Measurement Football Physical Tests Using an Outdoor Laboratory at an Educational Park

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Abstract

This study aims to assess the physical fitness of male students at Indralaya 1 Public Middle School through a descriptive research approach using a quantitative method, employing normality and percentage tests for data analysis. The study included the entire student population of Indralaya 1 Public Middle School, with a sample of 30 male students selected through total sampling. Physical fitness was measured using tests for explosive power, endurance, speed, strength (arm and abdominal muscles), agility, and flexibility. Data analysis involved the Smirnov Kolmogorov normality test and percentage calculations using Excel and SPSS 22. The findings revealed that the overall physical condition of the students in the soccer tests was categorized as pretty good, with an average result of 50.14%. The specific test results were as follows: explosive power 60%, endurance (bleep test) 60%, speed (40m run) 67%, strength (push-ups and sit-ups) 57%, agility 57%, and flexibility 50%. In conclusion, students at Indralaya 1 Public Junior High School a reasonably good physical condition based on soccer-related assessments. The practical implication of this research is that physical fitness significantly contributes to daily activities, particularly in the context of Physical Education and Sports football lessons.

How to Cite

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INTRODUCTION

Soccer is a universally known and beloved sport, not just played for entertainment but with an expectation for players and coaches to deliver their best performance. Achieving high performance requires planned and consistent training, considering soccer's longstanding presence at regional, national, and international levels (Pradana, 2019). According to Sandika (2021), a soccer match lasts for 2 x 45 minutes, during which players engage in continuous movement, including jumping, sliding, body charges, and maintaining a pace faster than the opponent. This demands a high level of physical fitness, encompassing strength, power, speed, agility, endurance, and flexibility (Prasedio, 2019; Agustin, Hartati, Aryanti, 2021).

Not only does soccer demand fundamental skills, but it also relies on excellent physical abilities. Suwandaru & Hidayat (2021) emphasize the importance of physical exercise to enhance physical fitness and performance in soccer, focusing on endurance, strength, speed, and flexibility. At Indralaya 1 Public Junior High School, soccer is taught once a week as part of physical education, including practical training in physical skills and basic soccer techniques. Physical performance is crucial for soccer players, requiring good physical qualities such as speed, stamina, strength, and agility. Given the demanding nature of soccer, where players must endure 2 x 45-minute matches, it becomes essential to maintain a high level of physical fitness (Suwandaru & Hidayat, 2021). Observations at Indralaya 1 Public Junior High School a limitation in the variety of physical exercises during soccer trainig, leading to potential boredom among athletes. The lack of diverse movements is evident in students' slow and incorrect execution of techniques, posing a challenge identified by the researcher. The students' physical abilities in soccer components, including strength, muscle endurance, speed, agility, flexibility, power, and cardiovascular endurance, are found to be lacking. This deficiency becomes apparent in the initial minutes of play, with a subsequent decline in physical strength affecting technical proficiency and overall gameplay.

To address these issues, the research draws on previous studies, such as Sugihartono et al.'s (2021) exploration of physical condition measurement in a sports laboratory. The current study aims to improve the understanding of Physical Education teachers regarding the significance of measuring students' physical conditions. The approach involves implementing physical exercises with various variations needed in soccer and aims to enhance athletes' physical fitness, enthusiasm, body endurance, flexibility, speed, and avoidance of training monotony. The study, titled "Measurement of Soccer Physical Tests in Indralaya 1 Public Junior High School Outdoor Laboratory at Educational Park," seeks to address these challenges.

METHODS

The research on measuring soccer physical tests in Indralaya 1 Public Junior High School using an outdoor laboratory in the educational park adopts a descriptive quantitative approach. The chosen method involves a survey or observational technique through soccer physical endurance tests for data collection. The survey method is preferred due to its application in direct observation of a phenomenon in either a large or small population. This research aims to understand specific aspects or events in the field, utilizing numerical calculations as a means of analysis (P. D. Sugiyono, 2014). The primary objective of this study is to assess the physical fitness related to soccer among the students of Indralaya 1 Public Junior High School.

The population is a generalized area consisting of objects or subjects with specific qualities and characteristics defined for study and subsequent conclusions (P. D. Sugiyono, 2014). According to Arikunto (2019), the population refers to the entirety of research subjects. In this study, the population comprises 30 students from Class VIII at Indralaya 1 Public Junior High School. As per Sugiyono (2017), a sample is a portion of the total population with its characteristics. The determination of sample selection is as follows: if the subject number is less than 100, it is preferable to include all, making it a population study. If the subject number exceeds 100, a sample of 10-15% or 20-25% can be taken. Since the participants are fewer than 100, this research employs total population sampling, meaning the entire population is included. The sample size for this study consists of 30 male students from Class VIII at Indralaya 1 Public Junior High School.

