

## **Survey of Physical Fitness Training Programs to Improve VO<sub>2</sub>max among Automotive Department Students**

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**Abstract:** The purpose of this research is (1) to determine the time period for implementing a physical fitness training program to improve the VO<sub>2</sub>Max of Automotive Department students, (2) to identify the fitness training program given to Automotive Department students to improve their VO<sub>2</sub>Max, (3) to understand the process of implementing physical fitness training programs that can increase the VO<sub>2</sub>Max of Automotive Department students, and (4) to determine whether there is an improvement in the VO<sub>2</sub>Max results of Automotive Department students after being given a physical fitness training program created by the Physical Education teacher. This research uses a qualitative descriptive design. The research is conducted in three vocational schools in the Empat Lawang regency, namely SMK N 1 Empat Lawang located in the Tebing Tinggi district, SMK N 2 Empat Lawang located in the Pendopo district, and SMK N 3 Empat Lawang located in the Paiker district. Data collection procedures include direct interviews with the Physical Education teacher, direct observations of SMK N 1 Empat Lawang, SMK N 2 Empat Lawang, and SMK N 3 Empat Lawang, and documentation to obtain relevant data. The survey findings and results obtained from interviews, observations, and documentation to obtain data can be summarized as follows: The fitness training program created by the Physical Education teachers for a semester or six months, involves running activities in all three vocational schools, while SMKN 1 Empat Lawang also includes push-ups and sit-ups activities. The fitness training program is conducted once a week during the Physical Education class. The results show that after the implementation of the fitness training program, there is an improvement in the VO<sub>2</sub>Max of Automotive Department students.

**Keywords:** Physical Fitness, Training Program, VO<sub>2</sub>Max

### **A. Introduction**

Physical fitness is the most crucial aspect when it comes to carrying out daily activities. Without good physical fitness, we won't be able to perform our daily activities effectively. Sometimes we think that physical fitness and health are the same thing. However, in reality, these two aspects are quite different. Being healthy refers to the condition of our body when we are not experiencing any illness, while being physically fit means being able to carry out daily activities without significant fatigue (Alamsyah

et al., 2017). Therefore, it can be concluded that being healthy doesn't necessarily mean being physically fit, but being physically fit certainly indicates good health. Based on this principle, people prefer to be described as physically fit rather than just healthy. Physical fitness is the ability of an individual to perform daily activities without significant fatigue (Ahdan & Sucipto, 2021). The term "without significant fatigue" means that even after working from morning until evening, a person is still capable of engaging in other activities effectively. For example, someone who works all day and can still participate in physical exercises like playing futsal in the evening can be considered to have good physical fitness. Furthermore, that person continues to make efforts to maintain their physical fitness through regular exercise. This is because physical fitness is a fundamental need that should be fulfilled by everyone. According to Darmawan (2017), physical fitness (PF) is an individual's basic ability to carry out activities successfully.

According to Lengkana, & Muhtar, (2021), physical fitness training has various factors that greatly influence its effectiveness, meaning that the same type of training performed over time will yield different physical fitness outcomes for each individual. Therefore, when a training program is given to multiple students, the final results will inevitably vary among them. Several factors can affect an individual's physical fitness improvement, including age, diet, rest patterns, and of course, physical activity itself. No matter how intense or disciplined someone's training program may be, if any external factors are neglected, the desired enhancement in physical fitness will not be achieved. Hence, the physical training program, diet, rest patterns, and age of an individual must be aligned and harmonized in order to attain the desired goals of improving physical fitness. Additionally, physical fitness can also be seen as being free from diseases, including having clean teeth, good hearing, clear vision, a strong mindset, and being able to sustain physical work for extended periods without significant fatigue (Lengkana, & Muhtar, 2021). The intention and purpose of improving physical fitness here are not only focused on physical well-being but also psychological well-being. The key is to align our thoughts with our actions. By doing so, we can be considered physically and mentally fit.

Exercise can be interpreted as a fundamental function to improve human activities for the better (Ismail & Ibrahim, 2010). In the process of Physical Education and Health (PJOK) learning, teachers plan instructional programs with the goal of enhancing the physical fitness of their students. A training program is a planned program that can be implemented and measured using components of physical fitness activities as test parameters (Mahfud, et. al., 2020). Without a proper training program, the objective of improving students' physical fitness will not be easily achieved. This training program should be taken seriously and responsibly by all students. Without a sense of responsibility and high awareness from the students, the program will not run well and will not yield good results either. According to Hanafi & Prastyana (2020), training is a

process of improving an individual's physical ability that follows rules in terms of methods, implementation rules, principles, and is in line with planned and regular activities, thus achieving the intended program goals. To obtain the desired results from a training program, training should be conducted continuously. A training program serves as the foundation to achieve success in sports/physical activities (Ahdan & Sucipto, 2021). Even though individuals may follow the program accordingly, the results achieved by each individual will still vary. As explained earlier, external factors also have a significant impact on the improvement of physical fitness.

