

The effect of extensive interval training, intensive intervals, and motivational training on the speed of athletes swimming 50 meters freestyle

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Abstract

Training programs in supporting an achievement are factors that need to be considered. The impact of these factors will result in the quality and quantity of skills possessed by athletes. This study aims to determine the effect of extensive interval training, intensive interval training, and motivation on the speed of swimming 50 meters freestyle of Agam Regency swimming athletes. This research method uses a quasi-experimental method that uses a treatment design by Level 2x2. The sample of this study was 16 Agam Regency swimming athletes. Swimming athletes' motivation data were measured using questionnaires to measure the speed of swimming 50 meters freestyle using the speed test of swimming speed 50 meters freestyle. Data analysis using two-path ANOVA at significance level $\alpha=0.05$ and Shapiro-Wilk Sig. normality test > 0.05 and continued with the Tukey test. The results of the data analysis showed that: (1) There is an overall difference in freestyle 50-meter swimming speed between the extensive interval training method and the intensive interval training method (Sig. $0.00 < 0.05$) (2) There is an interaction between the interval training method and the motivation to train at the speed of the 50-meter freestyle swimming (Sig. $0.00 < 0.05$) (3) In the highly trained training group, the extensive interval method is more effective than the intensive interval method (Sig. $0.003 < 0.05$) (4) In the group that Having low training motivation, extensive exercise methods could not be different from the intensive interval method group (Sig. $0.057 > 0.05$). So it can be concluded that there is a significant influence of extensive interval training, intensive intervals, and training motivation on the speed of athletes swimming 50 meters freestyle.

Keywords: Interval training, training motivation, speed athlete swimming, freestyle

INTRODUCTION

The development of swimming at this time is increasingly rapid and more benefits are felt (Pradana et al., 2018). Swimming can be used for recreation, relieving stress, burning calories, building muscle, and training breathing (Syahputra & Arwandi, 2019). In addition to swimming, it also increases physical freshness and increases performance (Selpamira & Roepajadi, 2022). It can be seen that many people visit the swimming pool every day. In addition, many swimming associations continue to be active in coaching achievements that will produce great athletes who can make clubs, regions, and even Indonesia proud in various competitions. Swimming sports have many benefits for every individual who does it like one type of exercise that can improve health, namely swimming, among others: can be used as a means to train to breathe, relieve stress, burn calories, and build muscle (Jariono, Subekti, Sistiasih, Fatoni, Sudarmanto, et al., 2022).

The achievements that an athlete has achieved in the field of sports, especially in swimming, always come from effort and dedication that is inseparable from the training process (Negara et al., 2021). Through constant and regular practice, remarkable achievements can be realized. Even today, humans have been able to run less than 10 seconds in a 100-meter race, jump more than two meters, and even swim at speeds previously considered difficult to achieve. All these achievements are

possible thanks to dedication in practice. Exercise is a process that involves physical and mental activity that is done in an organized and repetitive manner. The goal is to improve human capabilities, and this continues to evolve (Sanjaya et al., 2022).

Increasing achievement in swimming in particular is complicated and complex, achieving maximum achievement is influenced by many factors (Jariono, Subekti, Sistiasih, Fatoni, & Sudarmanto, 2022). There are mainly four aspects that play a role in getting the maximum possible achievement, namely: technique, tactics, mental, and physical condition (Prawira & A'la, 2021). A swimming athlete needs to have a good and accurate mastery of swimming techniques. It involves an understanding of proper body position while swimming, how to move hands correctly while pedaling, coordination of foot movements while moving, effective breathing techniques, and alignment of movements when freestyle. In addition to mastering freestyle swimming techniques, the tactics and mental state of athletes when competing also have an important role. A swimming athlete must have optimal physical condition and be well-trained (Wiradihardja, 2017). This trait is seen in elite swimmers at the world level. In addition to having a tall and loaded posture, they also show strong and clearly defined muscles.

