

The Effectiveness of the Instruments of Non-Test Center Physical Fitness Pandemic COVID-19 and Index Fitness Participants Webiner Judging from SDI

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To cite this article:

Setya Rahayu, Soegiyanto, Ipang Setiawan, Ricka Ulfatul Faza. The Effectiveness of the Instruments of Non-Test Center Physical Fitness Pandemic COVID-19 and Index Fitness Participants Webiner Judging from SDI. *Reports*. Vol. 1, No. 1, 2021, pp. 1-6.

doi: 10.11648/j.reports.20210101.11

Received: October 18, 2020; **Accepted:** January 26, 2021; **Published:** April 16, 2021

Abstract: This study aims to study and analyze how the physical fitness level of the participants in the physical fitness webinar during the COVID 19 pandemic through non-test indicators. This study uses a quantitative method by looking for the physical fitness value of the webinar participants using the non-test method. Data is collected via google form and then processed and analyzed. To measure VO2max using non-exercise variables (based on variables of age, body mass, and resting heart rate) to predict the estimated VO2max value so that it knows the degree of physical fitness. The formula that is used is $VO2maxPred = 3,542 + (-0.014 \times age) + (0.015 \times Mass\ Body) + (-0.011 \times Beat\ Heart\ Break)$. The data obtained were then compiled and analyzed using the sport and physical education development index for the fitness index. Results of the study showed that the index of fitness physical is $10.62:20.4=0.52$. The conclusion of the study it was based on norm index SDI, it is known that the index of fitness physical of the sample was 0.52 and entered in the category of medium.

Keywords: Physical Fitness, Measurement Test, COVID-19 Pandemic

1. Introduction

Physical fitness is important for all people to live a daily life - today. Even for the life of the nation and state, good physical fitness is the main foundation for enhancing the *character and nation building* of a nation. By having good physical fitness, people will be able to carry out daily activities for a longer time than people who have low physical fitness.

Physical fitness is an important aspect that humans need to live day-to-day activities. Physical fitness can be obtained by getting used to a healthy lifestyle, such as doing regular physical activity. Fitness is important in order not to experience excessive fatigue when doing physical activity. Physical fitness is physical ability to customize the functionality of the tools of his body to the task of physically specific and / or to the environmental conditions that must be addressed in an efficient manner, without excessive fatigue and has recovered completely before coming task of the same on the following day [1].

Factors that affect the fitness of physical dinataranya

namely: (1) age, (2) types of sex, (3) offspring, (4) food, (5) the habit of smoking (6) exercises. Fitness can be measured by the volume of oxygen that can you consume when exercising with a capacity of maximum you. VO2max is the maximum amount of oxygen in milliliters that can be used in one minute per kilogram of body weight.

They are fit have a value VO2max is high and can exercise more intensely than those who are not conditioned by the well. Numerous studies show that VO2max can be increased by exercising at an intensity that increases heart rate to 65 and 85% of the maximum for at least 20 minutes three to five times a week. The average value of VO2max for the athlete man is approximately 3.5 liters/minute, and for athletes female, approximately 2.7 liters /minutes. There are several ways to find out the VO2max capacity, including: a. 2.4 km test run; b. Astrand 6 minute cycle test; c. Balke VO2max test; d. Cooper VO2max test; e. Rockport test; f. Multistage fitness test and so on [2].

During the pandemic COVID-19 are almost experienced by the entire country in the world is, become important for every person to maintain and improve fitness physical. With

a body that is healthy and fit to raise then system imun, can minimize exposure to COVID-19. Coronavirus is a group of viruses from the Orthocoronavirinae subfamily in the Coronaviridae family and the order Nidovirales. Group of viruses is that can cause disease in birds and mammals, including humans. In humans, coronaviruses cause infections tract breathing are generally mild, such as colds, although some forms of diseases such as; SARS, MERS, and COVID-19 are more deadly in nature [9]. Disease virus in 2019 corona (corona virus disease / COVID-19) a name new that is given by the Wolrd Health Organization (WHO) for patients with infectious virus 2019 novel corona first time reported from the city of Wuhan, China at the end of 2019. The transmission of COVID 19 occurs rapidly and creates a new pandemic threat to a country by forming new clusters [2].

