Analysis of Physical Fitness Levels of High School Students Using the Indonesian Student Fitness Test Application (TKPN)

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Abstract. *Physical fitness is a person's ability to do something or a task well without excessive fatigue and can be useful in developing students' learning and insight. Apart from that, physical fitness is also important in learning, especially in learning PJOK. However, many people consider physical fitness unimportant. The aim of this research is to determine the level of physical fitness of students and the differences in physical fitness levels of vocational science and vocational social science at SMA Hang Tuah 5 Sidoarjo. This research involved class XI F2 and class XI F5. Class XI F2 has 33 students with a ratio of 17 male students and 16 female students. Class XI F5 has 36 students with a ratio of 19 male students and 17 female students. This research applies a non-experimental method with a comparative design using the Independent sample t-test data analysis technique. The TKPN test (Indonesian Student Fitness Test) was used as an instrument for this research. The results obtained from the SPSS application showed a hypothesis test value of 0.15 (p-value > 0.05), indicating that there was no difference in physical fitness. Meanwhile, from the norm results for fitness results in the TKPN test (Indonesian Student Fitness Test) there was a difference in scores of 4.47 for science vocational students in the very good category and 3.78 for social science vocational students in the good category.*

Keywords: Physical Fitness, Physical Education, TKPN (Indonesian Student Fitness Test)

BACKGROUND

Education is a very important element in human life because it is expected to be able to develop human knowledge, skills, spirituality and creativity. Education is an effort to create cultural heirs from generation to generation(Rahman et al., 2022). . Education consists of 2 types, namely academic and non-academic education. Academic education itself means learning about the field of science, while non-academic education means learning about sports and the arts. In a child's future development, education is also very important. Children's learning success can be influenced by several factors which are divided into 2, namely internal factors and external factors, internal factors are factors that come from oneself which include health, attitude, psychological and physical while external factors are factors that come from outside which include motivation. , environment, family, and education carried out by teachers.

Sports learning is a mandatory subject in school learning. The aim of PJOK itself is for the joy and enjoyment of students as well as improving students' physical fitness so that the quality of human resources will be better, sports learning itself becomes a forum for students to channel their hobby of sports while providing a place for students to study and practice the material directly. There are several objectives in PJOK, namely, developing physical growth, developing motor skills, developing students' psychology, cultivating a social spirit, developing intelligence and knowledge, appreciating norm values, and cultivating healthy

living habits.(Kusyandi et al., 2021). According to(Gu et al., 2016)explained that PJOK aims to develop students' knowledge, skills, self-confidence and positive attitudes to live actively in the context of life. PJOK in the world of education is used as a program listed in the national curriculum, as an effort to raise a superior generation. PJOK is one of the lessons at school that studies psychomotor movement material for students.

According to(Bagaskoro et al., 2020)Modern fitness is the ability to perform a task so that the body is able to perform the task satisfactorily and does not feel excessive fatigue. Also reinforced by the statement(Setyawan & Wahyuni, 2018)that physical fitness is where the body is still able to carry out activities that are entertainment or games, therefore a person must have endurance, flexibility and strength in carrying out these activities. Everyone's physical fitness is different and students do not have the same level of physical fitness. Students who have a good level of physical fitness can carry out their assignments well, meaning that a person's physical fitness influences their physical and mental will and ability to accept the pressure of learning activities.(Kusyandi et al., 2021). Therefore, students need to be aware of their own physical condition and physical strength.(Bergier et al., 2018)explained that the fitness level of male students was significantly higher than that of female students.

Physical fitness is influenced by many factors, ranging from external factors to internal factors. Some research is one of them(Kljajević et al., 2022)states that body weight and socio-economic status are factors that can influence fitness, especially physical health. But according to(Bagaskoro et al., 2020)There are five factors that can influence physical fitness, namely: food and nutritional factors, rest, healthy lifestyle, exercise, and age. And added another statement by(Kristiyandaru et al., 2020)which states that physical fitness is also influenced by a person's physical activity. Considering the importance of physical fitness for students, in sports learning at school the role of the Physical Education Teacher is very important to guide and supervise students in order to improve their physical fitness. According to(Kusyandi et al., 2021)Monitoring the development of physical fitness is very important. Because, it can be used as an assessment tool to improve the development of students' physical fitness. Apart from that, it can also be used by teachers as an evaluation tool to improve and expand the physical education learning process, and as a basis for Physical Education teachers in schools to evaluate the success of sports teaching and learning activities.