In principle, sports training is the peak of an athlete's success physical training methods, both general and specific, are a process of preparing athletes to achieve the best performance (Sunandarti et al., 2017). In training an athlete in swimming, especially a coach must design and carry out planned and regular preparations. It aims to achieve maximum achievement by devising an effective exercise program (Putra & Witarasyah, 2019). To improve the quality of exercise, improvements are made regularly, systematically, and based on exercise principles, as well as the type of exercise, exercise intensity, length of exercise, and frequency of exercise called the exercise program (Perdana, 2023).

Alkayis & Soedjatmiko, (2019) suggest that interval training is an exercise system that is inserted with intervals in the form of rest periods. Interval training need not refer to a specific training method, concerning an exercise approach in which periods of high intensity are followed by periods of mild recovery (Astuti et al., 2020). Interval training is highly recommended by coaches because it has a positive impact on the development of endurance athletes (Mubarok & Kharisma, 2021). The extensive interval method is a training method that is almost the same as the intensive interval training method in which it is determined in terms of intensity, reps, number of sets, and rest (Yusuf & Khaliq, 2017). An intensive interval method is an approach to training in which athletes perform a series of high-intensity repetitions of movements or workouts followed by short breaks to maximize performance improvement. One of the training methods aims to increase speed to prepare athletes for the stress of hard work and improve speed increase when experiencing oxygen deprivation and lactic acid formation (Amin et al., 2021). Because swimming is included in aquatic sports, to achieve achievements in this sport also requires coaching, development, and knowledge (Fitriady et al., 2020).

Based on observations and observations on Agam Regency swimming athletes and researcher interviews with Agam Regency swimming coaches, there is still a lack of speed in freestyle swimming in particular and low motivation of these athletes. Due to the lack of training to improve the athlete's swimming speed, the time obtained in swimming 50 meters freestyle is still far from what is expected at race time. Then when you want to do a training session, athletes often arrive late and even laze doing training sessions. Therefore, researchers are interested in conducting research and want to provide a program to improve the ability to swim 50 meters freestyle swimming athletes in Agam Regency. In this study, researchers provided extensive interval speed training and intensive interval training that had been programmed. This indicator is observed through the time it takes the athlete to complete a distance of 50 meters freestyle during practice or competition. Motivation is measured using questionnaires that explore athletes' feelings and beliefs about their training and performance. Delay and Unseriousness in Training Sessions is an indicator of this seen through the presence of athletes at training sessions, whether they are often late or not serious in undergoing training.

To measure speed, a 50-meter freestyle swimming test is used. The time it takes the athlete to complete this distance becomes an indicator of speed. To measure motivation, questionnaires are used designed to assess athletes' confidence and enthusiasm in training and achieving achievements. Lack of speed is observed during training when athletes strive to improve their performance. Motivation is also measured in the context of exercise. Decreased speed can be caused by several factors, such as lack of adequate training to increase speed, low enthusiasm and motivation of athletes in training, and technical problems in swimming techniques that may need to be corrected. Performance Comparison

i.e. No information is given regarding performance comparison before and after implementation of the interval training program. However, this study aimed to see if an extensive and intensive interval training program could improve the swimming speed of athletes.

The extensive interval training method is an exercise approach in which athletes train with moderate weight intensity and many reps, accompanied by short rest periods, aiming to improve speed and endurance. The difference lies in the intensity of work, and rest is shorter than in intensive intervals (Susanto, 2015). (Reftari et al., (2018) The principle of speed training is to focus on developing the athlete's ability to perform movements as quickly as possible through high-intensity training and proper technique.

Furthermore, the intensive interval method is a training method in which it has been determined regarding the distance traveled, travel time, number of repetitions, and recovery time (Yudha Prawira et al., 2021). Reftari et al., (2018) Explained the characteristics of the extensive interval method as medium load intensity of 60% - 80%, the number/volume of high loads and many repetitions of 20-30 series times, incomplete intervals/rest of 45-90 seconds series, and the effect of training caused is an increase in speed endurance. This is in line with the research researched by (Sulastio, 2016) about his research entitled "The Effect of Extensive and Intensive Interval Training Methods on the Performance of the Men's 400 Meter Run of Riau Pasi Athletes" The principle of speed training involves an understanding of the methods applied and the relationship between running and swimming in developing the ability to move quickly.

