Jurnal SPORTIF: Jurnal Penelitian Pembelajaran
Vol. 6 No. 4, Special Issue 2020, pp. 38-56
https://doi.org/10.29407/js_unpgri.v6i4.15324

The physical condition profile of rock-climbing athletes in Bogor Regency

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Received: 29 October 2020; Revised: 5 December 2020; Accepted: 28 December 2020

Abstract

This study aims to determine the physical condition of rock-climbing athletes in Bogor Regency. Besides, it is also to make the basis for providing training proportions and finding the right solution to overcome the physical condition problems of rock-climbing athletes in Bogor Regency. This study uses a descriptive method approach using tests and measurements. The sample in this study were 15 rock climbing athletes in Bogor Regency. The instrument used in retrieving the data is a test instrument that has been arranged in the test and manual measurement and is following the physical conditions used in the sport of rock climbing. The results showed that athletes in the very good category was 13.34%, then in the good category was 13.34%, then in the moderate category was 66.66%, also in the poor category was 6.66%, and then 0.00% in the poor category. Furthermore, for researchers who will develop this research they ought to cover a wider range of materials, because this research is limited to athletes in Bogor Regency only.

Keywords: *rock-climbing athletes, strength, physical condition.*

INTRODUCTION

Sport is an effort to improve the quality of human life, apart from the main goal of forming a healthy lifestyle, through exercise, a person will benefit, one of which is that the body's metabolic system will run smoothly (Hardiyono, 2020). Sport is used as a means of unifying the nation, forming individual and collective characters, and has the potential to dynamize development sectors (Utami, 2015). The existence of sports nowadays has become an important part of people's lives (Prakoso &

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Sugiyanto, 2017). Sports coaching and development are directed at improving physical, mental and spiritual fitness as well as shaping the personality of the Indonesians who are disciplined and sporty to achieve achievement (Jamalong, 2014). To obtain achievements in a sport, it is necessary to have focused cooperation and pay attention to all aspects that contribute to these achievements. Among the sport activities that are carried out must be carried out in a programmed, directed and sustainable manner. As well as the application of self-discipline in doing and pursuing a sport (Rifandi, 2019).

In getting a high achievement in competitive sports, an athlete needs to be in prime physical condition according to the needs and demands of the sport. Excellent physical condition must be a necessity for every athlete, especially for sports that require long duration heavy performance (Mansur, 2016). Optimal performance can only be achieved, if an athlete has gone through a very complex training process. In the training process, the role of exercise physiology is the basis for modifying the exercise program. Sports physiology is a branch of physiology that studies physiological changes in the body when a person is exercising (Anggriawan, 2015). The same thing was said by (Lafanda et al., 2015) The application of sports physiology to improve athlete performance is very important to determine the exercise dose, the success of athlete's training during the training periodization. To obtain achievement, the rock climbing / wall sport branch offers opportunities for achievement.

Rock climbing is a sport that has a high level of difficulty and is full of challenges (Rifandi, 2019). Based on the category of climbing techniques, it is divided into 3, namely the level of difficulty, bouldering and speed of climbing (Zheng & Ke, 2020). In its development, the sport of rock climbing is modified into wall climbing, which distinguishes rock climbing from wall climbing, which is the medium. The media wall climbing is artificial cliffs, while media rock climbing is natural cliffs (Hardiono, 2018). Rock climbing sport has attracted young people to perform, moreover, this sport has been competed at the national and international

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levels. The existence of competitions has also encouraged those who are involved in it to continue to spur achievement.

One of the factors that affect the performance of an athlete in rock climbing is physical condition, because without good physical condition the athlete will not be able to apply climbing techniques optimally (Hardiono, 2018). This is following what was conveyed by Utami (2015), who stated that the physiology and ability of the physical condition are the initial foundations to sports achievement. Furthermore, efforts to improve sports achievement need to be carried out with coaching through talent scouting and scouting, nurseries, education and training for sports achievements which are based on science and technology effectively and efficiently, and improving the quality of sports (Jamalong, 2014).