Pandemic COVID-19 make every person alert when the need to interact with others. It is because the transmission occurs mostly through droplets and contact with the virus then the virus can enter into the mucosa that is open. An analysis of trying to measure the rate of transmission by period of incubation, the symptoms and the duration of symptoms by patients who were isolated [2].

The occurrence of outbreaks COVID-19 makes each person keep a distance with other people (*social distancing*). In accordance instigation of government, things have done to anticipate the occurrence of transmission COVID-19. When a pandemic like this, the measurement of fitness physically difficult to do, given advice the government on *social distancing*. By because the researchers did a study of literature on the test physical fitness are safe to use when the pandemic nCOVID 19 like that occurs when this [2].

2. Method

The method that is used in research this is a descriptive quantitative survey techniques and fitness tests with non- test physical. The quantitative descriptive research method was chosen because it is in accordance with the substance and focus of this study. The research is expressed through an index where the data are presented in the form of numbers and then they are described. The index will provide an operational explanation of the requirements for the Minimum Service Standards for Sports as stated in PP RI No. 16 of 2007 Article 92 which includes open space for exercise, sports participation levels, sports human resources and community fitness levels in each region. The sample in this study were participants of the physical fitness webinar. The data analysis method used in this research is a quantitative approach using SDI analysis from the dimensions of physical fitness. The following formula are used:

$$\text{Index} = \frac{\text{Actual value} - \text{Minimum Value}}{\text{Maximal value} - \text{Minimum Value}}$$

a. Maximum Value=40.5

b. Minimum Value=20.1

after obtaining the index value of the last stage is to determine the category or norm of index values obtained to

provide justification.

3. Results and Discussion

3.1. Physical Fitness

Developing a culture of living healthy through activity physically like doing sports is expected to able to become a style of life for people in order to support sports society and popularize the sport. By doing activity physical or exercising the pitch regularly and do it regularly, have benefit for maintaining health and fitness physical for who did it. In addition, body image can be measured in the context of sports or daily life [4].

Routine malakukan activity physically as exercise can improve and maintain the physical and spiritual health, exercise is useful in preventing the causes of stress becomes more dangerous because it can reduce the production of hormones precipitating stress. Exercise regularly will decrease the level of epineprine and cortisol. The existence of an increase in these hormones is a result of stressor stimulation. Besides that bengan exercise which regularly can improve physical fitness. Physical Fitness is a translation of *Physiological fitness*. In Physiological ability to function physically consists of the ability of anaerobic and ability aerobic. Anaerobic ability consists of the anaerobic ability of alactacids and the anaerobic ability of lactacids. With physical fitness, people will be able to appear more dynamic / enthusiastic and create work productivity. Besides that, a physically fitness be one of the factors that is very important for every human being in life everyday in order to be able to carry out tasks and activities with either no sense of fatigue that means. The benefits of fitness physical at the moment is already much realized by the community, proven by the development of centers of fitness proliferation activities of sports are held by, things are all rooted in search fitness physical. Fitness physical is relative (related), both are anatomically and physiologically, meaning fit or whether or not someone is always in relation with the task of physical which must be implemented [1].

Fitness classified into two categories namely: fitness were associated with health or health- related fitness and fitness are associated with skills or Skill- related fitness. The following is a discussion of each category. 1). Fitness physical which relate to health (health related physical fitness), which includes: a. Body fat composition; b. Flexibility; c. Muscle strength and endurance; d. Power - resistant heart-lung (cardiorespiratory). 2. Physical Fitness which is associated with keterampilana, or skill-related fitness is fitness physically which is important to confront the condition - the condition of emergency which sometimes requires dexterity. However, the category that is much role in the group of athletes than society in general, so its use is limited to the community and the activities of sport [2].

