The Effect of Using Hand Paddles and Leg Loads on the Speed of 50 Meter Freestyle Swimming in Rejang Lebong Regency

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Article Info	Abstract
	This study aims to analyze all club athletes under the auspices of the PRSI Rejang Lebong Regency. With this, the researchers raised the title of the effect of using hand paddles and leg loads on the speed of 50-meter freestyle swimming in Rejang Lebong Regency. The method used is quantitative research with a 2x2 factorial pretest–posttest design. The study population consisted of 40 athletes consisting of 22 men and 18 women for the 50-meter freestyle. Who were selected total sampling technique. The research instrument was a 50-meter freestyle swimming test, and data analysis involved prerequisite tests, normality tests, homogeneity tests, and hypothesis testing using SPSS 25. This study resulted in significant differences between the effects of using hand paddles and leg loads with height >150cm test result 2.58 with height <150cm result 1.83 for speed in 50-meter freestyle swimming athletes and there is a significant difference between the effect of using hand paddles and leg loads on the difference in using assistive devices with a height of more than 150cm using aids whose height is less than 150cm with a difference of 0.75. Conclusion, the body of an athlete who has a height of 150cm is better than the body of an athlete whose height is less than 150cm.

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INTRODUCTION

Exercise is an important part of a healthy and active lifestyle, and one of the most popular sports is swimming. Swimming is a type of sports activity that focuses on demonstrating performance and achieving maximum performance (Pelana, 2019). In the world of swimming, speed is a measure of achievement, which includes the ability to move at maximum or minimum speed to match predetermined swimming speed standards (Nopiyanto & Raibowo, 2019).

In the process of achieving optimal swimming performance, there are various factors that influence it, both internal factors in individuals (exogenous factors) and external factors (endogenous factors) that come from the surrounding environment, (M. Buchheit, Æ. H. Al, A. Chivot, Æ. P. Marie, S. Ahmaidi, and Æ. P. B. Laursen,2010). Exogenous factors include a person's physical and psychological attributes, while endogenous factors include the practice environment, geographical, economic, social, and cultural conditions, and activity traditions in society (Cahyandaru, 2015).

Achievement in swimming is measured based on the speed and endurance of the arm muscles in the stroke. Speed describes the ability to move to the maximum or at least match the standard swimming speed that has been determined. In addition, arm muscle endurance also plays an important role in achieving achievement, because the lack of power at the stroke stage can have an impact on decreasing speed in the glide. Consistency and stability of arm muscle endurance are important to maintain the rhythm of the stroke (Ilham & Kurniawan, 2023). In freestyle swimming, speed, and arm muscle endurance are two inseparable factors for achievement.

Trainers have developed various methods and techniques to maximize the speed and endurance of the arm muscles. Effective training is the key to achieving optimal physical condition and mastering proper swimming techniques. Research by Febrianto (2019: 21) emphasizes the importance of training that functions as a whole,

gives satisfaction and happiness to athletes, and has a positive influence on the material and training techniques delivered by the teacher or coach.

Effective training in swimming is the key to improving athlete abilities. To achieve this, a well-structured and organized training program is required, and the swimming club is an important vehicle for developing athlete talent (Hartati, H., Bayu, W. I., & Aryanti, S. 2020).Through swimming clubs, athletes have the opportunity to develop their potential and achieve more optimal performance (Listyani & Supriyono, 2021). One of the training aids used in swimming is the Hand Paddle, which is attached to the palm of the hand. With Hand Paddles, pushing water will feel heavier, and continuous training with this tool will train swimmer strength and maximize speed (Aulia, 2020).

According to (Pebrianti, 2020) It is important to adapt the use of the hand paddle according to the athlete's strength level, starting from a small size for beginners and progressively increasing its size as the athlete's arm strength develops. Thus, using the hand paddle can provide endurance and increase arm strength, which is an important factor in achieving swimming speed and efficiency.

In the pre-athlete group and athletes in each club, they already have their swimming equipment, including tools to train speed. In addition, the pre-athlete and athlete groups are familiar with the existing training program. This is in the spotlight even though he has become a porprov athlete, but based on pre-research observations, there are still deficiencies and weaknesses in some freestyle swimming techniques such as not maximal speed training which includes hand strokes and leg swings. Because hand strokes and leg swings are an important part of the freestyle swimming technique to achieve maximum efficiency and speed (Kurniawan & Winarno, 2020). Weak or uncoordinated leg swings can affect swimming speed and efficiency(Mero, A. A., Hirvonen, P., Saarela, J., Hulmi, J. J., Hoffman, J. R., & Stout, J. R. 2013). Lack of balance can cause athletes to have difficulty maintaining positions and making

appropriate movements (Agus, 2012). Poor breath-holding ability can affect athlete performance and make them less efficient at utilizing their energy (Firdausi & Sulistyarto, 2021).