Success is always associated with the purpose of an activity. The goal of rock climbing is to finish climbing with the correct technique and good physical and mental strength. Therefore, the success of climbing is identified with the completion of climbing to the end point using the ability of rock-climbing athletes. In this case the components of the physical conditions needed by athletes, especially rock-climbing athletes, include strength, flexibility, and balance. Strength in rock climbing supports the athlete to hold onto the points by lifting the body only with the grip and support at the points. Flexibility is useful for making it easier for rock climbing athletes to move on walls and get points for each point. Meanwhile, balance is useful in an effort to maintain endurance when climbing (Hardiyono et al., 2019). All components of these physical conditions are very important in supporting the performance of rock-climbing athletes so that they are sustainable with climbing techniques for completing the given path. The resulting performance in every physical activity including exercise is dominated by biomotor components. Each sport has a dominant biomotor component. Rock climbing athletes who have these three physical conditions are believed to get glorious achievements (Hardiono, 2018).

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This physical condition provides full support for the techniques needed in climbing. Thus, good physical condition will easily provide high achievement. Achievements in wall climbing are achieved by the success of the climbers in completing the climb to the final point (top) (Hardiyono et al., 2019). In other words, an athlete who has a good performance is likely to complete the climb to the end point (top) by scoring a faster time. The development of sports achievement following the correct concept and management must be carried out through various processes and stages within a certain period. The results showed that high-achieving athletes were born from long-term coaching that takes between 8-12 years (Rohman, 2019).

Referring to the concept above, the researcher tries to examine the physical condition profile of rock-climbing athletes. Research on the physical condition profile of athletes is very important so that the athlete's condition can be monitored to what extent the athletes' ability to obtain achievements. By knowing the physical condition profile, it is expected that the coach can optimally supervise and implement the training program that has been made and adjusted to the target to be achieved in the physical condition of each athlete himself.

METHOD

This type of research is quantitative with a descriptive approach, which is a research method that seeks to describe the object under study following its purpose of describing the facts and characteristics of the object under study appropriately (Sukardi, 2013). According to Maksum, (2012) The quantitative method can be interpreted as a research method characterized by hypothesis testing and used standard test instruments. According to Maksum (2012). Descriptive is research conducted to describe certain symptoms, phenomena or events. In this research, the focus is on the Physical Condition Profile of Rock-Climbing Athletes in Bogor Regency which includes flexibility, leg muscle strength, back muscle strength, hand muscle strength, hand muscle strength, arm muscle endurance, abdominal muscle endurance, balance, endurance. (Vo2max).

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To obtain appropriate data, this study uses survey methods and test and measurement techniques (Zuhdi et al., 2018). In researching the physical condition of the rock-climbing sport, the data collection techniques used include:

1. Flexibility using the Sit and Reach Test Box tool
2. Strengthen the leg muscles using the Leg and Back Dynamometer
3. Strengthening the back muscles using the Leg and Back Dynamometer
4. Hand muscle strength using the Handgrip Dynamometer
5. Arm muscle strength Using the Hand Dynamomenter
6. Arm muscle endurance using Push-up Test
7. Endurance of the abdominal muscles using the sit-up test
8. Balance using a stork stand test
9. Endurance (Vo2max) using the Bleep Test

Data that has been converted into t-scores are then interpreted, namely by categorizing the data. Categorization is grouped into 5 categories, namely: very good, good, enough, lacking, very lacking. Categorization using reference to 5 normal limits (Schffl et al., 2010), is as follows:

Table 1. Category Standard Score

No	Normal Range	Category
1	X ≥ M + 1,5 SD	Very Good
2	M + 0,5 SD ≤ X < M + 1,5 SD	Good
3	M – 0,5 SD ≤ X < M + 0,5 SD	Sufficient
4	M – 1,5 SD ≤ X < M – 0,5 SD	Less
5	X < M – 1,5 SD	Very Less

The next step after the data is obtained is to analyze the data to conclude the research being conducted. Analysis of the data used in this study was done using quantitative descriptive analysis techniques with percentages. According to Sugiyono (2015) the formula used is as follows:

$$P = \left(\frac{f}{N} \right) + 100\,\%$$

Information:

