

Evaluation on the Physical Condition of Football Extracurricular Participants before and during the COVID-19 Pandemic

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Abstract Background: One of the most popular extracurricular activities at school is football. However, extracurricular activities have been temporarily suspended due to the COVID-19 outbreak, which on the other hand will affect students' physical abilities. The purpose of this study was to evaluate the physical condition of students which included speed, endurance, agility, before and during the COVID-19 pandemic. The participants were 15 male students aged 14-15 years with a weight of 51-71± kg and a height of 157-173± cm. **Material and method:** This study used a quantitative descriptive method with a survey approach. The instruments used include a multistage fitness test, a 30-meter sprint, and a shuttle run. Data were analyzed based on percentage data analysis and the Wilcoxon test. **Result:** The Wilcoxon test results on the speed test showed sig (2 tailed) 0.826 > 0.05, endurance test 0.001 < 0.05, and agility test 0.033 > 0.05. If categorized, the overall percentage results on the physical condition of students have not been included in the "good" category. **Conclusion:** The findings of this study revealed that physical condition tests before and during the COVID-19 pandemic, both fall into the "poor" and "very poor" categories. Furthermore, tests carried out during the COVID-19 pandemic experienced a higher percentage decline compared to tests before the

COVID-19 pandemic. The research results obtained can thus be used as material for evaluation and improvement for teachers, coaches, and extracurricular football students, especially training related to improving physical condition so that better results can be obtained in the future.

Keywords Physical Condition Evaluation, Football, COVID-19 Pandemic

1. Introduction

In December 2019, a rare case of unexplained pneumonia was reported [1]. The World Health Organization (WHO) on January 30, 2020, stated that this case came from a new virus infection which was later called COVID-19 [1]. The COVID-19 virus has spread widely in several countries [2]. The spread of this virus has an impact on the delay in the formal education process given the very easy and fast rate of transmission of the COVID-19 virus.

To prevent the spread of the COVID-19 virus from spreading, the government has imposed a temporary closure of educational institutions from primary school to

university level [2]. Instead, e-learning or distance learning is applied. In addition to the delay in the formal education process, extracurricular activities that are part of education in schools are also affected, considering that these activities are carried out face-to-face which is contrary to the social distancing rules applied [3].

It is clear that extracurricular sports certainly involve physical activity. Physical condition and physical fitness related to physical education are important in learning and practicing motor skills [2]. Sports extracurricular activities are the channeling of talents and interests for students outside school hours to facilitate outstanding students [4]. Examples of extracurricular sports, in this case, are futsal, volleyball, basketball, football [5]

Long before the COVID-19 pandemic and the enactment of social distancing, football extracurriculars at junior high schools (SMP) ran smoothly without any obstacles. The synergy of physical education teachers and soccer coaches in nurturing students to improve soccer achievement is evident. This can be seen from the initial physical condition test, preparation of training programs, and training activities three times a week, all of which have been carried out well. It aims to prepare for inter-school competitions and regional student sports week. This activity was also supported by Bompa & Buzzichelli [6] who stated that the synergy of all aspects such as infrastructure, motivation, and supporting sciences other than sports science is very much needed to improve student achievement. However, the training program that has been running has now been hampered due to the current COVID-19 pandemic. In other words, soccer practice activities cannot be carried out as usual before the pandemic occurs.

The results of investigations in several pieces of works of literature inform that individuals and communities have decreased physical activity due to the pandemic. It was also explained that decreased physical activity will have an impact on increasing body mass index and decreasing performance due to lack of physical activity [7]. Therefore, physical education teachers and soccer coaches agreed to provide online physical exercise programs and models that can be done at home to maintain physical condition.

The description above indicates a gap in this study. The field survey stated that sports extracurricular activities before the COVID-19 pandemic and before the implementation of social distancing had been going well, but this has changed since the COVID-19 pandemic where extracurricular activities could not be carried out, especially soccer extracurricular. This extracurricular was attended by more than 10 participants which caused this extracurricular to be temporarily suspended. Ideally, self-awareness for independent exercise to maintain physical condition is very necessary.

The literature review that has been done shows that a lot of research on the evaluation of physical conditions has been carried out. However, research that specifically discusses extracurricular in the field of improving sports

achievement in schools is still minimally evaluated. Therefore, this study aims to evaluate physical conditions which include endurance, agility, and speed in soccer extracurricular participants by looking at the comparison of physical conditions before (test 1) and during (test 2) the COVID-19 pandemic.

