2010) agree that the development of specific physical characteristics has a basic role and positive effect on promoting skill performance of karate player. The lack of these characteristics has a negative effect on the player in terms of mastering and developing skill performance easily. Moreover, using exercises that are similar to the kinetic performance of skills is the best way to develop performance. (2), (23), (24), (33), (34), (25), (27), (28), (29).

The previous results are similar to those of Sherein Ahmad Youssef (2004), Alia Adel Shams Eldeen (2004), Hala Nabil Yehya(2008) and RashaTaleb Zeiab (2012). (14), (15), (16), (17), which proves the validity of the first hypothesis of the research that states:

There are statistically significant differences between pre and post measurement differences between pre and post measurements of the experimental group for the sake of post measurement in the level of some specific physical variables, the concentration of inter- leukin -6, Creatine Phosphokinase in blood and the skill performance level of kata (under study) of karate young female players.

The fourth table shows that there are statistically significant differences at 0.05 level between pre and post measurements of the control group in some special physical variables (under study) for the sake of post measurement. The improvement percentages in the distinct speed power were 20.39% in performing right counter front straight punch in 10 seconds, 22.19% in performing left counter front straight punch in 10 seconds, 18.19% in quartet leap test in 10 seconds to measure agility, 23.97% in performing right circular kick in 25 seconds in 20 seconds, 22.74% in performing left short front straight punch in 20 seconds to measure speed bearing variable, 14.11% in measuring pelvic joint angle and 27.32% in trunk draping form standing to measure the flexibility variable. The researcher attributes the improvement in the post measurement of the control group in some specific physical variables of karate young players to the fact that the control group used to practice regularly using the conventional programme adopted by the team trainer at Sharqia Sport Stadium.

The fifth table shows that there are statistically significant differences at 0.05 level between pre and post

measurements of the experimental group in the concentration of inter - leukin - 6 and Creatine Phosphokinase enzyme in blood for the sake of post measurement. The improvement percentages of post measurement range between 8.75% in inter - leukin - 6 variable in blood and 12.66% in Creatine Phosphokinase enzyme variable in blood.

The researcher attributes that improvement to the control group's adaption to research due to their regular implementation of the conventional programme adopted by the coach. In addition to the rising level of some of their specific physical variables due to the traditional programme which depends on the repetition of performing karate skills and the decrease of harmful muscle effects because of the training.

The results of table (6) show that there are statistically significant differences at 0.05 level between pre and post measurements of the control group at the skill performance level of kata (under study) of karate young players for the sake of post measurement. The improvement percentages of post measurement range between 19.83% at skill performance level of kata Heian – Youdan and 20.49% at skill performance level of kata Heian- Godan.

The researcher attributes the improvement of the control group in skill performance level to the efficiency of the conventional training programme which includes training on kinetic movements, their repetition and the capability of the coach to guide players artistically during the implementation of the programme which contributes to improving the skill performance level of kata (under study) of karate young players.

The results of the current research are similar to those of Emad Abdel Fatah Allsersy (2001), Adel Ibrahim Ahmad (2008) and Safaa Saleh (2010) which reflect that the conventional programme applied on the control group that includes training on kinetic skills has a positive effect on the skill performance level of the control group. However, the improvement of the control group is less than that of the experimental one which stresses the importance of practicing the suggested Tae-bo exercises. (2), (25), (29). Consequently, the second hypothesis of the research also proves true. It states:

There are statistically significant differences between pre and post measurements of the control group for the sake of post measurement at the level of some special physical variable, the concentration of inter-leukin-6, Creatine Phosphokinase in blood and the skill performance level of kata (under study) of karate young players.

Tables (7),(8)and (9) show that there are statistically significant differences at 0,05 level between pre and post measurements of both experimental and control groups in all variables (under study). The difference percentages in some specific physical variables (under study) were for the sake of the experimental group, i. e., 23.76 % in performing left counter front straight punch in ten seconds, 18.48% performing right circular kick in seconds to measure agility, 17.50% in performing right circular kick in 25 seconds, 20.46% in performing left circular kick in 25 seconds, 13.21% in performing right short front straight punch in 20 seconds, 13.47% in performing left short front straight punch in 20 seconds to measure speed bearing, 12.44% in measuring pelvic joint angle and 15.51% in trunk draping from standing to measure flexibility variable.