P = Percentage

F = Frequency

N = Number of respondents

https://doi.org/10.29407/js_unpgri. v6i4.15324
6 (4) 2020 | 38-56

ISSN : 2477-3379 (Online)
ISSN : 2548-7833 (Print)

RESULTS

1. Results of the Overall Physical Condition of Rock-Climbing Athletes

This study involved 15 rock-climbing athletes in Bogor Regency. All rock-climbing athletes who were the subjects of this study were tested and measured, including flexibility, leg muscle strength, back muscle strength, squeeze muscle strength, hand muscle strength, arm muscle endurance, abdominal muscle endurance, balance. The following are the results of the tests and measurements of rock-climbing athletes as a whole, which are presented in table two as follows:

Table 2. Results of the Overall Physical Components of Rock-Climbing Athletes

No.	Percentage	Frequency	Category
1	Very Good	2	13.33%
2	Good	2	13.34%
3	Enough	10	66.66%
4	Less	1	6.66%
5	Very Poor	0	0.00%

Based on the results of the physical condition of the athletes in rock-climbing as a whole in the table above, which amounts to 15 people, it is known that the percentage of physical components of rock-climbing athletes in Bogor Regency in the excellent category as much as 13.34%, then in the good category as much as 13.34%, then in the sufficient category as much as 66.66. %, then in the poor category as much as 6.66%, and then in the less category as much as0.00%. The following is presented in the form of a histogram to make it easier to understand the table:

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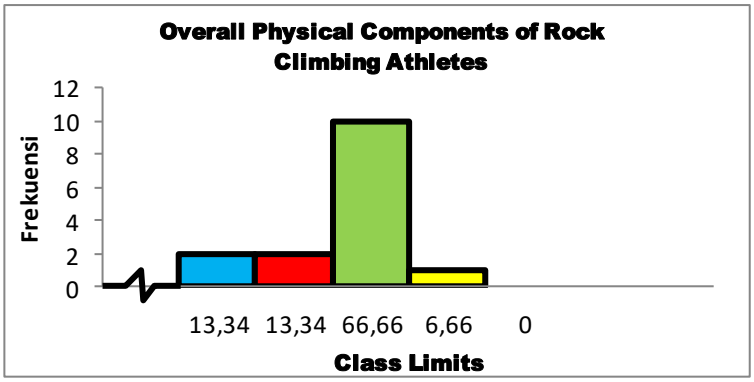

Figure 1. Histogram of the Results of the Overall Physical Components of Rock-Climbing Athletes

2. Results of Each Physical Component of Rock-Climbing Athletes

The results of the analysis of the physical components of rock-climbing athletes in Bogor Regency are presented with the descriptive analysis as follows:

a. Flexibility

The results of data collection on the physical condition of rock-climbing athletes on the flexibility test are presented in the following table:

Table 3. Flexibility Test Results

Percentage	Result	Conversion	Category
Very Good	26.4-30.1	3	20%
Good	22.3-26.3	4	26.6%
Enough	18.2-22.2	3	20%
Less	14.1-18.1	2	13.4%
Very Poor	<10.1-14	3	20%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the flexibility test for rock-climbing athletes in Bogor Regency in the excellent category are 20%, then in the good category as much as 26.6%, then in the sufficient category as much as 20%, then in the poor category as much as 13.4%, and then in the less category as much as 20%. The following is presented in the form of a histogram to make it easier to understand the table:

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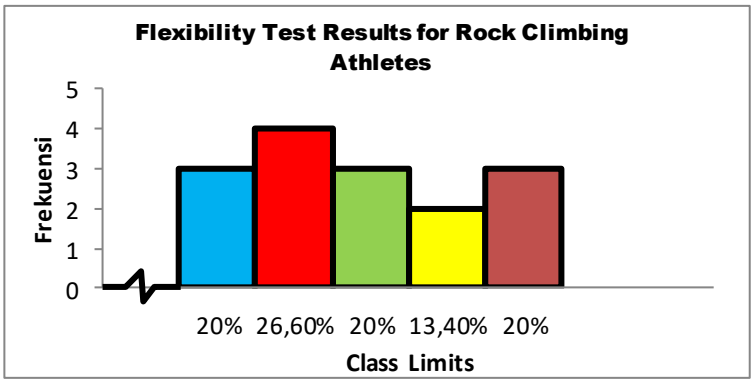

