

50 M Free Style Swimming Stroke Speed Improvement by Using Hand Paddle Swim and Parachute Swim

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Abstract

Swimming is the basic ability of every living being. Consciously and unconsciously, we have already done this activity even since we were not born yet. However, once human was born, some of creatures lose their ability to swim. A well-structured training is necessary to emerge one's swimming potential. Currently, there are many Olympiads and competition for swimming. The most common aspect in swimming competition is the speed. In order to obtain the maximum swimming speed, a special training program is essentially needed. This research used hand paddle swim and parachute swim training program to increase arm muscles' power and swimming speed. The result obtained was hand paddle swim and parachute swim training program were able to increase arm muscles' power and swimming speed.

Keywords: hand paddle swim, parachute swim, swimming speed, arm muscles' power.

Introduction

Swimming is one type of sport competed in the international Olympics. In addition to being competed in the international arena, swimming is also proven to have various health benefits, including preventing hypotension, cardiovascular health, bone health, and prevention of obesity [14]. There are many styles in swimming, one of which is freestyle swimming stroke. Freestyle swimming stroke is the fastest stroke among the other swimming strokes. Some techniques in exercise are used to increase swimming speeds such as training intensity, training programs [22, 31], supplements' consumption [20] and use of swimming tools. The realistic variations of the shape of the palms proved to affect the speed in swimming. Hand variation used in this research is the use of hand paddle swim. In addition to using hand paddle swim, this research also uses parachute swim. Parachute swim is a tool mounted on the athlete's hip to increase resistance in swimming.

There has been prior review of techniques and equipment to improve swimming speed. Swimming and dietary exercises have an influence on performance in swimming. Fasting refers

more to the process of metabolism in the body. So it is indirectly proved that metabolism also has an effect on the swimming performance. High intensity training swim are also shown to improve body's metabolism. High intensity in training if it was done continuously over a period of time will form the muscle of the limbs. Periodization in training proved to have improved athletes' performance in swimming. Training's periodization when combined with supplements, can also improve the performance of a swimming athlete. Performance of an athlete is influenced by several factors, one of which is the arm muscle power. The increase of muscle power can be done with various things such as high speed power training. Limb muscle enhancement can also be performed in more modern ways such as playing Nintendo Wii and multicomponent exercise . The use of hand paddle has a purpose to increase arm muscle power. Increased power from the arm muscles and the ability to resist artificial resistance will improve the performance of swimming athletes in the championships.

The purpose of this research is to know the effect of hand paddle swim and parachute swim in improving athletes' performance. This was measured by the increased power of arm muscle and swimming speed. To obtain maximum speed in swimming, it is recommended to warm up before. Warming up before swimming has an effect on achieving maximum performance from athletes. The initial start when swimming starts also has a great influence on the swimming speed. Maximum use of force at the start gives a stronger boost to the athlete to achieve maximum speed. Maximum strength will be perceived by exercises that are done repeatedly. This study uses hand swim paddle and parachute swim to increase power from athletes. Increased muscle power will also expectedly increase athletes' speed in swimming.

Materials and Method

The type of research used is quantitative research with experimental design. Before the treatment started, pretest was given to the subject study, and after the treatment was over there would be a posttest. Research subjects were 30 junior athletes aged 11-14 years old, forming three groups of 10 athletes each. The first group [K1] was a group given treatment in the form of hand paddle swim. The second group [K2] was a group given treatment in the form of the use of parachute swim. The third group [K3] was a control group that was not given any treatment at all. The study was conducted for 11 consecutive weeks. The first week was used for research preparation. The second week was used for the initial test. The third to the tenth week was treatment period to the subjects of research. The training was held for 32 meetings, four times a week.

There were two types of tests used for data collection in this study. First one was a strength test of the arm and shoulder muscles. The muscle power test has the goal of measuring the muscle power of the arms and shoulders by using a 6-pound medicine ball. Three repetitions were done in the medicine ball test to get the best value. The second test is a 50-meter freestyle swimming stroke test. The purpose of this swimming speed test is to measure the speed of the athlete in a 50-meter swim using the freestyle. The instrument used to measure the speed of this

pool is automatic electronic time keeper. A stopwatch was also used as a comparison to the automatic time keeper tool to record the swimming time of the athletes.

The exercise program used in this study was a normal swimming activity in the water with 90-120 minutes duration. Especially for K1 and K2 get additional training program in the form of hand paddle swim for K1 and parachute swim for K2. The additional training programs used by K1 and K2 are more clearly shown in Table 1.

