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### Abstract:

Due to bouts amendment of karate rules, which became 3 minutes for both men and women from 18 years old and above this research aims to investigate the results of specific kumite endurance exercises given to kumite female players to improve their VO<sub>2</sub> max and bouts endurance and the efficiency of skill performance and match results too, all of this by designing a rationing training program depending on competition performance endurance exercises and specific match conditions and situations.

**Keywords:** karate, kumite, performance level, endurance, stamina, vo<sub>2</sub>max, respiratory fitness

### Introduction

Karate is considered one of the individual sports that have developed, recently it was included in the Olympic Games in Tokyo 2020, which called upon the World karate Federation and its technical committees to amend and develop some kumite rules to raise the level of technical performance and the pace of performance in bouts, and among these amendments Article (5) bouts time “Duration of the Kumite bout is defined as 3 minutes for Senior Male and Female Kumite (both teams and individuals). Under 21 years is 3 minutes for both the Male and the Female categories. Cadet and Junior bouts will be 2 minutes for both genders.”

This modification has a great effect on changing the map of the physical requirements for the karate players, like, increasing the bout load, stamina, mental, and physical effort affecting the various vital organs, as this appeared from the results of the researcher's analysis of the championship(2020) series A, The researchers noted that after the second minute, The level of technical performance and the level of physical performance decreases as a result of increasing the time of the bouts for 1 minute, which requires physical, mental and physiological effort in order to make the player continue performance efficiently and effectively, especially in the case of a tie, the Hante (weighting) between the players is given upon some criteria such, skill diversity, the





competence of the physical player and the attempts to attack, which requires the player to be in a high level of technical and physical rhythm over the hall period of the bouts.

The importance of the research problem is highlighted by the researcher's after follows-up many tournaments at the level of "sectors for the 2019/2020 season" and through the latest amendments to the "International Karate rules" the researchers noticed deficiency in the athletes physical abilities and low endurance of bouts performance, which affected the inability to continue the bouts with high efficiency, which prompted researchers to conduct this research in an attempt to develop the level of respiratory fitness and endurance of the bouts' performance through exercises similar to competitive performance, which will affect Skillful and physical performance and improving bouts results.

This study aims to design a training program that includes exercises of endure competition performance and knowing the extent of its impact on respiratory fitness, represented by (vital capacity) and (Vo2 max) for kumite players.

### Research hypothesis

1- There are statistically significant differences between the mean of the pre- and post-measurements values in the

measurement of respiratory fitness and the vo2max of kumite female players (+18: -21) in favor of the post measurement of the research sample.

### Methodology

The researcher used the experimental method by designing the measurement (pre-post) for one experimental group and that is due to its relevance to the nature of the research.

### Participants:

The research sample was deliberately chosen from the female kumite players, the Sadat City University team from the Sunni stage (over 18 years: under 21 years) and registered with the Egyptian Karate Federation for the 2019/2020 season, who obtained the brown belt (1) with a minimum and participated in the sectors championship for the 2019/2020 sports season, Their number reached (26) karate players, they were divided into the exploratory study sample (12) and the basic study sample (14).

### Data collecting tools:

#### A- anthropometric measurements

- Weight.
- Measure the total length to the nearest centimeter.
- Measuring the heart rate at rest.
- Measuring BMI.
- Age in years.
- Training age in years.



**B- The tests used under investigation**

- The shuttle run test to measure maximum oxygen consumption. Attachment (27) (27:90)
- Use of a cosmed device to measure vital functions. Attachment (26) (15: 92)

**Statistical processors**

- The researcher used the following statistical parameters:
- Arithmetic Mean
- Mediator. Mode
- Standard Deviation
- Skewness Coefficient
- T-test

- Pearson's simple correlation coefficient. Simple Correlation (person) coefficient

**Exploratory study**

The researcher conducted the exploratory study on Sunday 6/9/2020 until Saturday 19/9/2020 on the exploratory research sample consisting of (12) players chosen randomly from the research community and outside the basic sample, in order to extract scientific transactions (honesty - Persistence).