As Physical Education and Health (PJOK) teachers, we can only control the physical activities included in the PJOK curriculum. External factors such as controlling students' eating and resting habits are the responsibility of the students themselves. As for age factor, we do not consider it an issue because the ages of 15-19 are considered productive years for students. However, individuals with underlying health conditions or ongoing illnesses may not be able to participate in the prescribed training program. As PJOK teachers, when designing a training program, we need to first assess the students' level of physical fitness. The test used to determine the level of physical fitness among students is the VO2Max test. VO2Max refers to the long-term utilization of oxygen for physical activity or sports (Barus, 2020). Therefore, having a high VO2Max is beneficial for engaging in prolonged physical activities. It can be said that individuals with a high VO2Max are capable of performing physical activities effectively for an extended period.

Additionally, VO2Max is also a determinant of fitness levels for both athletes and non-athletes (Barus, 2020). Having a high VO2Max is not only essential for athletes but also for students, especially those in vocational schools (SMK) who study from morning until afternoon. It is crucial for them to absorb knowledge and remain active and productive during the learning process. Moreover, students in vocational schools, especially in automotive departments, require good physical fitness as they need to be capable and able to carry out tasks during practical sessions and internships. If students do not have good physical fitness, they will struggle to perform tasks effectively. Companies and workshops where internships take place also require employees who are always ready, agile, strong, and capable of performing daily activities with good results. Therefore, it can be concluded that VO2Max can be used as a parameter for assessing physical fitness, both for athletes and employees in companies. Sports activities can enhance students' VO2Max, and the higher the VO2Max, the better their level of physical fitness, while a low VO2Max indicates low physical fitness (Sulastri et al., 2018). There are several tests commonly used to measure an individual's level of physical fitness or determine their VO2Max, such as the TKJI test, Harvard Step Test, Balke Test, Bleep Test, and many other physical fitness tests.

All elements of physical fitness must be developed in order to improve performance (Purnomo, 2019). Whether as an athlete or non-athlete, the elements of physical fitness are crucial for enhancing one's quality. This also applies to the VO2Max test. In the VO2Max test, there are various types of tests that can be used, one of which is the bleep test. The bleep test involves running back and forth over a 20-meter distance while following the bleep rhythm. The higher the level, the faster the running pace. In the bleep test, there are several elements of physical fitness that are influenced, including lung endurance, cardiovascular endurance, muscular endurance, agility, and muscle strength. Therefore, in order to improve VO2Max, we need to analyze which elements need to be enhanced. The goal is to ensure that there is an increase in students' VO2Max after implementing the training program.

In Empat Lawang regency, there are three state vocational high schools (SMK), namely SMK Negeri 1 Empat Lawang, SMK Negeri 2 Empat Lawang, and SMK Negeri 3 Empat Lawang. Among these three vocational high schools, there is an automotive department. The automotive department requires students to have good physical fitness as they are required to engage in physical activities while practicing automotive technical skills. Arifandy et al. (2021) state that physical education and health are a learning process that utilizes physical activities and health to improve physical, mental, and emotional well-being. The enhancement of students' VO2Max is incorporated into the physical education and sports (PJOK) learning process. In the PJOK learning process, during the first meeting of the semester, the PJOK teacher conducts a physical fitness test. The purpose of this test is to determine the students' level of VO2Max, which serves as initial data for the VO2Max level of students in the automotive department. The results of the students' VO2Max will vary, ranging from very poor, poor, moderate, good, to well-trained. Based on this initial data, PJOK teachers can use it as a reference to develop physical fitness programs that can improve the students' VO2Max. This program is implemented as part of the PJOK learning process in the educational institution or school.

However, in reality, the initial VO2Max test results of the automotive students in those vocational high schools are still suboptimal. Therefore, an effective physical fitness training program is needed to improve the students' level of physical fitness, especially in enhancing their VO2Max capacity. In order to achieve that, a survey was conducted to determine the physical fitness training programs implemented by the PJOK teachers in vocational high schools in the Empat Lawang regency, specifically targeting the improvement of VO2Max for automotive students. This survey is expected to provide appropriate recommendations for the development of a physical fitness training program that can optimally enhance the students' VO2Max.

## **B. Methods**

According to Astuti, (2019), research variables refer to everything that can be used by researchers to obtain detailed information for study purposes, aiming to gather comprehensive information according to the researcher's desires and draw conclusions. In this research, the variables include the independent variable: Physical Fitness Training Program, and the dependent variable: Improvement of VO2Max in Automotive Department Students. The population is the object or subject that researchers select to gather research data because it possesses characteristics that align with what will be studied or investigated, and conclusions can be drawn from it (Astuti, 2019). In this study, the population used as the research object is the students of vocational high schools (SMK) in Empat Lawang District, particularly those in the Automotive department. The sample is a subset of the population data that researchers collect to gather information related to the conducted research. If the population is too large, the researcher will not study the entire population but only select a portion that is relevant to the research needs. The sampling technique used in this research is purposive sampling, where the sample is selected based on specific considerations required for the study (Astuti, 2019). Therefore, the sample in this research consists of students from the automotive department in grade X.

