Journal of Physical Education Health and Sport

Volume 8. Number 1. 2021

Table of Contents

DESCRIPTION
The journal contains themed texts research or conceptual articles about physical education, sports, health. This journal can be utilized by audiences broad, especially professionals and observers of physical education, body, health, and recreation

ISSN
2354-7901 (Print)
2354-8231 (Online)

PUBLISHER
Jurusan Pendidikan Jasmani, Kesehatan dan Rekreasi, Fakultas Ilmu Keolahragaan, Universitas Negeri Semarang

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Gedung F1 Lantai 2 Kampus Sekaran Gunungpati, Semarang 50229
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E-JOURNAL
http://journal.unnes.ac.id/nju/index.php/jpehs

8 (1) (2021) 1 - 6

Journal of Physical Education, Health and Sport

http://journal.unnes.ac.id/nju/index.php/jpehs

Basic Movement Skills: Using Turbo Media for Throwing Skills for Elementary School Students

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History Article

Received April 2021
Approved July 2021
Published vol 8 no 1 2021

Keywords

Turbo Media; Basic Movement Skills; Throwing

Abstract

This study aims to analyze how much influence the turbo media has on the javelin throwing skill. The method used in this research is the experimental method. The research design used was the-one group pretest-postest design. In this research design, the first step taken was to do a pretest, then give treatment and finally give a posttest or final test. The data analysis used is the normality test, homogeneity test and T-test. Based on data processing and analysis, a significance value of 0.000 <0.05 was obtained, which indicates that there is a significant effect of using turbo media on javelin throwing skills for elementary school students. The recommendation is to reveal other more comprehensive variables to improve javelin throwing skills in elementary school students.

How to Cite

Fikrianto, R., S., Et al. (2021). Basic Movement Skills: Using Turbo Media for Throwing Skills for Elementary School Students. *Journal of Physical Education, Health and Sport*, 8 (1), 1-6.

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p-ISSN 2354-7901
e-ISSN 2354-8231

INTRODUCTION

Everything that is obtained by humans in the form of physical or non-physical nature is the result of systematic or unsystematic motion that is controlled by the heart and is responded by his mind and interpreted by his movements (D Sofyan et al., 2021). Borko, et al. (Hamdu et al., 2018) state that, there has been an increasingly urgent need for professionals by assuring a quality and effective programs implementation. Eslamian and Aref (Hariadi et al., 2020) state that, the teaching and learning process is a system, which includes various integrated components to achieve learning objectives. The availability of media in the teaching and learning process is expected to help teachers improve student achievement. Therefore, teachers should employ media in every learning process to achieve learning objectives.

Athletic learning in elementary schools is very important to develop students› interests and talents in sports. Javelin throwing is an individual sport which includes throwing numbers in athletics that aim to throw as far as possible with the correct technique (Irianti et al., 2015). Meanwhile, according to Saputra ((Irianti et al., 2015) explains that «it is one of the abilities to throw objects in the form of a javelin as far as possible with the correct technique». The javelin throw requires a lot of skills, drills, flexibility and technical understanding to execute the throw. You need to be fast, explosive, elastic, and have an overall fitness level that is very well-balanced.

For a given pitcher there will be a set of release parameters which will yield the largest reach. These parameters are escape velocity (vo), angle of release (ao), angle of attack (bo), angle of release (co), height of release (zo), distance of the forefoot to foul line (s) and component of angular velocity (Bartlett & Best, 1988). Throwing events pose an interesting optimization problem because the flight path cannot be affected by the thrower once the implement has been released, the airborne phase being entirely defined by gravitational and aerodynamic forces (Hubbard & Rust, 1984; (Best et al., 1995). In this regard, effective tools for intensifying the learning process are required (Akhmetshin et al., 2019).

Lumintuarso (Aprilyanti, 2014) states that, throwing a turbo is one of the kid's athletic materials taught in elementary schools. This material is an athletic number adapted from throwing, instead of using a javelin or bullets which tend to be dangerous for children, turbo throwing is a modification of the throwing number with a tool that is safer for students. The development of basic athletic movements makes the forms of developing games a brilliant idea so that elementary school children know the basic athletic movements from an early age. In addition, the characteristics of the development of athletic games for elementary school children are a form of play with the aim of making athletic sports not boring or tiring (Rumini, 2014). Turbo throw is a modified javelin throw intended for children where the series of movements are preceded by a prefix, a throw and a continuation of motion (Jamili, 2014). Turbo is equipment used in learning kid's athletics to throw turbo, turbo-shaped short sticks like missiles that can be thrown like a javelin (Khoerudin, 2014). Thus, this is done to meet the needs and the joy of movements of the child. To achieve the desired results, kids' athletics is designed to bring excitement through their involvement in Athletics. Thus, this is done especially during physical education lessons at school through the implementation of the cooperative strategy (Bensikaddour et al., 2015). The javelin throw requires a lot of skills, drills, flexibility and technical understanding to execute the throw. You need to be fast, explosive, elastic, and have an overall fitness level that is very well-balanced.

The main factor affecting the lack of development of the javelin throwing learning process in elementary schools is that the existing facilities and infrastructure in elementary schools are still far from adequate to fulfill the javelin throwing learning process itself. Even though the original facilities and equipment of the javelin already exist, it only makes students feel difficult in the learning process because the size and weight of the javelin are not suitable for elementary school children, resulting in less than optimal results. In addition, learning is teacher-centered so that students are less creative in collecting information (Sofyan, 2020).

Based on the results of observations on the athletic material of javelin throwing numbers, there are still many students who do not know about the javelin throwing sport. In addition, the process of facilities and infrastructure is still inadequate, students also lack understanding in terms of movement. Most of the students› ability to practice is still far from expectations, for example in handling, prefix, final five steps, release, and recovery. Because all of that is a series of movements that must be mastered well because it is an asset in throwing the javelin.

So that students can practice the basic techniques of throwing the javelin well, it is

necessary to modify learning media that makes it easy, safe and does not make it difficult for students to carry out the learning process. The modification made in this research is to use turbo media as an alternative to the javelin. Turbo media is one of the children›s sports materials taught in elementary schools (Sari, 2013).

The success of learning outcomes in javelin throwing will be classified as low if other supporting facilities or support such as textbooks are inadequate. When the learning process is only with the lecture method or only the material is not accompanied by pictures, it will feel very saturated and monotonous, so that the enthusiasm for student learning is less enthusiastic which results in the javelin throwing skills which are still very far from expectations. The teacher tries to stimulate students› curiosity about javelin throwing by giving the task of watching videos using electronic media. After the students see the video, their sense of wanting to learn will grow and the Physical Education teacher must optimize the children›s enthusiasm by providing interesting learning.

When the learning process is fun, students will respond more quickly or improve their skills so that the results have enormous benefits for the learning process of javelin throwing. When students see the turbo media very enthusiastically, it is a good first step to start the learning process of javelin throwing so that it is easier to direct students to learn javelin throwing using turbo media. When the learning process is fun, students will respond more quickly so that learning outcomes become more effective and efficient.

Based on what has been discussed in the previous, this research uses turbo media or a modified tool for learning javelin to improve skills. Before researcher conduct research, they must first prepare a learning implementation plan (RPP), then prepare turbo media, finally the researcher prepares an assessment sheet.

Overcoming the low learning outcomes of javelin throwing researchers took the initiative to overcome it by providing other alternatives using modified tools so that children can be aroused and excited to learn javelin throwing. Researchers replaced the original javelin which looked very difficult for elementary school children with media that almost completely resembled the original javelin, but this tool is safe for the learning process using turbo media. Turbo media at first glance looks like children›s play but has enormous benefits for the learning process of javelin throwing. The enthusiasm of students when they see turbo media is a good first step to make it easier to direct students to start the learning process.

METHOD

The method used in this research is the experimental method. The experimental research method can be interpreted as a research method used to find the effect of certain treatments, there are others in controlled conditions. The research design used was the-one group pretest-posttest desigen. In this research design, the first step taken was to conduct a pretest or initial test then given treatment and finally given a posttest or final test. Thus, the results of treatment can be known to be more accurate, because it can compare with the conditions before being treated.

The sample in this study can be seen in **Table 1.**

Table 1. Sample

Name of Scholl			
SDN Waringin I		SDN Waringin II	
Male	Female	Male	Female
8	10	9	13
18		22	

Research instrument is a tool used to collect data in a study. The instrument in this study used an assessment rubric. The scoring rubric can be seen in **Table 2.**

Table 2. Assessment rubric

No	Initials	Assessment Rubric																				Total Score
		Start					5 step rhytyrm					Release					Recovery						
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
1																						
2																						
Etc.																						
Total																						

For more details regarding the assessment indicators in **Table 2**, it will be explained as follows:

Start

1. The javelin is held horizontally over the shoulder
2. The top of the javelin is at head level
3. Arm remains steady (does not move forward or backward)
4. Run relaxed, controlled and rhythmic acceleration (6-12 steps)

5. Accelerate until you reach the optimal speed, which is maintained or increased in a 5-step running cadence

Step rhythm phase
1. Towing begins on the landing of the left foot.
2. Left shoulder facing the direction of the throw, left arm in front for balance.
3. The arm used for throwing extends backwards during the first and second steps.
4. The arm used for throwing is at shoulder level or slightly higher after pulling.
5. The tip of the javelin is close to the head .

Release phase
1. The right foot is placed flat at an acute angle to the direction of the throw.
2. Legs overtook the axis of the shoulder, javelin and waist are parallel.
3. The right knee and waist are actively pushed forward.
4. The throwing arm remains straight.
5. Shoulder axle, javelin and waist are parallel.

Recovery phase
1. The limbs are quickly swapped after releasing the javelin.
2. The right leg is a bent leg.
3. The upper body is lowered.
4. The left leg swings back.
5. The distance between the feet from the holding leg to the throwing line is 1.5-2.0.

