Journal of Physical Education, Sport, and Human Performance (JPESHP)
Journal Homepage: https://lenteracendekia.co.id/jpeshp

Analysis of Student Physical Fitness Using the TKJI in Sixth-Grade Learners at SD Negeri Biringkaloro

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ARTICLE INFO

Keywords:
physical fitness
TKJI
elementary school students
cardiorespiratory endurance
physical education.

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ABSTRACT

This study aims to analyze the physical fitness levels of sixth-grade students at SD Negeri Biringkaloro based on the Indonesian Physical Fitness Test (TKJI). Using a descriptive quantitative approach, the research assessed 21 students through five test components: 40-meter sprint, pull-up, 30-second sit-up, vertical jump, and 600-meter run. Data were collected using standardized TKJI procedures for the 10–12 age group and analyzed using descriptive statistics. The results indicate that the majority of students fall into the "Poor" and "Very Poor" categories, with 52% categorized as Very Poor and only 5% achieving a Good level. The weakest components were cardiovascular endurance (600-meter run) and upper-body strength (pull-up). These findings suggest that students' physical fitness levels are still below the expected standards and highlight the need for improved physical activity engagement through more varied PE learning strategies, structured training programs, and increased motivation both in and outside of school. Overall, the study underscores the importance of implementing targeted interventions to enhance students' physical fitness.

ABSTRAK

Penelitian ini bertujuan untuk menganalisis tingkat kebugaran jasmani siswa kelas VI SD Negeri Biringkaloro berdasarkan Tes Kebugaran Jasmani Indonesia (TKJI). Penelitian menggunakan pendekatan kuantitatif deskriptif dengan melibatkan 21 siswa sebagai sampel yang mengikuti lima item tes, yaitu lari cepat 40 meter, gantung siku tekuk, sit up 30 detik, loncat tegak, dan lari 600 meter. Pengumpulan data dilakukan sesuai prosedur standar TKJI untuk kelompok usia 10–12 tahun, kemudian dianalisis menggunakan statistik deskriptif. Hasil penelitian menunjukkan bahwa mayoritas siswa berada pada kategori "Kurang" hingga "Kurang Sekali", dengan 52% termasuk kategori Kurang Sekali dan hanya 5% berada pada kategori Baik. Komponen dengan hasil terendah terdapat pada daya tahan kardiorespirasi (lari 600 meter) dan kekuatan otot lengan (gantung siku tekuk). Temuan ini menunjukkan bahwa tingkat kebugaran jasmani siswa masih berada di bawah standar yang diharapkan, sehingga diperlukan peningkatan aktivitas fisik melalui pembelajaran PJOK yang lebih variatif, program latihan yang terstruktur, serta peningkatan motivasi dan peluang siswa untuk berpartisipasi dalam aktivitas fisik baik di sekolah maupun di luar sekolah.

1. Introduction

Physical fitness is a fundamental component that supports health, physical growth, and academic performance among elementary school students. Engaging in adequate physical activity not only strengthens physiological systems but also contributes significantly to cognitive and psychological development (Suryadi, 2022; Marsanda et al., 2023; Due et al., 2024). A growing body of evidence demonstrates that physical fitness directly influences learning processes through improvements in brain structure and function. Matejek & Planinšec (2022) report that enhanced fitness positively affects cognitive abilities and academic achievement, while Gil-Espinosa et al. (2020) and Maulana et al. (2024) highlight the contribution of cardiorespiratory fitness to intelligence and learning outcomes. Collectively, these studies underscore physical fitness as a critical foundation for student success across multiple domains of schooling.

Physical education (PE) plays a strategic role in cultivating students' physical fitness through structured, systematic, and well-planned instructional activities (Mawarni & Faruk, 2023). High-quality PE programs not only promote physical activity but also foster fundamental motor competence, active lifestyle habits, and social–emotional development. Empirical findings by Zhou et al. (2019) indicate that well-designed PE instruction can significantly enhance students' cardiorespiratory endurance. Moreover, participation in regular physical activity has been shown to strengthen executive functions such as memory and attention, which are crucial for academic engagement and classroom learning (Klizienė et al., 2018). Thus, PE serves as a vital educational component that supports both health and academic readiness in elementary schools.