From the research gap that has been explained, research to determine the condition of students' physical fitness levels is very important. Therefore, it is necessary to carry out more in-depth research regarding physical fitness which is really needed to support everything, especially the learning process and student development process which is the fundamental

foundation for a superior generation. This research aims to determine the level of physical fitness, especially among students.

THEORETICAL STUDY

       In the process of student development, especially at the level of physical fitness, of course there are many fitness tests that can be carried out by Physical Education teachers at school to monitor student fitness growth and development. One type of fitness test that can be used to monitor students' physical fitness levels is the Nusantara Lesson Fitness Test (TKPN). The Indonesian Student Fitness Test is a fitness test published by the Ministry of Youth and Sports in 2022 for the assistant deputy for sports management, education, deputy for sports cultivation, which includes BMI (Body Mass Index), V Sit Reach Test, 60 Second Sit-up, 30 Second Squat Thrust, Pacer Test (Progressive Aerobic Cardiovascular Endurance Run). This test has the same purpose as other fitness tests, namely to monitor physical fitness levels.

       The Indonesian student fitness test is the newest physical fitness test that has not been widely used in previous research and is still widely studied by PJOK teachers in Indonesia. This statement was also reinforced by(Destriana et al., 2023)which states that increasing understanding increases the competence of PJOK teachers, especially regarding the Indonesian Student Fitness Test. Strengthened by(W et al., 2024)who stated that there was a need for understanding regarding the Indonesian Student Fitness Test because it was something new, so that PJOK teachers as the main actors could understand, know and practice the test skills. This research adheres to several previous studies,(Nusantara et al., 2023)Analyzing the physical fitness level of children aged 15-16 years at SMAN 1 Plupuh,(Januarianto & Warthadi, 2023)analyzing the level of physical fitness of students at SMK Muhammadiyah 1 Sukoharjo and(Fajaryanto et al., 2022)to determine the fitness level of students at SDN 1 Rejomulyo, Kras District, Kediri Regency.

RESEARCH METHODS

Study Design

       A quantitative approach was used in this research, with non-experimental methods. Design in this researchusing comparative design. The design in this study was carried out by comparing two different groups.

Study Participants

Sample studiedwere 69 students from 2 classes, namely classes XI F2 and XI F5 at high school level. The sampling technique used is cluster random sampling. The spinner is used to determine the cluster or class to be studied.

Instruments

This research adapts an instrument from. Indonesian Student Fitness Test (TKPN) in 2022(Rusdiana et al., 2022). In the test manual there are two tests that need to be carried out. Practice Tests include BMI (Body Mass Index), V Sit Reach Test, 60 Second Sit-ups, 30 Second Squat Thrust, Pacer Test (Progressive Aerobic Cardiovascular Endurance Run). Meanwhile, the written test is a sports participation questionnaire and a psychological fitness test for Indonesian students which aims to determine students' sports activity and determine students' personal development in sports.

Research Procedures

The research was conducted over two weeks or two meetings, where the researchers used the first meeting to observe the students' condition when carrying out sports lessons. Meanwhile, at the second meeting the researchers took data using a test adapted from the Nusantara Student Fitness Test manual and the Nusantara Student Fitness Test (TKPN) application which is available on the Android Playstore. The first test carried out is a practical test which consists of measuring body mass index, v sit reach test, sit-ups for 60 seconds, squat thrust for 30 seconds, and pacer test. After carrying out the practical test or the first test, all students filled out the written test that was provided on the Google form that had been created by the researcher.

Statistical Analysis

Data analysis in this study used IBM SPSS Statistics 26. Normality tests were carried outusing Kolmogorov Smirnov, with normal data distribution indicated by a p-value > 0.05 and if the data is not normal it is indicated by a p-value < 0.05. In this study, different sample tests were used in data collection to determine whether the alternative hypothesis or the null hypothesis was accepted. There are two ways to determine the results of this test. The Independent T Test is carried out if the data distribution is normal, while the Man Whiteney test is carried out if the data distribution is not normal. If the p-value <0.05 then there is a difference in physical fitness levels. If the p-value is > 0.05 then there is no difference in physical fitness level. And to calculate the results of physical fitness levels, use the following formula for calculating the Indonesian Student Fitness Test,

Table 1. Physical Fitness Calculation Norms

Variable	Weight
Pacer Test	85%
V sit and reach	5%
Sit ups	5%
Squath Thrust	5%

RESULTS AND DISCUSSION

Normality test

In this study, descriptive statistical tests used the Kolmogorov Smirnov method because the number of samples was more than thirty by displaying descriptive data from the data analyzed. The test results also show the significance value of each variable studied or tested. The significance value displayed shows the normality of the variable. Descriptive statistical tests are divided into two, namely descriptive statistical tests for male students and descriptive statistical tests for female students.

