



The Effect of Hand Paddle and Push Up Exercises to Increase Swimming Speed in Children Aged 11-12 Years

Rakafadni Historian *¹, Dewi Susilawati², Respaty Mulyanto³

^{1,2,3} Physical Education of Elementary Teacher Program, Universitas Pendidikan Indonesia, Bandung, Indonesia

Article Info

Article History :

Received : February 2024

Revised : March 2024

Accepted : March 2024

Keywords:

Hand Paddle,
Push Up,
Swimming,

Abstract

This study aims to determine how influential the use of Hand Paddle media and Push Up Exercises are to increase freestyle swimming speed in children aged 11-12 years. This study used Quantitative research methods and Experimental research types, Freestyle swimming test using one-group pre-test post-test design for 10 treatments, This study was as many as 20 students from extracurricular swimming at SDN Pasir benteng 2 with Purposive Sampling sampling technique, The results of descriptive analysis showed a significant decrease in swimming time for both groups. The average swimming time of the Hand Paddle group decreased from 35.66 seconds in the Pre Test to 29.82 seconds in the Post Test, while the Push Up group decreased from 37.41 seconds to 35.35 seconds, These findings suggest that both interventions have been successful in increasing swimming speed.

OPEN ACCESS



*Corresponding email :
rakafadni07@upi.edu

ISSN 2685-6514 (Online)
ISSN 2477-331X (Print)

INTRODUCTION

Physical education is a very important part of education, besides that if directed and fostered properly, children will develop skills that are useful for leisure time, engage in activities that are conducive to life development (A. Hidayat et al., 2023). One sport that is very influential for health and development is swimming (Darmawan & Destiasari, 2019). Janet Evans says: "Swimming is an activity, many people have done virtually their entire lives. Kids look forward to days at the pool, lake, or ocean, splashing around and racing friends" (T. A. S. Hidayat, 2019). Swimming is one of the sports in aquatic branches where the movement is purely done in water (Harmoko & Sovensi, 2021). Swimming can optimize the process of body development through movements based on muscle movements, and provide benefits both physically and emotionally such as improving physical fitness, self-rescue, rehabilitation, and achievement, (Yoon, 2014). Quantitative swimming has become popular with the increasing number of swimming associations in big cities and regions throughout Indonesia (Civilization et al., 2021). Swimming ranks third in the type of sport that is most in demand by Indonesians after running and cycling (Juniana P, 2019). The problem that occurs in freestyle swimming is the lack of speed, Every speed in swimming is the result of two forces. One force tends to hold it is called resistance caused by water that must be pushed forward (Wardhani, 2022).

The benefits of swimming are to form physical abilities such as endurance, muscle strength and also beneficial for the development and physical growth of children (Sanjaya et al., 2022). The history of the development of swimming sports in Indonesia before Indonesia became independent there were several pools, but

the people of Indonesia did not have the opportunity to swim, because swimming at that time was only intended for nobles (Ginting, 2021). The swimming styles contested are freestyle, butterfly, backstroke, and breaststroke (Syaputra et al., 2024). In this study the style that will be focused on is freestyle swimming, freestyle swimming has four kinds of movement components, namely body position, foot movements, hand movements and how to take a breath with coordination (dos Santos et al., 2021).

In freestyle swimming has four components of movement namely, body position, foot movement, hand movement, breatching and coordination (Raison & Madilis, 2022). Freestyle swimming is the fastest of all styles (Puristy & Alsaudi, 2020). In order for students in extracurricular swimming to have increased speed ability and to have achievements, the movements in the freestyle swimming component must be considered, a very important exercise program in freestyle swimming is speed training (Sin & Hudayani, 2020). If a person does freestyle swimming at a very maximum speed then there is little chance of having obstacles (Yuliana et al., 2021). If a person does freestyle swimming at a very maximum speed then there is little chance of having obstacles.

Hand paddle is a plastic disc worn over the palm of the swimmer's hand and attached to the back of the swimmer's hand with an elastic strap, the use of Hand Paddle is more recommended for swimmers with a stroke that is good / stable (not changing) (Irwanto et al., 2022). So the use of this tool is given not to students who are just learning to swim but novice athletes who have low arm strength. Push ups are a type of exercise that is widely done to form upper body muscles, such as chest muscles, shoulders, arms, hands, upper back, and several joints. In addition, the abdominal and thigh

muscles are also trained when push ups are done (Arhesa, 2019), Based on the results of analysis from previous studies, there is significance in the use of Hand Paddle and Push Up exercises to increase freestyle swimming speed.