The researcher attributes the differences for the sake of the experimental group to their implementation of the suggested Tae-bo exercises during the main part of daily training module, particularly that both groups were equivalent in terms of physical level in pre measurement. They were also subject to similar conditions during the training content except the main part of the training unit which was used by the experimental group in doing the suggested Tae-bo exercises that are similar to the nature of skill performance and training on katas (under study). Gradation of loading, formation of in-between training rest also improved the level of some physical variables (under study) of young karate players. Meanwhile, the control group continues the remaining part of the traditional unit by the coach which depended on performing kinetic skills regardless of standardized training which is based on scientific foundations. Ahmed Mahmoud Ibrahim (2011) confirms that to develop special capabilities that are associated with the nature of kinetic clause (kata), the trainer should use special exercises as the basis of promoting the structural skeleton of the player's training state. The aim, in this case, is basically to fulfill the highest levels of skill performance. These exercises include performing movements that are similar in term of kinetic structure, the type of exerted power and its speed in addition to the dynamic path of performance.(40).

Similarly, the difference percentages of the concentration of inter-leukin -6 and Creatine Phosphokinase enzyme in blood are for the sake of the experimental group, i.e., 8.32% at the level of the inter-leukin-6 concentration in blood and 32.14% in measuring Creatine Phosphokinase enzyme in blood.

The researcher argues that the difference percentages for the sake of the experimental group is due to their using the Tae-bo exercises which are the most suitable for the research sample compared with the conventional

programme. The Tae-bo exercises have been scientifically standardized to fulfill structural and physiological changes associated with some specific physical variables (under study) of karate young players. Consequently, in the post differences of measuring the concentration of inter-leukin-6 and Creatine Phosphokinase enzyme in blood, there is stimulation of biochemical processes that are necessary for continuing performance during training. Thus, it will help continuing performing katas (under study) in terms of strength, required speed and efficiency. The difference percentages at the skill performance level of kata (under study) of karate young players were for the sake of experimental group, i.e., 18.15% at the level of performance of kata Heian-Sandan, 18.89% at the level of skill performance of kata Heian-Yondan and 20.02% at the level of skill performance of kata Heian-Godan. The researcher attributes these differences to the experimental group's use of the suggested tae-bo exercises which have a positive effect on some physiological and physical variables (under study) which positively affected the skill performance level of kata (under study). These results are also similar to those of Salwa Said Moses (2002), Sherein Ahmed Youssef (2004), Alia Adel Shams Eldein (2004), Hala Nabil Yehaya (2008), Rasha Taleb Zeiab (2002) which all state that the Tae-bo exercises have a positive effect on improving the skill performance and physical levels in various activities. (41), (14), (15), (16), (17). So, the third hypothesis of the research also proves true. It states:

There are statistically significant differences between post measurements for both experimental and control groups for the sake of the experimental groups at the level of special physical variables, the concentration of inter-leukin-6, Creatine Phosphokinase in blood and the skill performance level (under studies) of karate young players".

Conclusion:

Based on the research findings' the researcher reaches the following conclusions:

1. The suggested tae-bo exercises have a positive effect on improving some specific physical variables (under study) Study). The study results show that the experiments group has higher improvement percentages than the control one.
2. Practicing the suggested Tae-bo exercises leads to increasing the concentration of inter-leukin-6 level and decreasing level of Creatine Phosphokinase enzyme in blood for karate young players. The study results also show that there are difference percentages between post measurements of both experimental and control groups in terms of the concentration of inter-

leukin-6 level (28.32%) and a difference percentage of 32.14% in the level of Creatine Phosphokinase enzyme in blood for the sake of the experimental group.

3. Using the suggested Tae-bo exercises which are similar in nature to karate movements and in the same kinetic path results in structural and functional changes of skeleton muscles. Consequently they have a positive effect on rising improvement percentage at the skill performance level of kata (under study) of the experimental group compared with the control one.

Recommendations:

According to the conclusions of the study and limited to the research sample, the researcher recommends, the following:

1. The necessity of using the Tae-bo exercises to develop some special physical elements (under study) of karate young player.
2. Interest in using the suggested Tae-bo exercises to improve the skill performance level of kata for various ages.
3. Interest in making the measurements of the concentration of inter-leukin-6 and Creatine Phosphokinase enzyme in improving the level of players' performance in other sports and in different physiological and environmental circumstances.
4. Conducting more studies to determine the muscle Tissues that help liberate inter-leukin-6 in blood plasma.
5. Making a comparative study to find out the difference between inter-leukin-6 which is produced through muscle concentration and inter-leukin-6 of monocytes and their effect on the player's physiological state.
6. Supporting sport institutions with medical test laboratories in order to help planning, following up, evaluating and developing training programmer.

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