The normality test is carried out with the aim of finding out whether the data has a normal data distribution or not. This test will also determine the descriptive data of the data studied. The normality test results are declared normal because the p-value is > 0.05.

Table 2. Normality Test Results

Variables	N	Mean	elementary school	Min	Max	P-Value
IPA	35	4.46	1.89	2.02	9.26	0.20
Social Sciences	33	3.78	1.93	1.32	10.16	0.06

*Sig > 0.05

Independent Sample T Test

The T-test sample test aims to find out which alternative hypothesis (Ha) is acceptable, or which null hypothesis (H0) is acceptable. In the sample T-test test, we use the Independent Sample T Test (if the data is normally distributed) and Mann Whitney/Chi Square (if the data is not normally distributed). Hypothesis testing in this study used the Independent Sample T-test because the normality test results were stated to be normal. In the hypothesis test carried out in the SPSS application, data results were obtained that had a p-value > 0.05, which stated that there was no difference between the test results of class XI vocational science students and class XI vocational science students.

Table 3. Hypothesis Test Results

Variables	N	Mean	elementary school	Sig. Homogeneity	P-Value
SCIENCE FITNESS	33	4.46	1.89		
Social Sciences FITNESS	33	3.79	1.94	0.79	0.15

*Sig < 0.05

Physical Fitness Calculation Results

1. BMI results

a) Science students

Table 4. IPA IMT results(Fajaryanto et al., 2022)

Category	Threshold (Z-score)	Frequency	Percentage (%)
Obesity	> + 2 SD	0	0%
More Nutrition	+ 1 elementary school + 2 elementary school	4	11%
Good Nutrition	- 2 elementary school + 1 elementary school	29	83%
Malnutrition	3 elementary school - 2 elementary school	2	6%
TOTAL		35	100%

The table above shows the results of the frequency of nutritional status of the science profession where there are 4 students with over nutritional status with a percentage of 11%, good nutritional status with 29 students with a percentage of 83%, while under nutritional status there are 2 students with a percentage of 6%. So the average nutritional status of science vocational students is in the good nutrition category.

b) Social Studies Students

Table 5. IPS BMI results(Fajaryanto et al., 2022)

Category	Threshold (Z-score)	Frequency	Percentage (%)
Obesity	> + 2 SD	0	0%
More Nutrition	+ 1 elementary school + 2 elementary school	2	6%
Good Nutrition	- 2 elementary school + 1 elementary school	28	85%

Malnutrition	3 elementary school - 2 elementary school	3	9%
TOTAL		33	100%

The table above shows the results of the frequency of nutritional status for the Social Sciences profession, where nutritional status is 2 students with a percentage of 6%, good nutritional status is 28 students with a percentage of 85%, while nutritional status is 3 students with a percentage of 9%. So the average nutritional status of science vocational students is in the good nutrition category.

2. **V Sit Reach Results**

a) **Science students**

Table 6. V sit Reach IPA results

Category	Frequency	Percentage
Very well	1	3%
Good	15	42%
Enough	13	37%
Low	3	9%
Very low	3	9%
TOTAL	35	100%

In the results table above, the results show a percentage of 3% in the very good category with 1 student, a percentage of 42% in the good category with 15 students, a percentage of 37% in the fair category with 13 students, and the low and very low categories with a percentage value of 9% totaling 3 students each. So the average v sit reach results of science vocational students are in the sufficient category.

b) **Social Studies Students**

Table 7. V sit Reach IPS results

Category	Frequency	Percentage
Very well	8	24%
Good	12	36%
Enough	10	31%
Low	3	9%
Very low	0	0%
TOTAL	33	100%

In the results table above, the results show a percentage of 24% in the very good category with a total of 8 students, a percentage of 36% in the good category with 12 students, a percentage of 31% in the fair category with 10 students, and the low category with a

percentage value of 9% totaling 3 students. So the average v sit reach results of social studies vocational students are in the good category.

