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The different distance of the start in swimming

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ABSTRACT

This study aims to determine the difference in the distance start between the racing start and grab start technique. The research design is expost facto research. The population of the research are 23 people, out of these population, the sample was purposive sampling about 12 male swims athletes. To measure the distance of grab start technique and racing start technique then measured using meter tool. The data analysis technique used in this research is comparative analysis by using the test equation of different mean or t test. Result, There is a significant difference between the launch distance of grab start technique with the launch distance in racing start technique. The average launch distance of grab start technique is 9. 26 meters while the average start from racing start technique is 9.04 meters. Thus, the grab start technique is better than racing start technique.

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Introduction

Sport is a physical activity that is a necessity for human life for survival. At this time many people choose exercise as an alternative to get a healthy and fit body naturally. By exercising regularly and continuously, a person can have a healthy body, where a healthy body will determine the productivity of his life. By having a healthy and fit body, humans can perform every task and obligation in daily life productively and independently. So that humans can live their lives with full prosperity (Haryanto & Welis, 2019). There are many types of sports that can be practiced, one of which is swimming. Swimming has benefits so that children's motoric development and skills develop optimally (Bogdan et al., 2020). The sport of swimming has been competed a lot from the regional to the international level, so it is necessary to conduct a talent search process so that it can be trained and can make the country proud in the future. In the process of preparing the athlete's ability to face every competition, the coach provides various forms of training to the athlete. One of the training materials carried out to prepare athletes' swimming abilities and speed in swimming competitions is the start technique. according to (Rifandi & Syahara, 2018) start is an important skill to be trained so that the distance of the drop can be maximized, the start is the best way to get into the pool and is the initial movement made to start a swimming competition, both freestyle, breaststroke, butterfly, and backstroke . In swimming, there are several forms of start that can be used by swimmers including racing start, swing start, grab start, and track strat. (Rubiansyah et al., 2016). However, the usual and dominant forms of start used are racing start and grab start. Racing start and grab start is a start made from above the starting place, so that this form of start can be used for breaststroke, freestyle, and butterfly swimming techniques in swimming competition rules. The difference between racing start and grab start lies in the initial phase of the start

movement. At the racing start, the swimmer's body position is standing with the legs bent above the start block, then both arms are straight behind the body right next to the waist. While at the grab start, the swimmer's body position is standing with the legs bent above the start block, the swimmer's big toe grips the edge of the start block and the fingers also hold the edge of the start block (Cossor & Mason, 2001). Every swimming athlete needs a good and correct starting ability. Therefore, every athlete must have maximum starting ability (Putra & Herpandika, 2016) Because with a good start, swimmers will be able to cover long distances in a short time (Tore et al., 2014). Start has a big role so that an athlete is able to become a champion in a competition (Matúš & Kandráč, 2020; Ozeki et al., 2012; Mason et al., 2014). Athletes who have a good start have a tendency to become champions in an official competition (Clephas et al., 2019).

There are several studies that have been done related to this problem. (Putra & Herpandika, 2016) explained that the distance of the glide when the athlete started was related to the strength of the abdominal muscles, back muscles, and leg muscles possessed by the athlete, as well as the explosive power of the leg muscles and the strength of the leg muscles. (Fitriyati, 2021). (Galbraith et al., 2008) revealed that the conventional track start is still faster than the modified one-handed track strat technique. In another study conducted by (Setiawahyu, 2020) explained that there is no significant difference between the distance of the jump using the grab start and swing start techniques. Maulana & Irawan (2017) explained in his research that burpee training can increase the distance the jump results at the start. other than that (Sinatra & Sudijandoko, 2020) explained that the track start ability can be improved by doing jump to box exercises. Because there are still very few studies that try to compare which is farther the athlete jumps using the grab start or racing start technique, the purpose of this study is to determine the difference between the racing start and grab start techniques on the distance of the slide in the swimming sport.