2. Materials and Methods

2.1. Study Participants

In this study, a descriptive quantitative method was used with a survey approach. This is an attempt to find out and describe the variables to be studied where the data presented is in the form of numbers [8]. The study participants were 15 male soccer extracurricular participants in junior high school (SMP) aged 14-15 years with a height of 157-173± cm and weight of 51-71± kg. Participants, in this case, have carried out the first stage of physical condition tests conducted on March 11, 2020, followed by the second test conducted on September 18, 2021. The physical components measured were endurance, agility, and speed

2.2. Study Organization

The instrument used to measure endurance, in this case, is the multistage fitness test (MFT) while the agility test is the shuttle run. In the speed test, the instrument is used to measure it is a speed of 30 meters. The research technique for obtaining data is carried out with the norms that have been compiled in the Guide to the Implementation of Athletes' Tests and Measurements [9]. Norms can be seen in the table below:

Table 1. Speed Test Norms

Sex	Category	Achievement (second)
Male	Excellent	3.58 – 3.91
	Good	3.92 – 4.34
	Adequate	4.35 – 4.72
	Poor	4.73 – 5.11
	Very Poor	5.12 – 5.50

Table 2. Aerobic Endurance Test Norms

Sex	Category	VO ₂ Max (ml/kg/min)
Male	Excellent	≥61,00
	Good	55,10-60,90
	Adequate	49,20-55,00
	Poor	43,30-49,10
	Very Poor	≤43,20

Table 3. Agility Test Norms

Sex	Category	Achievement (second)
Male	Excellent	<12,10
	Good	12.11
	Adequate	12,11-14,96
	Poor	14,98-16,39
	Very Poor	>16,40

2.3. Statistical Analysis

The data analysis technique used in this research was descriptive analysis using percentages according to the formula of $F/N \times 100\%$, $P = \text{Percentage sought}$, $F = \text{frequency}$, $N = \text{number of respondents}$. At this stage, the results obtained are categorized according to the norms of the Guidelines for the Implementation of Athletes' Tests and Measurements [9]. Thus, the categories found will be excellent, good, adequate, poor, and very poor. The next stage is to find the difference between tests before and during COVID-19 by using the Wilcoxon nonparametric test assisted by statistical product and service solutions.

3. Results

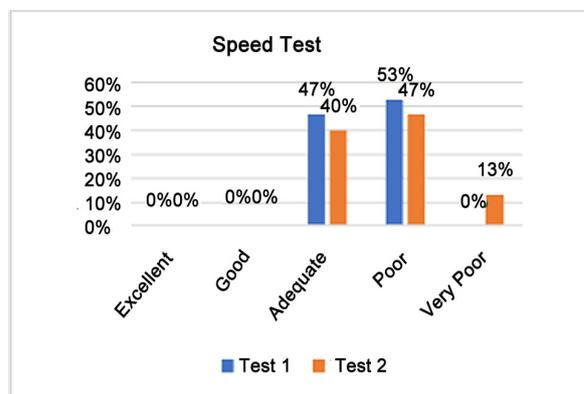
The following are the results of the percentage of physical components presented in the table below:

Table 4. Percentage of Speed Test Results

Test Data	Category	Frequency	Percentage
Test 1	Excellent	0	0%
	Good	0	0%
	Adequate	7	47%
	Poor	8	53%
	Very Poor	0	0%
Test 2	Excellent	0	0%
	Good	0	0%
	Adequate	6	40%
	Poor	7	47%
	Very Poor	2	13%

The percentage analysis above shows that the test results before the COVID-19 pandemic showed a percentage of 0% in the excellent, good, and very poor categories, while the percentages for the adequate and poor categories were 47% and 53%, respectively. Meanwhile, the results of tests during COVID-19 by implementing home exercises independently showed a percentage of 0% for the excellent and good categories. In the adequate, poor, and very poor

categories, the percentages obtained were 40%, 47%, and 13%. If we look closely, the category of very poor test results during COVID-19 has increased by 13%. This indicates that the physical condition of the speed of the soccer participants has decreased. These results are presented in the form of a diagram as follows.