The purpose of this data analysis is to simplify the data into a form that can be understood and interpreted. The data analysis used in this study include: 1) Normality test, 2) Homogeneity test, 3) T-test. After knowing the test results data are normally distributed and the two scores to be tested for equality have the same variance, the next step is to perform a parametric test with a T-test.

The research was conducted in the new normal era, so there are many health regulations or protocols that must be obeyed according to the face-to-face permit issued by the Majalengka Regency Education Office. The face-to-face meeting was held on August 24, 2020 according to a circular from the Majalengka Regency Education Office.

The contents of the Majalengka Regency Education Office Circular issued on August 19, 2020, Number 423/3017-Disdik concerning the Implementation of Face-to-Face Learning in Elementary and Middle School Education Units during the Covid 19 Emergency Period in Majalengka Regency, among others:

1. Students must always wear masks and face slides made of clear plastic.
2. The school must also provide a place to wash hands and soap for students.
3. Before students enter the school area at the school gate, students must check their body temperature first after the health protocols are adhered to.
4. The entire contents of the Circular also issue rules for reducing lesson hours and are applied in groups or alternately / take turns.
5. All policies issued by the Majalengka Regency Education Office must always be obeyed so that the face-to-face process can run and avoid the Covid-19 virus outbreak

RESULTS AND DISCUSSION

Pretests were conducted on students of SDN Waringin I and II, of course, at different times. To provide an initial understanding, students were told how to hold a javelin, then students took a pretest. The results of the pre test and post test can be seen in **Table 3**.

Table 3. Pre-test and Post-test Result

	Group	N	Mean	SD	Min	Max
Pretes	Group 1	18	56,39	5,893	50	65
	Group 2	22	45,23	4,219	40	50
Postes	Group 1	18	78,61	4,791	70	85
	Group 2	22	72,73	3,355	70	80

Based on **Table 3**, it can be seen that the statistical descriptive results of the pretest experimental class 1 are 56.39, and the mean posttest score for experimental class 1 is 78.61. Meanwhile, the descriptive statistical pretest results for experimental class 2 were 45.23 and the mean posttest score for experimental class 2 was 72.73. Based on these calculations, the experimental class 1 has increased more than the experimental class 2. The results showed that the pretest statistical description for experimental class 1 was 56.39, and the mean post-test score for experimental class 1 was 78.61. Meanwhile, the descriptive statistical pretest results for experimental class 2 were 45.23 and the mean posttest score for

experimental class 2 was 72.73. Based on these calculations, the experimental class 1 increased more than the experimental class 2.

Normality test is to find out whether a data distribution is normal or not.

Table 4. Normality Test Kolmogorov-Smirnov

Group	df	Sig.	Distribution
Pre test Ex. 1	18	0,955	Normal
Posttest Ex. 1	18	0,440	Normal
Pre test Ex. 2	22	1,583	Normal
Posttest Ex. 2	22	1,101	Normal

From the results of the **Table 4** normality test using the Kolmogorov-Smirnov value, it can be concluded that the pretest and posttest data of experimental group 1 and experimental group 2 are normally distributed because all significance values are greater than 0.05.

Table 5. Homogenity Test

	Levane Statictic	df1	df2	Sig.	
Pretest	0,893	1	38	0,351	Homogeneous
Posttest	3,664	1	38	0,063	Homogeneous

Based on the output above, it is known that the results of the **Table 5** homogeneity test of the experimental pretest 1 and 2, the significance value is 0.351 > 0.05, and the results of the homogeneity test for the post-test experiment 1 and 2, the significance value is 0.063 > 0.05, so both variances are homogeneous. So it can be concluded that the variance of the pretest experimental class 1 and posttest experimental class 2 is homogeneous.

To find out whether there is a difference between the experimental class 1 and the experimental class 2, a t-test was performed.

Table 6. Results of T-test for Experimental Class 1 and Experiment Class 2

Variable	Paired Differences	95% Confidence Interval of the Difference		t-count	Sig. (2 tailed)
	Mean	Lower	Upper		
Pre-Posttess Ex. 1	73,900	72,379	75,421	98,30	0,00
Pre-Posttest Ex. 2	48,750	46,367	51,133	41,37	0,00

Based on **Table 6**, the significance value for the t-test of the experimental class 1 is 0.000 <0.05 and the significance value of the experimental class 2 is 0.000 <0.05. And he difference value for the experimental class 1 is 73,900 and for the difference value for the experimental class 2 is 48,750. So, the Ho test criteria were rejected, meaning that the use of turbo media had a positive impact on the javelin throwing skills of elementary school students (Yunarni et al., 2016).

Research conducted by Irianti, et al., in 2015 reported that the application of learning methods using turbo media was proven to improve learning outcomes of javelin throwing skills. This is evidenced by an increase in learning outcomes of javelin throwing skills which is quite good, namely in the first cycle with an average value of 69.64, so the increase is 18.25%. While the average value in the second cycle is 80.67, so the increase is 36.98%.

The learning method using turbo media is proven to improve learning outcomes of javelin throwing skills (Dika et al., 2019). From several relevant studies related to the use of turbo media on javelin throwing skills, the results show that the use of turbo media can have a positive impact on the development of javelin throwing skills..

CONCLUSION

After the researcher gave the javelin throwing lesson using turbo media, there was a positive change. Turbo media is a very suitable tool for elementary school students as a substitute for the original javelin to improve students' javelin throwing skills.

Recommendations for further research are to reveal other variables to be studied in order to obtain more comprehensive information to improve the basic movement skills of javelin throwing in elementary school students.

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Journal of Physical Education, Health and Sport

http://journal.unnes.ac.id/nju/index.php/jpehs

The Effectiveness of Applying Handball Shooting Skills Training Model to Improve Beginner Athlete Shooting Skills

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History Article

Received April 2021
Approved July 2021
Published vol 8 no 1 2021

Keywords

Application of Exercise Model ; Skills; Shooting; Handball

Abstract

This research uses quantitative methods. This study aims to determine the effectiveness of the application of the handball shooting skills training model to improve the shooting skills of novice athletes. The research design in this study was the one group control pretest-posttest. The research has been carried out in several handball sports clubs in Palembang, South Sumatera. Based on the results of the test of the effectiveness of the application of the handball shooting skills training model that has been carried out, the N-Gain Score test results obtained on the results of the shooting skills obtained by an average N-Gain Score for the experimental class of 86.88% with the "effective" category, the value N-Gain Score at least 68% and maximum N-Gain Score of 100%. Meanwhile, the average N-Gain Score for the control class is 25.63% with the "ineffective" category, the minimum N-Gain Score is 8.33% and the maximum N-Gain Score is 53.85%, so it can be concluded that the application of the development model is proven. So thus from the results of this study it is recommended to teachers, coaches and novice athletes to be able to use the product training model that has been developed by researchers as a reference in teaching, training and learning handball.

How to Cite

Lanos, M., E., C., Et al. (2021). The Effectiveness of Applying Handball Shooting Skills Training Model to Improve Beginner Athlete Shooting Skills. *Journal of Physical Education, Health and Sport*, 8 (1), 7-11.

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p-ISSN 2354-7901
e-ISSN 2354-8231

INTRODUCTION

The development of sports progress in Indonesia is growing rapidly as seen from the many international championships held in Indonesia. This has also had a positive impact on the development of sports progress at the national level. The government tries to support athletes by providing training platforms from the regional and even national levels. One of the sports that has become a concern and favored by all people in Indonesia today is handball. The handball game played in ancient Greece is a sign of the creation of the modern handball sport (IHF, 2012). Handball in Indonesia is growing again after not being able to compete with the sports that are currently developing at that time, at this time the community has begun to open up to new sports that can give their characteristics, especially those that can make sports fun to watch. Handball sport is where two teams of seven players each with six players and one goalkeeper in each team try to get a ball into the opponent›s goal. Handball is one of the most interesting game sports played by all groups. Because handball is a complex sports game (Mulyani & Sumarno, 2017). In principle, a handball game was created to make the human body able to move and carry out activities so that the burning occurs in the body. (Triwijayanto, 2013) explains that, «handball can be interpreted as a team game using the ball as a tool, which is played using one or both hands. The ball can be thrown, bounced, or shot. This game aims to get as many balls as possible into the opponent›s goal and prevent the opposing team from getting the ball into their own goal ".

Supporting achievement in handball games players must have good speed, strength, endurance, and accuracy to support their appearance in the field (Ramadan, 2018). This is a concern in carrying out training for current handball athletes, the need for a training program, and coach coordination in carrying out the training properly. The handball athlete development program starts from coaching novice athletes in Indonesia, one of which is the province of South Sumatera in the city of Palembang. Based on Law of the Republic Number 3 of 2005 concerning the National Sports System (SKN), Chapter I Article (1), it is stated that the definition of achievement sports is sports that foster and develop sportsmen in a planned, tiered and sustainable manner through competitions to achieve achievements with support for sports science and technology (Undang-Undang, 2005). Thus, basic coaching is an important foundation as a basis for increasing achievement in the handball sport.

Handball sports coaching in the Province of South Sumatra, especially in the city of Palembang, has been running quite well, however, various obstacles have been found to improve performance in handball, namely the training pattern that has not varied which causes athletes to be less motivated in training. The need for innovation and adding variety in handball training as well as analysis of the factors that affect success during field appearances. The basic technique in handball is the key in addition to the basic abilities it already has. Both will sustain a person›s appearance in a match. In principle, coupled with a training process or repetition will produce basic player techniques that are expert and the highest level of players or high-level performance (Muhlisin & J.P, 2016). Skilled motor behavior relies on the brain learning both creases after the load force peak and reached its peak to control (Flanagan, J. R., Vetter, P., Johansson, R. S., & Wolpert, 2013). Skilled motor behavior relies on the brain studying the strength of the load to reach its peak to be controlled .