Table 1. Additional Training Programs for K1 and K2

<i>Training Week</i>	<i>Hand Paddle/Parachute Swim</i>	<i>Distance</i>	<i>Set</i>	<i>Repetition</i>	<i>Rest</i>
1-2	80% of maximum speed	25 meter	3	4	3 minutes
		15 meter	3	5	3 minutes
		12,5 meter	3	6	3 minutes
3-4	85% of maximum speed	25 meter	3	5	3 minutes
		15 meter	3	6	3 minutes
		12,5 meter	3	7	3 minutes
5-6	90% of maximum speed	25 meter	3	5	3 minutes
		15 meter	3	6	3 minutes
		12,5 meter	3	7	3 minutes
7-8	95-100% of maximum speed	25 meter	3	5	3 minutes
		15 meter	3	6	3 minutes
		12,5 meter	3	7	3 minutes

The results of the data were analyzed using descriptive statistics and inferential statistics. To facilitate the calculation, then the analysis was assisted by using the program SPSS for windows release 20.0.

Result

Treatment results for 32 meetings showed that the whole group experienced an escalation in both swimming speed and arm muscle power. Descriptively, however, there is a difference in each improvement experienced by each group. The increase of arm muscle power is shown in Fig. 1, while the increase in speed is shown in Figures 2 and Table 2 for the whole group mean score.

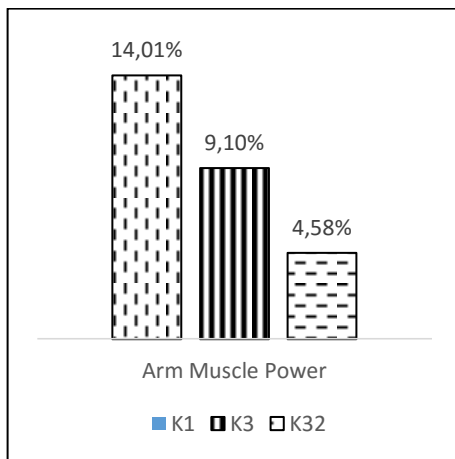


Figure 1. The increase of arm muscle power

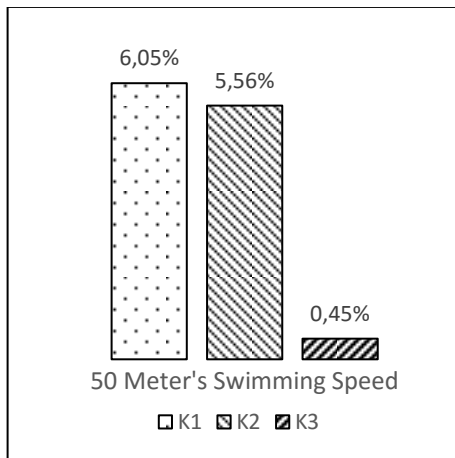


Figure 2. The increase in swimming speed

Table 2. Pretest and Posttest Mean Score of Each Group

Mean		Training Group		
		<i>Hand Paddles</i>	<i>Parachute</i>	Control Group
<i>Arm Muscle Power</i>	<i>Pretest</i>	2,63	2,74	2,66
	<i>Posttest</i>	2,99	2,99	2,78
	Δ	0,37	0,25	0,12
	%	14,01	9,1	4,58
A 50-mete Freestyle Swimming Stroke's Speed	<i>Pretest</i>	38,4	38,84	37,71
	<i>Posttest</i>	36,08	36,69	37,54
	Δ	-2,33	-2,16	-0,17
	%	6,05	5,56	0,45

Descriptively, it appears that K1 has the greatest increase in arm muscle power and 50-meter's swimming speed, followed by K2 and K3 respectively. All data used in the study have normal data distribution and variant of homogeneous data. Furthermore, the paired sample t test was done to determine the significance of the effect given by the exercises on the subject of the study. The result of paired sample t test (Table 3) showed that giving the exercise to all groups had a significant influence. Further testing is done, to find out whether the use of additional exercises in swimming really affects muscle power and swimming speed together. The test in question is the test using Manova (Table 4). The probability used in decision making is 5% [0.05]. The calculation result shows that Sig = 0,00, hence concluded that type of exercise give significant influence to increase of arm muscle power and swimming speed as a whole.

