

# Priska

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## THE DIFFERENCES OF THE MULTISTAGE FITNESS TEST AND MULTISTAGE SHUTTLE SWIM TEST ON SWIMMER'S AEROBIC ABILITY

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### Abstract

Studi Purpose. Discusses the differences between the multistage fitness test and the multistage shuttle swim test on the aerobic ability of swimmers.

Material and Methods. This research is a descriptive research. The method used is survey method. Data collection techniques using tests and measurements.

Result. The results of the analysis show that the t count is  $0.001 < t$ , and the significance value is  $0.999 > 0.005$

Conclusion. There was no significant difference in the aerobic ability of swimmers using the multistage fitness test and the multistage shuttle swim test.

### Keywords

Multistage fitness test, multistage shuttle swim test, swim

### Introduction

The physical test is one of the benchmarks for athletes and coaches to monitor the success of the training program that has been implemented [1].. Many variations of the physical test for endurance in sports have been developed and tested in Indonesia, such as the multistage test, the Harvard test, and the Balke test [2].

The current physical test is more relevant and more appropriate for land sports. For example the multistage fitness test or running back and forth to the rhythm [3,4]. It's different if this test is applied to swimming sports where water is the main means of training and competition. It could be if the swimming coach wants the athlete to carry out the multistage fitness test but does this test match the athlete's actual condition while in the water [5,6,7]. Regulation of breathing, energy systems, body mass against land and water and the predominance of movements performed are very different between running and swimming [8].

Swimming has experienced development with physical exercise not only on land sports, but also in water [9]. The forms of physical exercise include interval training, fartlek training, pyramid training, repetition training, over-distance training and sprint training [10]. All forms of physical exercise have been well implemented by the coaches. It's just that physical tests that match or resemble multistage have not been developed in Indonesia [11].

The researchers found some discrepancies between physical tests that were often applied to muscle exposure in swimming [12]. Therefore, researchers wanted to see how much contribution the multistage fitness test and multistage shuttle swim test made to VO<sub>2</sub>max in swimmers [13]. If the multistage shuttle swim test makes the same contribution as the multistage fitness test, then the physical test for swimming athletes in the future can use the multistage shuttle swim test.

## **Materials and methods**

### **Population and Sample**

The population and sample in this study were DIY swimming athletes, both male and female, who were active in water polo, totaling 14 athletes.

### **Exercise Protocol**

The instruments to be used in this research are The Multistage Fitness Test and Multistage Shuttle Swim Test. Data collection will be carried out for 2 days so that test participants do not experience excessive fatigue.

The test of the aerobic ability of swimmers in this study used the multistage fitness test and the multistage shuttle swim test. The data in this study were the multistage fitness test data and the multistage shuttle swim test which were then converted into the VO<sub>2</sub>Max table.

### **The Multistage Fitness Test Measurement**

The start is done standing, starting from behind the starting line of the track and with a musical tone of more than 1 note. The athlete continues to run until he is unable to follow the

rhythm from the compact disc or sound system. The athlete has reached the finish line before the next rhythm sounds and starts again after the music rhythm is heard. Conversely, if the athlete has heard the rhythm of the music and has not reached the finish line, the athlete must increase his running speed until the finish line then immediately turn around to continue the next run. An athlete is declared to have completed the test when he is unable to follow 2 or 3 rhythms of music. After the athlete is declared a failure, he must continue to run slowly to cool down. Record the final results that are capable of being performed by athletes.

### **The Multistage Shuttle Swim Test Measurement**

The start is done standing, starting from behind the starting line of the track and with a musical tone of more than 1 note. The athlete will continue to swim until he is unable to keep up with the rhythm of the compact disc or sound system. The athlete has reached the finish line before the next rhythm sounds and starts again after the music rhythm sounds. Conversely, if the athlete has heard the rhythm of the music and has not reached the finish line, the athlete must increase swimming speed until the finish line then immediately turn around to continue the next run. An athlete will be declared to have completed the test if he is unable to follow 2 or 3 rhythms of music. After the athlete is declared a failure, he must continue swimming slowly for cooling down. Record the final results that are capable of being performed by athletes.

### **Statistical Analysis**

In this study will be tested for normality and homogeneity test data. Before moving on to the t-test, there are requirements that must be met by researchers that the data being analyzed must be normally distributed, for this it is necessary to carry out normality tests and homogeneity tests.