The basic technique of handball is the form and pattern of handball, which can be said to be a modification of soccer and basketball games (Sumarsono et al., 2019). Handball game consists of several basic techniques such as warming-up, dribbling, passing, shooting, positioning, attacking exercise, defencing exercise, and fast-break exercise, but only three basic techniques are used in games, including; (1) dribbling technique, namely the player›s effort to bring the ball closer to the opponent›s defense by bouncing the ball to the floor, (2) passing technique, which is an attempt to give the ball to a friend using one or two hands, (3) shooting technique or shooting the ball into the goal (E. Susanto, 2017). One of the basic techniques that greatly affect victory during a match performance is shooting skills. (Sutrisna et al., 2018) argue that "skills are used to describe the motor movements of a person who has achieved excellence in his activities. An athlete who is considered skilled often has the qualities of coordination, ability, control and efficiency of movement ". Movement skills are supported by motor skills as a capacity of a person related to the implementation of physical abilities to be able to carry out a movement (Widiastuti, 2011). According to (H. Susanto, 2019) revealed that «In a learning process, skills are designed as a learning communication process to change student behavior to be fast, and precise in doing or facing something». While shooting is the main technique that must be mastered by every

athlete in handball. As explained by (Sungkono & Siantoro, 2020) «shooting is the movement of taking a direct shot towards the opponent›s goal and will determine victory». Therefore, this shooting technique needs to be mastered by every handball player because this shooting can be done by every player who gets the opportunity to do it. Handball player can master good shooting techniques, it takes a lot of of shooting skill training models. Therefore, the researcher will test the effectiveness of the application of the handball shooting skill training models so that later it can be applied as an exercise models that can improve the shooting skills of novice athletes.

METHOD

This research uses quantitative methods. The purpose of this research is to determine the effectiveness of the application of the handball shooting skills training model to improve the shooting skills of novice athletes. The research design in this study was the one group control pretest-posttest. In this design, two groups were randomly selected and then given a pretest to determine the difference in the initial state between the experimental group and the control group. A good pretest result is if the value of the experimental group is not significantly different (Hidayat, 2012).

This research was conducted in 3 (three) Palembang South Sumatera handball sports clubs including; 1) SMA Tridharma Palembang, 2) SMAN 8 Palembang, and 3) SMA Pusri Palembang. Sampling was done by purposive sampling. Purposive sampling is a sample taken based on research needs, meaning that each individual taken from the population is chosen deliberately based on certain considerations (Notoatmodjo, 2003). With the number of test subjects totaling 60 subjects (30 for the experimental class and 30 for the control class). The test tool for this effectiveness test is a test made by researchers and has been justified by experts. The test is testee standing 7 (seven) meters from goal and then a testee throws the ball towards the goals that has been numbered, each testee is given 3 chances. Every chance testee takes 5 shots. The value taken is the total value of the given chance

RESULTS AND DISCUSSION

Based on the data taken through the handball shooting skills test, the following is a **Table 1** of the results of the shooting skills of the control and experimental groups:

Table 1. Data Pretest - Posttest Control and Experiment groups

Name	Control Class		Name	Experimental Class	
	Pre-test	Post-test		Pre-test	Post-test
X1	17	23	X1	15	40
X2	20	31	X2	19	39
X3	15	25	X3	21	37
X4	22	26	X4	18	35
X5	17	31	X5	19	37
X6	14	27	X6	14	39
X7	14	19	X7	17	43
X8	19	25	X8	20	40
X9	18	21	X9	18	43
X10	17	23	X10	16	41
X11	16	24	X11	14	43
X12	15	26	X12	14	38
X13	19	31	X13	19	37
X14	20	28	X14	17	42
X15	18	27	X15	18	40
X16	19	21	X16	16	42
X17	21	26	X17	19	40
X18	18	26	X18	20	41
X19	19	23	X19	20	38
X20	14	22	X20	17	41
X21	17	25	X21	19	38
X22	20	22	X22	15	40
X23	18	22	X23	19	41
X24	19	24	X24	20	39
X25	20	22	X25	15	42
X26	21	24	X26	19	38
X27	18	21	X27	20	41
X28	19	22	X28	19	40
X29	19	25	X29	19	39
X30	16	22	X30	14	40
Average	17.97	24,74	Average	18,00	39,80

Based on the data from the **Table 1** handball shooting skills above, the data normality test was then carried out with the Kolmogorov-Smirnov test and the Shapiro-Wilk test. The test results show that the results of the shooting skills show the significance value (sig.) For all data, namely the Kolmogorov-Smirnov test and the Shapiro-Wilk test> 0.05, so it can be concluded that

the research data is normally distributed. Then the t-test is carried out. Obtained the mean score of the results of the test shooting skills in the posttest group of the experimental class was 39.80 and the standard deviation was 1,990, while the average results of the shooting skills test in the control group class were 24.47 and the standard deviation was 3.071. Then obtained the value of t = 4.683 and the value of Sig. (2-tailed) or p-value = 0.000 <0.05 or Ho is rejected. So thus there is a significant increase in the results of the shooting skills of novice athletes in the handball sport after being given a handball shooting skill training model. Furthermor.

The N-gain score test is a way of calculating the difference between the pretest-posttest scores of the control group and the experimental group. Based on the results of the N-Gain Score test on the results of shooting skills, the average N-Gain Score for the experimental class is 86.88%, is "Effective" category with a minimum N-Gain Score of 68% and a maximum N-Gain Score of 100. %. Meanwhile, the average N-Gain Score for the control class was 25.63%, is "ineffective" category with a minimum N-Gain Score of 8.33% and a maximum N-Gain Score of 53.85%. Thus, the use of an "effective" handball shooting skill training model can improve the shooting skills of novice athletes. This is in line with the results of research from (Juditya & Aprila, 2018) which revealed that "The application of an animation-based jigsaw model can improve basic shooting skills in soccer games". In addition, another study from (Mashur, 2017) concluded the results of his research that "The model is a basketball shooting practice through a combination of effective approaches to improve the shooting ability of basketball players". And the research results from (Sugiarto & Wijaya, 2019) also concluded that "Freethrow shooting practice using BEEF can improve basketball shooting skills for beginners".

The results showed that the handball shooting skills training model can improve the shooting skills of novice athletes with the acquisition of t = 4.683 and Sig. (2-tailed) or p-value = 0.000 <0.05. This result is in line with research from (Lusiana, 2015) which states that "A good throwing ability team in winning a match". In addition, (from a player will have a significant impact on the Pratama, 2016) in his research explained that "shooting the ball is also a skill that must be possessed by every player". In principle, handball is a team sport that uses the ball as a tool to play with one or two hands. In handball games, each player is required to be able to master various basic handball skills.

In a game or handball match, there are two teams in the game, and each team must try to shoot the ball at the opponent's goal which is protected by the goalkeeper. Each team consists of 7 players, including 1 goalkeeper and 6 defensive and offensive players. This handball game aims to get as many balls as possible into the opponent's goal to score goals and prevent the opposing team from shooting the ball into the goal itself. Handball games have various basic techniques which are one of the main factors that determine whether a team wins or loses in a game. Regarding this, research from (Budi et al., 2019) states that "Mastery of basic technical skills aims to support the ability to play handball well as shown by the standard assessment of handball playing skills". This handball game is played with a very fast, dynamic rhythm, with spectacular tactics and techniques (very interesting) from the players, then ends with a fast, hard, and precise shooting action. So shooting skills in the game of handball are very important for every player to master and do well.

CONCLUSION

Based on the results research of the application of the handball shooting skills training model that has been carried out, and it has been proven effective so that it can improve the shooting skills of novice athletes. So thus from the results of this study, it is recommended to teachers, coaches, and novice athletes to be able to use the product training model that has been developed by researchers as a reference in teaching, training, or learning handball.

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8 (1) (2021) 12 - 16

Journal of Physical Education, Health and Sport

http://journal.unnes.ac.id/nju/index.php/jpehs

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

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History Article

Received June 2021
Approved July 2021
Published vol 8 no 1 2021

Keywords

Dryland training model, Youth athletes, Swimming performance, Covid-19 pandemic

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

Subekti, R., D., Et al. (2021). The Effect of Dry Land Training Model on Youth Athletes Swimming Performance During Covid-19 Pandemic. *Journal of Physical Education, Health and Sport*, 8 (1), 12-16.

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p-ISSN 2354-7901
e-ISSN 2354-8231

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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8 (1) (2021) 17 - 23

Journal of Physical Education, Health and Sport

http://journal.unnes.ac.id/nju/index.php/jpehs

Correlation Between Nutritional Status, Energy Intake, and VO2Max Level in Female Futsal Player

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History Article

Received June 2021
Approved July 2021
Published vol 8 no 1 2021

Keywords

Nutritional Status; Energy Intake; VO2Max Level; Female Futsal

Abstract

The purpose of this study was to discover the correlation between nutritional status, intake of energy, and VO2Max level in female futsal players. The method used is quantitative correlation with the research design of Cross Sectional Study. The subjects in this study used female futsal players from Antartika Senior High School Sidoarjo with an age range of 15-18 years with a total of 30 people. Data were collected using measurements of height and weight, food recall 2x24 hours, and Multistage Fitness Test (MFT). Data analysis used Rank Spearman, the results of the correlation test using Spearman's Rank obtained the results of r= 0.646 and p= 0.000 which was interpreted as a significant correlation between nutritional status and energy intake with a strong correlation strength and a positive correlation direction. Based on the results of the study, it can be concluded that there is a correlation between energy intake and VO2Max with nutritional status. However, there is no correlation between energy intake and VO2Max (r=0.080 and p= 0.674).

How to Cite

Wulandari, C., & Sulandjari, S. (2021). Correlation Between Nutritional Status, Energy Intake, and VO2Max Level in Female Futsal Players. *Journal of Physical Education, Health and Sport*, 8 (1), 17-23.

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p-ISSN 2354-7901
e-ISSN 2354-8231

INTRODUCTION

Futsal is a type of soccer sport game that has undergone an evolution of games and regulations. Currently, the game of futsal is popular among the public, not only as a recreational sport, but this game has become a place for healthy competition between communities. Maryami (2016) states that futsal competitions are available at regional, national, and international levels and have been widely implemented as a form of effort to improve achievement.