**Results and Discussion:**

Depending on the objectives and assumptions of the research, the researcher presented the findings of the results and discussed them in line with the data obtained as follows:

Table (1 ) The significance of the differences and rates of improvement between the two groups average measures (pre-post) for Respiratory Fitness and Vo<sub>2</sub>Max

Physiological variables and there components	Special motor abilities	Part	Pre measurement		Post measurement		difference	T* value	Improvement
			mean	SD	mean	SD			
Vital capacity	Best FVC	Liter / minute	3.14	0.70	5.82	0.79	2.68	9.467	%46
	Best FVC1	Liter / minute	1.91	0.64	5.94	0.78	4.03	15.035	%68
	Best PEF	Liter / sec	2.09	0.94	10.44	16.87	8.35	1.849	%80
VO <sub>2</sub> MAX	Shuttle run	Milli liters	31.18	1.91	53.07	2.62	21.89	25.314	%41

\*T value(0.005)= 1.796



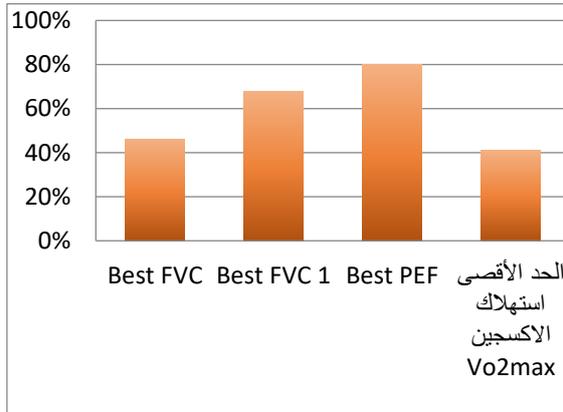


Figure ( 1 ) The rates of improvement between the two average measures (pre-post) for special Respiratory Fitness and Vo<sub>2</sub>Max

Table (1), Fig. (2,1) shows the existence of statistically significant differences between the pre and post measurements in for the sake of the post-measurement of the values of physiological tests under investigation, T value calculated is (9.467, 15.035,1.849), for the vital functions variables BEST FVC and BEST FVC1 The value of T calculated for the body mass index variable in the Cosmed test was (2.155) and the value of T calculated for the variable in the maximum oxygen consumption by the Shuttle run test was (25.3), which indicates the fulfillment of the second hypothesis: There are statistically significant differences between the mean of the pre and post measurements values in respiratory fitness and VO<sub>2</sub>MAX Under study (vital functions, maximum oxygen

consumption) of kumite players in favor of the research sample. It is evident that there is a difference in the improvement rates between means of the pre and post measures of the experimental research group In respiratory fitness and VO<sub>2</sub>MAX under study and for the benefit of post measurements, where the vital functions test using a cosmed device achieved the Best PEF variable with an improvement rate of (80%), while VO<sub>2</sub>MAX was the lowest improvement rate, with (41%).

This is consistent with what was stated by Ahmed Ibrahim (2005 AD): The attempt to identify the physiological variables and their mechanisms and biological facts in the body during the activity and study them in addition to determining the quality of the physical abilities related to the movement performance helps in raising the level of achievement during the competition, so the physical load is evaluated with the ability of the physiological player to achieve the goals of planning And develop the best methods of training. (4: 239, 60)

These results also agrees with Fahmi Al-Beik et al (2009), It is not practical to take repeated blood samples to determine the training dose that equals the lactate threshold, and it is also not practical to continuously control pulmonary ventilation during training and as an alternative to direct laboratory testing and to determine the





lactate threshold. Get athletes to train at a specified percentage of their maximum heart rates equal to the representative rate at which a lactate threshold occurs, lactate accumulation in the muscle increases, and acidosis occurs. (14: 276,269)

Where the results are consistent with the results of Ibrahim Al-Ibbari (2007) and Ahmed Omar Al-Farouq (2009 AD) that the training program that contains experimental bouts, conditional and unconditional, that the attack used would be effective in the least time with the good use of competitive positions between the player and the opponent during the time The bouts is highly effective by avoiding failed attacks that deplete the player's energy and effort, lack of focus, a sense of anxiety, psychological tension, and the possibility of some injuries, as well as uncovering the play methods and aspects of the player's strength and weakness in front of the competitors increases the competitors' chances of winning bouts over the players. The use of successful attacks that result in accurate and appropriate planning behavior efficiently doubles the competitor's ability to read the player's thought. (1: 99) (5: 100) As the researcher notes

### Recommendations:

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