The components kebugarana physical is a factor determinant of the degree of the condition of each individual. Fitness physical (physical fitness) is one of the aspects of the

physical from the freshness of the overall (total fitness). Fitness physically associated closely with daya resistant aerobic. Power-resistant aerobic is an important component of athletic performance and is usually measured by VO_2 max. Aerobic endurance is the ability of the body's respiratory system to continue prolonged physical activity and resist fatigue. Aerobic endurance can be estimated by measuring the volume of oxygen. Cardio-respiratory endurance, also known as aerobic capacity, is cardiovascular and respiratory capacity. The system for supplying the muscles of the body with the required fuel and oxygen. It is also used as a valuable tool for assessing health. This ability can be estimated by the volume of oxygen a person can consume while exercising at maximum capacity. VO_2 max or maximum oxygen uptake is the maximum amount of oxygen we can get used in one minute, besides that it can be used as a parameter that can measure a person's aerobic capacity [15].

3.2. The COVID-19 Pandemic

When this COVID-19 into a plague that hit many countries in the world including Indonesia. COVID 19 / Virus Corona first reported in Wuhan, currently occurring has an impact on various sectors of life. Coronavirus is a family of large viruses that cause the disease mild to severe, such as the common cold or runny nose and illnesses are serious like Mers and SARS. -Sign sign of a person exposed to COVID-19 is the temperature of the body rises, fever, died taste, cough, pain in the throat, head of dizziness, difficulty breathing if the virus corona own until the lungs [6, 11].

The World Health Organization gives the name of the virus just the Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) and the name of the disease as Coronavirus Disease 2019 (COVID- 19). The spread is very fast and deadly. Spreading through contact direct physical human being transmitted through the mouth, nose and eyes. Efforts to break the eyes of the chain deployment COVID-19 carried the government and institutions of religious by issuing several regulations to be obeyed by the people. The COVID-19 outbreak which has an impact on controlling social and economic activities of the community. By thus established the rules of which are as follows: 1). Regulation of Government Number 21 Year 2020 on pembatasan Social Scale Large (PSBB) is the restriction of the activities of certain people in a region who allegedly infected COVID-19 to prevent its spread; 2). Health Minister Regulation No. 9 Year 2020 on Limitation of Social Scale Large (PSBB) which explains that the scope PSBB includes peliburan schools and places of work, facilities public, except supermarkets, minimarkets, market, store, where sales of medicines and equipment medical, as well as the needs of the subject, activities of social and cultural, the banning of a crowd of people, meeting the political, sports, entertainment, academic, and cultural, modes of transport modes exception of the transport of passengers public or private with attention to the number of passengers and keep the distance between the passenger, activities more specifically related to aspects of defense and security unless, defense and security activities to

uphold State sovereignty, territorial integrity, and protect the nation from threats of disturbance, as well as to create security and public order; 3). Notices Chief of Police No. Mak / 2 / III / 2020 concerning Compliance Against Policies Government in handling Spread of Viruses Corona, the contents of the edicts Chief of Police are among others not conduct activities of social community which led to the gathering of the masses in the number of lots. Stay calm and do not panic and more increasing awareness in the environment each and following the information and call the government [11, 14].

The virus, which is a single positive RNA virus, infects the respiratory tract. Enforcement diagnosis starts from symptoms of the common form of fever, cough and difficult breathing until their contact closely with countries that already terinfeksi. Symptoms of clinical varies depending on the degree of the disease but the symptoms were the main are fever, cough, myalgia, tightness, sore head, diarrhea, nausea and pain abdomen. Decision swab the throat and channel the breath becomes a basic rule of the diagnosis of coronavirus disease. Management in the form of isolation must be done to prevent the spread of more advanced [14].

The main prevention is to limit the mobilization of people at risk to the incubation period. Prevention Another is the increasing power hold the body through the intake of food is healthy, memperbanyak washing hands, using a mask when located in areas at risk or solid, did though exercise, rest sufficiently and eat food that is cooked until done and when the pain immediately for treatment to hospital referral for evaluation No. No single country can predict when a pandemic COVID-19 is going to expire. A simple way to adapt and deal with this pandemic is to prepare short – term and long-term strategies while continuing to hope that the COVID-19 virus vaccine will soon be found and mass produced [5, 11].