In the game of Futsal requires good physical endurance to support performance in playing on the field. This is because the futsal game has dynamic characteristics due to its fast movement when attacking and defending (Lhaksana, 2011). Furthermore, Lhaksana (2011) explains that the condition of high physical endurance is needed in futsal games to carry out activities continuously for a relatively long time. Endurance is one component of physical fitness. Physical fitness according to Suhartoyo et al. (2019) is one of the supporting factors in achieving achievements. In line with the opinion of Salamah et al. (2019) which states that good physical fitness can support athletes› abilities, because creating high athlete achievement requires good physical fitness and stamina.

Futsal game uses a combination of aerobic and anaerobic, so that in practice futsal players need oxygen (O2) supply. With this, one of the efforts to determine the level of endurance of the players can be known through the VO2Max value. Sugiarto (2012) states that a high VO2Max value will prove that the body›s resistance when doing sports activities is also high, meaning that it will not get tired quickly after doing various physical activities. Players who do not have a good VO2Max will experience a decrease in stamina and will affect playing performance on the field (Debbian & Rismayanthi, 2016).

The VO2Max value is influenced by several factors, one of which is nutritional status (Wagner in Eviana (2016)). Cornia & Adriani (2018) in their research also states that there is a relationship between nutritional status and VO2Max value. A measure of nutritional status is needed by an athlete in achieving achievement. According to Irianto in Adnyani (2019), good nutritional status can maintain fitness and health degrees, as well as support the athletes› achievements. Nutritional status is a picture that can be used to determine the condition of a person›s body. Ulfa et al. (2017) argues that nutritional status is said to be good if it is directly proportional to physical fitness.

Nutritional status can be interpreted as an indicator of whether or not the daily food supply is good or bad. Susetyowati (2016) explained that nutritional status is a measure of the consumption of nutritional intake and the body›s ability to use these nutrients. Nutritional status is said to be normal if the quality and quantity of food intake meet the body›s needs (Pujiati, Arneliwati, & Rahmalia, 2015). Food intake is obtained through the consumption of carbohydrates, fats and proteins which will later become the energy needed to perform physical activity. The fulfillment of the right energy intake will support the athlete›s performance to be maximal (Zoorob in Adisoejatmien et al. (2018)). In line with Maulana (2016)›s statement that a person›s nutritional status is determined by a combination of certain nutritional measures related to macronutrient intake, namely carbohydrates, fats, and proteins. These nutrients are needed by players to fulfill daily nutrition which will be used for physical activity and can support physical fitness.

Research related to the correlation between nutritional status and energy intake with VO2Max level has been carried out by previous researchers several times, but in this study there were fundamental differences and updates from previous studies. This study discusses the correlation between nutritional status, energy intake and VO2Max level in female futsal players in Sidoarjo. This discussion will be interesting because in general futsal is dominated by male players, especially in Sidoarjo there is still no research related to the topic to be discussed. The popularity of female›s futsal is currently increasing rapidly, especially in Sidoarjo, this is evidenced by the many high schools that provide female›s futsal extracurriculars, one of which is the Antartika Senior High School Sidoarjo. Antartika Senior High School is a high school that has won many achievements in the female›s futsal sport since 2015.

Based on the description above, the purpose of this study was to determine the correlation between nutritional status, energy intake, and VO2Max level for female futsal players in Sidoarjo, especially for members of the female futsal team of Antartika Senior High School Sidoarjo who had achieved many previous achievements.

METHOD

This research uses correlational quantitative research with a correlational research design

with the type of Cross Sectional Study. The subjects in this study were female futsal players at Antartika Senior High School Sidoarjo with an age range of 15-18 years with a total of 30 people. The instrument used to measure the nutritional status of the research subjects used a digital scale with an accuracy of 0.05 kg and a microtoise with a height of 2 meters with an accuracy of 1 millimeter. Measurement of energy intake was carried out using a food recall form instrument which was carried out 2 times. Meanwhile, to find out VO2Max level, a Multistage Fitness Test (MFT) was carried out with the support of a tape recorder or speaker, MFT audio, and the Multistage Fitness Stage (MFT) form to record the levels successfully taken by the research subjects.

Data collection related to nutritional status and VO2Max level was carried out at the same time, while data on energy intake was carried out for 2 days, on weekdays and weekends. The research data that has been obtained will be analyzed with the help of the SPSS version 22.0 program. The correlation test was carried out using the Spearman Rank test because the research subjects were 30 people with statistics at a significance level of 0,05. There is no specific guidelines for nutritional status, energy intake, and VO2Max on female futsal players. Based on the Permenkes RI No. 2 of 2020 concerning "Child Anthropometric Standards" states that the nutritional status of adolescents is declared good if the BMI/U shows -2 SD to +1 SD. The total energy expenditure (TEE) and the requirements of each soccer player are definitely different, it can be divided into three main contributions: basal metabolic rate (BMR), diet-induced thermogenesis (DIT), and activity energy expenditure (AEE) (Dobrowolski et al., 2020). According to the Widyakarya Nasional Pangan dan Gizi (2012), the recommended energy intake is 90% - 120% of the RDA. Futhermore, ideal VO2Max score for female athlete is between 35 - >41 ml/kg/min (Heywood, 1998).

RESULTS AND DISCUSSION

Based on research data on female futsal players at Antartika Senior High School Sidoarjo as many as 30 people, the results of nutritional status were obtained as shown in the table below. The majority of players' nutritional status was in the good or normal nutritional category (83.3%). Besides that, there are 2 players with overweight nutritional status (6.7%) and 3 people with obesity nutritional status (10%).

Table 1. Frequency Distribution of Nutritional Status

Nutritional Status (IMT/U)	Total	
	n	%
Severly Thinnes (Gizi Buruk)	0	0%
Thinnes (Gizi Kurang)	0	0%
Normal	25	83,3%
Overweight (Gizi Lebih)	2	6,7%
Obese (Obesitas)	3	10%
Total	30	100%

The results of data **Table 2** recap of energy intake obtained by food recall 2x24 hours can be concluded that the data obtained is very varied. Most of the research subjects were classified as severe deficit (33.3%) and moderate deficit (23.4%). Research subjects who meet the needs of energy intake in accordance with the needs are counted as many as 5 people (16.7%) while the category of mild and over deficits is 13.3% or as many as 4 people. So from these results it can be said that the majority of female futsal players have energy intake <70% RDA or classified as severe deficit.

Table 2. Frequency Distribution of Energy Intake

Energy Intake	Total	
	n	%
Severe Deficit (Defisit Berat)	10	33,3%
Moderate Deficit (Defisit Sedang)	7	23,4%
Mild Deficit (Defisit Ringan)	4	13,3%
Normal	5	16,7%
Over (Lebih)	4	13,3%
Total	30	100%

Table 3. Frequency Distribution of VO2Max Level

VO2Max Level	Jumlah	
	n	%
Very Poor	6	20%
Poor	7	23,3%
Moderate	13	43,3%
Good	2	6,7%
Very Good	2	6,7%
Total	30	100%

In the **Table 3** above, there are results from the implementation of the Multistage Fitness Stage (MFT) carried out by all research subjects, it was found that most of the female futsal players at Antartika Senior High School had a moderate

VO2Max level value of 13 people (43.3%). In addition, several other players have VO2Max scores in the very poor (20%), poor (23.3%), good and very good categories of 6.7%. So it can be said that the VO2Max level of female futsal players is in the moderate category.

Correlation between Nutritional Status, Energy Intake, and VO2Max Level in Female Futsal Players

Table 4. Results of Rank Spearman Test

		Nutritional Status	Energy Intake	VO2Max Level
Nutritional Status	r	1,000	0,646	-0,427
	p	-	0,000	0,019
Energy Intake	r	0,646	1,000	0,080
	p	0,000	-	0,674
VO2Max Level	r	-0,427	0,080	1,000
	p	0,019	0,674	-

Based on the results **Table 4** of the significance level test and the correlation coefficient using the Rank Spearman test, it shows that there is a correlation between nutritional status and VO2max level with a p value = 0.019 and r value = -0.427, which means that it has sufficient correlation strength with a negative correlation direction.

The fitness parameter that is commonly used to determine the level of endurance is VO2Max. A good VO2Max level is an important thing that must be owned by players. Sinamo in Setiadi & Zaidah (2019) explained that VO2Max is a description of an individual's aerobic capacity in carrying out physical activities. One of the factors that can affect VO2Max is nutritional status.

Table 5 shows that normal nutritional status tends to have moderate VO2Max level, which is 40%, overweight status has less and moderate VO2Max level each 3.3%, while obese nutritional status has 10% very poor VO2Max level. Based on the results of the Spearman Rank correlation test, the value of p = 0.019 which states that nutritional status has a correlation with VO2Max level. These results are in line with research conducted by Cornia & Adriani (2018) that there is a relationship between nutritional status and physical fitness in Taekwondo UKM students, it says that the normal nutritional status makes the better physical fitness. Another study conducted by Pratama (2018) stated that nutritional status has a relationship with VO2Max in Wonosobo Beringin Putra Football Club Athletes, that the higher of nutritional status will make the physical fitness lower.

The correlation coefficient based on Spearman's Rank test analysis on nutritional status and fitness yields r = -0.427 so it can be interpreted that the direction of the correlation is negative with sufficient correlation strength. The direction of the negative correlation means that the higher the nutritional status value, the lower the level of fitness. This statement is in line with the research conducted by Laxmi et al. (2014) and Ekoparman & Widajadnja (2015) which state that nutritional status and physical fitness have a negative relationship. This is in line with research conducted by Pratama (2018) which explains that the higher the nutritional status will hamper the physical fitness of athletes. So an athlete must strive to maintain nutritional status in order to remain in the normal or good category.