Here are some relevant research titles " The Effect of the Use of Hand Paddle and Fins Swimming on Freestyle Swimming Speed in Club Tirta Bima Majalengka Swimming Athletes" "The effect of push-ups and squat-jump exercises on freestyle swimming speed in arhesa swimming club athletes, Previous research proved that swimming performance can not only be improved through special exercises in the water, but also through exercises on land (Komang Ayu Krisna Dewi et al., 2022) .

METHODS

This research uses quantitative methods, namely research that uses numbers and statistics in collecting data analysis (Harmoko & Sovensi, 2021), Experimental research is to determine the causal relationship between two phenomena (Mahyuddin et al., 2023). One Group Pretest-Posttest research design is to conduct tests before treatment and tests after treatment (Viera Valencia & Garcia Giraldo, 2019), This research was carried out as many as 10 meetings, namely the provision of treatment in the form of Hand Paddle and Push Up 8 times and 2 meetings for the implementation of pretest and posttest.

Participants

A population is a whole group of people or other objects of study that want to be described and understood (Firmansyah & Dede, 2022), The population in this study was 23 extracurricular swimming students at SDN

Pasir benteng 2 in Rancakalong sub-district, Sumedang regency.

Sampling Procedures

Sampling is the process by which a population is selected in order to be representative of that population (Harmoko & Sovensi, 2021), In this study using Purposive sampling technique which is a sampling technique not based on random, area or strata (Septian, 2021), Purposive sampling techniques include maximum variation sampling, homogeneous sampling and typical case sampling (Firmansyah & Dede, 2022), The number of samples in this study was 20 extracurricular swimming students of SDN Pasirbenteng 2 with an average age of 11-12 years.

Materials and Apparatus

This study uses an instrument, namely a freestyle swimming test by taking travel time to take scores, so in this study the necessary instruments are a 50-meter swimming pool, Pluit and stopwatch.

Procedures

Research procedures are procedures for answering research questions (Laili et al., 2023), Here are the stages of this research process; a). Selecting a sample of extracurricular swimming students at SDN Pasirbenteng 2, b). Licensing stage to the school, c). instrument composing stage, d). Research Implementation Stage, this stage is carried out by providing treatment for 10 meetings, e). the stage of calculating the number data obtained to find out how influential Hand Paddle and Push Up Exercise are, f). interpretation of calculations from the results of the study.

Design or Data Analysis

This study used the Pretest-Posttest Group Design research design. In this design, there is a pretest, before being

treated by means of a freestyle swimming speed test, then, the posttest is to carry out a test after being given a test in the form of hand paddle aids and push up exercises so that the results of the treatment can be known more accurately (Dwi Wahyuni et al., 2023). This study obtained the results of the data in the following ways; a). Find averages, default intersections, and variants. b). Test Normality c). Homogeneity Testing d). Hypothesis Testing e). Paired Test

RESULT

The results of Pre Test and Post Test Group 1 Hand Paddle showed an increase in time from a slower category to a faster category. For example, swimming time on Pre Test 29.6 seconds to 45.4 seconds, after doing Post Test, time increased to 27.2 seconds to 35.4 seconds, This indicates the use of Hand Paddle increased speed, group 2 showed the results of Pre Test and Post Test Push Up Group, showing an increase in time from slower category to faster category. For example, the time on the Pre Test is 28.4 seconds to 46.4 seconds, after doing the Post Test, the time increases to 25.4 seconds to 44.6 seconds. This indicates that Push Up training has an effect on freestyle swimming speed.

Table 1. Descriptive Analysis

		Descriptive Statistics				
		N	Min	Max	Mean	Std. Dev
Pre Test	Hand Paddle	10	29.6	45.4	35.660	5.2333
Pos Test	Hand Paddle	10	26.2	34.4	29.820	2.8514
Pre Test	Push Up	10	28.4	46.4	37.410	6.3012
Post Test	Push Up	10	25.4	44.60	35.350	6.3133
Valid N (Listwise)		10				

Descriptive analysis results for four test groups, namely Pre Test and Post Test for the Hand Paddle Group and the Push Up Group, The analysis provides an overview of the basic characteristics of the trial data conducted related to the use of Hand Paddle and Push Up training The results of the descriptive analysis show the average and distribution of scores for Pre Test and Post Test from both test groups. Descriptive analysis provides information about the spread of scores, which can indicate the degree of variation in performance within that test group. For example, the standard deviation for the Push Up Group Pre Test is 6.30123, while for the Post Test it is 6.31335. This shows that the distribution of Pre and Post Test Group Push Up Group scores is quite variable, which can be related to the effect of Push Up training on swimming performance.

