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Analysis of the Physical Fitness Level of Students at SMP Jalan Jawa Surabaya

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ABSTRACT

This study aims to analyze the level of physical fitness among students at SMP Jalan Jawa in Surabaya using the Nusantara Student Fitness Test (TKPN). This study employs a quantitative approach with a descriptive design. The population consisted of 122 students, all included through total sampling. Data were collected using TKPN components: BMI, flexibility, muscle strength and endurance, and cardiorespiratory endurance. Data were analyzed using descriptive statistics, namely frequencies and percentages. Results showed overall fitness was in the poor category 92.6%, while 7.4% were adequate, with none good or very good. For BMI, most students were overweight, boys 50.00% and girls 64.29%. In flexibility, females were mostly excellent 72.73%, while males were adequate 32.14%. In muscle strength and endurance, most students were poor or very poor, boys 81.82% and girls 76.79%. In squat thrust, most were adequate to very good. Cardiorespiratory endurance PACER showed the lowest results, dominated by very poor, boys 98.48% and girls 83.93%. These findings indicate that low fitness is mainly influenced by weak cardiorespiratory endurance and muscle strength. Therefore, improvements are needed through optimizing PJOK learning, implementing structured exercise programs, and promoting active healthy lifestyles at school and home environments. These interventions should be consistent, monitored, and supported by teachers and parents to ensure sustainable improvements in students' physical fitness levels and overall health outcomes in adolescence and future development stages across different school contexts and demographic backgrounds for broader applicability.
Keywords: Physical Fitness, TKPN, Descriptive Statistics, Students

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INTRODUCTION

Physical fitness is an important component in supporting an individual's ability to perform daily physical activities effectively and efficiently. Individuals with good physical fitness are able to perform various activities without experiencing excessive fatigue and still have energy reserves to perform additional activities or deal with emergency situations. In sports science studies, physical fitness is classified into two main categories, namely health-related fitness and skill-related fitness (Yanuarius Ricardus Natal, 2022). Fitness components related to health include cardiorespiratory endurance, muscle strength, muscle endurance, flexibility, and body composition (Antoni et al., 2025). These five components play an important role in supporting the physical performance and health of students. Cardiorespiratory endurance is related to the ability of the heart and lungs to supply oxygen during sustained physical activity, while muscle strength and endurance play a role in supporting various daily movements. Flexibility contributes to movement

flexibility and injury prevention through increased Range of Motion (ROM) (Kondo et al., 2021). whereas body composition relates to the proportion of fat and muscle mass in the body (Akazawa et al., 2022; Reiter et al., 2025; Wu et al., 2024). Physical fitness also reflects the level of efficiency of bodily functions that affect an individual's quality of life. During adolescence, a good level of physical fitness is very important because it can support concentration in learning, increase participation in school activities, and strengthen students' physical endurance in participating in the learning process (Kristen, 2023). In the context of formal education, particularly at the junior high school level, physical fitness development is facilitated through physical education classes. Physical education plays a strategic role in building physical fitness, developing motor skills, and shaping students' character through planned and systematic physical activities (Hasanuddin & Irfan Hasanuddin, 2024). Regular exercise has been proven to contribute to improvements in physical fitness, particularly cardiorespiratory endurance and muscle strength (Ariffah Sriratih Ahmad Muzaffar, 2022).

In addition, consistent physical activity can also support the psychomotor, affective, and social development of students, such as improving discipline, cooperation, and self-confidence (Tadulako, 2022). In order to achieve these objectives optimally, the PJOK learning process needs to be designed in accordance with the developmental characteristics of the students so that physical activities can take place safely, enjoyably, and effectively (Rahmadani et al., 2024). Instilling basic movement patterns through structured games and sports activities is very important in supporting the growth and physical development of adolescents (Siregar et al., 2024). Several studies show that the physical fitness levels of students in Indonesia are still in the moderate to low category. Research conducted by Salamah and Setiawan shows that most junior high school students have physical fitness levels in the adequate category, so efforts to improve this through programmed physical activities in PJOK learning are still needed (Salamah & Setiawan, 2022). In addition, the low level of physical fitness among students is also influenced by the lack of physical activity and the minimal implementation of periodic physical fitness tests in schools (Dana Kurniawan Aswoko1, 2024).