3.3. The Effectiveness of Physical Fitness Measurement Non- Physical Test

Many of the criteria currently used to determine physical fitness and VO_2 max include: a. 2.4 km test run; b. Astrand 6 minute cycle test; c. Balke VO_2 max test; d. Cooper VO_2 max test; e. Rockport test; f. Multistage fitness test and so on. In addition, there is also Graded exercise testing (GXT), which is the most widely used assessment to examine the dynamic relationship between exercise and integrated physiological systems. The information from the GXT is applicable across the spectrum of sports performance, safety screening work, research and clinical diagnostics. The suitability of the GXT for determining valid maximal oxygen consumption (VO_2 max) has been investigated for decades. But the test is to use the tool with the price of the expensive so not all people can use it [5].

When we are faced with the problem to choose any one of two or more tests are similar to used in an activity ratings fitness physical, we should have guidelines that will be used as a material consideration in deciding / selecting a test which will used in order to test it meets the requirements as a

test that well. References are used to choose a test that is: 1) The validity (Validity); 2) Countability (reability); 3) Objectivity (objectivity).

With through tests and measurements we will get data that the objective of a data measured. Because it was in order to test and measurement is objective and runs with both the necessary means of measuring valid and reliable to provide an overview that of tools that measure and the implementing tests that have knowledge and experience as well as master the ways of measurement that will be implemented and determined. In addition, the factors of accuracy and accuracy in the implementation of tests and measurements will greatly help to fulfill the objective data criteria. Ratings are an objective to provide motivation and satisfaction of the self-participant test [7].

There are several things that need to be considered before carrying out tests and measurements in the field of sport including, namely: 1) Measurements carried out in accordance with the scope and type of goal that was about to be achieved; 2) The measurement method is not limited to tests; 3) Using valid and reliable measuring tools; 4) Tests and measurements carried out by personnel who have been trained and experienced.

no future pandemic COVID-19 as it is today, is not allowed to carry out activities with a lot of people in accordance edict Chief of Police No. Mak / 2 / III / 2020 concerning Compliance Against Policies Government in handling Spread of Viruses Corona, notice it contains not being allowed to hold activities social community which led to the gathering of the masses in the number of lots. State all like this is not me might be right to measure VO2max using exercise variables (maximal or submaximal test). Therefore, it can take advantage of the non-exercise variables mentioned above to predict the estimated value of VO2max as a measure in assessing physical fitness.

Fitness can be measured by the volume of oxygen that is consumed when exercising on a capacity maximum. VO2max is the maximum amount of oxygen in milliliters a person can use in one minute per kilogram of body weight. They are fit have a value VO2max which is higher and can exercise more intensely than those who are not conditioned by the well. Some studies show that you can improve VO2max you to exercise at intensities that increase the rate of heart you be between 65 and 85% of the maximum at least for 20 minutes three to five times a week (quoted from: <https://www.brianmac.co.uk/VO2max.htm#ref>).

Aerobic endurance (VO2max) is an important component and indicator of athletic performance. Given that direct or indirect VO2max measurement requires expensive equipment, a lot of time, and many motivated test takers have been trying to find an easier way to predict VO2max. The results of this study indicate that the newly formulated regression equation, based on non-exercise variables of age, body mass, and resting heart rate, can significantly predict aerobic endurance (VO2maxPred [16]).

Hill was the first to introduce the concept of VO2max as the maximum amount of oxygen consumed in a minute and

try to explain about the physiological mechanisms. Along the development of the times, a number of tests have been introduced to measure accurately VO2max. Ba nyak of the practice test is done on a treadmill or cycle ergometer that requires equipment that is expensive, involving elaborate testing procedures, and it is difficult to do. Therefore, the researchers sought to develop and discover how much easier to predict VO2max using a more easily measured variables [15, 16].

Developing non-exercise prediction equations, used multiple regression analysis to predict VO2max. According to Abe et al. used variables such as thigh muscle mass and cardiac dimensions to be valid methods for predicting VO2max [1]. Alexander et al. demonstrated the validity of using bioelectric impedance for non-exercise prediction of VO2max, although Moon et al. concluded that the use of bioelectric impedance may not accurately predict VO2max in healthy men and women [3, 11]. Oxygen consumption has also been estimated using heart rate, where a lower resting heart rate value among trained athletes is generally considered an indicator of higher aerobic performance, thus signifying higher levels of oxygen consumption, higher efficiency in exercise, and the ability to do more physical activity before reaching fatigue [15, 16].