The results of this descriptive analysis provide relevant information to understand the data characteristics and performance of each test group in the context of 10 studies on the effect of Hand Paddle and Push Up exercises on increasing swimming speed in children aged 11-12 years. These results can be the basis for evaluating the effectiveness of each treatment and its potential effect on swimming performance.

Table 2. Normality Test

Test Of Normality			
	Shapiro-Wilk		
	Statistic	df	Sig.
Pre Test Group Hand Paddle	.923	10	.382
Post Test Group Hand Paddle	.945	10	.615
Pre Test Group Push Up	.933	10	.476
Post Test Group Push Up	.963	10	.815

The normality test results using the Shapiro-Wilk method, shown in the table, show that the significance value (Sig.) for all test groups and conditions (Pre Test and Post Test) is greater than the significance level of 0.05, indicating that the data derived from this study sample are normally distributed. The Shapiro-Wilk method is one method that is suitable for small samples to detect abnormalities in small samples such as in this study. The results of this normality test are carried out as a prerequisite before conducting parametric hypothesis tests, such as paired sample t tests.

Homogeneity Test

Based on the results of the study "The Effect of Hand Paddle and Push Up Exercises to Increase Swimming Speed in Children Aged 11-12 Years", the results of the variance homogeneity test using the Levene method showed a significance value (Sig.) for all conditions and calculation methods greater than the significance level of 0.05. Therefore, the data collected by researchers in two or more groups can be said to be homogeneous. The assumption of homogeneity of variance is important in statistical analysis, especially in the context of hypothesis tests such as paired sample t tests. If the data do not meet the assumption of homogeneity, variance can affect the reliability and interpretation of the results of statistical tests carried out to test the hypothesis in this study. Thus, the results of this variance homogeneity test support the validity of the use of hypothesis tests that require the assumption of variance homogeneity, such as the t sample paired test, in analyzing the effect of Hand Paddle and Push Up Exercises on increasing swimming speed in children aged 11-12 years. The paired samples t-test results for comparison of Pre Test and Post Test in the Hand Paddle Group showed a significant difference

between the average Pre Test and Post Test in the Hand Paddle Group, with a significance value (Sig.) of .001. This indicates that the use of hand paddles significantly contributes to the increase in freestyle swimming speed. These results are consistent with the aims of the study, which aimed to examine the effect of hand paddle and push-up exercise on increased swimming speed in this age group. Thus, the results of this statistical test provide strong support for the positive effect of the use of hand paddles on increasing swimming speed.

Paired Samples Statistics Hand Paddle

Based on the results of the calculation of paired sample statistical hand paddles, it can be concluded that there is an increase in the acceleration of swimming achievement at the age of 11-12 years. Where in a swimming pool with a length of 50 meters, the average achievement of children increased from the initial 35.6 seconds in the pretest to 29.8 seconds after getting hand paddle treatment. Therefore, it can be concluded that hand paddles can increase swimming speed.

Different Test Pre Test and Post Test Push Up Group

The paired samples t-test results for comparison of Pre Test and Post Test in the Push Up Group, obtained significance results (Sig.) of .000. This shows a significant difference between the average Pre Test and Post Test in the Push Up Group. These results indicate that Push Up exercises significantly contribute to increased swimming speed.

Paired Samples Statistics Push Up

The results of the calculation, there is an increase in the achievement of swimming duration in children aged 11-12 years. That is, the average swimming duration in the Push Up Group PreTest was

37,410 seconds, while in the Post Test it became 35,350 seconds. Therefore, it can be concluded that Push Up exercises are effective in increasing swimming speed in children aged 11-12 years. These results are consistent with the goal of the study to examine the effect of Push Up exercise on increased swimming speed in this age group, These statistical test results provide strong support for the positive effect of Push Up exercise.

DISCUSSION

This study aims to evaluate the effect of Hand Paddle and Push Up training on the swimming speed of children aged 11-12 years. The results of the descriptive analysis showed a significant reduction in swimming time for both groups. The average swimming time of the Hand Paddle group decreased from 35.66 seconds in the Pre Test to 29.82 seconds in the Post Test, while the Push Up group decreased from 37.41 seconds to 35.35 seconds. These findings suggest both interventions were successful in increasing swimming speed. The normality test using the Shapiro-Wilk method showed that the data from both groups were normally distributed, with significance values above 0.05. This indicates that the data meets the normality assumption, which is important for the validity of parametric tests such as paired samples t-test. The variance homogeneity test using the Levene method shows that the variance homogeneity assumption is met, with significance values above 0.05. This indicates that variability within similar groups supports the validity of paired samples t-tests.

