

The Effect of The Drill Method of Swimming Bracelet on Peak Expiratory Flow Rate In Asthma Patients

Akhmad Sobarna¹, Sumbara Hambali², Dodi Ilham³, Rony Mohamad Rizal⁴,
Sherina Salsabila Arthamevia⁵

¹ Sports Education, STKIP Pasundan, Indonesia

Email: akhmadsobarna9@gmail.com,

² Sports Education, STKIP Pasundan, Indonesia

Email: sumbarahambali8@gmail.com,

³ Education, IAIN Palopo, Indonesia

Email: dodi@iainpalopo.ac.id,

⁴ Sports Education, STKIP Pasundan, Indonesia

Email: denrony@gmail.com,

⁵ Sports Education, STKIP Pasundan, Indonesia

Email: sherinasalsabila28@gmail.com

(Received: 17-10-2021; Reviewed: 12-11-2021; Accepted: 28-11-2021;

Available online: 20-12-2021; Published: 28-12-2021)



This is an open access article distributed under the Creative Commons Attribution License CC-BY-NC-4.0 ©2021 by author (<https://creativecommons.org/licenses/by-nc/4.0/>).

Abstract. This study aims to determine the effect of the breaststroke swimming drill method on the peak expiratory flow rate in asthmatics. This study uses an experimental research method with a one-group pre-test-post-test design, which means that research activities are carried out by giving an initial test before treatment and a final test after treatment. The subject of the study was an asthmatic patient aged 12 years using the purposive sampling technique. In this study, the research instrument used was a test to determine whether or not the effect of the breaststroke swimming drill method on the peak expiratory flow rate in asthmatics. The data analysis technique used in this study is to find the average value and standard deviation, test for normality using the Kolmogorov-Smirnov test, Marginal homogeneity test, and hypothesis testing using Paired T-test. This study indicates a significant result of an increase in the peak expiratory flow rate through the application of the breaststroke swimming drill method in someone with asthma.

Keywords: *peak expiratory flow rate*, breaststroke swimming, asthma sufferers

INTRODUCTION

Practicing breathing with swimming can help treat asthma and reduce the frequency of asthma attacks. Swimming that is done regularly will train the work of the heart and lungs. However, asthmatics who can be cured with this therapy are patients who rarely experience daily asthma attacks with a limit of 2 times a week and are not too frequent or dependent on asthma

reliever drugs. In this study, the drill method was used as a method for swimming. The drilling method is an activity to do the same movement repeatedly, continuously, or continuously.

The method is a way to apply a planned exercise systematically and organize it to achieve a goal. Many methods can be used to achieve this goal. One of them is the drill method (Irawadi & Yusuf, 2021).

The drilling method contains a series of exercises designed to build new skills. With repeated practice can improve skills and perfect agility. With this drilling method, one can also acquire motor skills, build habits, and increase speed in execution (Andriani et al., 2019).

Swimming is a sport carried out in the water by moving the limbs, floating in the water, and all limbs moving freely. This sport has long been known as a sport that can provide benefits both physically and emotionally (Prasetyo & Yunus, 2017).

Swimming is an activity that is played on the surface of the water and is carried out in various styles such as freestyle, breaststroke, butterfly, and backstroke (Yulinar & Kurniawan, 2018).

Breaststroke is the first style that people learn when they start learning to swim. Breaststroke swimming, commonly called the frog style, is swimming with the chest position facing the water's surface; both legs kick outward while both hands are opened sideways like a water-splitting movement so that the body moves forward faster (Rulianto et al., 2016). This breaststroke is a combination of leg, arm, and breathing movements. The feet and hands are in the water while the head is moved up and down from the inside to the water's surface when breathing. Breathing in this swimming style is done when the mouth is above the water's surface.

Peak expiratory flow rate, also known as peak expiratory flow, is the achievement of the highest airflow at the time of expiration (Suprayitno, 2018). Peak expiratory flow is the maximum airflow achieved during a maximal forced expiration after a forced inspiration. Measurement of peak expiratory flow aims to assess the degree of airway obstruction objectively and evaluate asthma therapy (Putri et al., 2020). A normal person is capable of exhaling or blowing air vigorously. At the same time, asthmatics are not able to blow air strongly (Suryowinoto et al., 2017). Peak expiratory flow measurement can use a spirometer or also called a peak flow meter. The peak flow meter is a simple tool to monitor peak expiratory flow in asthma or obstructive airway disease patients in children or adults.

Peak expiratory flow rate Normal values depend on age, height, and gender. The normal peak expiratory flow rate has a higher value than the peak expiratory flow rate of asthmatics.

Peak flow readings are higher when the patient is healthy and lower when the airways are

narrowed. Reference normal PEFR patients based on: sex, age, and height (wikipedia, 2021).

