

Students' Proficiency in Volleyball and Physical Fitness Level

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Abstract

Objective. This study aimed to conduct a comprehensive assessment of the physical fitness levels and fundamental abilities essential for playing volleyball, with a specific focus on eighth-grade students enrolled at SMP Negeri 3 Belo. The assessment aimed to provide valuable insights into the student's overall health and fitness levels and identify areas that require improvement to enhance their potential for excelling in volleyball.

Material and Method. The research study comprised 27 students in class VIII enrolled in SMP Negeri 3 Belo to analyze the data collected from the participants using the SPSS Version 16.00 program. The research methodology adopted for this study is quantitative, and the data was collected through surveys, assessments, and other relevant methods. The study's primary objective was to identify the correlations and patterns in the data, and the results were analyzed using statistical tools and techniques to draw meaningful conclusions.

Result. The fitness assessment has yielded promising results, with an average score of 18.14 indicating good physical fitness among the participants. Additionally, the basic volleyball skills test revealed that 14.3% of the participants displayed excellent skills, while 7.1% showed good skills. A majority of 42.7% fell under the medium skills category, followed by 21.4% of the participants with poor skills. The remaining 10.7% demonstrated very little skill in the sport.

Conclusion. Based on the assessment of basic volleyball playing skills among class VIII students of SMP Negeri 3 Belo, it can be concluded that their performance falls under the moderate category, with an average score of 147.96. This indicates that while the students possess a basic understanding of volleyball techniques and rules, there is still room for improvement in terms of their overall proficiency.

Keywords: Physical, Fitness, Volleyball skills

Introduction

The human body gets nutrients in the form of animal protein and vegetable protein (Hiskya et al., 2023) this nutrient supports physical fitness which refers to the body's ability to perform daily tasks without excessive fatigue, while still having energy reserves to handle additional workloads (Ikbal et al 2024). Physical fitness is crucial for humans to carry out their daily activities without experiencing significant fatigue. Being able to avoid fatigue means that individuals can still have enough energy and enthusiasm to enjoy their leisure time and attend to sudden needs. Improving physical fitness is closely linked to engaging in sports activities. (Yunita Herlina, 2023). By exercising regularly and regularly, humans can encourage the development and development of a person's physical and spiritual potential, both individually and in community groups, in the form of games, competitions, or competitions (Sufitriyono et al., 2023).

Sport refers to physical and mental activities that promote physical fitness and well-being (Mulyaningsih et al., 2023). Many types of sports can be done. The benefits of exercise for the human body can help protect against disease and reduce stress (Burhein et al., 2023). Exercise can also build the muscles in the human body and maintain body stamina. Various types of sports, many sports that can be done with interest and desire. There are types of sports that can be done alone or in groups such as running, swimming, softball, basketball, volleyball, football, futsal, and so on (Firman Farial Anwar, 2023).

Volleyball is a sport played by two opposing groups, each group has six players (Aser Paul Nainggolan¹, Rizki Bastanta BManalu², 2023). It cannot be denied that volleyball has become a sport that is very popular with people around the world, especially Indonesian people (Fitriani Bulonggodu, Sarjan Mile, Risna Podungge, Asry Syam, 2023). It is not surprising that volleyball is played by almost all groups, from rural communities, and office workers, to urban residents who live in housing complexes. In fact, in high schools and college campuses, there are currently many volleyball courts (Bumburo et al., 2023).

Volleyball is a sport that is popular among people because it is a fun game. This can be seen from the many volleyball competitions held between schools in Surabaya, for this reason, it is hoped that volleyball coaching will begin to be carried out in schools with training aimed at improving playing skills (Batiurat et al., 2023). To be able to improve your playing skills, you must be able to master the basic techniques of playing volleyball well. Basic technique is the most important element in the game of volleyball. Without good mastery of basic technique, the game of volleyball cannot be played perfectly (Irwanto et al., 2023). These basic techniques need to be trained. Training refers to the process of putting in effort to improve one's overall physical condition through a systematic and repeated approach that involves increasing the amount of training load, time, or intensity (Manullang & Wijaya, 2023).

The fundamental techniques of playing volleyball include serving, passing, setting, spiking, and blocking (Jayadilaga et al., 2023). The fundamental techniques of playing volleyball include serving, passing, setting, spiking, and blocking (Yuni Astuti, 2023). Further information was conveyed by (Yuni Astuti, 2023) that the level of achievement to be achieved that is so high requires the support of a high level of physical fitness to be able to carry out good technical movements and tactics to achieve success in a match or competition.