To assess the physical abilities of soccer players, measurements of explosive power, speed, and endurance are essential (Hermawan & Batista Sili, 2016). The instruments used for each aspect are as follows:

Explosive Power
Test Objective: To evaluate the explosive power of soccer players.

Testing Tools: Writing tools, forms, and a modified vertical jump apparatus.

Test Procedure:

Participants stand in the middle of the modified vertical jump box with readiness and relaxation.

The tester secures a measurement tape to the participant.

Upon the "Go" signal, participants jump as high as possible, aiming to land back in the center of the apparatus.

The height of the jump is recorded on the test form.

Table 1. Explosive Power

Man	Score	Woman
>66 cm	5	>50 cm
53-56 cm	4	39-49 cm
42-52 cm	3	30-38 cm
31-41 cm	2	21-29 cm
<31 cm	1	<21 cm

Source : (Hermawan & Batista Sili, 2016)

Speed

Test Execution: Sprint test covering a distance of 40 meters.

Standing Sprint:

Track length: 40 meters

Five tracks available

Sprint track with a two-meter gap between each lane

Participants get one chance to sprint, and the fastest time is recorded.

Table 2. Speed Test Norms

Man	Category	Woman
<5,4 Second	Excellent	< 5,2 Second
5,4 – 6,6 Second	Good	5,2 – 6,0 Second
6,6 – 7,2 Second	Adquate	6,0 – 6,4 Second
7,2 – 9,0 Second	Inadequate	6,4 – 7,6 Second
> 9,0 Second	Very Poor	>7,6 Second

Source: (Pasaribu, 2020)

Endurance

Test Preparation: bleep test

Track length: 20 meters with markings at both ends.

Prepare a cassette or CD with the MFT test instructions.

Test forms and writing tools.

Refrain from eating two hours before the test, wear non-slip sportswear and shoes, stretch especially leg muscles, and cool down after the test.

Test Execution:

Follow cassette instructions, perform the run within intervals signaled by two "beep" sounds.

Participants must reach the opposite end after each beep sound.

Participants continue running until they can no longer maintain the required pace.

Table 3. Man Endurance Test Norms (Bleep Test)

Category	Age					
	15-19	20-19	30-39	40-49	50-59	60-69
Excellent	>48	>43	>36	>31	>25	>23
Good	42- 47	37 – 42	31- 35	26 – 30	22 – 25	17 – 22
Adquate	38-37	33 – 36	27 – 30	22 – 25	28 – 21	12 – 16
Inadequate	33- 37	29 – 32	22 – 26	17 – 21	13 – 17	7 – 15
Very Poor	<32	<28	<21	<16	<12	<6

Table 4. Woman Endurance Test Norms (Bleep Test)

Category	Age					
	15-19	20-19	30-39	40-49	50-59	60-69
Excellent	>42	>36	>29	>25	>29	16
Good	36- 41	31 – 35	24- 28	20 – 24	12 – 18	12 – 15
Adquate	31-35	25 – 30	20 – 23	15 – 19	5 – 11	4 – 11
Inadequate	33- 37	29 – 32	22 – 26	17 – 21	3 – 4	2 – 3
Very Poor	<26	<20	<14	<6	<2	<1

Source: (Pasaribu, 2020)

Strength

a. Push Up:

Objective: Measure upper body strength and endurance, specifically arm muscles.

Equipment: Flat surface or mat, stopwatch, writing tools.

Test Procedure: Participants perform push-ups, and the count is recorded.

Table 5. Push Up Test Norms

Score	Man	Category	Woman
5	>38	Excellent	>21
4	29 – 37	Good	16 – 20
3	20 – 28	Adquate	10 – 15
2	12 – 19	Inadequate	5 – 9
1	4 – 11	Very Poor	1 – 4

Source: (Pasaribu, 2020)

b. Sit Up:

Objective: Measure endurance and strength in abdominal muscles.

Equipment: Flat surface or mat, stopwatch, writing tools.

Test Procedure: Participants perform sit-ups, and the count is recorded.

Table 6. Sit Up Test Norms

Score	Man	Category	Woman
5	>30	Excellent	>25
4	36 – 30	Good	21 - 25
3	20 – 25	Adquate	15 – 20
2	17 – 19	Inadequate	9 – 14
1	<17	Very Poor	<9

Source: (Pasaribu, 2020)

Agility

Agility Test: Shuttle run to measure the ability to change direction quickly.