Maslow's Need Hierarchy Theory or A Theory of Human Motivation is proposed by (Maulana & Irawan, 2017) states that needs are arranged in a hierarchy. The lowest level is physiological needs and the highest level of needs is self-actualization needs. Narlan et al., (2023) Motivation is the force that drives a person to react not to react to determine the direction of activity towards the achievement of goals Motivation is very important in the learning process, sports performance, and achievement of learning/match achievements. Based on this opinion, it can be concluded that motivation is the basic drive that moves a person to behave. This impulse is in a person who moves to do something that is by the motivation in him. Internal motivation is the drive that arises from within the individual, while external motivation comes from outside factors that drive the individual to act or achieve goals (Oemar & Marsudi, 2019).

Motivation must be possessed by an athlete in the training process to achieve achievements in sports (Prasetyo et al., 2021). Training motivation allows athletes to achieve something perfectly, improve fitness at the highest level, and train to the maximum (Garcia & Badri, 2019). Motivation to practice is essentially the desire, start, will, and drive to be able to excel, namely surpassing the achievements he has achieved himself or the achievements achieved by others in the process of training (Mubarok, 2016). So that the motivation to practice is a driver in achieving a goal, then the motivation to practice is to improve a quality that is more than usual. Someone who has a high motivation to practice tends to always try to achieve what is desired despite experiencing obstacles and difficulties in achieving it (Suhdy, 2018). Training motivation can be explained as an encouragement for individuals to exercise and improve the quality of themselves that comes from inside and outside the individual and is influenced by several intrinsic and extrinsic factors (Zakky Mubarok & Kharisma, 2022).

METHOD

This study uses an experimental method that uses a treatment design by Level Two x Two, which is a factorial experiment involving two factors. Each independent variable is classified into 2 (two). Treatment-free variables are classified into two forms of exercise methods (A), namely extensive interval training methods (A1) and intensive interval training methods (A2). While moderator variables are classified into two levels of motivation (B), high motivation (B1) and low motivation (B2).

This research was conducted at the Merlin Swimming Pool, Agam Regency, and the time of this study was carried out from May 2 to June 7, 2023, with a population of 30 athletes who were still actively participating in training. In this study, sampling was carried out by purposive sampling, meaning that the sampling technique with consideration was 27% of the highest score and 27% of the lowest score after being given a motivational questionnaire. Thus, the number of treatment group

samples was obtained as many as 16 athletes. The speed measurement method uses an indicator of the time it takes the athlete to complete a distance of 50 meters freestyle.

The data collection process in this study used two instruments, namely using questionnaires and using tests. Which is where to get data on training motivation in Agam Regency swimming athletes, a training motivation questionnaire trial was first carried out. Then this questionnaire was validated by experts with as many as 42 items. With a reliability value of 0.96 using the Crochbach Alpha value. While the data collection process for the test, researchers used a 50-meter freestyle swimming speed measuring instrument using a stopwatch, namely conducting individual swimming speed tests in units of seconds, by calculating the fastest time. Furthermore, in analyzing the data in this study is with a 2x2 treatment level design, the data analysis technique uses the two-line Anava technique followed by a Tukey test with a significant level of $\alpha=0.05$. Previously, the data was processed using the Anava technique, Anava requirements were first tested, namely the normality test and variance homogeneity test with a significant level of $\alpha=0.05$, and prerequisite tests, among others, normality tests and homogeneity tests.

RESULTS AND DISCUSSION

Result

Description of data from the speed of swimming 50 meters freestyle which is the result of measurements of all research objects. Based on the experimental research design conducted, several groups of data are described separately. The data is below.