A person who has sufficient strength, ability, creativity, and endurance to work efficiently without significant fatigue is said to be physically fit (Yuniarko et al., 2023). Physical fitness is a person's functional ability to face their work. So, a fit person will be able

to carry out his work repeatedly without causing significant fatigue and still have the reserve capacity to overcome unexpected difficulties. (Hayati et al., 2023).

The primary objective of physical fitness is to establish the fundamental physical basis for athletes in the sport of volleyball (Purnomo & Nurrochmah, 2023). Lack of endurance can negatively impact a volleyball player's performance. Strength, speed, and ability are crucial components of physical fitness for success in volleyball (Hariansyah, 2023). Muscular endurance, cardiorespiratory endurance, flexibility, and body composition are all important components for an athlete to have. For a volleyball player specifically, having good endurance is crucial to play for 3 to 5 sets in a match. Therefore, maintaining good physical fitness is key to an athlete's success, especially in the sport of volleyball (Phalevi et al., 2019).

Materials and Methods

Study Participants.

The study was conducted at SMP Negeri 3 Belo, located in the Belo District of Bima Regency. The sample included 27 students, all of whom had an average age of 14 years.

Study organization.

This study employs quantitative research to establish the correlation between the physical fitness and fundamental volleyball skills of class VIII students at SMP Negeri 3 Belo. A survey method has been used to collect the data, where the TKJI test technique for physical fitness has been implemented. The test includes a range of physical fitness measures:

1. Run 60 meters

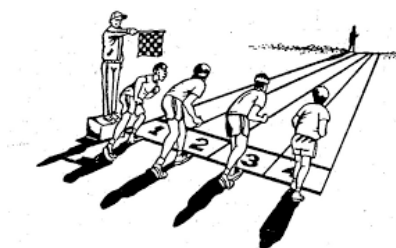


Figure 1. Start to Run 60 meters (Cerika Rismayanthi, 1984).

2. Hang bent elbows



Figure 2. Hang bent elbows position (Cerika Rismayanthi, 1984).

3. Sit Up

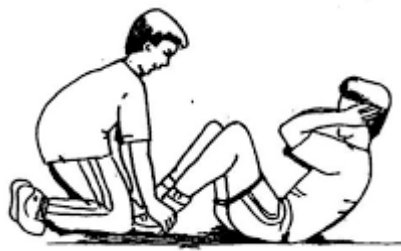


Figure 3. Sit Up Position (Cerika Rismayanthi, 1984).

4. Upright Jump

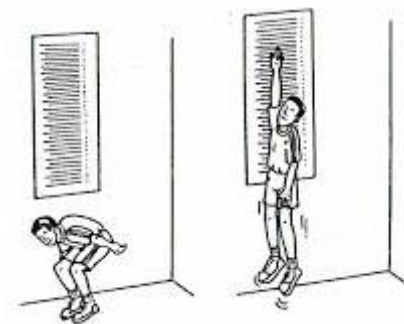


Figure 4. Upright Jump Position (Cerika Rismayanthi, 1984).

Meanwhile, to find out basic volleyball skills, use the Braddy Volyball Test

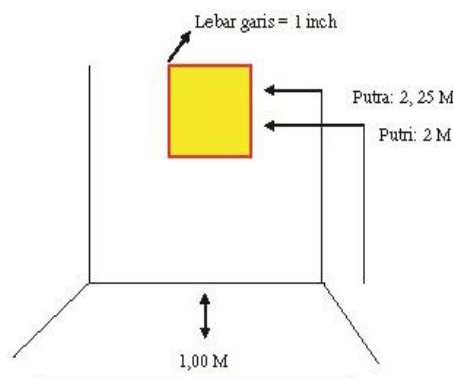


Figure 5. Braddy Volleyball Test (Ngatman, 2019).

Statistical analysis.