Physical fitness can be measured using various test instruments, including the Harvard Step Test, Cooper Test, ACSPFT (Asia Committee on the Standardization of Physical Fitness Test), TKJI (Indonesian Physical Fitness Test), and TKPN (Archipelago Student Fitness Test). Each instrument has different characteristics, measurement components, and implementation procedures. The TKPN is a relatively new instrument designed specifically to comprehensively measure the physical fitness level of students aged 9–18 years. Based on its implementation guidelines, the TKPN consists of five test components, namely Body Mass Index (BMI), V-Sit and Reach, sit-ups (lying down), squat thrusts, and Progressive Aerobic Cardiovascular Endurance Run (PACER) (Mae et al., 2024). The combination of these five components enables a comprehensive assessment of physical fitness that covers body composition, flexibility, muscle strength and endurance, and cardiorespiratory endurance.

Various studies also show that students' physical fitness has a significant relationship with their daily physical activity levels and active lifestyles at school and at home. Students who have high levels of physical activity tend to demonstrate better cardiorespiratory endurance and muscle strength than students who are less physically active (Dedy Pranata 2022, n.d.). shows that student involvement in regular sports activities can significantly improve cardiorespiratory capacity and muscle endurance. In addition,

structured physical activity programs in physical education classes have also been proven to gradually improve students' physical fitness level (Adi et al., 2021). Based on the results of initial observations and interviews conducted by the researcher at SMP Jalan Jawa in Surabaya, it was found that students' physical fitness levels remain relatively low. This situation is believed to be linked to the high demands of academic activities, which cause students to spend more time on studying than on physical activity. Additionally, students' physical activity outside of school hours is also relatively limited. These findings are supported by the results of initial physical fitness assessments, which indicate that the majority of students fall into the low category. This suggests that greater attention and more effective efforts are needed to improve students' physical fitness through well-planned and sustained Physical Education (PJOK) instruction.

Based on the above description, this study aims to analyze the physical fitness level of students at SMP Jalan Jawa Surabaya using the Nusantara Student Fitness Test (TKPN) as the main measuring instrument to obtain an empirical description of the physical fitness condition of students as a basis for evaluating PJOK learning at school.

METHOD

This study uses a quantitative approach with a descriptive research design. A descriptive design is used to systematically describe the physical fitness conditions of students based on empirical data without providing specific treatment or intervention to the research subjects. The quantitative approach was chosen because the data obtained were numerical scores from fitness tests that were analyzed using descriptive statistics such as mean values, percentages, and category distributions to obtain an objective picture of the students' physical fitness levels (Sugiyono, 2022). The population in this study consisted of all 122 students at Jalan Jawa Junior High School in Surabaya. The sampling technique used was total sampling, whereby the entire population was used as the research sample. This technique was used because the population size was relatively small and it was possible to study the entire population, so that the research results could represent the actual physical fitness of all students at the school.

The instrument used in this study was the Nusantara Student Fitness Test (TKPN), which is the official instrument for measuring the physical fitness level of students aged 9–18 years. The TKPN consists of several components, namely Body Mass Index (BMI), flexibility (V-sit and reach), muscle strength and endurance (sit-ups and squat thrusts), and cardiorespiratory endurance (PACER). The data obtained from the TKPN was then calculated according to the applicable assessment guidelines. The total score obtained is then classified into physical fitness categories (very good, good, fair, poor, and very poor) based on the TKPN norms for the 9–18 age range.

RESULT

The study used the Nusantara Student Fitness Test (TKPN) instrument on 122 junior high school students at Jalan Jawa Surabaya. The research subjects consisted of 66 male students and 56 female students. The demographic distribution of the research subjects is presented to provide an overview of the characteristics of the respondents based on gender. This study aimed to determine the level of physical fitness of students aged 9–18 years using the Nusantara Student Fitness Test (TKPN) norms. The measurements were

conducted at SMP Jalan Jawa Surabaya, and the results of the analysis of the students' physical fitness levels are presented as follows:

1. Body Mass Index (BMI)

Body Mass Index (BMI) is one of the indicators used to determine a person's body mass status, categorized as obese, overweight, ideal, and underweight. BMI is calculated based on the ratio between weight (kilograms) and height (square meters) using the formula weight (kg) divided by height (m^2).