Method

The research that will be conducted is ex post facto research. Ex post facto research is research that reveals comparisons or relationships between variables without any manipulation of the variables by the researcher. The research that the researcher will do aims to compare the distance of the start slide between the racing start and grab start. However, the data collected is data as it is from each sample without any treatment. The sample in this study were male athletes in the achievement group, which amounted to 12 people. The instrument or tool used to measure the distance of the start slide is a meter. To collect data on the distance of the start slide from the racing start and the distance of the start slide from the grab start, it can be done through direct measurements of the research sample. The data analysis technique used is the t-test formula (mean difference test). The steps for analyzing the data are as follows: 1) Normality test using liliefors. The normality test aims to determine whether the data obtained are normally distributed or not. 2) Homogeneity test. 3) T-test analysis (mean difference test)

Results and Discussions

Launch Data of Grab Start Technique

After measuring the launch start from the grab start technique and data analysis, it is known: The highest score = 10.65 meters and the lowest score is 8.15 meters. Then based on the calculation of the average score, it is known that the average (mean) = 9.26 meters and the standard deviation score = 0.87 meters. The following is a data frequency distribution table for the start of the grab start technique.

Table 1 <Distribution of Data Frequency Launches of Grab Start Techniques>

Interval Class (meters)	Frequency	
	Absolute (fa)	Relatively (%)
< 7.94	0	0.00%
7.94 – 8.75	4	33.33%
8.76 – 9.56	5	41.67%
9.57 – 10.37	1	8.33%
> 10.37	2	16.67%
Total	12	100.00%

Based on the frequency distribution table and the bar histogram, from the 12 athletes as the research sample, 4 people (33.33%) had the ability or distance to start gliding with scores ranging from 7.94 to 8.75 meters. 5 people (41.67%) had the ability or distance to start with a score ranging from 8.76 to 9.56 meters. 1

person (8.33%) has the ability or distance to start the slide with a score ranging from 9.57 to 10.37 meters. 2 people (16.67%) have the ability or distance to start with a large score of 10.37 meters.

Start Launch Data of Racing Start Techniques

After measuring the start slide from the racing start technique and data analysis, it is known: The highest score = 10.40 meters and the lowest score is 8.05 meters. Then based on the calculation of the average score, it is known that the mean = 9.04 meters and the standard deviation score = 0.76 meters. The following is a table of frequency distribution of data for the start of the racing start technique.

Table 2 <Frequency Distribution of Racing Start Technique Data Launches>

Interval Class (meters)	Frequency	
	Absolute (fa)	Relatively (%)
< 7.94	0	0.00%
7.94 – 8.75	5	41.67%
8.76 – 9.56	4	33.33%
9.57 – 10.37	2	16.67%
> 10.37	1	8.33%
Total	12	100.00%

Based on the frequency distribution table and bar histogram, from 12 athletes as the research sample, 5 people (41.67%) had the ability or distance to start gliding with scores ranging from 7.94 to 8.75 meters. 4 people (33.33%) had the ability or distance to start the slide with scores ranging from 8.76 to 9.56 meters. 2 people (16.67%) had the ability or distance to start the slide with scores ranging from 9.57 to 10.37 meters. 1 person (8.33%) has the ability or distance to start the slide with a large score of 10.37 meters.

To prove the research hypothesis, it is necessary to test the hypothesis. Hypothesis testing is done by using comparative analysis with the mean difference test formula or t test. Based on the analysis of the mean difference test (t test) carried out, the results of the analysis of the mean difference test (t test) are obtained in the form of calculated t test coefficients. These results can be seen in the summary table of the results of the t-test analysis as follows.

Table 3 <Summary of Mean Difference Test Results (t Test)>

dk = (n-1)	Launch Start $\bar{x}_1$ (GrabStart)	$\bar{x}_2$ (Racing Start)	th	yyyy	Conclusion
11	9.26	9.04	4.23	2.20	There is a difference

Based on the t distribution table with degrees of freedom (dk) = (n-1) = 12 - 1 = 11 and the significance level (α) = 0.05, the value of tt = 2.20 is obtained. From these results, the price of th > tt or 4.23 > 2.20. So, Ho is rejected while Ha is accepted. In conclusion, there is a significant difference in how far the racing start technique start slide with the grab start technique start slide and the grab start technique start slide is better than the racing start technique start slide.