Equipment:

Wooden beams for each participant.

10x5x5 cm wooden block.

Tape, cones for marking start lines.

Stopwatch.

Non-slip flat surface with lines 10 meters apart.

Test Execution:

Participants start at the marked line and run to the second line, picking up a wooden block.

They then run back to the start line, placing the block behind the line.

This is repeated twice, covering a total distance of 40 meters.

Table 7. Agility Test Norms

Man	Score	Woman
<12.10	5	>12.42
12.11 – 13.53	4	12.43- 14.09
13.54 – 14.96	3	14.10 – 15.74
14.97 – 16.39	2	15.75 – 17.39
<16.40	1	<17.40

Source: (Pasaribu, 2020)

Flexibility

Test Objective: Measure joint flexibility using the sit and reach test.

Equipment:

Measuring tape (minimum 2 meters).

Wall or upright board with a flat surface.

Writing tools.

Test form.

Test Execution:

Participants sit with legs stretched, touching toes while a partner holds their feet to prevent forward movement.

Reach is measured in centimeters, recorded after a minimum of 3 seconds.

The flexibility is calculated by the difference between the reach distance and the foot distance in centimeters.

Table 8. Flexibility Test Norms

Score	Man	Category	Woman
5	>19,5	Excellent	20,0-23,0
4	17,0-19,0	Good	18,5-19,5
3	14,5 – 16,5	Adquate	17,0 – 18,0
2	12,5 – 14,0	Inadequate	15,0 – 16,5
1	< 12,0	Very Poor	13,5 – 14,5

Source: (Pasaribu, 2020)

The data analysis technique employed in this research utilizes a quantitative descriptive analysis with percentages. Quantitative analysis involves the computation of figures after categorizing data into groups, followed by determining the percentage for each data point using the percentage formula (Arikunto, 2019). The percentage formula applied is:

$$P = (F/N)x100\%$$

Explanation:

P : Percentage

F : Frequency

N : Total number of subjects or respondents.

RESULTS AND DISCUSSION

The data collection for this research includes tests for explosive power, speed, endurance, and strength (sit-ups and push-ups), which are fundamental physical components required for students at Indralaya 1 Public Junior High School participating in the sport of soccer.

Description of Explosive Power Test Results

Based on the conducted research, the physical data for the explosive power component in the sport of soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average test result of 53.56, categorizing it as good. The distribution of these results is further detailed in the **Table 9.**

Table 9. Description of Explosive Power Test Results

Results (cm)	Gender	Frek. Absolut	Frek. %	Category
57-66		8	27%	Excellent
53-56		18	60%	Good
42-52	Man	1	3%	Adquate
31-41		3	10%	Inadequate
<31		0	0%	Very Poor
Amount		30	100%	Good

Based on the **Table 9** the results of the explosive power test for eighth-grade male students at Indralaya 1 Public Junior High School show that there are 30 students in total. Among them, 8 students, constituting 27%, achieved a very good category with test results ranging from 57 to >66 cm. Additionally, 18 students, accounting for 60%, demonstrated a good category with results between 53 and 56 cm. One student, representing 3%, falls into the moderate category with results from 42 to 52 cm. Furthermore, 3 students, making up 10%, obtained results in the range of 31 to 41 cm, categorized as less good. No students scored below 31 cm, categorized as very poor.

Description of Speed Test Results

Based on the research findings, the physical measurement for the speed component in soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average speed test result of 5.6 seconds, categorizing it as good. The distribution of these results is further detailed in the **Table 10.**

Table 10. Description of Speed Test Results

Results (Second)	Gender	Frek. Absolut	Frek. %	Category
<5,4		5	17%	Excellent
<5,4-6,6		18	60%	Good
<6,6-7,2	Man	5	17%	Adquate
<7,2-9,0		2	10%	Inadequate
<9,0		0	0%	Very Poor
Amount		30	100%	Good

Based on **Table 10** the results of the speed test for eighth-grade male students at Indralaya 1 Public Junior High School indicate that there are 30 students in total. Among them, 5 students, constituting 17%, achieved an excellent category with a speed test result of <5.4 seconds. Additionally, 18 students, accounting for 60%, demonstrated a good category with results ranging from 5.4 to 6.6 seconds. Five students, representing 17%, fall into the moderate category with results between 6.6 and 7.2 seconds. Furthermore, 2 students, making up 10%, obtained results in the range of 7.2 to 9.0 seconds, categorized as less good. No students scored below the category of very poor.