In addition, data analysis related to energy intake and VO2Max level based on the results presented in **Table 6**, it can be concluded that there is no correlation between energy intake and VO2Max level in female futsal at Antartika Senior High School Sidoarjo. This is evidenced by the value of p = 0.674 and the value of r = 0.080. These results are in line with Amin & Lestari's research (2017) that there is no correlation between energy intake and cardiovascular fitness of the Amanatul Ummah Islamic boarding school students in Surabaya.

The data collection method in this study used a food recall of 2x24 hours, which could affect the results of the study because the data obtained were less than optimal. To obtain data on an individual's eating habits, a minimum of 2 24-hour recalls are required within a certain period of time (Penggalih, 2019). So it is better to use a data collection method with a longer frequency to get maximum results. In her book, Penggalih (2019) explains further regarding recalls performed on athletes, it is better to pay attention to the training schedule in one period. Differences in the type and duration of exercise will affect the energy needs of the athlete. The recall results obtained during high-intensity exercise will be different from those obtained when athletes train with light intensity. Penggalih et al. (2019) in his research related to the consumption patterns of adolescent soccer athletes in Indonesia using 3x24 hour food recall and semi-quantitative food frequencies as data collection instruments related to the athletes' food intake. The use of both methods is used to reconfirm the food intake that has been consumed.

Based on the data presented in **Table 7**, it can be seen that the female futsal team at Antartika Senior High School which has normal nut-

Table 5. Data Distribution of Nutritional Status and VO2Max Level

Nutritional Status	VO2Max Level							
	Very Poor	Poor	Moderate	Good	Very Good	Total	r	p
Severly Thinnes	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)		
Thinnes	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)		
Normal	3 (10%)	6 (20%)	12 (40%)	2 (6,7%)	2 (6,7%)	25(83,3%)	-0,427	0,019
Overweight	0 (0,0%)	1 (3,3%)	1 (3,3%)	0 (0,0%)	0 (0,0%)	2 (6,7%)		
Obese	3 (10%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	3 (10%)		
Total	6 (20%)	7 (23,3%)	13 (43,3%)	2 (6,7%)	2 (6,7%)	30 (100%)		

Table 6. Data Distribution of Energy Intake and VO2Max Level

Energy Intake	VO2Max Level							
	Very Poor	Poor	Moderate	Good	Very Good	Total	r	p
Severe Deficit	1 (3,3%)	6 (20%)	2 (6,7%)	0 (0,0%)	1 (3,3%)	10(33,3%)		
Moderate Deficit	2 (6,7%)	0 (0,0%)	5 (16,7%)	0 (0,0%)	0 (0,0%)	7 (23,4%)		
Mild Deficit	0 (0,0%)	0 (0,0%)	3 (10%)	1 (3,3%)	0 (0,0%)	4 (13,3%)	0,080	0,674
Normal	0 (0,0%)	1 (3,3%)	2 (6,7%)	1 (3,3%)	1 (3,3%)	5 (16,7%)		
Over	3 (10%)	0 (0,0%)	1 (3,3%)	0 (0,0%)	0 (0,0%)	4 (13,3%)		
Total	6 (20%)	7 (23,3%)	13 (43,3%)	2 (6,7%)	2 (6,7%)	30 (100%)		

Table 7. Data Distribution of Nutritional Status and Energy Intake

Nutritional Status	Energy Intake							
	Severe Deficit	Moderate Deficit	Mild Deficit	Normal	Over	Total	r	p
Severly Thinnes	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)		
Thinnes	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)		
Normal	10(33,3%)	7 (23,4%)	4 (13,3%)	4 (13,3%)	0 (0,0%)	25(83,3%)	0,646	0,000
Overweight	0 (0,0%)	0 (0,0%)	0 (0,0%)	1 (3,3%)	1 (3,3%)	2 (6,7%)		
Obese	0 (0,0%)	0 (0,0%)	0 (0,0%)	0 (0,0%)	3 (10%)	3 (10%)		
Total	10(33,3%)	7 (23,4%)	4 (13,3%)	5 (16,7%)	4 (13,3%)	30 (100%)		

ritional status has the majority of energy intake classified as a severe deficit of 33.3% and for the moderate deficit category of 23.4%, while for the mild and normal deficit categories, each by 13.3%.

The results of the correlation test using Spearman's Rank obtained the results of r= 0.646 and p= 0.000 which was interpreted as a significant correlation between nutritional status and energy intake with a strong correlation strength and a positive correlation direction. It is called a positive correlation because high energy intake will lead to high nutritional status as well. These results are in line with research related to the relationship between energy intake and nutritional status of SMA Negeri 4 Manado students conducted by Reppi et al. (2015) with statistical test results showing the value of p= 0.000 and the correlation coefficient r= 0.567. So that there is a relationship between energy intake and nutritional status of SMA Negeri 4 Manado students with a moderate relationship category and a positive correlation direction.

Energy intake is closely related to nutritional status. Nutritional status is a description of individual conditions obtained from the intake and utilization of nutrients by the body (Susetyowati, 2016). Poor food intake patterns will have an impact on a person's nutritional status. This is in line with the opinion of Dwira (2017) which states that one of the factors that cause poor nutritional status and over nutritional status in adolescence is the wrong eating factor, such as consumption of foods that are high in fat, salt, sugar, but rarely consume vitamins and fiber. especially those from vegetables and fruits. Reppi et al. (2015) argues that excessive energy intake will lead to weight gain, overweight, and obesity. Foods with a high energy density without being balanced with fiber consumption will also cause a bad effect on energy balance. A balanced diet is highly recommended for all people. The intake of nutrients consumed will determine the health status of each individual (Karim, 2017).

CONCLUSION

Based on the results of the research that has been done, it can be concluded that there is a correlation between nutritional status and VO-2Max level with sufficient correlation strength and negative correlation direction. In addition, nutritional status and intake of energy also have a significant correlation with the strength of a strong correlation and a positive direction of correlation. However, there is no significant correlation between energy intake and VO2Max level, as evidenced by the p value = 0.674.

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8 (1) (2021) 24 - 30

Journal of Physical Education, Health and Sport

http://journal.unnes.ac.id/nju/index.php/jpehs

Analysis of the Implementation National Paralympic Committee of Indonesia Swimming Training Program in 2021

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History Article

Received June 2021
Approved July 2021
Published vol 8 no 1 2021

Keywords

Analysis; Paralympic; Swimming; Training Program

Abstract

The research aim to describe the strengths, weaknesses, opportunities, and threats in the implementation of the training program at the National Paralympic Swimming Committee Indonesia 2021. These studies use a qualitative descriptive method. The research subjects were Head coaches, coaches, athletes, and administrators of the National Paralympic Committee. The data analysis technique includes data collection, data reduction, data presentation, and data conclusion. The validity of the data in this study used data triangulation. Research result. 1) Strength: the implementation of the mesocycle, microcycle, macrocycle training program, the complete composition of trainers and infrastructure affects strength in the implementation of the swimming training program at the National Paralympic Committee. 2) weakness: targets on training programs that have been neglected due to the pandemic have made sports events canceled so that the training programs are not on target. 3) opportunity: the implementation of the National Paralympic Committee swimming training program brings achievement opportunities for athletes with Tryout Results who have reached the target. 4) The delay of several events can affect the athlete's mental state so that it poses a threat to the athlete during the competition. The recommendation from the results of the SWOT analysis is that the Swimming training program at the National Paralympic Committee has been measured and structured based on existing training theory. Although the targets in the training program had not been realized due to the Covid-19 pandemic, it is hoped that the National Paralympic Committee's Swimming athletes and coaches can prepare the athlete's condition for the upcoming event. So that athletes can readjust mentally back to the next competition.

How to Cite

Rahman, S., E., Et al. (2021). Analysis of the Implementation National Paralympic Committee of Indonesia Swimming Training Program in 2021. *Journal of Physical Education, Health and Sport*, 8 (1), 24-30.

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p-ISSN 2354-7901
e-ISSN 2354-8231

INTRODUCTION

Sport is an activity that is part of human physical activity because physical activity has the intent and purpose of improving the quality of life. National Paralympic Committee or National Paralympic Committee of Indonesia is an institution or organization that has sports activities. National Paralympic Committee is an official institution established by the government as a sports forum or organization for people with disabilities in Indonesia. Each Championship event has been determined and assigned a date and year. Therefore, the role of the National Paralympic Committee Organization is to make plans and programs that will be achieved in determining targets. The National Paralympic Committee organization has 18 sports, one of which is swimming. In (International Paralympic Committee, 2018) write about that aquatics has been belonging of the Paralympic programme on account of the fundamental olympiads in roma in 1960 and has seen the character of athletes and nations aggrandizement every quadruplet second childhood on account of then. The swimming is regulated by World Para Swiming, formerly known as International Paralympic Committee swimming. National Paralympic Committee has a very important role in developing achievements for athletes with disabilities. National Paralympic Committee prepares athletes who are struggling to face the competition or championship that will be followed. In the swimming competition, the National Paralympic Committee has slightly different regulations from non-disabled athletes. National Paralympic Committee is an organization that accommodates athletes with disabilities to foster athletes to reach their potential. National Paralympic Committee makes people with disabilities able to become athletes with good achievements. They are able to achieve achievements both at home and abroad in their respective fields. The following is data on the achievements of swimming sports that have been achieved by National Paralympic Committee swimming athletes.

As reported on the International Paralympic Committee website (https://m. paralympic.org/) there are rules in the competition for swimming sports: (1) there is an international standard swimming (FINA) with eight lanes along 50 m; (2) there are eight-spot organization competitions with the eight-spot quickest swimmers competing in the final; (3) thither are indefinite classifications for swimmers to inauguration the race, much as in inundate motion on the turn program or conventional modified to the incapacitated class; (4) during competitions the blind swimmer must have an assistant to assist when approaching the end wall of the pool, either to direct or finish the race, this process is called tapping; (5) Blind swimmers must wear sunglasses in all competitions that are entered.