Based on the results of data analysis using the t test, it was obtained that (th > tt or 4.23 > 2.20). Based on the results of the analysis, the proposed research hypothesis is accepted as true. The conclusion is that there is a significant difference between the distance of the start slide of the racing start technique and the start slide of the grab start technique. Thus, it can be understood that there is a difference between the distance of the start glide from the grab start technique and the distance of the start of the racing start technique. The average launch distance from the grab start technique is 9.26 meters while the average launch distance from the racing start technique is 9.04 meters. From these data, the magnitude of the difference in the distance of the resulting start slide is 0.22 meters. Therefore, a good starting technique used by athletes is the grab start technique. The results of this study are in line with the findings of research conducted by (Lee et al., 2001; Carradori et al., 2015). Other research results (Naemi et al., 2001) shows the influence of the hands placed between the legs and the hands placed outside the legs. Hands positioned on the outside of the feet can make a good start. Timed kicks have no significant effect on the start (Honda et al., 2012) as well as in other studies the success of grab

start for great athletes is the magnitude of the vertical and horizontal forces generated when starting the very maximum carried out by the athletes (J Vantorre et al., 2010).

Good starting ability, one of which can be seen from the distance the glide can be generated. Therefore, swimmers can choose various forms of starting that can be used to support the appearance of swimming athletes during the competition. To be able to start properly and correctly, the selection of the starting form used is not the only factor that affects the distance of the start slide. This means that there are many other factors that affect the distance of the start, strength, flexibility and balance have a role in the success of starting in the swimming sport (Maidarman, 2016)

According to (Amin et al., 2012) Explosive power of leg muscles is included in the physical condition factors that affect the distance of the start glide, besides that the length of the legs and muscle strength will also contribute to the distance of the glide. The explosive power of the leg muscles is the ability of the leg muscles to perform by directing maximum force with very fast muscle contractions. In this case the leg muscles are not only able to move strongly but are able to move quickly. The form of leg muscle explosive power can be seen from how far a person can jump, especially horizontal jumps. (Rusdiana, 2020 ; Olstad et al., 2020) stated that the success of the start is largely determined by the mechanic leg power factor, the force just before take off, the breadth of the knee angle when doing the push off (Barkwell & Dickey, 2020)

The explosive power of the leg muscles and the strength of the back muscles are needed by swimming athletes, especially in terms of starting. When viewed from the analysis of the start movement, the start movement is carried out by relying on the ability to push or push the legs against the start block. The strong push in a short time from the swimmer's limbs causes the swimmer's body to be pushed forward, then floats in the air, then enters the water, and then slides under the water surface. For athletes who are able to maximize the push (rejection) of the legs strongly and quickly, this gives them the advantage of being able to float in the air as far forward as possible and the momentum of the strength and speed of the repulsion of the legs can carry the swimmer's body further up and down the surface. water forwards away from the starting block. This is in accordance with the results of research conducted by(Fitriyati, 2021) which explains that two physical components, namely leg muscle power and back muscle strength, have a significant contribution to the distance of the glide produced by the athlete. To maximize the distance of the slide when starting the training factor will also have an effect. Burpee exercises can increase the distance of the glide this is as described by (Rubiansyah et al., 2016)

The next factor that can affect the distance of the start in swimming is the mastery of the start technique itself. Mastery of starting technique is an important factor that determines the level of starting ability. Mastery of the maximum starting technique is a factor that determines the level of starting ability. Therefore, every swimming athlete must have a good mastery of starting technique (Nata et al., 2020).

One of the efforts to optimize the distance of the slide made by the athlete is by improving and maximizing how to learn the athlete's grab start technique, with the good grab start technique, the distance of the slide will also be better. (Gani et al., 2020) in his research recommends a reciprocal teaching style to improve grab start abilities, because this teaching style has been proven to improve athletes' grab start abilities, the reciprocal learning process emphasizes interactions between athletes to provide input to their friends so that they can also correct each other's movement mistakes, by In the presence of intense movement correction, technical improvement can be increased.

The grab start technique which is proven to be good in the results of this study is also not only supported by physical factors, but psychologically also has a close relationship, (Hasmarita & Septiana, 2019) in his research found that the self-confidence possessed by athletes will support the success of the grab start technique that will be carried out by an athlete, therefore the coaches and teachers who will teach this technique cannot also ignore this psychological element, solid confidence will make athletes do not hesitate in jumping so that the results of the slide will also be more optimal. The athlete's performance when swimming after doing both types of start has good results, but at the start, athletes who use the track start technique biomechanically are able to glide faster than the grab start (Julien Vantorre et al., 2011).