Table 3. Paired Sample t test

Group	Arm Muscle Power	Status	50-meter Swimming Speed	Status
K1	0,000	Have impact	0,009	Have impact
K2	0,000	Have Impact	0,006	Have impact
K3	0,000	Have Impact	0,227	No impact

Table 4. Multivariate Tests

Effect	F	Sig.
Group	Pillai's Trace	8,846 ,000
	Wilks' Lambda	13,109 ^b ,000
	Hotelling's Trace	17,961 ,000
	Roy's Largest Root	38,030 ^c ,000

The result of paired sample t test showed that the training given to K3 did not give effect to the 50-meter's speed. However, as a whole, every training had an effect on the swimming athlete who become the subject of research. The different effects of each training given to the group were tested using Tukey HSD. The test results showed that treatment at K1 gave the best effect to the increase of arm muscle power Table 4 with difference of 0.360. Followed by treatment on K2 which has difference of 0,2490 and K3 with difference 0,1220. Different results are indicated by an increase of 50-meter's swimming speed [Table 5]. The training results on K1 and K2 did not differ significantly. The difference is seen between K1 with K3 and K2 with K3.

Discussion

Subjects in this study consisted of 30 young athletes (11-14 years). The use of athletes as the subject of this study in order to make sure the subject of research has basic ability in swimming. Researchers were not taking risks by using non-athlete children as research subjects, with the assumption it would exert negative external influences on the research objectives. Researchers also required to re-explain the basic techniques in swimming when using non-athlete research subjects. The age of athletes also has an influence in swimming performance. Age has a positive influence for a 50-meter swimming distance, but has a negative effect for a 1500-meter

distance. The peak age of a female athlete is 19 years, while the peak age of the male athlete is 22 years.

This research used three groups to know the difference of influence given by the training program. Group determination was done by matching criteria to the goal of each group having the same initial ability. This proved successful to form a homogeneous group. Pre-test results in all groups showed no significant difference. The result of pre-test on arm muscle power gives result of $K1 = 2,63$, $K2 = 2,74$, $K3 = 2,66$. While pre-test results at 50 meters swimming speed obtained results $K1 = 38.4$, $K2 = 38.84$, and $K3 = 37.71$. The use of matching criteria to divide groups in research proved a capability of forming homogeneous groups. A homogeneous group is needed to reduce the external variables that may be detrimental to the results of the study.

The purpose of this research is to know the influence of hand paddle swim and parachute swim to increase arm muscle power and 50-meter speed. Treatment results for 32 meetings indicated that the use of hand paddle swim in swimming exercises was proven to improve arm muscle performance. Hand swim paddle would increase in resistance when an athlete did a hand swing in the water. In addition to increasing resistance, the use of paddle swim handles will also increase the speed of the athlete when gliding in the water. The wide shape of hand paddle swim when applied in swimming would capture more of the water flow, making the hand swing more severe. Exercise with a certain intensity by using a heavy load could increase muscle power. Exercises to increase arm muscle power can be done in several ways such as pull ups, push-ups, chair dips, hover rotation, weighted shadow boxing and triangle push-ups. However, if the exercise is only done once, then it will not give a significant effect. Exercises with specific time intervals are required to obtain maximum results. In addition to the time interval, high intensity of an exercise is also required to establish maximum muscle power.

In addition to arm muscle power, the purpose of this study was to determine the effect of the use of hand paddle and parachute swim to increase the speed of a 50-meter freestyle swimming stroke. Swimming speed was adapted from several animal movements, one of which is the fins in fish, membranes on the frog and duck legs. Hand paddle swim adapted the shape of a frog's leg which utilizes the membrane to give more impetus when swinging the hand. The greater the impulse generated, the resistance received by the arm will also increase. This great resistance is what increases arm muscle power. Resistance training has been shown to increase the working life and muscle power of a juvenile athlete. In addition to muscle performance, the manipulation of the environment in swimming is also able to increase the swimming speed of an athlete. The combination of a dry-land strength or electrical stimulation exercise program is able to increase swimming speeds more efficiently than self-swimming.

Hand swim paddle and parachute swim is a simple tool that can be used directly when swimming in the water. Both of these tools are not the kind of electronic devices that require external support to function properly. But this tool is more like a passive burden placed on the limbs of a swimming athlete whose goal is to increase resistance in swimming. Hand paddle adapted the pattern of frog's legs which would capture more water when swung. The impetus

given to the use of the hand paddle swim is also quite high, so the use of a paddle swim hand will increase glide inside the water.

Conclusion

Hand paddle swim proved to be used as a training program to increase arm muscle power and a 50-meter freestyle swimming stroke by athletes. Parachute swim could also be used to increase arm muscle power and 50-meter freestyle swimming stroke's speed. Training programs with specific intervals and timing of these two tools formed arm muscles and improved the performance of a swimming athlete. The use of simple tools was also not burdening athletes in the water.

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