Bhima Kautsar as the swimming National Paralympic Committee coach also revealed that the swimming National Paralympic Committee s achievements in the Asian Para Games in 2015 were in second place with 17 Gold, 17 Silver, and 16 Bronze. At the 2017 Asian Para games, he was ranked first with 39 Gold, 13 Silver, and 12 Bronze medals. Thus, the National Paralympic Committee swimming performance increased very significantly. The Covid-19 pandemic in the past year caused the cancellation of the 10th ASEAN Para games event which was supposed to be held in 2020. At this time, the Swimming National Paralympic Committee is preparing for a paralympic games event which is planned to be held in August 2021.

When adaptation is allowed to occur in this way, the must evolve program, providing new challenges to swimmers as they adapt. Such challenges can take the form of doing the same exercise with more load, more repetitions, or faster repetitions depending on the objective The performance of swimming athletes often decreases or recedes, this is because the components of the physical condition are not as expected, especially the components of the physical condition that are considered (Mehrsafar et al., 2020). In addition, several factors can cause a swimming athlete›s ability to be not optimal, including because it is not supported by the state of the body structure that is owned, is not supported by adequate physical ability in swimming, is not supported by intensive training, is not mastered by proper swimming techniques. etc. The training program is one of the determinants of an athlete›s performance, where the program is a reference for preparing for future events.

The basic concept of periodization is a macrocycle, mesocycle, and macrocycle which are commonly used to describe training periods (Bompa & Buzzichelli, 2019). Achievements cannot be set-apart from the influence of the practice program. The training program is a binding instruction/guideline in writing containing the methods to be taken to achieve the stated goals. The training program is compiled and is an effort strategy to achieve the future goals of athlete achievement as optimal as

possible. In preparing the training program, an appropriate alternative training plan is chosen as the demands that need to be implemented to increase the current athlete›s performance to the future achievement of the goals the athlete wants to achieve. The training program becomes a guide for athletes to gain achievement through clearly structured training that has been prepared and designed by their coach. training can also be said to be a systematic training process that is carried out repeatedly, which increases the number of training loads every day.

According to (Sari et al., 2018) The quality of training is determined by various factors, including the ability and personality of the coach, facilities and equipment, research results, competition, and the ability of athletes which include talent and motivation, and nutritional fulfillment of athletes. Qualified training is expected to produce high-achieving athletes. The training program itself is divided into several stages which include general preparation and special preparation stages. The general preparation stage begins with exercises that focus on improving the physical ability of an athlete to be physically ready for the competition, then at the special preparation stage, he is given training that is useful for improving the athlete›s technique, tactics, and mental health. Usually in this special preparation stage contains real match simulations as well as looking for tryouts or opponents to practice sparring which is useful to test how ready the athlete is in facing the match. In this regard, the formation of a training program must also pay attention to the period of training and training principles. This is because training must be carried out throughout the year, not only when facing matches. Because athletes who train throughout the year with the correct training program will become athletes who get maximum performance and can sustainably maintain these achievements above a relatively far-reaching period of time.

From the results of the study (Yendrizal et al., 2020), training socialization has been held during a pandemic in several areas. The aim is that the training can find out about exercise programs that can be done during a pandemic. from research (Anders Håkansson & Kenttä, 2021) the impact of short-term athlete training cessation, the postponed and still uncertain Olympic and Paralympic Games can represent major career insecurity for many athletes around the world and can lead to severe changes in daily life and lasting psychological potential.

However, the Covid-19 pandemic canceled and postponed several paralympic sports events, such as ASEAN Para games 2020 and Paralympic 2021. Because sporting events are considered to be able to cause the covid-19 transmission chain (Shaw et al., 2021). So that the targets that the National Paralympic Committee had set and planned were uncertain. Besides that, the development of the National Paralympic Committee achievements is also hampered. Given these problems, researchers will analyze the Swimming training program at National Paralympic Committee Indonesia in 2021 with a SWOT analysis. According to research from (Uroh & Adewunmi, 2021) some athletes experience increased levels of psychological stress during the COVID-19 pandemic. Besides that, the development of the National Paralympic Committee achievements is also hampered. Given these problems, researchers will analyze the Swimming training program at National Paralympic Committee Indonesia in 2021 with a SWOT analysis.

The results of the study (Wijayanti et al., 2016) The role of the Salatiga NPC management in improving the achievement and welfare of persons with disabilities. But it has not studied about the training program in detail and gradually. From the results of the study (Handoko et al., 2019) This research focus to determine the suitability of the Kepahiang Football School training program with the Grass Root Football training program. From this research, it has not been discussed about the period of the exercise program in detail. Research Results (Sulistiyo & Rahayu, 2017) Patient Gymnastics Training Center Training Program for the Preparation for the Championship in Central Java Province. In this study, it has not been discussed about the periods of the training program and the forms of training programs carried out during Covid-19 pandemic.

Purpose of this research is to describe the Strengths, Weaknesses, Opportunities, Treats in thein the implementation of the training program at the NPC Swimming 2021 during the pandemic. The benefit of this research is cognitive knowledge in training swimming properly. As a reference for arranging an exercise program correctly according to existing theories. The novelty of this research is the implementation of training programs that were affected during the pandemic so that the targets have not been realized. So that an alternative emerged for the NPC to adjust the implementation of the training program during the pandemic.

METHOD

This study uses a qualitative approach that aims to analyze existing conditions or phenomena, or the research process to understand human problems / social problems, based on a complex, holistic picture, arranged in discussion reporting the comprehensive perspectives of informants and implementing it. This approach leads to circumstances and individuals as a whole (holistic). The qualitative method is a research method used to investigate the condition of characteristic objects. where the researcher is the key instrument. All qualitative information are unionised into individual collections information. This combines to the accurateness of the analysis as it allows for triangulation of data sources (Skinner et al., 2012)

Research that uses a qualitative approach always has a natural background and a natural setting of data sources. Researchers as the main instrument in qualitative methods, this research prioritizes the process of finding the meaning behind the observed behavior, prioritizing direct data (firsthand) whose results are mutually agreed upon between the researcher and the respondent.

This research was conducted in February-April 2021 at the Indonesian National Paralympic Committee swimming sport. Sources of data, both primary data and secondary data used in this study were National Paralympic Committee administrators, coaches, athletes. Research data in the arrangement of written or oral discussion pictures, photos, or activity obtained from three information sources, namely; person writings, and location. This is following opinion (Tangkudung, 2018) that the data source is obtained from three objects that is paper, place, and person. Papers are data information in the form of documents, books, articles or other written materials, in the form of theories, research reports, and so on. Place is a location that becomes the object of observation with various behaviors or actions of the people in that place. Sources of data in the form of people (respondents) to ask and real. Data collection was obtained in three ways, namely (1) observation, (2) in-depth interviews, and (3) documentation.

This study analyzes data as a step of organizing and sorting information into categories, and introductory description component so that concept can be found and can be formulated as suggested by the information (Friesner, 2017). Data processing used is SWOT analysis. Consists of four components, namely strengths (strengths), weaknesses, opportunities (opportunities), and threats (threats).

Understanding strengths, weaknesses, opportunities and threats. Strengths Positive characteristics and advantages of an issue, situation, or technique. Negative characteristics and disadvantages of the issue, situation, or technique. Opportunity factor, a situation that can benefit, improve or improve an issue, situation or technique. Threats Factors, situations that can hinder the issue, situation, or technique. S-O Strategy/Analysis uses strengths to take advantage of opportunities. W-O Strategy/Analysis Overcome Weaknesses by taking advantage of opportunities. ST strategy/Strength Analysis to avoid threats. W-T Strategy/Analysis Minimize weaknesses and avoid threats. (Sammut-bonnici, 2017).

Information & procedure provide adequate data in the text or by direction to other work to coincide the submitted functioning to be repeated without the need to convey with the authors. validity and reliability information should be provided for critical methods. State the classification of statistical trials used. state the number of observations and statistical findings where appropriate. Two types of parametric and nonparametric statistics should be used.

RESULTS AND DISCUSSION

National Paralympic Committee Indonesia has 45 Swimming athletes. The number of human resources in the National Paralympic Swimming Committee is 6 trainers, three support staff, and one manager. The the implementation of the workout program will be carried out in accordance with the intended event. This year there are two international events, namely the Paralympic games which are planned to be launched in August 2021 in Tokyo, and ASEAN Para Games which are planned to be held in December 2021 in Vietnam.

The training program at the National Paralympic Committee in Sports has a Periodization of the general preparation of competitions. There is a physical test that is measured and routinely held every three months. From aerobic or endurance tests to anaerobic tests, which are carried out by National Paralympic Committee from all sports and from swimming itself. Try out To measure the extent to which athletes have competed with National Paralympic Committee Swimming athletes. The impact of the Pandemic, the paralympic championship event was canceled and canceled. This causes harm to athletes due to uncertain health conditions. Not only is the athlete mental exercise program that is planned cannot

be realized due to delays and cancellations of events. Seven matches failed to be implemented so that the training program that had been arranged could not be realized. Where the coach feels confused when giving training in the match preparation phase, because of the uncertainty of the match schedule impacted by the COVID-19 pandemic. Athletes and coaches also served the anxiety due to the cancellation of the match.

Implementation of The Mesocycle, Microcycle, Macrocycle Training Program The intensity of exercise that is applied in one week itself includes physical, aerobic, anaerobic threshold, endurance performance, anaerobic race pace, sprint, and periodization. Twice a week vigorous physical exercises are performed on lands such as push-ups, pull-ups, and rubber pull. Meanwhile, for aerobic exercise, Anaerobic threshold, Endurance Performance, Anaerobic Race Pace, and Sprint, are done in the pool. The training periodization at National Paralympic Committee itself is structured and scheduled. General fitness preparation for physical fitness, developing basic aerobics. The special preparation of each athlete has received a different program according to the specialist race number that is being followed. Preparation for matches with reduced intensity and prioritizing mental athletes, which are scheduled for June.