Tabel 1. Result IMT (Male Student)

Kategori Status Gizi	Ambang Batas (Z-Score)	Frekuensi	Presentase(%)
Gizi Kurang (Thiness)	*-3 SD sd < - 2 SD	14	21,21%
Gizi Baik (Normal)	* -2 SD sd + 1 SD	8	12,12%
Gizi Lebih (Overweight)	*+ 1 SD sd + 2 SD	33	50,00%
Obesitas (Obese)	* > + 2 SD	11	16,67%
TOTAL		66	100,00%

Tabel 2. Hasil IMT (Female Student)

Kategori Status Gizi	Ambang Batas (Z-Score)	Frekuensi	Presentase(%)
Gizi Kurang (Thiness)	*-3 SD sd < - 2 SD	7	12,50%
Gizi Baik (Normal)	* -2 SD sd + 1 SD	6	10,71%
Gizi Lebih (Overweight)	*+ 1 SD sd + 2 SD	36	64,29%
Obesitas (Obese)	* > + 2 SD	7	12,50%
Total		56	100,00%

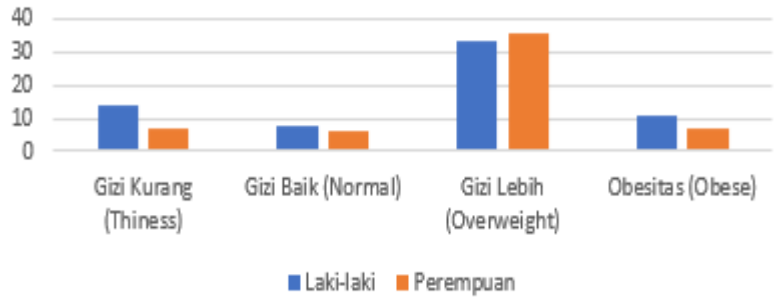

Figure 1 Diagram IMT

2. V Sit And Reach

The V-Sit and Reach test is a modification of the sit and reach test used to measure the flexibility of the lower back muscles and hamstrings. Flexibility is the ability of joints to move optimally within a wide range of motion. The purpose of the V-Sit and Reach test is to determine the level of flexibility of students as part of physical fitness components that support effective movement in various physical activities.

Tabel 3. Hasil V Sit And Reach (Male)

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	0	0,00%
Kurang	2	3,03%
Cukup	1	1,52%
Baik	15	22,73%
Baik Sekali	48	72,73%
TOTAL	66	100,00%

Tabel 4. Hasil V Sit And Reach (Female)

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	1	1,79%
Kurang	14	25,00%
Cukup	18	32,14%
Baik	16	28,57%
Baik Sekali	7	12,50%
TOTAL	56	100,00%

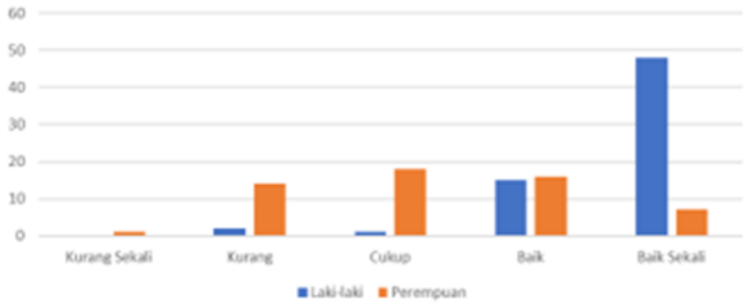

Figure 2. Diagram V Sit And Rea

3. Sit-ups

The sit-up test is a form of measurement that aims to assess the strength and endurance of the abdominal muscles. The test is performed by lying on your back with your knees bent, then repeatedly lifting your body into a sitting position for 60 seconds.

Tabel 5. asil Sit Up (Male)

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	25	37,88%
Kurang	29	43,94%
Cukup	11	16,67%
Baik	1	1,52%
Baik Sekali	0	0,00%
TOTAL	66	100,00%

Tabel 6 Hasil Sit Up (Female)

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	24	42,86%
Kurang	19	33,93%
Cukup	11	19,64%
Baik	2	3,57%
Baik Sekali	0	0,00%
TOTAL	56	100,00%

Figure 3 Diagram Sit Up

4. Squat Thrust

The squat thrust test is a combination movement performed by changing body position from standing to squatting, then to a push-up position, and back to a standing position repeatedly for 30 seconds.