In Rexhepi & Brestovci's study age, body mass and resting heart rate were treated as independent variables for non-exercise, while VO max calculated from the stretch bike test (VO2maxAST) was treated as the dependent variable [12-14]. Estimated maximal oxygen uptake (VO2maxAST) and estimated maximal oxygen uptake (VO2maxPred) were assessed using students' paired sample t test. All statistical procedures were performed using SPSS. From the research that d itemukan that three independent non-exercise variables (age, mass body and the beating heart breaks) can significantly predict aerobic endurance athletes (VO2maxAST) as the dependent variable. Using the regression constant (α) and the β coefficient of each independent variable, which indicates a significant correlation with the dependent variable. Regression equations were derived are as follows:

$$\text{VO2maxPred} = 3,542 + (-0.014 \times \text{age}) + (0,015 \times \text{Mass Body}) + (-0.011 \times \text{Beat Heart Break}).$$

VO2maxAST descriptive parameters (aerobic endurance estimates based on maximal oxygen uptake during bike Astrand Test) and VO2maxPred (aerobic endurance estimates based on maximal oxygen uptake), were found to be very similar. Maximum oxygen uptake as measured by the Astrand bike Test (VO2maxAST) was significantly correlated (0.688) with the predicted value of maximum oxygen uptake (VO2maxPred). The difference between measured maximal oxygen uptake (VO2maxAST) and predicted maximal oxygen uptake (VO2maxPred) was assessed using a paired sample t test. This comparative test showed no significant difference between measured and predicted VO2max ($p=0.782$). Base on statistical analysis, there is a high degree of similarity between the measured and

VO2maxPred VO2maxAST that estimated [15, 16].

Webinar Student Fitness Index with Physical Non- test Measurement.

This study used a sample of 207. The sample consisted of junior high school, high school and general education teachers. Before you do the research conducted webinar up first. Webinar with the theme of physical fitness in the midst of a pandemic.

Data is collected via *google form* and then processed and analyzed. The collection of data use. To measure VO2max using non-exercise variables (based on variables of age, body mass, and resting heart rate) to predict the estimated VO2max value so that it knows the degree of physical fitness. The formula that is used is $VO2maxPred = 3,542 + (-0.014 \times \text{age}) + (0,015 \times \text{Mass Body}) + (-0.011 \times \text{Beat Heart Break})$. The results of the study are as follows:

Based on the data obtained, it is known that the VO2Max average physical fitness value is 51.12 (ml / kg / min). Method analysis of the data used in this research is quantitative approach using SDI analysis of the dimensions of physical fitness. According to Mutohir and Maksum (2007: 88) the formula used is as follows.

$$\text{Index} = \frac{\text{Actual value} - \text{Minimum Value}}{\text{Maximal value} - \text{Minimum Value}}$$

According to Muthohir and Maksum (2007)

a. Maximum Value=40.5

b. Minimum Value=20.1

c. Actual Value=Average value of physical fitness=51.12 (ml / kg / min).

The result of the physical fitness index is 10, 62: $20.4=0.52$.

after obtaining the index value of the last stage is to determine the category or norm of index values obtained to provide justification. The SDI norms used are:

Table 1. SDI index norms.

Index Figures	Norm / Category
0.800 - 1.000	High
0.500 - 0.799	Intermediate
0.000 - 0.499	Low

Source: Mutohir and Maksum, 2007: 67

Based on the index norm, it is known that the physical fitness index of the sample is 0.52 and falls into the medium category.

4. Conclusion

The results of the research by Rexhepi & Brestovci show that using the newly formulated regression equation, based on the variables of age, body mass, and resting heart rate, can significantly predict an athlete's aerobic endurance (VO2maxPred) [12-14]. Therefore, during the COVID-19 pandemic such as the current situation it is recommended to measure VO2max using non-exercise variables (based on variables of age, body mass, and resting heart rate) to predict

the estimated VO2max value so as to know the degree of physical fitness [8].

The average physical fitness index value of the VO2Max of the webinar participants was 51.12 (ml / kg / min). When viewed from the physical fitness index value, SDI is in the medium category.

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