This research employs a qualitative research approach, where the data obtained are descriptive in nature and focus on providing explanations within a specific context. The research design used is a survey, with the research subjects being 10th-grade students in the automotive department of SMKs in the Empat Lawang Regency. The data collection techniques include conducting direct interviews with Physical Education teachers in each school, direct observation in schools, and documentation during the research process. The data analysis conducted in this study involves descriptive analysis, where the results of interviews, observations, and documentation in each school are examined. It explains the training programs provided, describes their implementation process, and presents the outcomes obtained after students have completed the given programs by the Physical Education and Sports (PJOK) teachers.

## **C. Results and Discussion**

This study was conducted to determine the training programs implemented by physical education teachers (PJOK) to improve students' VO2Max through physical fitness training (Gunawan, et al., 2022). The study aimed to identify the structure of the program, understand the implementation process, and assess the outcomes of the program's execution.

The findings and results obtained from the interviews, observations, and documentation are as follows:

**Table 1. The Result Obtained**

No	School Name	Training duration	Program provided	The implementation period	Results	Description
1	SMK Negeri 1 Empat Lawang	The program is designed for a duration of one semester, which consists of 18 meetings.	Meeting 1 Conducting initial tests to obtain students' VO2Max results Meeting 2-5 a. Students run around the field for 8 minutes (field with a circumference of 100 meters). b. Students perform push-ups for 30 seconds. c. Students perform sit-ups for 30 seconds Meeting 6-9 a. Students run around the field for 10 minutes (field with a circumference of 100 meters). b. Students perform push-ups for 30 seconds. c. Students perform sit-ups for 30 seconds Meeting 10 Conduct the VO2Max test after 8 sessions of treatment Meeting 11-14: a. Students run around the field for 12 minutes (field with a circumference of 100 meters). b. Students perform push-ups for 1 minute. c. Students perform sit-ups for 1 minute Meeting 15-17: a. Students run around the field for 14 minutes (field with a circumference of 100 meters). b. Students perform push-ups for 1 minute. c. Students perform sit-ups for 1 minute Meeting 18: Conduct the final VO2Max test after 7 sessions of treatment.	It is done in the Physical Education learning process, specifically once a week.	There is an improvement in the VO2Max results of automotive department students.	
2	SMK Negeri 2 Empat Lawang	The program is designed for a duration of one semester,	The training program is incorporated during the warm-up period. Meeting 1 Conducting an initial test to obtain students' VO2Max results.	It is done in the Physical Education learning process,	There is an improvement in the VO2Max results of automotive	

		consisting of 18 sessions	Meeting 2-5. Students run for 8 laps around the basketball field.	specifically once a week	department students
			Meeting 6-9 Students run for 10 laps around the basketball field		
			Meeting 10-13 Students run for 12 laps around the basketball field		
			Meeting 14-17 Students run for 14 laps around the basketball field		
			Meeting 18 Conducting the final VO2Max test after providing treatment for 16 sessions.		
3	SMK Negeri 3 Empat Lawang	The program is designed for a duration of one semester, consisting of 18 sessions.	The training program is inserted during warm-up time. Meeting 1 Conducting an initial test to obtain students' VO2Max results Meeting 2-5 Students run a total of 10 laps around 2 volleyball fields. Meeting 6-9 Students run a total of 12 laps around 2 volleyball fields. Meeting 10-13 Students run a total of 14 laps around 2 volleyball fields. Meeting 14-17 Students run a total of 10 laps around 2 volleyball fields Meeting 18 Conducting a final VO2Max test after providing treatment for 16 session	It is done in the Physical Education learning process, specifically once a week	There is an improvement in the VO2Max results of automotive department students.

The Physical Education (PJOK) teacher has created a physical fitness training program that can improve the VO2Max of automotive department students. In the first semester, during the initial session, the PJOK teachers conducted physical fitness tests to obtain the VO2Max results of their students. The initial data obtained can be used by the PJOK teachers as baseline data before implementing the treatment. Thus, at the end of the

semester, the PJOK teacher will conduct the VO2Max test again to determine the students' VO2Max results (Lockie, et. al., 2021; Saputro, 2019).

#### **D. Conclusion**

Based on the data presentation, research results, and discussions, the researcher can draw the conclusion that the PJOK teacher has provided a physical fitness program that can improve the VO2Max of automotive department students. This program is implemented by all PJOK teachers in vocational schools throughout Empat Lawang District, which includes running exercises. Additionally, in SMK Negeri 1 Empat Lawang, push-ups and sit-ups are included as additional activities. The training program is conducted once a week during the PJOK class. The PJOK teacher gradually increases the intensity of the training program every month as part of the treatment. The expectation is that by gradually increasing the intensity, students will not be surprised by the treatment given, leading to an improvement in their physical fitness without them realizing it. When the VO2Max test is conducted again, there is an improvement in the test results

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