Besides that, there are also some inaccurate training techniques and techniques that have not been used in practice. As well as the use of training tools that are not appropriate. This can be seen from the effects after exercise, such as lesions on the arms, hands, and legs due to the lack of precise exercise techniques. In addition, there is also no good health awareness. Swimming requires good physical condition, and athletes must consider their health before and after practicing and competing (Nurjaya, 2012).

Based on the background above, the researchers assume that to increase the speed of time, weight training is needed which aims to train the quality of hand and leg muscle strength. Weight training in question is using something outside the body to train muscle strength. Furthermore, to get the speed with a good freestyle, it takes the correct arm strokes and leg swings. To practice swimming, a tool is needed, namely hand paddles and leg weights. Therefore the researchers tried to conduct research by raising the title "The Effect of Using Hand Paddles and Leg Loads on the Speed of 50-meter Freestyle Swimming in Rejang Lebong Regency" to improve the quality of athlete swimming in Rejang Lebong Regency.

METHODS

This type of research is quantitative research. This study will examine the effect of using hand paddles and leg loads on speed in 50-meter freestyle swimming athletes in Rejang Lebong Regency. The study used a 2x2 factorial design with pretest and posttest data collection. The sample in the study was 40 athletes with details of 22 men and 18 women swimming the 50-meter freestyle in Rejang Lebong Regency with the level of athletes in the club under the auspices of PRSI Rejang Lebong with a total sampling technique.

The test instruments used were hand paddles, leg loads, and a 50-meter swimming track. Treatment was carried out 16 times with a frequency of 4 times in 1 week. Data collection techniques used an initial test (Pretest), an application (Treatment) using hand paddles, and leg loads, and a final test (Posttest). Data analysis techniques used the data normality test, homogeneity test, and carried out the T-test using SPSS version 25.

RESULTS AND DISCUSSION

Table 1. Paired Test (Using Tools)

Paired Samples Test			
	t	df	Sig. (2-tailed)
Pretest - Posttest	9.495	10	0.000

From the t value, it can be seen that the t count is 12.795 and the t table is 1.729 with a Sig. (2-tailed) value of 0.000. Because the t count is 12.795 > t table is 1.729 and the significance value is 0.000 <0.05, the results show that there is a significant difference.

Table 2. Paired Test (Without Using Tools)

Paired Samples Test			
	t	Df	Sig. (2-tailed)
Pretest - Posttest	8.768	10	0.041

From the t value, it can be seen that the t count is 8.768 and the t table is 1.729 with a Sig. (2-tailed) value of 0.000. Because the t count is 8.768 > t table is 1.729 and the significance value is 0.041 <0.05, the results show that there is a significant difference.

Table 1. Paired Test (Using Tools)

Paired Samples Test			
	t	df	Sig. (2-tailed)
Pretest - Posttest	12.792	10	0.000

From the t value, it can be see that the t count is 10.271 and the t table is 1.729 with a Sig. (2-tailed) value of 0.000. Because the t count is 10.271 > t table is 1.729 and the significance value is 0.000 <0.05, the results show that there is a significant difference.

In the results of the swim test with a height <150 cm there is a significant difference between the pretest and posttest using tools and without using tools, this shows that swimming tools affect swimming speed, tools are used to train swimming speed in water or a swimming pool.

Hand Paddles and leg weights are used by advanced or professional swimmers to demonstrate certain swimming techniques.

Table 2. Paired Test (Without Using Tools)

Paired Samples Test			
	t	df	Sig. (2-tailed)
Pretest - Posttest	0.732	10	0.031

From the t value, it can be see that the t count is 10.271 and the t table is 1.729 with a Sig. (2-tailed) value of 0.000. Because the t count is 10.271 > t table is 1.729 and the significance value is 0.000 <0.05, the results show that there is a significant difference. In the results of the swim test with a height > 150 cm, there is a significant difference between the pretest and posttest using tools and without using tools, this shows that tools affect swimming speed, the swimmer's body which can affect a person's swimming speed including arm length, leg length, and height. Height is an important parameter for humans which consists of the body, and the limbs of the head which are measured from the soles of the feet to the top of the head. Body height in the prone state is the length of the whole body divided by the length of the pool, the length of the pool is 50 meters as the distance to be covered. The distance will be divided by the length of the body. So the longer a person's body, the faster the movement rate to reach the other side of the pool.

The first hypothesis which reads "There is an influential difference between the use of paddles and leg load on speed in 50-meter freestyle swimming athletes, is accepted. This means that training using assistive devices and not using assistive devices has a significant effect on the speed of the 50-meter freestyle swimming.

Table 5. Paired Test (Difference in pretest and posttest <150cm)

Paired Samples Test			
	t	df	Sig. (2-tailed)
Pretest - Posttest	5.474	10	0.000

From the t value, it can be seen that the t count is 5.474 and the t table is 1.729 with a Sig. (2-tailed) value of 0.000. Because the t count is 10.271 > the t table is 1.729 and the significance value is 0.000 <0.05, the results show that there is a significant difference.