The trial which was held in mid-April at the world championship in Lignano is in preparation for Indonesia's participation in the 2021 Paralympic Games multi-event championship which will be held in Tokyo, Japan on August 24 - September 5. From the Tryout results, Jendi passed the minimum qualification score (MQS) in the S9 disability class. His record time was one minute 5.19 seconds (01:05:91) on the 100 meter back, placing him in fifth place. Rifky recorded a time of 01:01:20 in the 100-meter butterfly and ranked 10. However, the debutant athlete from Magetan was declared to have passed the S12 class classification. With the results of the National Paralympic Committee's target has been fulfilled. Jendi can pass Minimum Qualification Score (MQS) and break his own record. Rifky passed the disability qualification, as well as the order of ten S12.

Analysis implementation of the Swimming exercise program at the National Paralympic Committee 2021 using this type of SWOT analysis. The SWOT analysis in this study will determine the aspects of 1) Strength: Analysis of the strength elements possessed by the National Paralympic Committee swimming training program. 2) Weakness (weakness): In addition to the element of strength, some things must be known, namely what are the weaknesses of the training program, this weakness is a factor that causes program activities not to run as desired. 3). Opportunity (opportunity): The opportunity element is usually created or planned at the beginning of the implementation. This element is a factor that is used as the achievement of goals in the implementation of swimming extracurricular activities. 4) Treat (threat): Analysis of threats is very influential to determine whether the training program can affect or not in the future.

From the explanation above regarding the SWOT analysis, the researchers obtained the results of the research from the analysis implementation of the swimming training program at National Paralympic Committee 2021 as follows:

The Strength analysis is training periodization at the National Paralympic Committee's Swimming is well planned with an annual plan involving divides the program into stages to manage training execution, better adapt and ensure the best athlete performance on training goals and objectives. The annual periodization is very useful for coaches because it will be broken down into it there are general preparations, special preparations, main matches, and transition periods. a new annual plan should be used to improve the foundation for future or long-term training stages. (Bompa & Buzzichelli, 2019). The structure of the National Paralympic Committee's annual Swimming training program from the general preparation phase, specifically to competition, makes the strength in the National Paralympic Committee swimming team achieve achievements.

The Weakness analysis is, event target in the training program that has not been achieved due to the impact of the Covid-19 pandemic has caused several events to be canceled so that the training program cannot be realized. National Paralympic Committee is required to continue the training program in 2021 to maintain their achievements, athletes' physical and mental conditions so that they can achieve the targets that will be achieved in 2021.

The opportunity analysis With a training program, evaluation is structured and monitored. Affects the performance of several athletes at the time of the tryout. From the results of the tryout which was held in mid-April at the world championship in Lignano in preparation for Indonesia's participation in the 2021 Paralympic Games multi-event championship which will be held in Tokyo, Japan on August 24 - September 5. The National Paralympic Committee swim team has

exceeded its target. Competition in this championship is important for athletes, to further increase their confidence when competing, as well as hone the training that has been done. From the results of the tryout, the records of the National Paralympic Committee athletes had met the set targets. The tryout results can be a picture of opportunities in the upcoming event in August and December.

The Threat analysis pandemic has an impact on the lives of many people in terms of health and mental health, especially athletes. Adopted quarantine regulations and home isolation have impacted the ability of many elite athletes to train. The research results (Mehrsafar et al., 2020) show that there are mental changes in athletes during the pandemic. With the postponement of the paralympic event, the long wait for athletes to compete affects the anxiety of National Paralympic Committee Swimming athletes, so that the mental level of National Paralympic Committee Swimming athletes has decreased and excessive anxiety.

Strength Opportunity strategy is a strategy that utilizes the internal strength of the organization to take advantage of opportunities. The Strength Opportunity strategy in implementing the Swimming training program, namely maintaining and improving the components of a well-planned training program with linking annual plans and programs split into several units to monitor implementation and adaptation exercise properly and ensure peak performance of athletes at major competitions. So that the achievement targets for National Paralympic Committee Swimming athletes at the Tokyo Paralympic Event 2021 and ASEAN Para games 2021 can be achieved.

Weaknesses Opportunity strategy is a strategy that minimizes weaknesses to take advantage of opportunities. Weaknesses Opportunity strategy in implementing the swimming target swimming training program in 2020 was not realized. To maintain physical condition, mental condition, athletes and measurable stages of training can cover these weaknesses. Thus it becomes an opportunity for the National Paralympic Committee achievements to maximize opportunities to reduce weaknesses.

Strength Threat strategy aims to use force to avoid or reduce the impact of threats. The ST strategy in implementing the training program is a measured and gradual training program so that a qualified human resource trainer and supporting facilities can make training in National Paralympic Committee Swimming more leverage. Mental training is given to athletes to overcome mental athletes that cause anxiety in athletes. Thus it will make the strength to reduce mental instability in athletes.

The Weaknesses Threat strategy is a defining tactic used to minimize weaknesses and avoid threats. Weaknesses Threat strategy is to continue the training program in 2021 to maintain the athlete's performance, physical condition, and mental condition so that they can achieve the targets that will be targeted in 2021 to minimize the weakness of the training program in the pandemic era To avoid threats in the form of anxiety to athletes, holding a tryout in mid-April at the world championships in Lignano will avoid anxiety in athletes so that athletes can adapt mentally to the competition.

The recommendation from the results of the SWOT analysis is that the Swimming training program at the National Paralympic Committee has been measured and structured based on existing training theory. Although the targets in the training program had not been realized due to the Covid-19 pandemic, it is hoped that the National Paralympic Committee's Swimming athletes and coaches can prepare the athlete's condition for the upcoming event. So that athletes can readjust mentally back to the next competition.

CONCLUSION

The implementation of the Swimming training program at the National Paralympic Committee has been running according to the existing training theory. The weakness of the existing training program at the Swimming Branch at the National Paralympic Committee is the target of a training program that has not been realized due to the impact of the pandemic, but there is still a chance for the National Paralympic Committee swimming team to achieve achievements for athletes from the tryout results that have reached the target. Due to the delay in several events, it affects the mind of the athlete, causing anxiety and insecurity for the athlete when approaching the competition.

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PEDOMAN PENULISAN MANUSKRIP
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Persyaratan Umum Penulisan Manuskrip

Pedoman bagi penulis manuskrip dapat dijabarkan sebagai berikut.

a) Manuskrip ditulis dalam Bahasa Indonesia atau Bahasa Inggeris dengan kerapatan baris 1,5 spasi, font Times New Roman 12, ukuran kertas A4, format satu kolom, dan margin *last costum setting* (top 2,54 cm; left 2,8 cm; bottom 2,54 cm; right 2,54 cm).

b) Panjang manuskrip ilmiah hendaknya tak lebih dari 4000 kata atau kurang lebih 10-12 halaman, termasuk gambar, grafik atau tabel (jika ada) yang menyertainya.

c) Istilah-istilah dalam bahasa asing atau bahasa daerah dalam teks ditulis dalam huruf miring (*italic*).

d) Tinjauan pustaka (*literature review*) tidak dicantumkan sebagai bagian dari struktur artikel. Dengan demikian pengutipan pustaka yang dianggap penting dapat dipadukan dalam bab pendahuluan (*Introduction*) atau dalam pembahasan. Pengutip-an pustaka dalam pembahasan seperlunya saja dan yang lebih diutamakan adalah pembahasan terhadap hasil analisis data yang ditemukan sendiri.

e) Artikel ilmiah dari skripsi, tesis dan disertasi mahasiswa yang akan dimuat di jurnal ilmiah harus ada lembar penilaian manuskrip oleh penguji (berfungsi sebagai mitra bebestari jurnal), surat keterangan penerimaan manuskrip untuk publikasi dari dewan penyunting jurnal yang dilampirkan pada manuskrip dan pernyataan pengalihan hak cipta.

Struktur Artikel Ilmiah

Secara umum struktur artikel ilmiah hasil penelitian dan artikel ilmiah non penelitian relatif sama. Pada artikel non penelitian tidak ada bagian metode. Struktur artikel ilmiah hasil penelitian terdiri atas 10 bagian utama yaitu: (1) judul (2) baris kepemilikan; (3) abstrak; (4) kata kunci; (5) pendahuluan; (6) metode; (7) hasil dan pembahasan; (8) simpulan; (9) ucapan terimakasih dan (10) daftar pustaka. Adapun struktur artikel ilmiah non penelitian terbagi menjadi 9 bagian utama yaitu: (1) judul; (2) baris kepemilikan; (3) abstrak; (4) kata kunci; (5) pendahuluan; (6) pembahasan; (7) simpulan; (8) ucapan terimakasih dan (9) daftar pustaka. Masing-masing bagian diberikan penjelasan sebagai berikut.

a) Judul

1) Judul hendaknya ringkas dan informatif, dengan jumlah kata tidak lebih dari 12, sudah termasuk kata penghubung. Agar judul dapat dibuat singkat dan ringkas dalam 12 kata, hindari kata penghubung dan penyebutan obyek, tempat atau bahan penelitian yang sangat terperinci.
2) Judul mengandung kata-kata kunci dari topik yang diteliti.
3) Jenis huruf Times New Roman 14, dengan jarak baris satu spasi.
4) Judul dalam Bahasa Indonesia atau Bahasa Inggeris, sesuai dengan bahasa yang dipergunakan dalam manuskrip.
5) Hindari penggunaan singkatan, rumus dan rujukan.

b) Baris kepemilikan (*authorship lines*)

1) Baris kepemilikan terdiri atas dua bagian, yaitu nama-nama penulis dan afiliasi kelembagaan penulis.
2) Afiliasi kelembagaan mahasiswa mengikuti tempat dimana yang bersangkutan belajar.
3) Nama-nama penulis hendaknya hanya orang yang benar-benar berpartisipasi dalam perencanaan, pelaksanaan, analisis hasil, pembahasan, dan penulisan laporan.