**Figure 1.** The Diagram for Speed test**Table 5.** Percentage of Endurance Test Results

Test Data	Category	Frequency	Percentage
Test 1	Excellent	0	0%
	Good	0	0%
	Adequate	6	40%
	Poor	8	53%
	Very Poor	1	7%
Test 2	Excellent	0	0%
	Good	0	0%
	Adequate	0	0%
	Poor	8	53%
	Very Poor	7	47%

The results of the analysis shown in the percentages above explain that the test results before the COVID-19 pandemic which are included in the excellent and good categories are 0%, while the adequate, poor, and very poor categories were 40%, 53%, and 7%. Meanwhile, the results of tests during the COVID-19 pandemic with the application of self-practice at home which is included in the excellent, good, and adequate categories are 0%, while the percentages in the poor and very poor categories are 53% and 47%, respectively. In conclusion, tests during the pandemic whose results were categorized as poor and very poor experienced an increase to 53% and 47%. This indicates that the physical condition of the aerobic endurance of football players has decreased. Data related to these results are presented in the form of a diagram as follows.

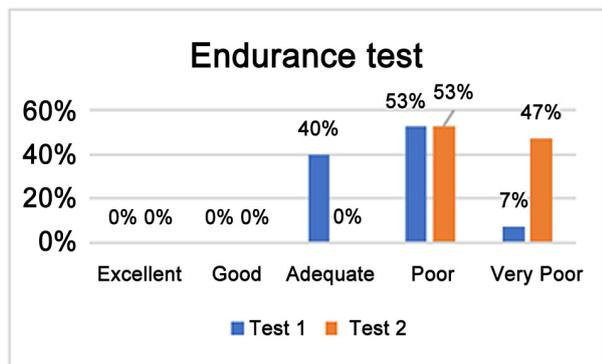


Figure 2. The Diagram for Endurance test

Table 6. Percentage of Agility Test Results

Test Data	Category	Frequency	Percentage
Test 1	Excellent	0	0%
	Good	0	0%
	Adequate	2	13%
	Poor	8	53%
	Very Poor	5	34%
Test 2	Excellent	0	0%
	Good	0	0%
	Adequate	0	0%
	Poor	7	47%
	Very Poor	8	53%

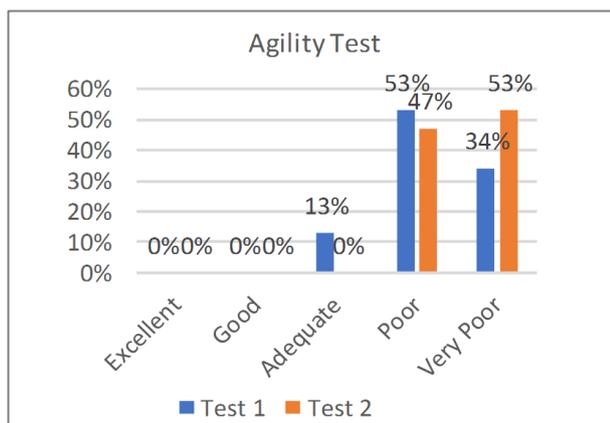


Figure 3. The Diagram for Agility test

Based on the percentage analysis (table 6), it is known that the test results before the COVID-19 pandemic are divided into 0% excellent category, 0% good, 13% adequate, 53% poor, and 34% very poor. Meanwhile, the results of test 2 carried out during the COVID-19 pandemic by implementing home exercises independently which were included in the excellent category are 0% while for good, adequate, poor, and very poor are 0%, 0%, 47%, and 53%, respectively. In other words, there is an increase in the percentage in the category of poor and very poor in the

pre-pandemic test compared to during the pandemic test, namely 47%, and 53%, respectively. This means that the physical condition regarding the agility of soccer participants has decreased. These findings are also presented in the form of a diagram as figure 3.

The following table presents the results of the data description and Wilcoxon test:

Table 7. Description of Physical Test Data

Variable	N	Min	Max	Mean
Test 1-Speed	15	4.39	4.96	4.66
Test 2-Speed	15	4.39	4.95	4.65
Test 1-Endurance	15	43.00	50.20	47.08
Test 2-Endurance	15	42.10	47.40	44.71
Test 1-Agility	15	12.12	16.45	15.37
Test 2-Agility	15	14.98	16.42	16.17

Table 8. The results of the Wilcoxon test

Physical component test	Asymp. Sig (2-tailed)
Test 1-Speed	0.826
Test 2-Speed	
Test 1-Endurance	0.001
Test 2-Endurance	
Test 1-Agility	0.033
Test 2-Agility	

The table above shows that the sig (2-tailed) value for speed is $0.862 > 0.05$. Thus, this result indicates that there is no significant decrease between speed before and during COVID-19. The sig (2-tailed) value for endurance is $0.001 < 0.05$ which indicates a significant decrease between endurance before and during COVID-19. Furthermore, the sig (2-tailed) value obtained for agility is $0.033 > 0.05$. This result describes no significant decrease occurred between agility before and during COVID-19.