To assess students' fitness levels effectively, schools in Indonesia commonly employ the Indonesian Physical Fitness Test (Tes Kebugaran Jasmani Indonesia/TKJI) as a standardized evaluation tool. The TKJI includes multiple test components such as sprint running, sit-ups, bent-arm hang, vertical jump, and middle-distance running, each representing distinct elements of physical fitness (Loviani et al., 2021). This instrument provides a comprehensive overview of students' physiological capabilities and assists teachers in developing targeted and age-appropriate instructional interventions. Studies by Widianto et al. (2019) show that routine implementation of TKJI can promote a fitness-aware culture within schools and encourage students to increase their physical activity levels. Furthermore, the TKJI accommodates variation in age and activity profiles, making it an inclusive and reliable assessment tool (Pratamalloh et al., 2023).

Preliminary observations at SD Negeri Biringkaloro revealed that sixth-grade students displayed considerable enthusiasm during PE lessons. Nonetheless, several students showed signs of early fatigue, even during low-intensity tasks such as warm-up activities or basic movement exercises. These observations suggest that a portion of the students may possess low levels of physical fitness. Discussions with the PE teacher further indicated that the school had never implemented systematic physical fitness assessments using the TKJI. This condition highlights the need for standardized, evidence-based evaluations to objectively determine the physical fitness status of the students.

Considering the vital role of physical fitness in supporting students' health, academic development, and preparation for higher educational levels, an analysis of the fitness levels of sixth-grade students at SD Negeri Biringkaloro is essential. Assessment using the TKJI is expected to produce a comprehensive profile of students' physical capacities and offer PE teachers valuable information for designing more effective and targeted training programs. Furthermore, the results of this study can serve as a reference for schools seeking to improve the quality of physical education instruction and promote a culture of active and healthy living within the school environment.

1. Methods

This study employed a descriptive quantitative design to provide an objective overview of the physical fitness levels of sixth-grade students at SD Negeri Biringkaloro using the Indonesian Physical Fitness Test (TKJI). The research was conducted in November 2025 at SD Negeri Biringkaloro and Butta Ejayya Field, involving all 21 sixth-grade students selected through total sampling.

Physical fitness was measured using the TKJI instrument for ages 10–12, consisting of five test items: (1) 40-meter sprint, (2) bent-arm hang/pull-up, (3) 30-second sit-up, (4) vertical jump, and (5) 600-meter run. TKJI applies separate scoring standards for male and female students; therefore, all raw scores were converted according to the appropriate gender-specific criteria. However, the final analysis combined the results of both genders to provide an overall fitness profile of the cohort, which may influence interpretation due to differing scoring thresholds.

Data were analyzed using descriptive statistics, including minimum, maximum, mean, median, mode, and category distribution based on TKJI norms. Results were presented in tabular form without hypothesis testing, as the study aimed to describe fitness levels rather than examine causal relationships.

The TKJI instrument used in this study referred to the official TKJI scoring guidelines. The assessment tables for each test item are as follows:

Table 1. TKJI Scoring for 40-Meter Sprint (Ages 10–12)

40 m Sprint (seconds)		Score
Boys	**Girls**	
≤ 6,3	≤ 6,7	5
6,4 – 6,9	6,8 – 7,5	4
7,0 – 7,7	7,6 – 8,3	3
7,8 – 8,8	8,4 – 9,6	2
≥ 8,9	≥ 9,7	1

Table 2. TKJI Scoring for Pull-Up (Ages 10–12)

Pull-Up Duration (seconds)		Score
Boys	**Girls**	
≥ 51	≥ 40	5
31 – 50	20 – 39	4
15 – 30	08 – 19	3
05 – 14	02 – 07	2
00 – 04	00 – 01	1

Table 3. TKJI Scoring for Sit-Up 30 Seconds (Ages 10–12)

Sit-Up Count		Score
Boys	**Girls**	
≥ 23	≥ 20	5
18 – 22	14 – 19	4
12 – 17	07 – 13	3
04 – 11	02 – 06	2
00 – 03	00 – 01	1

Table 4. TKJI Scoring for Vertical Jump (Ages 10–12)

Vertical jump		Score
Boys	**Girls**	
≥ 46 cm	≥ 42 cm	5
38 – 45 cm	34 – 41 cm	4
31 – 37 cm	28 – 33 cm	3
24 – 30 cm	21 – 27 cm	2
< 24 cm	< 21 cm	1