Test the hypothesis using the Independent Sample T test with the t test. If  $t \text{ count} \geq t$  table and  $p < 0.05$ , then  $H_a$  is accepted and  $H_o$  is rejected, meaning that there is a difference between The Multistage Fitness test and the Multistage Shuttle Swim Test on the aerobic ability

of swimmers. If  $t$  count  $<$   $t$  table and  $p > 0.05$ , then  $H_0$  is accepted and  $H_a$  is rejected, meaning that there is no difference between The Multistage Fitness test and the Multistage Shuttle Swim Test.

### Result

When displayed in the form of a frequency distribution, the data on the results of the aerobic ability of swimmers using the multistage fitness test and the multistage shuttle swim test results can be seen in the table as follows:

**Table 1. Frequency Distribution of Swimmer Aerobic Ability Using The Multistage Fitness Test and Multistage Shuttle Swim Test**

No	Interval	The Multistage Fitness Test		Multistage Shuttle Swim Test	
		F	%	f	%
1	$\geq 52.84$	2	14.29%	2	14.29%
2	47.18 – 52.83	1	7.14%	1	7.14%
3	41.52 – 47.17	3	21.43%	4	28.57%
4	35.86 – 41.51	4	28.57%	2	14.29%
5	$\leq 35.85$	4	28.57%	5	35.71%
Jumlah		14	100%	14	100%

**Table 2. Swimmer's Aerobic Capability Test Using The Multistage Fitness Test and Multistage Shuttle Swim Test**

\*( $t_{ht}$  =  $t$  count;  $t_{tb}$  =  $t$  table; Sig = Significantly)

Group	Mean	t-test for Equality of means			
		* $t_{ht}$	* $T_{tb}$	*Sig.	Difference
The Multistage Fitness Test	41.3571	0.001	2.16	0.999	0.00071
Multistage Shuttle Swim Test	41.3564				

From the results of the t-test it can be seen that  $t$  count is 0.001 and  $t$  table is 2.16 ( $df=13$ ) with a significance value of  $p$  of 0.999. Because the  $t$  count is  $0.001 <$   $t$  table 2.16, and the significance value is  $0.999 >$   $0.05$ , these results show no significant difference.

## Discussion

The hypothesis states that there is no significant difference between the multistage fitness test and the multistage shuttle swim test on aerobic ability. This is considered due to several influencing factors, including: the number of shuttles that have multistage shuttle swim tests has been reduced based on the level and shuttle determination procedures so that equalization occurs. The multistage fitness test level 1 consists of 8 shuttles while the multistage shuttle swim test level 1 consists of 5 shuttles. Another influencing factor is the initial speed at the start of the test. The multistage shuttle swim test starts with a speed of 0.09 m/s while the multistage fitness test starts with a speed of 8.5 km/hr. In addition, the determination of the distance between the two tests has been designed differently. The distance used in the multistage shuttle swim test is 10m while the distance used in the multistage fitness test is 20m. In addition, the magnitude of the resistance between water and air affects the results of both tests.

Multistage test is a test used to measure the body's ability to take in oxygen ( $VO_{2max}$ ) [3]. The multistage test consists of: the multistage fitness test (multistage running) and the multistage shuttle swim test (multistage swimming).

The multistage fitness test is a simple field test but produces a fairly accurate estimate of the maximum oxygen consumption for various uses or purposes. The Multistage test is considered the most economical test to be used as a measure of the athlete's aerobic ability, because this test does not need to use a wide field for taking the test. Basically the multistage test is direct in which the procedure is carried out by running back and forth along the 20-meter track or track that has been measured previously [4]. This test begins by running slowly and gradually getting faster and faster while listening to a series of rhythmic "tuts" recorded on a tape until the athlete is unable to keep up with the speed of the rhythmic sound. Meanwhile, an athlete is considered a failure if he is unable to keep up with the rhythm of the running time and

both feet are unable to cross the dividing line when the running signal begins. This shows that the maximum oxygen consumption level of the athlete is at the level and the shuttle is declared a failure [5,6].

Meanwhile, the multistage shuttle swim test is a development of the existing physical test, namely multi-stage running, only this test is multi-stage swimming.

## **Conclusion**

Based on the results of data analysis, description, testing of research results, and discussion, it can be concluded that there is no difference between the multistage fitness test and the multistage shuttle swim test on the aerobic ability of swimmers, with a  $t$  count value of  $0.001 < t_{table} 2.16$ , and a significance value  $0.999 > 0.05$ . The physical test for swimming athletes in the future can use the multistage shuttle swim test.

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