3. Sit-up Results

a) Science students

Table 8. Results of Science Sit-ups

Category	Frequency	Percentage
Very well	0	0%
Good	1	3%
Enough	10	28%
Low	15	43%
Very low	9	26%
TOTAL	35	100%

From the results of the table above, we get results in the good category with a percentage score of 3% with 1 student, the fair category with a percentage of 28% totaling 10 students, the low category with a percentage of 43% totaling 15 students, and the very low category 9 students with a percentage score of 26%. So the average results of science vocational sit-ups are in the low category.

b) Social Studies Students

Table 9. IPS Sit-up Results

Category	Frequency	Percentage
Very well	1	3%
Good	1	3%
Enough	3	9%
Low	16	49%
Very low	12	36%
TOTAL	33	100%

From the results of the table above, the percentage results are 36% in the very low category with a total of 12 students, in the low category the percentage is 49% with a total of 16 students, in the moderate category the percentage is 9% with a total of 3 students, in the good category with a percentage of 3% the number of 1 student, and in the good category with a percentage of 3% amounts to 1 student. So the average results of social studies vocational sit-ups are in the low category.

4. **Squath Thrust Results**

a) **Science students**

Table 10. IPA Squath Thrust Results

Category	Frequency	Percentage
Very well	0	0%
Good	0	0%
Enough	9	26%
Low	25	71%
Very low	1	3%
TOTAL	35	100%

From the results of the table above, we get a percentage of 3% in the very low category with 1 student, in the low category the percentage is 71% with a total of 25 students, in the moderate category the percentage is 26% with a total of 9 students. So the average science vocational squath thrust results are in the low category.

b) **Social Studies Students**

Table 11. IPS Squath Thrust Results

Category	Frequency	Percentage
Very well	3	9%
Good	1	3%
Enough	13	39%
Low	16	49%
Very low	0	0%
TOTAL	33	100%

From the results of the table above, the percentage results are 49% in the low category with a total of 16 students, in the fair category the percentage is 39% with a total of 13 students, in the good category the percentage is 3% with a total of 1 student, and the very good percentage is 9% with a total of 3 students. So the average IPS vocational squat thrust results are in the sufficient category.

5. **Pacer Test Results**

a) **Science students**

Table 12. Pacer Test Results for Science

Category	Frequency	Percentage
Very well	0	0%
Good	4	11%
Enough	2	6%

Low	11	31%
Very low	18	52%
TOTAL	35	100%

From the results of the table above, the frequency results are obtained, namely 4 students are in the good category with a percentage of 11%, 2 students are in the fair category with a percentage of 6%, and 11 students are in the low category with a percentage of 31%, and 18 students are in the very low category at 52%. So the average results of the science vocational pacer test are in the very low category.

b) Social Studies Students

Table 13. IPS Pacer Test Results

Category	Frequency	Percentage
Very well	1	3%
Good	0	0%
Enough	1	3%
Low	8	24%
Very low	23	70%
TOTAL	33	100%

From the results of the table above, the frequency results are obtained, namely 1 student is in the very good category with a percentage of 3%, 1 student is in the fair category with a percentage of 3%, and 8 students are in the low category with a percentage of 24%, and 23 students are in the very low category 70%. So the average results of the IPS vocational pacer test are in the very low category.

6. Physical Fitness Results

Table 14. Physical Fitness Results

Variable	Weight	Science Fitness Results	IPS Fitness Results
Pacer Test	85%		
V sit and reach	5%	4.47	3.78
Sit ups	5%		
Squath Thrust	5%		
CATEGORY		VERY WELL	GOOD

The table above shows the overall results of the Indonesian Student Fitness Test showing the scores of science vocational and social science vocational students. Science vocational students received the excellent fitness category with a total score of 4.47, while social science vocational students received the good category with a total score of 3.78.

CONCLUSIONS AND RECOMMENDATIONS

In this research, the results of calculating differences in physical fitness levels using the SPSS application obtained a value of 0.15 (p-value > 0.05). Meanwhile, the fitness score for science vocational students was 4.47 and for social science vocational students was 3.78. So, it can be concluded that there is no difference in physical fitness between vocational science students and vocational social studies students and it can be said that the application of the results of the Nusantara Student Fitness Test to class XI vocational science students has a very good category and students in class good fitness category.