Description of Endurance Test Results (Bleep Test)

Based on the research findings, the physical measurement for the endurance component in soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average endurance test result of 42, categorizing it as good. The distribution of these results is further detailed in the **Table 11.**

Table 11. Description of Endurance Test Results

Results	Gender	Frek. Absolut	Frek. %	Category
<48		7	23%	Excellent
39-47		20	67%	Good
37-38	Man	2	7%	Adquate
33-36		1	3%	Inadequate
<32		0	0%	Very Poor
Amount		30	100%	Good

Based on **Table 11** the results of the endurance test for eighth-grade male students at Indralaya 1 Public Junior High School show that there are 30 students in total. Among them, 7 students, constituting 23%, achieved an excellent category with an endurance test result of >48. Additionally, 20 students, accounting for 67%, demonstrated a good category with results ranging from 39 to 47. Two students, representing 7%, fall into the moderate category with results between 37 and 38. Furthermore, 1 student, making up 3%, obtained a result in the range of 33 to 36, categorized as less good. No students scored below the category of very poor.

Description of Strength Test Results
Push Up

Based on the research findings, the physical measurement for the strength component, specifically the push-up test, in soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average strength test result of 32.16, categorizing it as good. The distribution of these results is further detailed in the **Table 12.**

Table 12. Description of Push-Up Test Results

Results	Gender	Frek. Absolut	Frek. %	Category
<38		4	13%	Excellent
28-37		14	47%	Good
19-27	Man	7	23%	Adquate
8-18		5	17%	Inadequate
0-7		0	0%	Very Poor
Amount		30	100%	Good

Based on **Table 12** the results of the push-up test for eighth-grade male students at Indrala-

ya 1 Public Junior High School show that there are 30 students in total. Among them, 4 students, constituting 13%, achieved an excellent category with a push-up result of >38. Additionally, 14 students, accounting for 47%, demonstrated a good category with results ranging from 38 to 37. Seven students, representing 23%, fall into the moderate category with results between 19 and 27. Furthermore, 5 students, making up 17%, obtained a result in the range of 8 to 18, categorized as less good. No students scored below the category of very poor.

Sit Up

Based on the research findings, the physical measurement for the strength component, specifically the sit-up test, in soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average strength test result of 30.3, categorizing it as good. The distribution of these results is further detailed in the **Table 13.**

Table 13. Description of Sit-Up Test Results

Results	Gender	Frek. Absolut	Frek. %	Category
<41		4	13%	Excellent
30-41		17	57%	Good
21-29	Man	4	13%	Adquate
10-20		5	17%	Inadequate
0-10		0	0%	Very Poor
Amount		30	100%	Good

Based on **Table 13** the results of the sit-up test for eighth-grade male students at Indralaya 1 Public Junior High School show that there are 30 students in total. Among them, 4 students, constituting 13%, achieved an excellent category with a sit-up result of >41. Additionally, 17 students, accounting for 57%, demonstrated a good category with results ranging from 30 to 41. Four students, representing 13%, fall into the moderate category with results between 21 and 29. Furthermore, 5 students, making up 17%, obtained a result in the range of 10 to 20, categorized as less good. No students scored below the category of very poor.

Description of Agility Test Results

Based on the research findings, the physical measurement for the agility component in soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average agility test result of 13.02, categorizing it as good. The distribution of these results is further detailed in the **Table 14.**

Table 14. Description of Agility Test Results

Results (Second)	Gender	Frek. Absolut	Frek. %	Category
<12.10		4	13%	Excellent
12.11-13.53		17	57%	Good
13.54-14.96	Man	4	13%	Adquate
14.97-16.39		5	17%	Inadequate
<16.40		0	0%	Very Poor
Amount		30	100%	Good

Based on **Table 14** the results of the agility test for eighth-grade male students at Indralaya 1 Public Junior High School show that there are 30 students in total. Among them, 4 students, constituting 13%, achieved an excellent category with an agility test result of <12.10. Additionally, 17 students, accounting for 57%, demonstrated a good category with results ranging from 12.11 to 13.53. Four students, representing 13%, fall into the moderate category with results between 13.54 and 14.96. Furthermore, 5 students, making up 17%, obtained a result in the range of 14.97 to 16.39, categorized as less good. No students scored below the category of very poor.