4) Jabatan akademik/fungsional atau gelar kesarjanaan tidak perlu dicantumkan.
5) Nama lembaga dicantumkan secara lengkap sampai dengan nama negara, ditulis di bawah nama penulis beserta alamat pos, email dan faksimili (kalau ada) untuk keperluan korespondensi.
6) Jika penulis lebih dari satu orang dan berasal dari kelembagaan berbeda, maka semua alamat dicantumkan dengan memberikan tanda superskrip huruf kecil mulai dari **a** pada belakang nama penulis secara berurutan.
7) Nama penulis korespondensi diberi tanda bintang (*).

c) Abstrak

1) Abstrak ditulis secara ringkas dan faktual, meliputi tujuan penelitian, metode penelitian, hasil dan simpulan.
2) Abstrak ditulis dalam satu paragraf; ditulis dalam dua bahasa (Bahasa Indonesia dan Bahasa Inggeris); panjang abstrak berkisar antara 150 - 200 kata.
3) Hindari perujukan dan penggunaan singkatan yang tidak umum.

d) Kata Kunci

1) Kata kunci terdiri atas 3 sampai 5 kata dan/atau kelompok kata.
2) Ditulis sesuai urutan abjad
3) Antara kata kunci dipisahkan oleh titik koma (;).
4) Hindari banyak kata penghubung (dan, dengan, yang dan lain-lain).

e) Pendahuluan

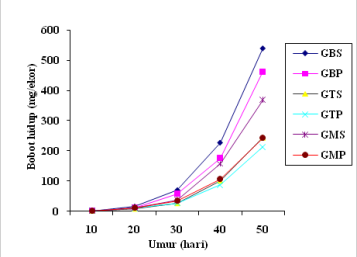
1) Hindari sub-sub di dalam pendahuluan.
2) Pendahuluan hendaknya mengandung latar belakang masalah, permasalahan dan tujuan penelitian.
3) Persentase panjang halaman pendahuluan antara 10-15% dari panjang keseluruhan sebuah manuskrip.
4) Rujukan ditunjukkan dengan menuliskan nama keluarga/nama belakang penulis dan tahun terbitan, tanpa nomor halaman. Landasan teori ditampilkan dalam kalimat-kalimat lengkap, ringkas, serta benar-benar relevan dengan tujuan penulisan artikel ilmiah.

f) Metode Penelitian

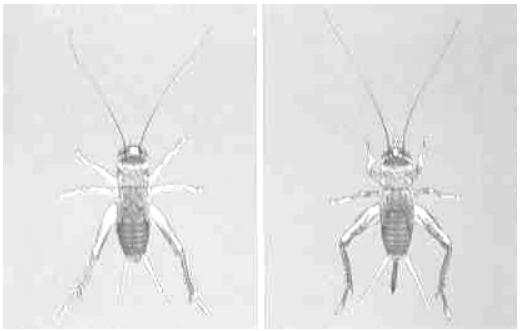
1) Informasikan secara ringkas mengenai materi dan metode yang digunakan dalam penelitian, meliputi subyek/bahan yang diteliti, alat yang digunakan, rancangan percobaan atau desain yang digunakan, teknik pengambilan sampel, variabel yang akan diukur, teknik pengambilan data, analisis dan model statistik yang digunakan.
2) Hindari penulisan rumus-rumus statistik secara berlebihan.
3) Jika menggunakan metode yang sudah banyak dikenal, sebutkan nama metodenya saja. Jika diperlukan, sebutkan sumber rujukan yang digunakan sebagai acuan.
4) Untuk penelitian kualitatif, metode penelitian dapat menyesuaikan.

g) Hasil dan Pembahasan

1) Format hasil penelitian dan pembahasan tidak dipisahkan, mengingat jumlah halaman yang tersedia bagi penulis terbatas.
2) Hasil penelitian dapat disajikan dengan dukungan tabel, grafik atau gambar sesuai kebutuhan, untuk memperjelas penyajian hasil secara verbal.
3) Judul tabel dan grafik atau keterangan gambar disusun dalam bentuk frase (bukan kalimat) secara ringkas.
4) Keterangan gambar/grafik diletakkan di bawah gambar/grafik tersebut, sedangkan judul tabel diletakkan di atasnya. Judul diawali dengan huruf kapital. Contoh dapat dilihat pada Gambar 4.1.



Grafik 1. Pertumbuhan kumulatif tiga spesies jangkrik lokal pada perlakuan pakan yang berbeda



Gambar 4. Profil jangkrik Jantan (kiri) dan betina (kanan) pada fase instar (Sumber: Hasegawa dan Kubo, 1996).

Tabel 1. Hasil Pengukuran Pertambahan Bobot Badan, Bobot Kokon Utuh, dan Bobot Kokon Kosong.

Peubah	Tk.Ketuaan Daun	Frekuensi Pemberian Pakan			Rataan
		B1	B2	B3	
Pertambahan bobot badan (gr/ekor/ minggu)	A1	0,602	0,610	0,612	0,613[a]
	A2	0,616	0,630	0,662	0,650[b]
	A3	0,654	0,672	0,706	0,677[c]
	Rataan	0,624[d]	0,643[d]	0,673[e]	

Keterangan: Superskrip huruf kecil yang berbeda pada baris/kolom yang sama menunjukkan perbedaan yang nyata pada taraf 5%.

Gambar 1. Contoh keterangan tabel dan gambar/grafik.

5) Jangan mengulang menulis angka-angka yang telah tercantum dalam tabel di dalam teks pembahasan. Jika akan menekankan hasil yang diperoleh sebaiknya sajikan dalam bentuk lain, misalnya persentase atau selisih. Untuk menunjukkan angka yang dimaksud, rujuk saja tabel yang memuat angka tersebut.
6) Pada umumnya jurnal internasional tidak menginginkan bahasa statistik (seperti: *significantly different*, *treatment*, dll) ditulis dalam pembahasan. Hindari *copy* dan *paste* tabel hasil analisis statistik langsung dari *software* pengolah data statistik.
7) Materi pembahasan terutama mengupas apakah hasil yang didapat sesuai dengan hipotesis atau tidak, dan kemukakan argumentasinya.

8) Pengutipan rujukan dalam pembahasan jangan terlalu panjang (bila perlu dihindari).
9) Sitasi hasil penelitian atau pendapat orang lain hendaknya disarikan dan dituliskan dalam kalimat sendiri (tidak menggunakan kalimat yang persis sama).
10) Kumpulan penelitian sejenis dapat dirujuk secara berkelompok.

h) Simpulan

1) Simpulan hendaknya merupakan jawaban atas pertanyaan penelitian, dan diungkapkan bukan dalam kalimat statistik.
2) Ditulis sepanjang satu paragraf dalam bentuk esai, tidak dalam bentuk *numerical.*

i) Ucapan Terimakasih

1) Ucapan terimakasih umumnya ditempatkan setelah simpulan.
2) Berisi ucapan terimakasih kepada lembaga pemberi dana, dan atau individu yang telah membantu dalam pelaksanaan penelitian dan penulisan manuskrip.

j) Daftar Pustaka

Ketentuan umum penulisan daftar pustaka:

1) Rujukan yang dicantumkan dalam daftar pustaka hanyalah rujukan yang benar-benar dikutip dalam manuskrip.
2) Untuk artikel hasil penelitian, daftar pustaka dirujuk dari sekitar 10-15 artikel jurnal ilmiah. Sedangkan artikel non penelitian sekurang-kurangnya telah merujuk 15 artikel ilmiah.
3) Kemutakhiran jurnal ilmiah yang dirujuk harus diperhatikan, sekurang-kurangnya merupakan hasil publikasi yang relevan dalam 10 tahun terakhir.
4) Daftar pustaka disusun secara alfabetis berdasarkan urutan abjad nama penulis.
5) Ketentuan nama penulis: nama yang ditampilkan adalah nama akhir (nama keluarga) penulis diikuti dengan singkatan nama awal (dan tengah jika ada). Jika penulisnya lebih dari satu orang, maka cara penulisannya sama.
6) Penulisan judul rujukan diawali dengan huruf kapital hanya pada awal kalimat.
7) Setiap penulisan nama, tahun, judul artikel dan seterusnya diakhiri dengan titik (.) sebelum dilanjutkan kata berikutnya. Khusus penulisan volume (nomor) jurnal diberi tanda titik dua (:) tanpa jarak spasi. Contoh-contoh penulisan dapat dilihat pada penjelasan setiap jenis pustaka yang layak dirujuk.

Ketentuan penulisan rujukan berdasarkan jenis rujukan:

1) Apabila sumber pustaka berupa artikel dalam jurnal ilmiah, ditulis mengikuti urutan: nama penulis. tahun. judul artikel. nama jurnal. volume(nomor): halaman (Nama jurnal diketik miring).

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4) Apabila sumber pustaka berupa **artikel dalam buku kumpulan artikel** ditulis mengikuti urutan: nama penulis artikel. judul artikel. dalam: nama editor jika ada diikuti Ed (jika tunggal) atau Eds (jika lebih dari satu) dalam tanda kurung. tahun.judul buku. volume (jika ada). edisi (jika ada). kota penerbit: nama penerbit (Judul buku dicetak miring).

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6) Apabila sumber pustaka berupa **karya ilmiah yang tidak dipublikasikan** (misal: skripsi, tesis, disertasi dan laporan penelitian), ditulis mengikuti urutan: nama penulis. tahun. judul laporan penelitian. nama proyek penelitian. kota penerbit: instansi penerbit/lembaga (Tulisan skripsi/tesis/disertasi/laporan penelitian dicetak miring).

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7) Apabila sumber pustaka berupa **artikel dalam surat kabar/majalah** umum, ditulis mengikuti

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ACKNOWLEDGMENTS TO REVIEWERS

We would like to thank the best partners who have contributed their thoughts in examining the substance of the contents of the article so that the publication of the Journal of Physical Education Health and Sport can publish selected texts. The list of bestari partners involved in reviewing the substance of the article is as follows:

Tandiyo Rahayu	(Universitas Negeri Semarang)
Soegiyanto	(Universitas Negeri Semarang)
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Hari Amirullah Rahman	(Universitas Negeri Yogyakarta)
Adang Suherman	(Universitas Pendidikan Indonesia)
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Best regards,
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