Figure 2. Histogram of Flexibility Test Results for Rock Climbing Athletes

b. Limb Muscle Strength

The results of data collection on the physical condition of rock-climbing athletes on leg muscle strength tests are presented in the following table:

Table 4. Leg Muscle Strength Test Results

Percentage	Result	Conversion	Category
Very Good	132.9-141	2	13.4%
Good	124.3-132.8	4	26.6%
Enough	115.7-124.2	6	40%
Less	107.1-115.6	2	13.4%
Very Poor	<98.5- 107	1	6.66%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the leg muscle strength test of rock-climbing athletes in Bogor Regency in the excellent category are as much as 13.4%, then in the good category as much as 26.6%, then in enough category 40%, then in the poor category as much as 13.4%, and then in the poor category as much as 6.66%. The following is presented in the form of a histogram to make it easier to understand the table:

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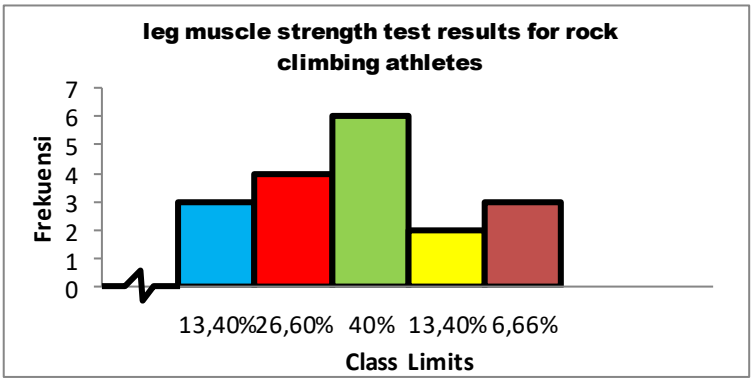

Figure 3. Histogram of leg muscle strength test results for rock climbing athletes

c. Back Muscle Nails

The results of data collection on the physical condition of rock-climbing athletes on leg muscle strength tests are presented in the following table:

Table 5. Back Muscle Test Results

Percentage	Result	Conversion	Category
Very Good	132.3-141.5	2	13.4%
Good	122.7-132.2	4	26.6%
Enough	113.1-122.6	7	46.6%
Less	103.5-113	1	6.66%
Very Poor	<94-103.4	1	6.66%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the back-muscle strength test for rock-climbing athletes in Bogor Regency in the excellent category as much as 13.4%, then in the good category as much as 26.6%, then in enough category 46.6%, then in the poor category as much as 6.66%, and then in the poor category as much as 6.66%.

The following is presented in the form of a histogram to make it easier to understand the table:

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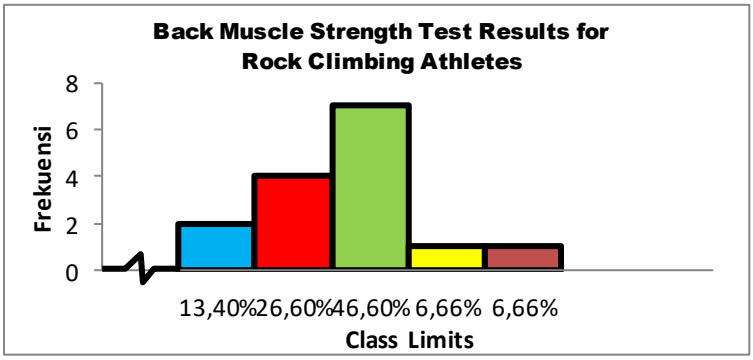