Tabel 5. Penilaian Lari Jarak Menengah TKJI Usia 10 - 12 Tahun

600 m Run		Score
Boys	**Girls**	
≤ 2’09”	≤ 2’32”	5
2’10” – 2’30”	2’33” – 2’54”	4
2’31” – 2’45”	2’55” – 3’28”	3
2’46” – 3’44”	3’29” – 4’22”	2
≥ 3’44”	≥ 4’22”	1

The five scoring components were then converted into TKJI total scores and categorized using the following classification:

Tabel 6. TKJI Classification Standards

No	Total Score	Category
1	22 – 25	Very Good (VG)
2	18 – 21	Good (G)
3	14 – 17	Moderate (M)
4	10 – 13	Poor (P)
5	05 – 09	Very Poor (VP)

Data were collected through standardized tests and measurements, with each participant completing the entire test sequence in rotation following TKJI procedures. The collected data were analyzed using descriptive quantitative statistics, including minimum, maximum, mean scores, and distribution across TKJI fitness categories. The results are presented in tabular form to illustrate the distribution of students' physical fitness levels without conducting hypothesis testing.

2. Results

This study aimed to determine the physical fitness level of sixth-grade students at SD Negeri Biringkaloro based on the Indonesian Physical Fitness Test (Tes Kebugaran Jasmani Indonesia/TKJI). Data were obtained from five physical test components: the 40-meter sprint, bent-arm hang (pull-up), 30-second sit-up, vertical jump, and 600-meter run. All raw scores were converted into TKJI scores according to the standardized criteria for ages 10–12, and the total scores were used to classify students’ overall physical fitness levels.

Overall, the findings showed that students’ physical fitness levels were predominantly in the lower categories. The distribution of students based on total TKJI scores is presented in Table 7.

Table 7. Distribution of Physical Fitness Levels of Sixth-Grade Students

Category	Frequency	Percentage
Very Good	0	0%
Good	1	5%
Moderate	4	19%
Poor	5	24%
Very Poor	11	52%
Total	21	100%

The table shows that most students fell into the Very Poor category (52%), followed by the Poor category (24%). Only 5% of students achieved the Good category, and none reached the Very Good category. These findings indicate that the majority of students possess low levels of physical fitness.

In addition to the total TKJI score, each physical fitness component was analyzed to identify specific strengths and weaknesses among students. A summary of the results from each component test is presented below.

1. 40-Meter Sprint

Table 8. Frequency Distribution of 40-Meter Sprint

Classification (seconds)		Category	Frequency	%
Boys	girls			
Sd – 6,3	Sd – 6,7	Very Good	0	0%
6,4 – 6,9	6,8 – 7,5	Good	3	14%
7,0 – 7,7	7,6 – 8,3	Moderate	3	14%
7,8 – 8,8	8,4 – 9,6	Poor	9	43%
8,9 – dst	9,7 – dst	Very Poor	6	29%
Total			21	100%

Descriptive Statistics: Mean = 8,6; Median = 8,5; Mode = 9,8; Maximum = 6,4; Minimum = 10,5.
Most students were classified as Poor (43%) or Very Poor (29%). Only 14% achieved Good or Moderate performance.

2. Bent-Arm Hang (Pull-Up)

Table 9. Frequency Distribution of Pull-Up Test

Classification (seconds)		Category	Frequency	%
Boys	Girls			
51 – dst	40 – dst	Very Good	0	0%
31 – 50	20 – 39	Good	1	5%
15 – 30	08 – 19	Moderate	6	28%
05 – 14	02 – 07	Poor	10	48%
00 – 04	00 – 01	Very Poor	4	19%
Total			21	100%

Descriptive Statistics: Mean = 9,67; Median = 5; Mode = 1; Maximum = 32; Minimum = 1.
Nearly half of the students (48%) were in the Poor category, while none achieved Very Good performance.

