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The Effect of Dry Land Training Model on Youth Athletes Swimming Performance During Covid-19 Pandemic

Rosswaqiah Darazat Subekti[1]✉, Boyke Mulyana[2], Yusup Hidayat[3], Geraldi Novian[4]

Study Program of Sport Education, School of Postgraduate Studies, Universitas Pendidikan Indonesia, Indonesia[1234]

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Abstract

The aims of this study were to examine the effects of the dryland training model on swimming performance in youth athletes duning covis-19 pandemic. The covid-19 pandemic affects the physical condition and performance of athletes, therefore these athletes need to maintain physical fitness by continuing to practice even with limitations in carrying out sports activities. The dryland training model was a training on land which aimed to improve physical and performance components in the form of strength, flexibility, agility, aerobic endurance, and speed also as an alternative training model on pandemic situation. The method used in this research is an experimental method (Experimental Design) with a One Group Pretest-Posttest Design with a sample of 30 youth athletes (17 male and 13 female) drawn from the population using total sampling technique. The instrument used in this study was the 50 meter freestyle swimming test. The results of this study indicate that the dryland training model increases endurance which can benefit athletes by taking as little breath as possible when swimming so that swimming time becomes faster. So, it can be conclu ded that there is a significant effect of the dryland training model on the swimming performance of youth swimming athletes during the covid-19 pandemic and the dryland training model provides an increase in swimming time of 50 meters freestyle.

How to Cite

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✉ Correspondence Author:
E-mail: rossqi1@gmail.com

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INTRODUCTION

The outbreak of the Covid-19 virus that hit Wuhan at the end of December 2019 caused an uproar and became a threat to all citizens of the world. According to the KemenkesRI (2020) Covid-19 (coronavirus disease 2019) is a disease caused by a new type of corona virus, namely SARS-CoV-2. Covid-19 can cause symptoms of acute respiratory distress such as fever above 38°C, cough, and shortness of breath for human. In addition, it can be accompanied by weakness, muscle aches, and diarrhea. In severe COVID-19 patients, it can cause pneumonia, acute respiratory syndrome, kidney failure, and even death.

Since it was first announced in Indonesia (Keputusan Presiden RI, 2020) regarding the Determination of Non-Natural Disasters for the Spread of Corona Virus Disease 2019 (Covid-19) as a national disaster. Covid-19 cases in Indonesia continue to increase, this makes the government ask the public to do social / physical distancing to prevent the transmission of Covid-19. According to data from CSSEGISandData-Covid (2021) in February 2021, the State of Indonesia recorded 1.22 million people who were tested positive for COVID-19, 1.03 million people were declared cured and 33,183 died.

The implementation of government policies regarding physical distancing and staying at home and increasing virtual communication are lifestyle changes that are becoming a trend in preventing the transmission of COVID-19 infection. Activities that are usually done outside, such as work, study and worship can be carried out at home. This period of imposition of social restrictions and physical distancing due to the COVID-19 pandemic certainly inconvenience to everyone, for example the closure of fitness centers, stadiums, swimming pools, dance studios, fitness centers, physiotherapy centers, parks and playgrounds . As a result, many people are unable to exercise individually or in groups. In fact, for physical activities outside their homes they experience obstacles.

The covid-19 pandemic can affect the physical condition and performance of distance athletes, decreased swimmer performance and detraining in soccer players, reducing the time to fatigue by 24% in five weeks (Nakisa & Ghasemzadeh Rahbardar, 2021) therefore these athletes need to maintain physical fitness by keep practicing even with limitations in carrying out sports activities and sporting events (Sangadah 2020). In this regard, there is a swimming training model that can still be done during independent training at home because it is done on land, this exercise is called dryland training. This training model is a form of exercise that aims to improve physical components in the form of strength, flexibility, agility, aerobic endurance, speed and others.