Figure 4. Histogram of Back Muscle Strength Test Results for Rock Climbing Athletes

d. Hand Muscle Strength

The results of the data collection on the physical condition of rock-climbing athletes on the hand muscle strength test are presented in the following table:

Table 6. Hand Muscle Test Results

Percentage	Result	Conversion	Category
Very Good	55.88-60.8	2	13.4%
Good	50.46-55.78	0	0.00%
Enough	45.04-50.36	9	60%
Less	39.62-44.92	2	13.4%
Very Poor	<34.2-39.52	2	13.4%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the hand muscle strength test of rock-climbing athletes in Bogor Regency in the very good category were as much as 13.4%, then in the good category as much as 0.00%, then in the moderate category as much as 60%, then in the poor category as much as 13.4%, and then in the poor category as much as 13.4%.

The following is presented in the form of a histogram to make it easier to understand the table:

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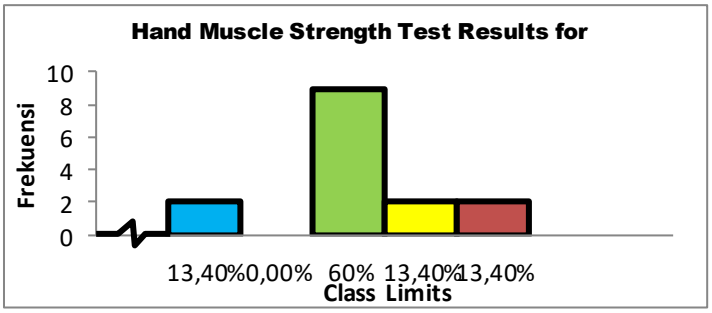

Figure 5. Histogram of Hand Muscle Strength Test Results for Rock Climbing Athletes

e. Arm Muscle Strength

The results of the data collection on the physical condition of rock-climbing athletes on the arm muscle strength test are presented in the following table:

Table 7. Arm Muscle Strength Test Results

Percentage	Result	Conversion	Category
Very Good	52.2-57.5	1	6.66%
Good	46.4-52.1	0	0.00%
Enough	40.6-46.3	8	53.33%
Less	34.8-40.5	5	33.33%
Very Poor	<29-34.7	1	6.66%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the arm muscle strength test for rock climbing athletes in Bogor Regency in the very good category were 6.66%, then in the good category as much as 0.00%, then in the moderate category as much as 53.33%, then in the poor category as much as 33.33%, and then in the poor category as much as 6.66%.

The following is presented in the form of a histogram to make it easier to understand the table:

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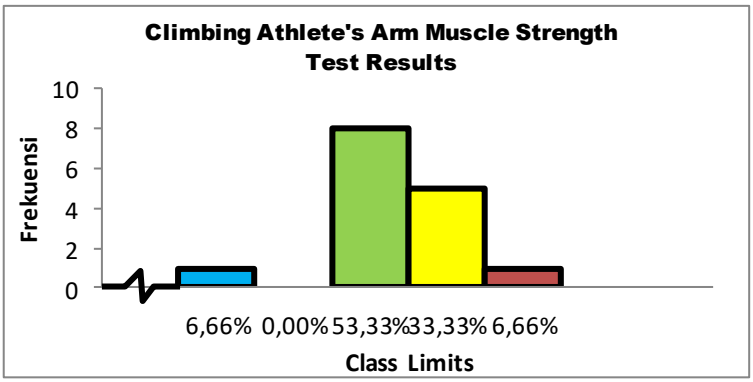

Figure 6. Histogram of Climbing Athlete's Arm Muscle Strength Test Results

f. Arm Muscle Endurance

The results of data collection on the physical condition of rock-climbing athletes on the endurance test of the arm muscles are presented in the following table:

Table 8. Arm Muscle Endurance Test Results

Percentage	Result	Conversion	Category
Very Good	52.4-56	3	20%
Good	48.3-52.3	5	33.33%
Enough	44.2-48.2	4	26.6%
Less	40.1-44.1	2	13.4%
Very Poor	<36-40	1	6.66%
		15	100%

Based on the results of the flexibility test for rock climbing athletes in the table above, which amounts to 15 people, it is known that the results of the endurance test for the arm muscle strength of rock-climbing athletes in Bogor Regency in the very good category as much as 20%, then in the good category as much as 33.33%, then in the moderate category as much as 26.6%, then in the poor category as much as 13.4%, and then in the poor category as much as 6.66%.