Table 6. Paired Test (Difference in pretest and posttest >150cm)

Paired Samples Test			
	t	df	Sig. (2-tailed)
Pretest - Posttest	13.486	10	0.000

From the t value, it can be seen that the t count is 13.487 and the t table is 1.729 with a Sig. (2-tailed) value of 0.000. Because the t count is 13.487 > t table is 1.729 and the significance value is 0.000 <0.05, the results show that there is a significant difference.

Based on the suitability of each sample for the indicators contained in the observation sheet regarding freestyle swimming speed in athletes, the results showed that the pre-test and post-test carried out proved that there was a difference in freestyle swimming speed before and after carrying out exercises using hand paddles and leg weights. evidenced by the existence of a significant difference with the value obtained a significance value <0.05.

DISCUSSION

Table 1 shows the effect of the use of the hand paddle device and leg load on speed in athletes (<150cm) in 50-meter freestyle swimming.

The results of the analysis show that there is an increase in the speed of the 50-meter freestyle before and after training using a floating aid. This is indicated by t count 4.983> t table 1.729 and a significance value of 0.000 <0.05, with an increase difference of 1.76. There is an increase in the speed

of the 50-meter freestyle swimming due to the training method using a floating aid which is carried out repeatedly with the same training program but the number of exercise portions is different in each exercise. This is done to train athletes to get used to doing training patterns that the longer the program gets heavier. In addition, a mixed training program is provided so that athletes are familiar with the training patterns given, to increase swimming speed.

Based on the results of research that has been done the average value of freestyle swimming time achievement before treatment and after treatment there is an increase.

The results of this study are in line with the opinion of Dinata, et al. (2015), Yuliana et al. (2021), and (Husaini, et al. (2020) which state that freestyle swimming exercises using hand paddles have a good effect, with intensity for 16 meetings. So that the speed of time becomes faster, this series also affects strength training muscle tone, endurance, agility, and balance.

Table 2 shows a significant difference between the effect of the use of hand paddles and leg load on speed in athletes (>150cm) in 50-meter freestyle swimming.

The results of the analysis show that there is an increase in the speed of the 50-meter freestyle swimming before and after training using a floating aid. This is indicated by t count 7.361> t table 1.729 and a significance value of 0.000 <0.05, with an increase difference of 2.52. There is an influence of the training relationship between using assistive devices and not using assistive devices on the speed of 50-meter freestyle swimming.

The results of this study are in line with the opinions of Dwi, P. M. (2017), Irhana, (2020), Matos, Barbosa, & Castro, (2013) and Yuliana, et al. (2021) which state that there is an effect of the use of hand paddle aids and leg load influencing the swimming speed of the 50-meter freestyle, this is because the hand paddle aids can make it easier for athletes to help increase the speed of the 50-meter freestyle swimming. There are differences when using and not using the pretest and posttest, the difference in question is before and after the

test, changes, and improvements made during 16 meetings.

Based on the results of research that has been carried out, the average value of achieving freestyle swimming time has differences in the pretest and posttest, there is an increase in the use of hand paddles and not using hand paddles in athletes with a height of > 150 cm.

Table 3 shows a significant difference between the effect of the use of hand paddles and leg load on a body height of more than 150 cm with a body height of less than 150 cm on the speed of an athlete in the 50-meter freestyle swim.

The results of the analysis show that there is an increase in the speed of the 50-meter freestyle swimming before and after training using a floating aid. This is indicated by t count 7.300> t table 1.729 and a significance value of 0.000 <0.05, with a difference of 0.75. In swimming, speed is needed to reach the finish line first. A swimmer must be able to master swimming techniques well. With a qualified height, body weight, and long legs, it will be better to play a role in freestyle swimming speed.

There is a difference in height to the speed of the 50-meter freestyle swimming due to good propulsion, body height, and leg length contributing to swimmers, so swimmers can maximize speed for the better.

The results of this study are in line with the opinions of Rohani, (2007), Febrianto, (2019), Gourgoulis, et al., (2014) and Anggraeni, et al. (2019) who state that leg length increases swimming speed because leg length role when taking the prefix, where the leg length is directly proportional to the resulting repulsion. This is supported by a training method that is carried out repeatedly with the same training program as a training method using a floating device and still doing a different number of portions of the exercise in each exercise so that the athlete gets used to doing a training pattern that the longer the program gets heavier. In addition, a mixed training program is provided so that athletes are familiar with the training patterns given, to increase swimming speed.

CONCLUSION

Based on the results of the study, there was an effect of hand paddles and leg load on speed in athletes <150cm freestyle swimming with a difference of 1.76 and there was a significant difference between the effect of using hand paddles and leg load on speed in athletes >150cm with a difference of 2.52 and there is a significant difference between the use of hand paddles and leg load on the difference in using aids with a height of more than 150 cm and using aids that are less than 150 cm at the speed of 50-meter freestyle swimming athletes with a difference of 0.75. So from the results, The conclusion is that the body of an athlete who has a height of 150 cm is better than the body of an athlete whose height is less than 150 cm.

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