Conclusions

Based on the data analysis that has been carried out, it can be concluded: There is a significant difference between the distance of the start slide of the grab start technique and the distance of the start of the racing start technique. The average launch distance from the grab start technique is 9.26 meters while the average launch distance from the racing start technique is 9.04 meters. Thus, the start slide of the grab start technique is better than the start of the racing start technique.

References

Amin, N., Subiyono, H. S., & Sumartiningsih, S. (2012). Sumbangan Power Otot Tungkai Panjang Tungkai Kekuatan Otot Perut Terhadap Grab Start. *JSSF (Journal of Sport Science and Fitness)*, *1*(2), 8–13.

Barkwell, G. E., & Dickey, J. P. (2020). Different lower-limb setup positions do not consistently change backstroke start time to 10 m. *Sports*, *8*(4). https://doi.org/10.3390/sports8040043

Bogdan, Adrian, & Toma, S. (2020). OPTIMIZING THE PERFORMANCE OF JUNIOR SWIMMERS BY DEVELOPING GENERAL STRENGTH. *Analele Universităţii Din Oradea*, *30103*, 26–32.

Carradori, S., Burkhardt, D., Sinistaj, S., Taylor, W. R., & Lorenzetti, S. (2015). Kinetic and kinematic analysis of the leg positioning in the freestyle track start in swimming. *33rd International Conference on Biomechanics in Sports*, 808–811.

Clephas, C., Stergiou, P., & Katz, L. (2019). Start performance and its relation to competition times in Paralympic swimmers. *Journal of Human Sport and Exercise*, *14*(3), 645–655. https://doi.org/10.14198/jhse.2019.143.14

Cossor, J. M., & Mason, B. R. (2001). Swim Start Performances At the Sydney 2000 Olympic Games. *Biomechanics Symposia*, 70–74.

Fitriyati, N. F. (2021). Kontribusi dua komponen fisik yaitu otot tungkai dan otot punggung terhadap capaian luncuran start pada atlet gaya punggung. *Jurnal Prestasi Olahraga*, *3*(4), 45–48. https://ejournal.unesa.ac.id/index.php/jurnal-prestasi-olahraga/article/view/37867

Galbraith, H., Scurr, J., Hencken, C., Wood, L., & Graham-Smith, P. (2008). Biomechanical comparison of the track start and the modified one-handed track start in competitive swimming: An intervention study. *Journal of Applied Biomechanics*, *24*(4), 307–315. https://doi.org/10.1123/jab.24.4.307

Gani, R. A., Winarno, M. E., Aminudin, R., Dimyati, A., & Bayu, D. (2020). Gaya mengajar resiprokal untuk peningkatan teknik grab start. *Jurnal Keolahragaan*, *8*(1), 98–107. https://doi.org/10.21831/jk.v8i1.31167

Haryanto, J., & Welis, W. (2019). Minat Berolahraga pada kelompok usia middle age. *Jurnal Performa Olahraga*, *4*(2), 214–223.

Hasmarita, S., & Septiana, R. A. (2019). Hubungan kepercayaan diri dengan teknik dasar grab start. *Journal of Physical and Outdoor Education*, *1*(1), 63–72. https://doi.org/10.37742/jpoe.v1i2.11

Honda, K., Sinclair, P., Mason, B., & Pease, D. (2012). the effect of starting position on elite swim start performance using and angled kick plate. *30 Th Annual Conference of Biomechanics in Sports*, *166*, 72–75.

Lee, C., Huang, C., Wang, L., & Lin, D. (2001). Comparison of the dynamics of the swimming grab start, squat jump, and counter movement jump of the lower extremity. *International Symposium on Biomechanics in Sports*, *1*(1), 143–146. https://ojs.ub.uni-konstanz.de/cpa/article/view/3840/3558

Maidarman. (2016). Kontribusi kekuatan otot tungkai, kelentukan pinggang, dan keseimbangan terhadap kemampuan start renang gaya kupu-Kupu pada mahasiswa. *Jurnal Performa Olahraga*, *1*(2), 147–156.