1. Description of training motivation and speed swimming 50 meters freestyle Agam District swimming athletes

Table 1. Agam District Swimming Athlete Data Results

Data Groups	Interval Class	Frequency	Percentage %	Category
Practice Motivation Test	186-201	8	50%	Excellent
	170-185	4	25%	Good
	154-169	1	6%	Enough
	138-153	2	13%	Less
	122-137	1	6%	Very Lacking
		16	100%	
Data Groups	Interval Class	Frequency	Percentage %	Category
Swimming Speed Test	32.99-33.80	4	25%	Excellent
	33.81-34.62	5	31%	Good
	34.63-35.44	1	6%	Enough
	35.45-36.26	3	19%	Less
	36.27-37.08	3	19%	Very Lacking
		16	100%	

2. Results of 50-meter freestyle swimming speed measurement in the treatment group

Table 2. Data Results in Each Group

Data Groups	Interval Class	Frequency	Percentage %	Category
Extension Interval A₁	32.99-33.80	4	25%	Excellent
	33.81-34.62	5	31%	Good
	34.63-35.44	1	6%	Enough
	35.45-36.26	3	19%	Less
	36.27-37.08	3	19%	Very Lacking
		16	100%	
Groups	Interval Class	Frequency	Percentage %	Category
Intensive Interval A₂	32.99-33.80	4	25%	Excellent
	33.81-34.62	5	31%	Good
	34.63-35.44	1	6%	Enough
	35.45-36.26	3	19%	Less

	36.27-37.08	3	19%	Very Lacking
		16	100%	
Groups	Interval Class	Frequency	Percentage %	Category
High Training Motivation B₁	32.99-33.80	4	25%	Excellent
	33.81-34.62	5	31%	Good
	34.63-35.44	1	6%	Enough
	35.45-36.26	3	19%	Less
	36.27-37.08	3	19%	Very Lacking
			16	100%
Groups	Interval Class	Frequency	Percentage %	Category
Low Motivation to Train B₂	32.99-33.80	4	25%	Excellent
	33.81-34.62	5	31%	Good
	34.63-35.44	1	6%	Enough
	35.45-36.26	3	19%	Less
	36.27-37.08	3	19%	Very Lacking
			16	100%

3. Results of 50-meter freestyle swimming speed data in each group division

Table 3. Results of group division data

Group	Interval Class	Frequency	Percentage %
Extensive Interval Method Exercise Group with High Training Motivation (A₁B₁)	32.99 – 33.05	1	25%
	33.06 – 33.12	1	25%
	33.13 – 33.19	2	50%
	33.2 – 33.26	0	0%
		4	100%
Group	Interval Class	Frequency	Percentage%
Intensive Interval Method Exercise Group with High Training Motivation (A₂B₁)	34.22 – 34.33	1	25%
	34.34 – 34.45	0	0%
	34.46 – 34.57	3	75%
	34.58 – 34.69	0	0%
		4	100%
Group	Interval Class	Frequency	Percentage%
Intensive Interval Method Exercise Group with High Training Motivation (A₂B₁)	34.58 – 34.95	1	25%
	34.96 – 35.33	1	25%
	35.34 – 35.71	2	50%
	35.72 – 36.09	0	0%
		4	100%
Group	Interval Class	Frequency	Percentage%
Intensive Interval Method Exercise Group with Low Training Motivation (A₂B₂)	35.56- 36.05	1	25%
	36.06 – 36.55	0	0%
	36.56 – 37.05	3	75%
	37.06 – 37.55	0	0%
		4	100%

4. Normality Test

Table 4. Normality Test Results

Normality Test (Shapiro-Wilk)			
Statistic	Df	Sig.	Information
0.896	16	0.07	Usual

The table above shows that all groups of data tested for normality with the Shapiro-Wilk test give Sig. values that are greater than a value L_{tabel} 0,05. Thus it was concluded that all data groups in this study were normally distributed.

5. Homogeneity Test

Table 5. Homogeneity Test Results

F	Sig.	Information
2.376	0.121	Homogeneous

Based on the table above, the homogeneity test result with the test criteria is acceptable H_0 Sig. 0,121 > 0,05 which means homogeneous variance with significance $\alpha = 0,05$. Dengan Thus it can be concluded that all four groups of data are homogeneous.