Data on physical fitness level and data on basketball playing skills tests, to test the hypothesis proposed in this research, the data was compiled, processed and analyzed using computer assistance through the SPSS program. The analysis technique to provide a general overview of the level of physical fitness and basketball playing skills is to use a percentage formula. The formula is as follows:

$$P = x \ 100 \frac{n}{N}$$

Description:

P = Percentage

n = Data Frequency

N = Number of research samples

To determine the physical fitness level classification standards used are:

1. Table 1 below shows the Indonesian Physical Fitness Test (TKJI) assessment norms for young men aged 13-15 years for the Physical Fitness Test:

Table 1. TKJI Score
(Male aged 13-15 years)

Run 50 meters	Score	Hanging body lift	Sit Up	Upright Jump	Run 1000 meters	Score
S.d – 6,7"	5	16 - Keatas	38 - Keatas	66 Keatas	s.d – 3'04"	5
6.8" – 7,6"	4	11 – 15	28 – 37	53 – 65	3'05" – 3'53"	4
7,7" – 8,7"	3	6 – 10	19 – 27	42 – 52	3'54" – 4'46"	3
8,8" – 10,3"	2	2 – 5	8 – 18	31 – 41	4'47" – 6'04"	2
10,4" - dst	1	0 – 1	0 – 7	0 - 30	6'05" - dst	1

Table 2. Test Norms Indonesian Physical Freshness
(Male and Female)

No	Total Score	Physical Fitness Classification
1.	22 – 25	Very good
2.	18 – 21	Good
3.	14 – 17	Fair
4.	10 – 13	Poor
5.	5 – 9	Very Poor

2. To assess the volleyball skills, use the Braddy Volleyball Test which modifies the target area's height. The target area is modified in this study due to the junior high school students' participation. According to (Ngatman, 2019) The Braddy Volleyball Test was designed mainly for male students, but it can be adapted for high school and middle school students by reducing the target area. For female students, the height of the target area was set at 2 meters while for male students, it was 2.25 meters. In this test, the target area box is 1 meter wide, has a 1-inch line, and is located 11 feet (3.35 m) above the floor. The basic volleyball playing skills of students are assessed through this test. The scores from the volleyball skills test items are recorded, and a regular T score is created to evaluate the students' performance (Ngatman, 2019). (Auliya & Lazim, 2020) stated that to give meaning to the existing scores, categories or groups are created according to existing levels. The categorization consists of five, namely very good, good, fair, poor, and very poor.

Table 3. Assessment Category Interval Formula

No	Norm Range	Categories
1	> Mean + 1.5 SD	Very good
2	Mean + 0.5 SD – < Mean 1.5 SD	Good
3	Mean + 0.5 SD – < Mean 1.5 SD	Fair
4	Mean + 0.5 SD – < Mean 1.5 SD	Poor
5	< Mean + 1.5 SD	Very Poor

Results

The following research was carried out on 27 eighth-grade students at SMP Negeri 3 Belo in Bima Regency, Belo sub-district. The data collected included physical fitness levels in areas such as running 60 meters, hanging with bent elbows, lying down, jumping upright, running 1200 meters, and overall physical fitness. The data has been summarized in the table below.

Table 4. Summary of analysis results, description of data for each variable

	Run 60m	Full up	Sit Up	Upright Jump	Run 1200m	TKJI	Description
N	27	27	27	27	27	27	27
Mean	8.11	14.62	35.85	52.88	4.04	18.14	147.96
Std. Dev	1.49	4.21	5.38	9.40	7.25	2.05	11.561
Range	5.46	18.00	25.00	47.00	3.05	9.00	71
Minimum	6.54	5.00	24.00	15.00	3.10	15.00	110
Maximum	12.00	23.00	59.00	62.00	6.15	24.00	181
Sum	219.13	395.00	968.00	1428.00	109.19	490.00	3403

Results of data analysis: Frequency percentage of physical fitness levels in class VIII students at SMP Negeri 3 Belo.

Results obtained regarding the physical fitness test consisted of running 60 meters, pulling up, hanging bent elbows, sitting up, jumping upright, and running 1200 meters for class VIII students at SMP Negeri 3 Belo.

a. Run 60m result

Table 5. Presentation of data frequency of 60m running test results

Score	Frequencies	Percent %	Classification	Description
s.d – 7,2"	11	40.7%	Very good	5
7,3 – 8,3"	8	29.6%	Good	4
8,4" – 9,6"	4	14.8%	Fair	3
9,7" – 11,0"	2	7.4%	Poor	2
11,1" dst	2	7.4%	Very Poor	1
Total	27	100		

The table above shows the results of the 60m running test taken by class VIII students of SMP Negeri 3 Belo. Out of 27 samples, 11 people (40.7%) were classified as "very good," 8 people (29.6%) as "good," 4 people (14.8%) as "moderate," 2 people (7.4%) as "poor," and 2 people (7.4%) as "very poor." Based on this data, it can be concluded that the results of the 60-meter running test obtained by class VIII students at SMP Negeri 3 Belo are categorized as "very good," with an average result of 8.11.

b. Pull up test result

The results of the pull-up test are expressed in percentages to obtain the frequency category for each variable obtained.