4. Discussion

Measurement and evaluation tests in sport are closely related. A test, in a specific definition, is a tool for collecting data, whereas evaluation is a process for providing an assessment. The measurement test in this case will produce quantitative data to be interpreted qualitatively.

The results of the literature review describe that evaluation is an integral part of the athlete's training process that is inseparable from the role of a coach [10]. Another opinion states that evaluation is important in the field of theory development, scientific activities, training methods, and various sports activities related to

performance evaluation and motor activity [11]. Evaluation is the final stage of activity where training efforts to optimize physical condition have been carried out first.

The purpose of the exercise is to optimize sports competence & skills [12][13]. Exercise is also intended to improve individual and team performance and health [14]. Reinforced by other literature, it is stated that exercise is not only to improve the physical condition but also develop individual personality to be positive [15]. It should be emphasized that the training process will show a marked improvement when there is a well-conducted measurement and evaluation test. In this case, physical condition tests were carried out on soccer extracurricular participants before and during the COVID-19 mass. The tests carried out were tests of speed, endurance, and agility.

Football is a sport with low and high-intensity characteristics [15]. Balyi's theory [16] explains that at the age of 12-16, the purpose of physical exercise is to develop endurance, speed, and strength. The results of the literature review state that aerobic endurance is an aspect related to the heart, lungs, and blood vessel performance to transport oxygen throughout the body so that energy is obtained and becomes the foundation for developing other physical abilities [17] [18].

Speed and agility are also important points in football. An athlete with adequate speed and agility will be able to carry out attack and defense movements effectively and efficiently [19] [20]. Therefore, it is necessary to evaluate the athlete's physical condition, especially endurance, speed, and agility before and during COVID-19 so that it can be evaluated regarding improvements that need to be made in the future.

The Wilcoxon test which tested the speed before the COVID-19 pandemic and during the COVID-19 pandemic found a sig (2-tailed) value of $0.826 > 0.05$. This means that there is no significant decrease in speed before and during the COVID-19 pandemic. However, the average test speed during COVID-19 is 4.65, which is better than before COVID-19, which was 4.66 seconds. When viewed from the percentage results, the results obtained during the COVID-19 pandemic increased by 13% and were included in the very poor category compared to before COVID-19 at 0%.

Endurance tests before the COVID-19 pandemic and during the COVID-19 pandemic based on the Wilcoxon test showed a sig (2-tailed) value of $0.001 < 0.05$ which indicates a significant decrease. Furthermore, the average value of the endurance test before the COVID-19 pandemic and during the COVID-19 pandemic also decreased from 47.08 to 44.71. These findings reflect that test scores before the COVID-19 pandemic were better.

Based on the Wilcoxon test for agility tests before the COVID-19 pandemic and during the COVID-19 pandemic, the sig (2-tailed) value was found to be $0.033 > 0.05$. This means that there is no significant decrease between tests

before and during the COVID-19 pandemic. The average agility test score before the COVID-19 pandemic was 15.37, while during the COVID-19 pandemic was 16.17. From these results, it can be interpreted that the average test score before the COVID-19 pandemic is better. Besides, the poor and very poor categories increased to 47% and 53%, respectively.

If it is reviewed based on the results that have been found following the norms and categorization of the speed test, then endurance and agility before and during the COVID-19 pandemic have not been included in the "good" category where only some are in the "adequate" category. Lack of exercise frequency, no special control over students when practicing outside of school, and low willingness and self-awareness of students to engage in physical activity are some of the causes of the endurance and agility decreased. The above findings are exacerbated by the fact that durability is drastically reduced. According to the literature, a person's aerobic endurance can be reduced by 17-27 percent after three weeks of no physical activity [21].

According to the conducted research, regular physical exercise with appropriate duration and intensity settings can improve physical performance [22]. In addition to physical tests and measurements, knowing students' nutritional status is critical for optimizing performance when practicing and competing, because nutritional status is a balance of body needs consumed by athletes [23]. As a result, this study may serve as a correction and evaluation guide for sports coaches and teachers seeking to improve the physical condition of soccer extracurricular students in preparation for inter-school matches.

5. Conclusion

In conclusion, the findings and discussion in this study show that physical condition tests performed before and during COVID-19 are both poor and very poor. On a percentage basis, however, tests conducted during the COVID-19 pandemic experienced a greater decline than tests conducted before the pandemic. The findings of this study can thus be used as evaluation and improvement material for teachers, coaches, and soccer extracurricular participants, particularly in terms of improving physical condition to achieve better results.

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