Mason, B. R., Franco, R., Sacilotto, G., & Hazrati, P. (2014). Characteristics of elite swim start performances. *32 International Conference of Biomechanics in Sports*, 377–380.

Matúš, I., & Kandráč, R. (2020). Kinematic analysis of the kick start from OSB12. *Physical Activity Review*, *8*(2), 86–96. https://doi.org/10.16926/par.2020.08.25

Maulana, B., & Irawan, R. J. (2017). Pengaruh latihan burpee terhadap jarak lompatan start pada olahraga renang. *Jurnal Kesehatan Olahraga*, *5*(2), 51–60. https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-kesehatan-olahraga/article/view/22019

Naemi, R., Arshi, A. R., Ahadian, A., & Barjasteh, B. (2001). 3D kinematic and kinetic analyses of two methods for grab start technique. *Biomechanics Symposia*, *28*(1964), 96–99.

Nata, A. D., Hanif, A. S., & Sukur, A. (2020). Model Technique on Grabstart Swimming Branch using Video Media for Deaf-Children. *PENDIPA Journal of Science Education*, *4*(1), 54–58. https://doi.org/10.33369/pendipa.4.1.54-58

Olstad, B. H., Wathne, H., & Gonjo, T. (2020). Key factors related to short course 100 m breaststroke performance. *International Journal of Environmental Research and Public Health*, *17*(17), 1–16. https://doi.org/10.3390/ijerph17176257

Ozeki, K., Sakurai, S., Taguchi, M., & Takise, S. (2012). Kicking the back plate of the starting block improves start phase performance in competitive swimming. *30th Annual Conference of Biomechanics in Sports*, *73*, 2010–2013.

Putra, R. P., & Herpandika, R. P. (2016). Hubungan kekuatan otot tungkai, otot perut, dan otot punggung terhadap jauh lompatan grab start atlet putra klub renang arwana. *Bravo's Jurnal Program Studi Pendidikan Jasmani Dan Kesehatan*, *4*(2), 72–84. https://doi.org/10.32682/bravos.v4i2.223

Rifandi, A., & Syahara, S. (2018). Perbandingan kemampuan teknik grab start dengan track start pada renang gaya bebas atlet renang tirta kaluang. *Journal Patriot*, *1*(1), 115–122.

Rubiansyah, A., Rusdiana, A., & Mulyana, R. B. (2016). Pengaruh latihan plyometrics terhadap hasil tolakan start pada olahraga renang. *Jurnal Terapan Ilmu Keolahragaan*, *1*(1), 6–11. https://doi.org/10.17509/jtikor.v1i1.1538

Rusdiana, A. (2020). Analisis Kinematika Gerakan Track Start dalam Olahraga Renang. *JUARA : Jurnal Olahraga*, *5*(2), 143–150. https://doi.org/10.33222/juara.v5i2.881

Setiawahyu, M. I. (2020). Perbedaan hasil loncatan swing start dan grab start terhadap hasil tolakan start dalam cabang olahraga renang. *Jurnal Kepelatihan Olahraga*, *12*(2), 95–100. https://doi.org/10.17509/jko-upi.v12i2.26265

Sinatra, M. K., & Sudijandoko, A. (2020). Pengaruh pelatihan jump to box terhadap kemampuan track start cabang olahraga renang klub tirta mulya sc. Nganjuk. *Jurnal Kesehatan Olahraga*, *8*(4), 107–112.

Tore, O., Bulgan, C., & Aydin, M. (2014). the kinematic analysis of the grab, rear track and front track start in swimming. *Crnogorska Sportska Akademija*, 57–62.

Vantorre, J, Seifert, L., Fernandes, R. ., Boas, J. P. V., & Chollet, D. (2010). Comparison of grab start between elite and trained swimmers. *International Journal of Sports Medicine*, *31*(12), 887–893. https://doi.org/10.1055/s-0030-1265150

Vantorre, Julien, Seifert, L., Vilas-Boas, J. P., Fernandes, R. J., Bideau, B., Nicolas, G., & Chollet, D. (2011). Biomechanical analysis of starting preference for expert swimmers. *Portuguese Journal of Sport Sciences*, *11*(2), 415–418. https://ojs.ub.uni-konstanz.de/cpa/article/viewFile/4861/4501