Table 6. Percentage of data on the frequency of pull-up test results

Score	Frequencies	Percent %	Classification	Description
19 – Keatas	5	18.5 %	Very good	5
14 – 18	11	40.7 %	Good	4
9 – 13	8	29.6 %	Fair	3
5 – 8	3	11.1 %	Poor	2
0 – 4	0	0.0 %	Very Poor	1
Total	27	100		

Based on Table 5 above, the full-up test results were obtained from Class VIII students of SMP Negeri 3 Belo. Out of 27 samples, 5 people (18.5%) had a very good classification, 11 people (40.7%) had a good classification, 8 people (29.6%) had moderate classification, 3 people (11.1%) had poor classification, and 0 people had a very poor classification. Therefore, it can be concluded that the full-up test results obtained by Class VIII students at SMP Negeri 3 Belo who participated in basketball extracurricular activities can be categorized as good with an average result of 14.62.

c. Sit up test result

The results of the sit up test are expressed in percentages to obtain the frequency category for each variable obtained.

Table 7. Percentage data on the frequency of sit up test results.

Score	Frequencies	Percent %	Classification	Description
41 – Up	3	11.1%	Very good	5
30 – 40	22	81.4%	Good	4
21 – 29	2	7.4%	Fair	3
10 – 20	0	0.0%	Poor	2
0 – 9	0	0.0 %	Very Poor	1
Total	27	100		

The research results of the Sit-Up test conducted on class VIII students of SMP Negeri 3 Belo indicate that out of 27 samples, 3 people (11.1%) were classified as 'very good', 22 people (81.4%) were classified as 'good', while 2 people (7.4%) were classified as 'moderate', and 0 people were classified as 'poor' or 'very low'. Based on these results, it can be concluded that the overall performance of the class VIII students in the Sit-Up test was 'good', with an average score of 35.85.

d. Upright Jump test result

The results of the vertical jump test are expressed in percentages to obtain the frequency category for each variable obtained.

Table 8. Percentage data on the frequency of upright jump test results.

Score	Frequencies	Percent %	Classification	Description
73-Up	0	0.0 %	Very good	5
60 – 72	7	25.9 %	Good	4
50 – 59	15	55.5%	Fair	3
39 – 49	4	14.8%	Poor	2
38 dst	1	3.7 %	Very Poor	1
Total	40	100		

The table above shows the results of the Upright Jump test performed on class VIII students of SMP Negeri 32 Belo. Out of the 27 students who took the test, none of them had a very good classification (0%), 7 students (25.9%) had a good classification, 15 students (55.5%) had a moderate classification, 4 students (14.8%) had a poor classification, and only 1 student (3.7%) had a very low classification. Therefore, it can be concluded that the results of the vertical jump test taken by class VIII students of SMP Negeri 3 Belo are moderate with an average result of 52.88.

e. Run 1200m test result

The results of the 1200-meter running test are expressed in percentages to obtain the frequency category for each variable obtained.

Tabel 9. Persentase frekuensi data hasil tes lari 1200 meter

Score	Frequencies	Percent %	Classification	Description
s.d – 3'14"	3	11.1 %	Very good	5
3'15" – 4'25"	13	51.8%	Good	4
4'26" – 5'12"	9	33.3%	Fair	3
5'13" – 6'33"	2	7,4 %	Poor	2
6'34" dst	0	0 %	Very Poor	1
Total	27	100		

According to Table 8, the 1200-meter running test results of Class VIII students from SMP Negeri 3 Belo were classified as follows: 3 people (11.1%) were classified as very good, 13 people (51.8%) were classified as good, 9 people (33.3%) were classified as moderate, 2 people (7.4%) were classified as poor, and 0 people (0%) were classified as very low. Therefore, it can be concluded that the overall result of the 1200-meter running test taken by Class VIII students of SMP Negeri 3 Belo was good, with an average score of 4.04.

f. Physical fitness level test results

The results of the physical fitness level test are expressed in percentages to obtain the frequency category for each variable obtained.