Tabel 7. Hasil Squat Thrust (Male)

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	1	1,52%
Kurang	11	16,67%
Cukup	28	42,42%
Baik	7	10,61%
Baik Sekali	19	28,79%
TOTAL	66	100,00%

Tabel 8. Hasil Squat Thrust (Female)

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	0	0,00%
Kurang	2	3,57%
Cukup	11	19,64%
Baik	23	41,07%
Baik Sekali	20	35,71%
TOTAL	56	100,00%

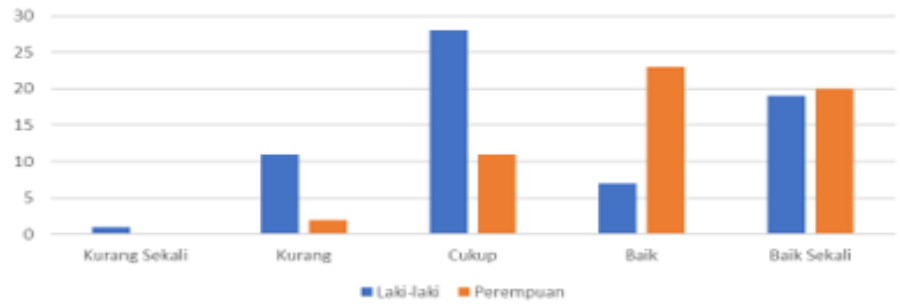

Figure 4 Diagram Shuat Thrust

5. Pacer Test

The Progressive Aerobic Cardiovascular Endurance Run (PACER) test is a cardiorespiratory endurance test conducted progressively by running back and forth for 20 meters at a speed that increases gradually every minute following a predetermined rhythm. This test is known as a modified form of the bip test or bleep test.

Tabel 9. Hasil Pacer Tes Laki-laki

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	65	98,48%
Kurang	1	1,52%
Cukup	0	0,00%
Baik	0	0,00%
Baik Sekali	0	0,00%
TOTAL	66	100,00%

Tabel 10. Hasil Pacer Tes Perempuan

Kategori	Frekuensi	Presentase (%)
Kurang Sekali	47	83,93%
Kurang	9	16,07%
Cukup	0	0,00%
Baik	0	0,00%
Baik Sekali	0	0,00%
TOTAL	56	100,00%

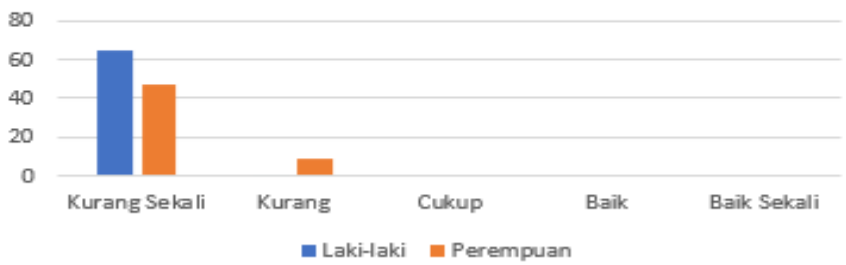

Figure 5 Diagram Pacer Test

DISCUSSION

The results showed that the physical fitness level of junior high school students at Jalan Jawa Surabaya was generally in the poor category. This condition was evident from the dominance of the poor category in several test components, especially cardiorespiratory

endurance and muscle strength. These findings are in line with research stating that most junior high school students measured using the Nusantara Student Fitness Test (TKPN) were in the fair to poor category, especially in the PACER and muscle strength components (Dewi et al., 2024). Data distribution analysis shows that the variation in fitness levels among students is in the moderate category. This indicates that there are differences in physical abilities among students, but the distribution is relatively even in the low category. This condition indicates that low levels of physical fitness are not only experienced by a small number of students, but are a collective phenomenon. This finding is in line with research results that report that the majority of junior high school students show a physical fitness profile in the poor category with a relatively homogeneous distribution pattern (Listanto et al., 2025). Other studies using the TKPN instrument also show that several components of physical fitness, such as cardiorespiratory endurance, flexibility, and muscle strength, are still in the low category. This indicates that students' physical abilities still need to be improved through planned and sustained physical activity programs (Rizandi et al., 2025).