The paired samples t-test revealed a significant difference in swimming speed for both groups. The Hand Paddle group showed a decrease in average swimming time of 5.84 seconds, while the Push Up group showed a decrease of 2.06 seconds, The significance value for both tests was

less than 0.05, indicating a statistically significant increase in swimming speed, Overall, the results of this study showed that Hand Paddle and Push Up exercises were effective in increasing the swimming speed of children aged 11-12 years.

CONCLUSION

Based on the results of this study, it can be concluded: This conclusion provides strong support for the positive influence of Hand Paddle and Push Up training on increasing freestyle swimming speed.

ACKNOWLEDGEMENT

The author thanks the party from SDN Pasirbenteng 2 school for the permission given by the author to carry out the research optimally. The author also expressed his gratitude to Mrs. Dewi Susilawati and Mr. Respaty Mulyanto who have guided the author and provided many criticisms

and suggestions so that the author can provide maximum research results.

REFERENCES

- Arhesa, S. (2019). Pengaruh latihan push-up dan squat-jump terhadap kecepatan renang gaya bebas pada atlet arhesa swimming club. *Prosiding Seminar Nasional Pendidikan*, 1025–1029.
- Darmawan, A., & Destiasari, C. (2019). Pengembangan Model Latihan Renang Gaya Dolphin Untuk Pemula. *Prosiding Seminar Nasional ...*, 15–18.
<https://ejournal.unibabwi.ac.id/index.php/semnassenalog/article/view/578%0Ahttps://ejournal.unibabwi.ac.id/index.php/semnassenalog/article/download/578/366>
- Dos Santos, M. A. M., Henrique, R. S.,

- Salvina, M., Silva, A. H. O., Junior, M. A. de V. C., Queiroz, D. R., Duncan, M. J., Maia, J. A. R., & Nevill, A. M. (2021). The influence of anthropometric variables, body composition, propulsive force and maturation on 50m freestyle swimming performance in junior swimmers: An allometric approach. *Journal of Sports Sciences*, 39(14), 1615–1620.
<https://doi.org/10.1080/02640414.2021.1891685>
- Dwi Wahyuni, A., Maulana, F., & Nurudin, A. A. (2023). Metode Drill dan Estafet: Bagaimana Pengaruhnya Terhadap Renang Gaya Bebas? *Jurnal Educatio FKIP UNMA*, 9(4), 1746–1751.
<https://doi.org/10.31949/educatio.v9i4.6079>
- Firmansyah, D., & Dede. (2022). Teknik Pengambilan Sampel Umum dalam Metodologi Penelitian: Literature Review. *Jurnal Ilmiah Pendidikan Holistik (JIPH)*, 1(2), 85–114.
<https://doi.org/10.55927/jiph.v1i2.937>
- Ginting, 2020: 147. (2021). Indonesian Journal for Physical Education and Sport Latihan Pull Buoy dan Rompi Terhadap Kecepatan Renang Atlet Tirta Tunggal Semarang. *Indonesian Journal for Physical Education and Sport*, 2(2), 61–68.
<https://journal.unnes.ac.id/sju/index.php/inapes>
- Harmoko, H., & Sovensi, E. (2021). Analisis Teknik Renang Gaya Bebas pada Atlet Renang. *Gelombang Olahraga: Jurnal Pendidikan Jasmani Dan Olahraga (JPJO)*, 5(1), 22–28.
<https://doi.org/10.31539/jpjo.v5i1.2859>
- Hidayat, A., Salminawati, S., & Usiono, U. (2023). Pendidikan Jasmani dalam Pendidikan Islam: Systematic Literature Review. *Fitrah: Journal of Islamic Education*, 4(2), 319–331.
<https://doi.org/10.53802/fitrah.v4i2.551>
- Hidayat, T. A. S. (2019). Model Pembelajaran Keterampilan Renang Gaya Bebas (Trias) Untuk Anak Usia Sekolah Dasar. *Gladi : Jurnal Ilmu Keolahragaan*, 10(1), 56–67.
<https://doi.org/10.21009/gjik.101.06>
- Irwanto, A., Sumartiningsih, S., & ... (2022). The Effect of Using Hand Paddles and Leg Loads on the Speed of 50 Meter Freestyle Swimming in Rejang Lebong Regency. *Journal of Physical ...*, 11(4), 510–516.
<https://journal.unnes.ac.id/sju/index.php/jpes/article/view/72908%0Ahttps://journal.unnes.ac.id/sju/index.php/jpes/article/download/72908/24993>
- Juniana P, H. L. (2019). Aplikasi Penghitung Jumlah Perenang Pada Kolam Renang. *J. Terap. Teknol. Inf.*, 3(1), 1–10.
- Komang Ayu Krisna Dewi, Ni Gusti Ayu Lia Rusmayani, I Ketut Addy Putra Indrawan, & I Putu Agus Dharma Hita. (2022). Perbandingan Pengaruh Pelatihan Calf Raise, Jump Rope, Dan Butt Kick Terhadap Peningkatan Kekuatan Dan Kecepatan Otot Tungkai Dalam Olahraga Renang. *Jurnal Kejaora (Kesehatan Jasmani Dan Olahraga)*, 7(1), 56–63.
<https://doi.org/10.36526/kejaora.v7i1.1926>
- Laili, M., Zega, S., & Hariansyah, S. (2023). The Effect Of Using Visual Videos For Learning Basic Swimming Techniques And Push Up Exercises On Swimming Breaststroke Ability At State 1 Singkil Primary School. 62–75.
- Mahyuddin, R., Syawal, M., & Amahoru, N. M. (2023). Research Methods (Issue Micssh). *Atlantis Press International BV*.
<https://doi.org/10.2991/978-94-6463-354-2>