Table 10. Percentage of data frequency of physical fitness test results

Score	Frequencies	Percent %	Classification	Description
22 – 25	1	3.7 %	Very good	5
18 – 21	16	59.2%	Good	4

14 – 17	10	37%	Fair	3
10 – 13	0	0.0 %	Poor	2
5 – 9	0	0.0 %	Very Poor	1
Total	27	100		

According to table 9, the physical fitness test results of class VIII students from SMP Negeri 3 Belo show that out of the 27 sampled students, (1) person (3.7%) was classified as very good, (16) people (59.2%) were classified as good, (10) people (37%) were classified as moderate, and (0) people (0%) were classified as poor or very low. Therefore, it can be concluded that the physical fitness results of class VIII students of SMP Negeri 3 Belo can be categorized as good with an average result of 18.14.

g. Results of volleyball playing skills

The results of volleyball playing skills are expressed in percentages to obtain frequency categories for each variable obtained.

Table 11. Percentage of frequency data for volleyball playing skills

Nilai	Frekuensi	Persen %	Klasifikasi	Keterangan
180 - ≤	4	14.3%	Baik sekali	5
160 – 179	2	7.1%	Baik	4
140 – 159	12	42.7%	Sedang	3
120 – 139	6	21.4%	Kurang	2
< 119	3	10.7%	Kurang sekali	1
Jumlah	27	100		

Based on table 10 above regarding the results of the volleyball playing skills test obtained by class VIII students of SMP Negeri 3 Belo, of the 27 samples that had a very good classification (4) people (14.3%), good classification (2) people (7.1%), moderate classification (12) people (42.7%), poor classification (6) people (21.4%), and very low classification (3) people (10.7%). Thus, it can be concluded that the results of the volleyball skills test obtained by class VIII students at SMP Negeri 3 Belo can be categorized as very moderate with an average result of 147.96.

Discussion

Based on the results of the descriptive analysis of physical fitness level data for class VIII students at SMP Negeri 3 Belo are as follows:

1. The average time taken for the 60-meter run was 8.11 seconds, with a standard deviation of 1.49 and a range of 5.46 seconds from the fastest time of 6.54 seconds to the longest time of 12.00 seconds.
2. The total average value for pull-ups was 14 times, with a standard deviation of 4.21 and a range of 18.00, from the lowest number of 5 times to the highest of 23 times.
3. The total average value for sit-ups was 35 times, with a standard deviation of 5.38 and a range of 25.00, from the lowest number of 24 times to the highest of 49 times.

4. The total average value for upright jumping was 52.88 cm, with a standard deviation of 9.40 and a range of 47.00 from the lowest amount of 15 cm to the highest of 62 cm.
5. The average time taken for running 1200 meters was 4.04 minutes, with a standard deviation of 0.725 and a range of 3.05 minutes from the fastest time of 3.10 minutes to the longest time of 6.15 minutes.
6. The average physical fitness test score was 18.20, with a standard deviation of 2.05 and a range of 9.00 from the lowest value of 15.00 to the highest of 24.00.
7. The average score for volleyball playing skills was 147.96, with a standard deviation of 23.017 and a range of 71 from the lowest value of 110 to the highest of 181.

In conclusion, the research shows that the physical fitness level of class VIII students at SMP Negeri 3 Belo is good.

Conclusions

The research results show that the eighth-grade students at SMP Negeri 3 Belo have good physical fitness, and their volleyball skills fall in the medium category. The research supports the idea that good physical fitness makes students fit, which means they can participate in physical education activities without getting tired quickly. This can have a positive impact on their volleyball game performance. The physical fitness levels of twenty-seven students were tested, and the results showed that 16 students (59.2%) have good physical fitness, while 10 students (37%) have medium physical fitness. None of the students have poor physical fitness. The average physical fitness score is 18.14. The volleyball skills of the eighth-grade students at SMP Negeri 3 Belo were also tested, and the results showed that 4 students (14.3%) have very good skills, 2 students (7.1%) have good skills, 12 students (42.7%) have moderate skills, 6 students (21.4%) have poor skills, and 3 students (10.7%) have very poor skills. The average volleyball skills score is 147.96. The results of the volleyball skills test indicate that the student's skills are moderate. This is probably due to the physical activities and hygiene factors that support physical fitness.

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Conflict of interest

The undersigned authors hereby affirm that there exists no conflict of interest that could potentially bias the content of this work. We declare that we have no financial or personal relationships with any third party that could influence the outcomes or interpretation of the data presented herein. This statement attests to our commitment to upholding the highest standards of research integrity and transparency.

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