Upon further analysis, the low level of physical fitness in this study was mainly influenced by cardiorespiratory endurance, which showed the lowest value compared to other components. Cardiorespiratory endurance is related to the ability of the heart and lung systems to supply oxygen during continuous physical activity (Wulyo Sigit Nawawi, 2021). Low scores on this component indicate a lack of aerobic activities such as running or games of moderate to high intensity in students' daily activities (Reza et al., 2025). Several factors that potentially affect students' physical fitness include increased duration of digital device use, low participation in extracurricular sports activities, and sedentary behavior. Decreased physical activity in adolescents has been reported to have an impact on decreased cardiorespiratory capacity and muscle endurance, which are major components of health-based physical fitness. This condition is even more important considering that the average age of respondents is 14 years old, which is the early adolescent phase that is physiologically an important period in the development of the cardiovascular and musculoskeletal systems. At this stage, adequate physical activity stimulus is needed to optimize the body's physiological adaptation. If physical activity needs are not met, the potential for physical capacity development will not be optimally achieved. The development of digital technology has also brought changes to students' lifestyles, including in the context of education. Digitalization provides ease of access to information and learning processes, but the increasing intensity of interaction with digital devices can have an impact on decreasing daily physical activity (Khemal & Mulyaningsih, 2025).

The findings of this study suggest that students' physical fitness levels are relatively similar across male and female groups. This finding is in line with studies reporting that variations in physical fitness between male and female students are relatively similar when viewed from the perspective of daily physical activity levels (Rahayu & Dirgantoro, 2023). In addition, several studies show that the variability of fitness component scores such as PACER and sit-ups is more influenced by physical activity levels than gender factors. This indicates that regular physical activity contributes more to improving physical fitness than gender (Khatami et al., 2022). Students who participate more frequently in structured physical activities tend to demonstrate better physical fitness levels than students who are less physically active. These findings indicate that the frequency and consistency of physical exercise are important factors in improving physical fitness components, such as cardiorespiratory endurance, muscle strength, and muscle endurance (Jariono, 2024). The

implications of these findings emphasize the importance of optimizing physical education learning that focuses on improving cardiorespiratory endurance and muscle strength. Progressive, structured, and continuous exercise programs need to be integrated into learning activities at school. In addition, collaboration between schools and families is also an important factor in shaping active lifestyles among students. Social environmental support, including family, is known to play a significant role in increasing participation in physical activity among adolescents (Prasetya et al., 2023).

Physical activity that is carried out in a programmed and consistent manner has been proven to increase the body's functional capacity, such as heart efficiency, muscle strength, and overall physical endurance. Various studies show that students who participate in structured physical activity programs experience a significant increase in physical fitness compared to students who are less active (Ilyasa & Efendi, 2024). Other findings also show that students who participate in regular physical activities, such as school gymnastics, have better physical fitness levels than students who are less physically active. This shows that structured physical activity can significantly improve cardiorespiratory capacity and muscle strength (Hidayat et al., 2025). In addition, research on the physical fitness of junior high school students shows that low frequency of physical activity in daily life is one of the main factors causing low levels of physical fitness among students. Therefore, physical education teachers play a very important role in designing exercise programs that can improve students' physical endurance (Antoni et al., 2022; Irawan & Mustangin, 2025).

In general, these studies show that the physical fitness levels of junior high school students are still in the moderate to poor category, requiring intervention through structured, programmed, and sustained physical activity in physical education classes at school.

CONCLUSION

Based on the results of the data analysis, the physical fitness levels of junior high school students on Jalan Jawa, Surabaya, are generally categorized as poor. This is reflected in the distribution of fitness test results, which shows that the majority of students fall into the poor category, while only a small proportion achieve the fair category and none reach the very good category.

The low level of physical fitness observed in this study may be associated with limited physical activity and high levels of sedentary behavior among students. Other lifestyle-related factors may also play a role; however, these variables were not measured in this study and therefore cannot be confirmed.

Overall, low physical activity and sedentary behavior are likely key factors associated with students' physical fitness levels. Therefore, intervention efforts are needed through structured physical activity programs, healthy lifestyle education, and the optimization of physical education instruction to improve overall physical fitness.

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