Dryland training models can be an alternative exercise that can be done by swimmers with limited sports facilities and infrastructure. Schumann et al. (2019) suggested that the increase in swimmer›s strength is mostly generated during training on dryland such as in the gym, but an adequate program incorporating proper training can increase the results in the water obtained from dryland strenght dan power training. The results of Popovici and Suciu (2013) research dryland training using an isokeinetic biometer for 4 weeks had a positive effect on increasing the time and speed of swimming in the 50 meter butterfly stroke.

Although dryland training models have been created and are common in the world of swimming for a long time, in Indonesia, its application is still limited, especially for youth swimming athletes. This is due to the assumption that dryland training are more beneficial for senior athletes, even though studies have proven otherwise. Grant and Kavaliauskas (2017) states that training for competitive young athletes should recognize the benefits of dryland strength training and make it part of their training program.

Dryland training model can improve swimming performance and become one of the variations of exercise to reduce the saturation of athletes who always train in the water (Heggy, 2019). Therefore, the author wants to test the dryland training model on the swimming performance of youth swimming athletes during the covid-19 pandemic, which incidentally is still difficult to carry out exercises in the water. The author assumes that this exercise model will have a significant effect.

METHOD

This study uses an experimental method (Experimental Design) with a One Group Pre-test-Posttest Design (Fraenkel et al., 2012). This study used an experimental group which was given treatment a dryland training model. The subjects involved in this study were Elite Swimming Club (ESC) athletes who had been actively practicing for 3 years, the age of practice was calculated before the pandemic entered Indonesia.

The population in this study was Elite Swimming Club (ESC) Bandung age group II-IV swimming athletes aged 10-14 years, totaling 30 athletes (17 male and 13 female). The sampling technique used in this study is total sampling, that is, taking the entire population as a sample. This was done because the population was relatively small, so the sample in this study amounted to 30 athletes.

The method used in this study is an experimental method, carried out for 4 weeks or 12 meetings with a frequency of 3 times a week (Popovici & Suciu, 2013). This research was carried out in the homes of each athlete every Monday, Wednesday, and Friday. The instrument that the researchers used in this study was a swimmming 50 meter freestyle which was used to measure the performance of swimming athletes within a distance of 50 meters (units of second). The 50 meter swim uses maximum strength by moving the entire body, arms, and legs with an average force production of 30 seconds (Mujika & Crowley, 2019). The instrument was given to the sample twice, before and after treatment. In collecting data on 50-meter swimming performance, athletes, and researchers always follow health protocols such as wearing masks when in the pool environment. The test is carried out in several sessions to avoid crowds of athletes. Every athlete who has done the 50 meter swimming test is encouraged to go home or leave the swimming pool area immediately.

In this study, the sample will receive treatment a dryland training model for 4 weeks in 60 minutes for each training session (Alto & Aquatics, 2021). The dryland training model is the same as training in general. The exercise consists of 3 parts, namely warm-up, core and cool-down. The following is a description of the implementation of the exercise in each meeting.

1. Warming up (10 minutes)
   Before doing the exercise, the athlete is given a warm-up movement that aims to prepare the muscles and joints to enter the core exercise to be performed. The warm-up exercises were static and dynamic stretching.
2. Main training (40 minutes)
   Main training consist of exercise items arranged in an exercise program that includes several forms of movement, namely squat, basic swimmer (each side), hip thrust, Russian twist. burpee, plank, donkey kick, sit up, plank, superman, push up, and jumping lunge. Each items is performed 10-12 repetitions with moderate intensity and it's measured after a person's heart rate reaches 40-59% reserve heart rate or 64-76% of athlete's age predicted maximum heart rate (220-age) (Kyral et al., 2019) according to an exercise protocol that recommended during the COVID-19 pandemic (PDSKO, 2020).
3. Cooling down (10 minutes)
   After doing main training, athletes are given static cooling down with the aim of reducing and preventing muscle fatigue due to exercise.

The data obtained were then processed and analyzed using SPSS version 24 using the t test.

RESULTS AND DISCUSSION

After the data is processed and analyzed, the data is presented in the form of a table. It can be seen in **Table 1**.