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REFERENCE LIST

Bagaskoro, FTRI, Jasmani, P., Health, O., Recreation, DAN, Sports, FI, & Semarang, UN (2020). Banjarnegara Regency in 2019.

Baresi, MR, Permadi, AA, & Hermawan, I. (2023). The influence of physical activity on the physical fitness of the VIII/Tarumanagara battalion student regiment. Bima Loka: Journal of Physical Education, 2(2), 71–79. https://doi.org/10.26740/bimaloka.v2i2.21365

Bergier, J., Tsos, A., Popovych, D., Bergier, B., Niźnikowska, E., Ács, P., Junger, J., & Salonna, F. (2018). Level of and factors determining physical activity in students in Ukraine and the visegrad countries. International Journal of Environmental Research and Public Health, 15(8), 1–12. https://doi.org/10.3390/ijerph15081738

Destriana, D., Aryanti, S., Destriani, D., Syamsuramel, S., Ramadhan, A., Nanda, FA, & Lestari, R. (2023). Assistance and Technical Guidance for Indonesian Student Fitness Tests for PJOK Teachers in Lahat Regency. Journal of National Community Service, 1(9), 1960–1968. https://doi.org/10.59837/jpmba.v1i9.451

Fajaryanto, M., Herpandika, RP, & Pratama, BA (2022). SPRINTER: Journal of Sports Science Results of the Application of TKPN to Students at SDN 1 Rejomulyo, Kras District, Kediri Regency. 3(3), 223–229.

Gu, X., Chang, M., & Solmon, M. A. (2016). Physical Activity, Physical Fitness, and Health-Related Quality of Life in School-Aged Children. 117–126.

Jananto, FA, & Warthadi, AN (2023). Analysis of Physical Fitness Levels of Muhammadiyah 1 Sukoharjo Vocational High School Students. Jambura Journal of Sports Coaching, 5(2), 149–154. https://doi.org/10.37311/jjsc.v5i2.20890

Kljajević, V., Stanković, M., Đorđević, D., Trkulja-Petković, D., Jovanović, R., Plazibat, K., Oršolić, M., Čurić, M., & Sporiš, G. (2022) . Physical activity and physical fitness among university students—A systematic review. International Journal of Environmental Research and Public Health, 19(1).

https://doi.org/10.3390/ijerph19010158

Kristiyandaru, A., Christina, S., Wibowo, S., Wahyudi, H., Ashadi, K., Himawan, I., Ridwan, M., Wijaya, A., Fitroni, H., Prakoso, BB, Ardha , MA Al, & Sifaq, A. (2020). Physical Education: Realizing the Meaning of My Life (1st ed.). Zifatama Jawara.

Kusyandi, A., Murniviyanti, L., & Rizhardi, R. (2021). Differences in Students' Physical Fitness Levels. Jolma, 1(1), 1. https://doi.org/10.31851/jolma.v1i1.5365

Nusantara, P., Sma, P., & Tahun, NP (2023). Survey of physical fitness through fitness tests for Indonesian students at SMA N 1 Plupuh in 2023. 23(2), 13–22.

Rahman, A., Munandar, SA, Fitriani, A., Karlina, Y., & Yumriani. (2022). Understanding Education, Educational Sciences and Elements of Education. Al Urwatul Wutsqa: Islamic Education Studies, 2(1), 1–8.

Rusdiana, A., Wiriawan, O., Ronald, H., Hadi, D., Guntur, P., Komarudin, P., Darmadi, D., Al Ardha, MA, Wicaksono, A., Fitranto, N., Nurulfa, R., Rochmani, KW, Taufik, M., & Zamil, A. (2022). Guidelines for Implementing Indonesian Student Fitness Tests.

Setyawan, AW, & Wahyuni, Endang S. (2018). Survey of Physical Fitness Levels of Students at SMP Negeri 1 Sampang. Journal of Sports and Health Education, 6(2), 351–353.

W, Y., Ali, R. ., Triansyah, A., Haetami, M., Hidasari, F. ., Simanjuntak, VG, Atiq, A., Bafadal8, M. ., Suwanto, W., & Pranata, D. (2024). PEDAMAS Journal (Community Service) Volume 2, Number 1, January 2024 ISSN: 2986-7819 Introduction Physical fitness in schools can be achieved optimally through. 2(1), 183–187. https://ojs.berajah.com/index.php/go/article/view/128