Table 1. Average Peak Flow Rate for Healthy Children and Teenagers (Polgar & Promadht, 2021)

Height in inches	Average peak flow
43	147
44	160
45	173
46	187
47	200
48	214
50	240
51	254
52	267
53	280
54	293
55	307
56	320
57	334
58	347
59	360
60	373
61	387
62	400
63	413
64	427
65	440
66	454

METHOD

The population in this study was asthmatics. The sample selected in this study is one person with asthma. In this study, the determination of the sample in this study uses purposive sampling, where according to Sugiyono, purposive sampling is sampling by determining certain criteria (Lararenjana, 2020).

Experimental research is a research method carried out with experiments used to determine the effect of the independent variable on the dependent variable. This study uses a one-group pre-- post-test design, namely research that provides an initial test before being given treatment and a final test after being given treatment. This study aims to determine the effect of the breaststroke swimming drill method on the peak expiratory flow rate in asthmatics.

A research instrument is a tool used to collect data or information that is useful to answer research problems—an instrument as a tool at the time of research that uses a method. By

the title studied, the type of test in this study is a spirometry test using a peak flow meter or spirometer tool. This tool can measure the amount and speed of air exhaled by the patient (Nareza, 2021).

The treatment given was breaststroke swimming with the drill method three times a week for two weeks. Therefore, the total meeting is six meetings.

Peak respiratory flow measurements were carried out before and after the drill swimming program as a pre-test and post-test. The distance given to the subject is as far as 10 meters which are carried out for 5 minutes.

The analysis used in this research is statistical analysis. According to Hadi, statistical analysis is a scientific method that is prepared to conclude, compile, present, and analyze research data in numbers (Rusydi & Fadhli, 2018).

The normality test aims to determine whether the data distribution deviates or not from the normal distribution. The normality test in this study used the Kolmogorov Smirnov method, with the help of the SPSS 26.0 program.

The homogeneity test shows whether or not the variances of two or more distributions are the same. This test is carried out to determine whether the data obtained are homogeneous or not (Hidayat, 2013).

Hypothesis testing is also called “data analysis confirmation” or a method of empirical evidence to show conclusions to reject or accept the hypothesis so that our selection is more detailed using sample data. The purpose of hypothesis testing is to decide whether the hypothesis being tested is rejected or accepted

RESULT DISCUSSION

Results

Peak Expiratory Flow Rate

The statistical description of research data regarding the increase in peak expiratory flow rate in asthmatics after doing breaststroke swimming with the drill method three times in 2 weeks, the average score for the pre-test is 294.1667 while for the post-test is 325,0000. The standard deviation for the pre-test is 48.519976, and for the post, the test is 32.24903. These results were obtained from 1 person as the research sample representing people living with asthma

The results of the normality test showed that the significance value of Asymp. Sig. (2-tailed)

for pre-test 0.100 (>0.05) and post-test 0.200 (>0.05). Therefore, according to the basis for decision making in the Kolmogorov - Smirnov normality test above, it can be concluded that the data are normally distributed.

The results of the homogeneity test showed that the Asymp value was obtained. Sig. (2- tailed) is 0.057. The rule is: if $p > 0.05$, then the data is considered homogeneous.

The hypothesis in this study reads, “There is a significant relationship between the breaststroke swimming exercise drill method and the peak expiratory flow rate in asthmatics.

Based on the analysis results, the significance column (2-tailed) to be tested on two sides is 0.040. Here the significance value is below 0.05 so that the results of the initial test (pre-test) and the final test (post-test) experienced significant (meaningful) changes.

It can be concluded that the breaststroke swimming drill method does have a significant effect on the peak expiratory flow rate (PEFR) in asthmatics.

Discussion

Based on the results of the study, it was shown that there was an increase in the peak expiratory flow rate through the application of the breaststroke swimming drill method for someone with asthma, it can be seen from the data acquisition using the Paired T-Test, which shows that the significance value is below 0.05. Therefore, it indicates that The breaststroke swimming drill method significantly affects asthmatics’ peak expiratory flow rate (PEFR).

These results can be interpreted that it can be concluded that the increase in the peak expiratory flow rate in asthmatics by doing breaststroke swimming drills is influenced by:

1. The pressure on the water makes swimmers need more oxygen reserves to survive in the water.
2. With increased respiratory circulation can increase the supply of oxygen to muscle cells, including respiratory muscles.
3. Doing physical activity regularly can increase lung function capacity.

Research Limitations

This study, which aims to determine the effect of the breaststroke swimming drill method on asthmatics’ peak expiratory flow rate, was conducted amid a pandemic that created obstacles in researching because of the emergency PPKM, which forced force researchers to stop research. Nevertheless, the

results of this imperfect research can already show a significant result for the research subject.