3. 30-Second Sit-Up

Table 10. Frequency Distribution of 30-Second Sit-Up Test

Classification		Category	Frequency	%
Boys	Girls			
≥ 23	≥ 20	Very Good	0	0%
18 – 22 kali	14 – 19 kali	Good	3	14%
12 – 17 kali	07 – 13 kali	Moderate	8	38%
04 – 11 kali	02 – 06 kali	Poor	10	48%
00 – 03 kali	00 – 01 kali	Very Poor	0	0%
Total			21	100%

Descriptive Statistics: Mean = 10,67; Median = 10; Mode = 4; Maximum = 20; Minimum = 4.
Most students were in the Poor (48%) and Moderate (38%) categories, with no students classified as Very Good.

4. Vertical jump

Table 11. Frequency Distribution of Vertical Jump Test

Classification		Category	Frequency	%
Boys	Girls			
≥ 46 cm	≥ 42 cm	Very Good	1	5%
38 – 45 cm	34 – 41 cm	Good	1	5%
31 – 37 cm	28 – 33 cm	Moderate	4	19%
24 – 30 cm	21 – 27 cm	Poor	6	28%
< 24 cm	< 21 cm	Very Poor	9	43%
Total			21	100%

Descriptive Statistics: Mean = 24,9; Median = 23; Mode = 14; Maximum = 46; Minimum = 13.
Nearly half of the students (43%) scored in the Very Poor category, indicating low leg power.

5. 600-Meter Run

Table 12. Frequency Distribution of 600-Meter Run

Classification		Category	Frequency	%
Boys	Girls			
Sd 2'09"	Sd 2'32"	Very Good	0	0%
2'10" – 2'30"	2'33" – 2'54"	Good	0	0%
2'31" – 2'45"	2'55" – 3'28"	Moderate	1	5%
2'46" – 3'44"	3'29" – 4'22"	Poor	5	24%
< 3'44"	< 4'22"	Very Poor	15	71%
Total			21	100%

Descriptive Statistics: Mean = 4,26; Median = 4,41; Maximum = 2,44; Minimum = 5,54.
The majority of students (71%) were classified as Very Poor in cardiovascular endurance, making it the weakest component among all TKJI tests.

3. Discussion

The findings of this study indicate that the overall physical fitness level of sixth-grade students at SD Negeri Biringkaloro falls within the low category, with most students classified as "Very Poor." This reflects a level of physical fitness that is below the ideal standard for elementary school children. Notably, 71% of students scored "Very Poor" in the 600-meter run, which is a direct indicator of extremely low cardiorespiratory endurance. These results align with national trends showing that many Indonesian students exhibit low-to-moderate fitness levels due to limited structured activity and insufficient engagement in school-based sports programs. This pattern reflects broader global concerns highlighted by the World Health Organization (WHO), which recommends a minimum of 60 minutes of moderate to vigorous physical activity (MVPA) daily for children. Research shows that failure to meet these guidelines is strongly associated with reduced endurance and overall low fitness (Alves et al., 2021; Supramaniam et al., 2023). Thus, the present findings reinforce the need for greater attention to students' physical fitness in elementary education.

When compared with previous literature, several parallels become evident. Loviani et al. (2021) found that TKJI components such as sprinting, pull-ups, sit-ups, and short-distance running often yield low scores among students who lack sufficient daily physical activity. This is consistent with the current study, where the poorest performance was observed in cardiorespiratory endurance (600-meter run) and upper-body strength (bent-arm hang). These deficits may be attributable to insufficient habitual physical activity, limited access to sports facilities, and low student motivation. Environmental disparities observed in previous studies, such as those reported by Rubiyatno et al. (2023), further support this explanation by demonstrating that school environments with fewer resources tend to produce lower fitness outcomes. International research similarly shows that only 27–33% of children in some countries meet WHO's MVPA recommendations (McCarthy et al., 2021), suggesting that the issue of insufficient activity is widespread and consistent with the patterns observed among students in this study.

Beyond these similarities, the present study contributes new insights by revealing that some students experienced fatigue even during basic warm-up exercises, indicating extremely low levels of endurance. This supports Hidasari (2021) finding that the quality and intensity of physical education programs significantly affect students' cardiorespiratory capacity. However, the current study also highlights an additional dimension: the influence of daily out-of-school activity patterns. Modern sedentary behaviors, including increased screen time and limited free-play opportunities, have been widely documented as major contributors to reduced physical fitness among children (Gomes et al., 2017; Lee et al., 2021). When viewed in the context of WHO guidelines which emphasize daily MVPA distributed throughout the week (Chaput et al., 2020), the low endurance levels observed here likely reflect insufficient daily movement, both inside and outside the school environment.