Description of Flexibility Test Results

Based on the research findings, the physical measurement for the flexibility component in soccer for male students in the eighth grade at Indralaya 1 Public Junior High School revealed an average flexibility test result of 30.3, categorizing it as good. The distribution of these results is further detailed in the **Table 15.**

Table 15. Description of Flexibility Test Results

Results (cm)	Gender	Frek. Absolut	Frek. %	Category
<45		3	10%	Excellent
31-45		15	50%	Good
21-30	Man	5	7	Adquate
11-20		7	23	Inadequate
<10		0	0%	Very Poor
Amount		30	100%	Good

Based on **Table 15** the results of the flexibility test for eighth-grade male students at Indralaya 1 Public Junior High School show that there are 30 students in total. Among them, 3 students, constituting 10%, achieved an excellent category with a flexibility test result of >45 cm. Additionally, 15 students, accounting for 50%,

demonstrated a good category with results ranging from 31 cm to 45 cm. Five students, representing 17%, fall into the moderate category with results between 21 cm and 30 cm. Furthermore, 7 students, making up 23%, obtained a result in the range of 11 cm to 20 cm, categorized as less good. No students scored below the category of very poor.

Data Analysis Results
Table 15. Data Analysis Results

Indikator	(%)	Average
Explosion power	60%	
Speed	60%	
Durability	67%	50,14%
Strength	57%	
Agility	57%	
Flexibility	50%	

Based on the **Table 15** above, a result of 50.14% was obtained. To categorize this result, refer to the **Table 16**.

Table 16. Score Persentase Category

Indikator	Category
0-19,9%	Excellent
20-39,9%	Good
40-59,9%	Adquate
60-79,9%	Inadequate
80-100%	Very Poor

From the **Table 16** above, it can be concluded that the results obtained from the physical tests for soccer in students at Indralaya 1 Public Junior High School using the Outdoor Education Laboratory fall into the "cukup" (sufficient) category with a value of 50.14%.

Based on the evaluation criteria, it is necessary to discuss the results of this research, focusing on the Physical Fitness Test Measurement in Soccer for students of Indralaya 1 Public Junior High School using the Outdoor Education Laboratory. Physical fitness is an essential aspect for everyone to develop and enhance their physical condition and overall body fitness, and it needs to be cultivated and improved according to individual needs. According to Supriyoko & Mahardika (2018), physical fitness supports daily activities and can enhance the performance of students. The physical condition of a student can be developed and improved both during learning

activities and at home. The aim is to enhance the physical condition of the students to support their daily activities. Particularly in school, students engage in various activities, including Physical Education and Health classes. This research specifically discusses the physical condition, particularly in the context of soccer, where the physical condition must be optimal. According to Aryanti et al. (2018), Physical Education, Sports, and Health aim to be carried out systematically by students to develop their individual capabilities.

Components of physical fitness must be measured in soccer to evaluate and establish future programs to improve physical fitness in soccer games. The factors contributing to physical condition play a crucial role and serve as a foundation for determining future learning. If students do not have optimal physical conditions, they will not maximize their participation in Physical Education classes, especially in the curriculum covering team sports like soccer. Regular and continuous physical activity leads to optimal physical fitness (Hartati et al., 2019). Soccer is a team sport played by two teams, demanding physical abilities from each player to conduct the game properly (Supriyoko & Mahardika, 2018). Physical condition involves all body movements resulting from skeletal muscle contractions that can increase energy in an individual's body. Students who engage less in physical activities are at risk of obesity, diabetes, depression, and other health issues (Supriyoko & Mahardika, 2018). Knowing their physical condition, assessing it, and designing further learning are crucial for monitoring and improving physical conditions. Providing physical fitness education for every student is essential to raise awareness of the importance of good physical conditions. The research results indicate that the measurement of physical fitness in soccer for students of Indralaya 1 Public Junior High School resulted in a fairly good category.

Comparing these findings with previous research, Wiwoho & Junaidi (2014) found that extracurricular soccer students at Unggaran 2 Public Senior High School in 2012 had moderate physical fitness. Aziz (2016) conducted research on physical fitness in soccer and found good results. In line with this, Hartati et al. (2020) agree that students with good physical fitness can support their daily activities. The physical measurement in soccer is conducted to provide information related to the physical condition of students, particularly those in Indralaya 1 Public Junior High School, who need to enhance their physical fitness to participate effectively in lessons, especially in large-ball sports like soccer.

CONCLUSION

Based on the description and analysis of the research on "Physical Fitness Test Measurement in Soccer for Students of Indralaya 1 Public Junior High School Using the Outdoor Education Laboratory," the results indicate that the physical condition in the sport of soccer falls into the category of fairly good with a percentage of 50.14%. The implication of this research is that students, especially those involved in soccer, should be aware of their physical condition. To assess their fitness level, physical tests are conducted, focusing on components relevant to the sport of soccer.

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