In this study, researchers used one asthmatic person as a sample the study; this was due to the difficulty of getting subjects who were willing to be research subjects, in addition to the factor of the spread of the covid-19 virus, which required to always avoid crowds in order to avoid the spread of the virus. Therefore, future researchers are expected to develop research samples into several factors such as gender or age.

Researchers have tried all stages of the research as well as possible, from the research design, data collection, data analysis, and concluding. However, there are still many shortcomings in this research, one of which is the total number of truncated meetings. It is hoped that doing this research can be a reference for further researchers to improve all the shortcomings that exist in this study and produce more convincing values

CONCLUSION AND SUGGESTION

Based on the results of research conducted on the effect of the breaststroke swimming drill method on the peak expiratory flow rate in asthmatics which was carried out three times a week for two weeks, the researchers concluded that the results of this study were: The breaststroke swimming drill method had a significant effect on the increase in peak expiratory flow rate in asthmatics.

REFERENCES

- Andriani, F. P., Sabri, Y. S., & Anggrainy, F. (2019). Gambaran Karakteristik Tingkat Kontrol Penderita Asma Berdasarkan Indeks Massa Tubuh (IMT) di Poli Paru RSUP. Dr. M. Djamil Padang pada Tahun 2016. *Jurnal Kesehatan Andalas*, 8(1), 89. <https://doi.org/10.25077/jka.v8i1.975>
- Hidayat, A. (2013). *Penjelasan Lengkap Uji Homogenitas*. Statistikan. <https://www.statistikan.com/2013/01/uji-homogenitas.html>
- Irawadi, H., & Yusuf, M. J. (2021). *Drill Exercise Method Influences Ability Groundstroke Tennis Court*. 35(Icssht 2019), 78–82.
- Lararenjana, E. (2020). *Purposive Sampling Adalah Teknik Pengambilan Sampel dengan Ciri Khusus, Wajib Tahu*. Merdeka.Com. <https://m.merdeka.com/jatim/purposive-sampling-adalah-teknik-pengambilan-sampel-dengan-ciri-khusus-wajib-tahu-kln.html?page=4>
- Nareza, M. (2021). *Mengenal tentang Tes Fungsi Paru*. Alodokter. <https://www.alodokter.com/mengenal-tentang-tes-fungsi-paru>
- Polgar, G., & Promadht, V. (2021). *Peak Flow Meter*. Children's Minnesota. <https://www.childrensmn.org/education/materials/childrensmn/article/15556/peak-flow-meter/>
- Prasetyo, E., & Yunus, M. (2017). Hubungan antara Frekuensi Gerakan Kaki Dengan Prestasi Renang Gaya Crawl 50 Meter. *Indonesia Performance Journal*, 1(2), 82–90.
- Putri, R. C., Primayanti, I. D. A. I. D., Handari, L. M. I. S., & Griadhi, I. P. A. (2020). Perbedaan Nilai Arus Puncak Ekspirasi (APE) Pada Wanita Usia Produktif Penderita Asma Yang Mengikuti Latihan Zumba dan Yoga. *Sport and Fitness Journal*, 8(2), 84–90.
- Rulianto, G., SpORtIVE, R. M.-, & 2017, U. (2016). Pengaruh Olahraga Renang Gaya Dada Sebagai Hydro Therapy Terhadap Penurunan Intensitas Kambuh Pada Penyakit Asma (Penelitian Eksperimen pada Siswa. *Ejournal.Upi.Edu*, 1(1), 80–85.
- Rusydi, A., & Fadhli, M. (2018). STATISTIKA PENDIDIKAN: Teori dan Praktik Dalam Pendidikan. In *Journal of Visual Languages & Computing*, CV. WIDYA PUSPITA (Vol. 11, Issue 3).
- Suprayitno, E. (2018). Pengaruh Pursed Lips Breathing Terhadap Peak Expiratory Flow Rate Penderita Penyakit Paru Obstruksi Kronis. *Wiraraja Medika*, 7(2), 56–60. <https://doi.org/10.24929/fik.v7i2.435>
- Suryowinoto, A., Hamid, A., & Desmalasa, A. F. (2017). Deteksi Dini Penyakit Pernafasan Asma Dengan Peak Expiratory Flow Meter Berbasis Microcontroller. *Jurnal Ilmiah Mikrotek*, 2(4).

wikipedia. (2021). *Peak Expiratory Flow*.
Wikipedia.
https://en.wikipedia.org/wiki/Peak_expiratory_flow

Yulinar, Y., & Kurniawan, E. (2018). Pengaruh Latihan Renang Terhadap Peningkatan Daya Tahan Kardiovaskuler Pada Atlet Klub Sepak Bola. *Jurnal Serambi Ilmu*, 30(2), 88.
<https://doi.org/10.32672/si.v30i2.754>