6. Test the hypothesis

Table 6. Analysis of Variance (ANOVA) Calculation Results

Analysis of Variance (ANOVA)	
Source	Sig.
Exercise Method	0.000
Training Method *Motivation to Practice	0.000

Table 7. Tukey's Advanced Test

Analysis of Variance (ANOVA) Test with Tukey Test			
Post Hoc	Post Hoc	Sig.	Information
A ₁ B ₁	A ₂ B ₁	0.003	Significance
A ₁ B ₂	A ₂ B ₂	0.057	No Significance
Dependent Variable: Tukey HSD Swimming Speed			

Discussion

The results of hypothesis testing showed that overall the average swimming speed exercise method in the extensive interval group was more effective than the intensive group exercise method. The advantages of these two training methods greatly determine the success of a given exercise, as it has been stated that extensive interval training methods have advantages in terms of execution according to Sulastio, (2016) On the principle of extensive interval training methods, these exercises are performed continuously and systematically with medium load intensity, many reps and little rest periods. According to (Suhdy, 2018) Extensive interval training is a form of exercise used to increase aerobic endurance to practice techniques in beginning and tactical training. While the method of intensive interval training according to Suhdy, (2018) is to increase speed, power, automatic motion techniques, and others. Correspondingly, intensive interval training is one of the exercise methods that can be used to increase an athlete's VO₂ max (Prasetyo et al., 2021). So to increase the swimming speed of 50 meters, Agam Regency swimming athletes in this study carried out two extensive interval training methods and intensive interval training methods. Based on the explanation above, these two interval training methods have different influences. The extensive interval training method is more effective than the intensive training method to increase the speed of swimming 50 meters freestyle of Agam District swimmers. Increased speed can be achieved through moderate-intensity training due to the focus on heavy reps and proper technique to improve movement efficiency, which can accumulatively optimize the athlete's performance.

In addition, there is an interaction between extensive interval training methods and intensive interval training methods with motivation for the speed ability to swim 50 meters freestyle Agam Regency swimming athletes, or in other words, the research hypothesis proposed can be proven true. According to Sulastio, (2016) The training method is the entire process of preparing athletes who are planned regularly to achieve their best performance. So with this extensive and intensive interval training method, researchers wanted to provide a program that could affect the speed of swimming 50 meters freestyle Agam District swimming athletes. So it was identified that increasing the speed of freestyle swimming 50 is not only by training methods but also influenced by the motivation of practicing swimmers (Susanto, 2015). So between interval training methods and training motivation, there is a significant influence on the speed of swimming 50 meters freestyle Agam Regency swimming athletes. In this study, there was an interaction between extensive and intensive interval training methods and the level of motivation of athletes in developing 50-meter freestyle swimming

speed in Agam District. This study aimed to prove the hypothesis that this exercise program has a positive effect on swimming speed, focusing on structured interval training programs and athletes' motivation in training. These findings identified that the increase in speed in 50-meter freestyle swimming depends not only on the training method, but is also influenced by the swimmer's training motivation (Putri et al., 2022).

In testing the last hypothesis, it was found that there was a difference in the effect between extensive interval training methods and intensive interval training methods on the speed of 50-meter freestyle swimming in a group of athletes with high training motivation. The results showed that extensive interval training methods were more effective in increasing the speed of freestyle 50-meter swimming in Agam District swimmers who had high motivation to train.

However, overall, the results of 50-meter freestyle swimming speed in the group receiving intensive interval training methods and extensive interval training methods with low category training motivation showed that there was no significant difference. This indicated that in the group of athletes with low training motivation, the intensive interval training method did not differ significantly from the extensive interval training method.

CONCLUSION

Based on the results of the study, it can be concluded that the extensive interval training method has a more effective effect than the intensive interval training method in increasing the speed of swimming 50 meters freestyle Agam Regency swimming athletes, then there is an interaction between the interval training method and motivation for the speed and in the group of extensive interval methods with the motivation to train to be more effective than the intensive interval method against increased speed. As well as the low-motivated swimmers, there was no significant difference between the trained group and the group trained with the extensive interval method and the intensive interval method.

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