Table 1. Description of Statistics

	Mean ± Std. Deviation	Minimum	Maximum
Pre-test	40.771± 1.947	37.56	45.00
Post-test	39.461± 1.955	36.02	44.11
Gain	1.310 ± 0.680	0.13	2.64

Table 1 shows that the pre-test average score is 40.771 with a standard deviation of 1.947 and the post-test average score is 39.461 with a standard deviation of 1.955, this means that there is an increase time of swimming 50 meters freestyle in the sample after being given treatment dryland training. The minimum and maximum time taken in the pre-test was 37.56 and 45.00 while in the post-test it was 36.02 and 44.11 in seconds.

Table 2. Normality Test

	Asymp. Sig. (2-tailed)	Information
Pre-test	0.059	Normal
Post-test	0.112	Normal

Table 2 shows the results of the normality test of research data to be able to determine the type of approach that will be used to test the hypothesis. Normality test use d One-Sample Kolmogorov-Smirnov Test. Based on the results of the normality test, the Asymp score was obtained. Sig. (2-tailed) for both data > 0.05 which means the data is normally distributed, so that hypothesis testing can be done using a parametric approach

Table 3. Hypothesis Testing

	t Score	Sig. (2-tailed)
Pre-test – Post-test	10.545	0.000

Table 3 shows the results of the research hypothesis testing using the Paired Sample T-Test. Based on the test results, it is known that the t count is 10,545. If t count is greater than t table, then H0 is rejected and H1 is accepted, which means there is a significant effect. he results of the hypothesis test show that t count < t table, which means that H0 is rejected. This shows that the dryland training model has a significant effect on the swimming performance of youth swimmers during the pandemic.

Strength training using dryland training can improve the ability to generate propulsion in the water. More research is important to identify the appropriate volume and intensity of training programs, by gender, age and level. In addition, the speed of movement should be considered because it can increase the specificity of the exercise performed (González-Badillo & Sánchez-Medina, 2010).

The results of the research by Grant and Kavaliauskas (2017) regarding dryland exercise related to injury said that adolescent athletes who did dryland exercise significantly strengthened their shoulders and increased their external rotational strength compared to athletes who only followed a regular swimming program. In addition, it can increase the strength of the external rotator in swimmers, increase stroke speed, increase pedaling distance and also reduce the risk of injury. This is the first study to examine the effects of a dryland strengthening program on swimmers under the median age of 14. Strength increased in both groups in all muscles tested. However, only the external rotational force increased significantly for the experimental group during the study.

Previous studies have shown that a dryland training program improves shoulder joint flexibility and strength, as well as core muscle and swimming performance (Sawdon-bea & Benson, 2015). Dryland treatment for six weeks showed that there was a significant increase in core muscles in the experimental group swimmers compared to the control group. As explained above, dryland training provide an increase in strength in certain muscle parts (shoulders, legs, and arms) so that this makes the athlete's arm stroke stronger and the distance longer. Results of research Grant and Kavaliauskas (2017) an increase in the durability of the upper body muscles as well as increased resistance to fatigue which allows the swimmer to maintain stroke technique and speed are effective in the longer term. It is very beneficial for athletes to suppress travel time as soon as possible with efficient movement. In addition, the dryland training model increases endurance which can benefit athletes by taking as little breath as possible when swimming so that swimming time becomes faster.

The research that has been done has given the result that there is a significant effect of dryland training on the swimming performance of youth athletes. These results are in line with the research by Popovici and Suciu (2013) dryland exercise using a swim bench improves sports performance compared to training in water alone. As stated by Girold (2007) in his research that the combination of land and water training is more efficient than just water training.

CONCLUSION

Based on the results of the study, researchers can provide several conclusions. There is a significant effect of the dryland training model on the swimming performance of youth swimming athletes during the covid-19 pandemic, and the dryland training model provides an increase in swimming time of 50 meters freestyle. The dryland trainig model can be used as a variation of exercise in conditions of limited sports facilities during the covid-19 pandemic, dryland training can be further developed by the trainer according to the situation and conditions in the field, and the dryland exercise model can provide maximum results if it is carried out regularly and in a short period of time.

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