- Puristy, P. C., & Alsaudi, A. T. B. D. (2020). Upaya Meningkatkan Hasil Belajar Renang Gaya Bebas melalui Penggunaan Alat Bantu Hand Paddle. *Prosiding ...*, 52–56. <http://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/view/736%0Ahttp://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/download/736/500>
- Raison, M., & Madilis, F. (2022). Survei Kemampuan Renang Gaya Bebas 50 meter pada Mahasiswa Prodi Pendidikan Olahraga STKIP Kie Raha. *Jurnal Ilmiah Wahana Pendidikan*, 8(3), 270–275. <https://doi.org/10.5281/zenodo.6392128>
- Sanjaya, P. M. D., Tjilen, A. P., Tambaip, B., Dongoran, M. F., Rahail, R. B., Riwu, L., & Hisky, H. J. (2022). Manajemen Perlombaan Dalam Memasyarakatkan Olahraga Renang di Wilayah Kota Merauke. *Indonesian Journal of Sport Community*, 2(2), 1–6. <https://ijosc.ejournal.unri.ac.id/index.php/ijosc/article/view/46%0Ahttps://ijosc.ejournal.unri.ac.id/index.php/ijosc/article/download/46/20>
- Septian, eldin siregar. (2021). Pengaruh Latihan Standing Press Dan Standing Incline Press Dengan Menggunakan Karet Terhadap Hasil Kecepatan Renang 50 Meter Gaya Dada Pada Atlet Putra Usia 12-14 Tahun Angkasa Swimming Club Labuhan Batu Tahun 2020. *Journal Physical Health Recreation*, 1(50), 107–116.
- Sin, T. H., & Hudayani, F. (2020). The influence of the swimming learning method using the swimming board towards students' interest in freestyle. *Jurnal Keolahragaan*, 8(2), 216–221. <https://doi.org/10.21831/jk.v8i2.34412>
- Syaputra, R., Personi, M., Apriansyah, D., Rahmalia, K., & Paulinsia, L. (2024). Pembinaan Intensif Atlet Renang Di Klub Allround Master Swimming Klub Bengkulu. 3(1), 75–78.
- Viera Valencia, L. F., & Garcia Giraldo, D. (2019). 濟無No Title No Title No Title. *Angewandte Chemie International Edition*, 6(11), 951–952., 2, 1415–1423.
- Wardhani, R. (2022). Pengaruh Kekuatan Otot Terhadap Kecepatan Renang Gaya Bebas Club Renang Bintang Khatulistiwa Pontianak. *Spj: Sport Pedagogy Journal*, 1(1), 103–109.
- Yoon, C. (2014). 濟無No Title No Title No Title. *Paper Knowledge . Toward a Media History of Documents*.
- Yuliana, S., Darsi, H., & Remora, H. (2021). Penerapan Latihan Hand Paddle terhadap Kecepatan Renang Gaya Bebas Atlet Pemula Noren Tirta Buana Swimming Club. *Educative Sportive*, 2(1), 16–20.