Motivational and instructional factors also help explain the study's findings. Students' intrinsic motivation to engage in physical activity strongly influences their overall fitness, consistent with the work of Zhou et al. (2019), who emphasized the importance of supportive social relationships in increasing active participation. A lack of engaging programming in PE may therefore contribute to low TKJI scores. Lei (2023) further noted that competent PE teachers play an essential role in developing dynamic, developmentally appropriate curricula, suggesting that increased instructional quality could help counter low motivation. The finding that students performed poorly on anaerobic and strength components also mirrors the results of Raibowo et al. (2024), who found that students not involved in extracurricular sports tend to exhibit lower fitness. Low participation in extracurricular activities at SD Negeri Biringkaloro may therefore be a key contributing factor to the weak overall performance.

From a holistic perspective, the present findings also align with research demonstrating the relationships between nutritional status, BMI, and physical fitness (Riyanto et al., 2023). Although the current study did not measure BMI, the frequent early fatigue observed among participants may suggest an imbalance between caloric intake and physical activity levels. Importantly, TKJI assessments play a critical role in monitoring fitness development and evaluating whether students' activity levels align with WHO physical activity recommendations (Adi et al., 2024; Pratamalloh et al., 2023). These standardized assessments also support national health education initiatives that emphasize lifelong physical activity and the creation of school environments that promote movement across the day (Mihardita & Putri, 2025).

While this study provides important insights, it also presents notable strengths and limitations. A key strength lies in the use of the nationally standardized TKJI instrument, which allows for accurate comparison with previous studies and ensures robust measurement validity. Conducting the tests in the natural school environment also ensured that students' performance reflected authentic conditions. Nevertheless, several limitations warrant attention. The sample consisted of only one class from a single school, limiting generalizability. The study also did not examine influencing variables such as nutrition, extracurricular involvement, sleep patterns, or motivation. Additionally, the TKJI was administered only once, preventing evaluation of day-to-day fluctuations in performance. These limitations suggest the need for future studies involving larger samples, repeated testing sessions, and more comprehensive variables to achieve a richer understanding of students' physical fitness.

Overall, the findings indicate that the physical fitness level of sixth-grade students at SD Negeri Biringkaloro requires substantial improvement, and several implementable actions can be undertaken by physical education (PJOK) teachers to address this issue. Teachers should design more structured and varied fitness-oriented lessons—such as interval training, circuit-based exercises, and age-appropriate endurance routines—to improve students' cardiorespiratory endurance and muscular strength, which were identified as the lowest TKJI components. Regular fitness monitoring, conducted through brief weekly assessments, can help track progress and maintain students' motivation. Additionally, incorporating active learning strategies such as station-based tasks, small-sided games, and cooperative challenges can enhance engagement while increasing time spent in moderate-to-vigorous physical activity. Collaboration with classroom teachers to integrate short movement breaks during academic sessions may also reduce sedentary time and support the WHO-recommended 60 minutes of daily physical activity. Furthermore, involving parents through simple take-home physical activity guidelines can reinforce active habits beyond school hours. Through these targeted and practical strategies, PJOK teachers can play a central role in improving students' overall physical fitness and promoting healthier movement behaviors within the school environment.

4. Conclusion

This study reveals that the physical fitness level of sixth-grade students at SD Negeri Biringkaloro, as measured by the Indonesian Physical Fitness Test (TKJI), falls within the low category, with most students classified as "Poor" to "Very Poor," particularly in cardiorespiratory endurance and muscle strength components. These findings indicate that students' physical activity levels are still not optimal and need to be improved through more varied physical education instruction, structured training programs, and increased motivation and opportunities for students to engage in physical activities both inside and outside of school.

Another limitation of this study lies in the combined analysis of male and female students. Although TKJI uses gender-specific scoring standards, this study aggregated the results into a single dataset. As a result, differences in physiological characteristics and distinct scoring thresholds between boys and girls may not be fully represented in the findings. Future research is recommended to analyze male

and female students separately to obtain a more detailed and accurate interpretation of physical fitness levels.

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