The following is presented in the form of a histogram to make it easier to understand the table:

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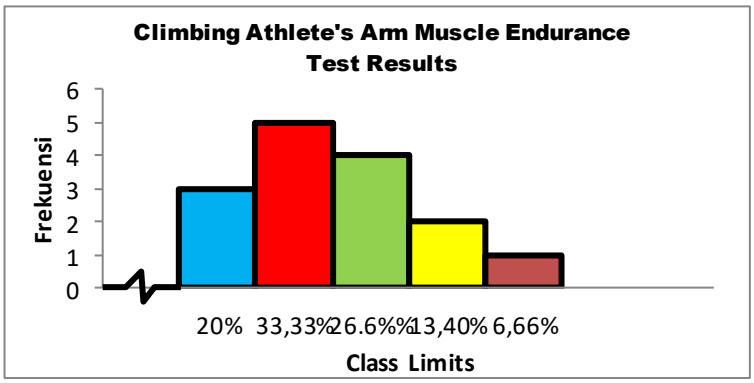

Figure 7. Histogram of Climbing Athlete's Arm Muscle Endurance Test Results

g. Abdominal Muscle Endurance

The results of data collection on the physical condition of rock-climbing athletes on the abdominal muscle endurance test are presented in the following table:

Table 9. Abdominal Muscle Endurance Test Results

Percentage	Result	Conversion	Category
Very Good	40.6-45	1	6.66%
Good	35.7-40.5	4	26.6%
Enough	30.8-35.6	5	33.33%
Less	25.9-30.7	2	13.4%
Very Poor	<21-25.8	3	20%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the abdominal muscle endurance test for rock climbing athletes in Bogor Regency in the very good category as much as 6.66%, then in the good category as much as 26.6%, then in the sufficient category as much as 33.33 %, then in the poor category as much as 13.4%, and then in the less category as much as 20%.

The following is presented in the form of a histogram to make it easier to understand the table:

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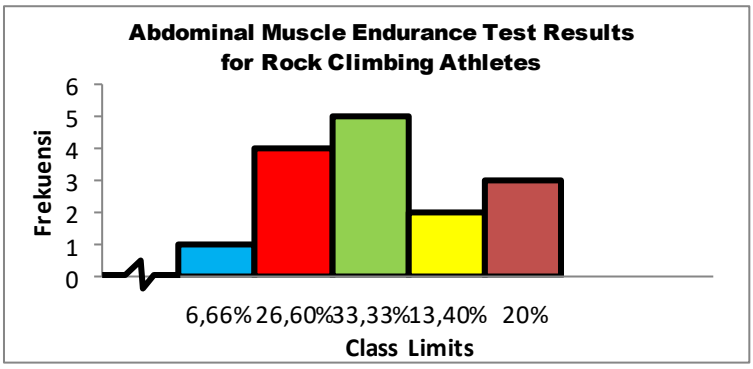

Figure 8. Histogram of Abdominal Muscle Endurance Test Results for Rock Climbing Athletes

h. Balance

The results of data collection on the physical condition of rock-climbing athletes on the balance test are presented in the following table:

Table 10. Balance Test Results

Percentage	Result	Conversion	Category
Very Good	80.2-89	1	6.66%
Good	70.9-80.1	6	40%
Enough	61.6-70.8	5	33.33%
Less	52.3-61.5	1	6.66%
Very Poor	<43-52.2	1	6.66%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the balance test for rock climbing athletes in Bogor Regency in the very good category as much as 6.66%, then in the good category as much as 40%, then in the sufficient category as much as 33.33%, then in the poor category as much as 6.66%, and then in the poor category as much as 6.66%. The following is presented in the form of a histogram to make it easier to understand the table:

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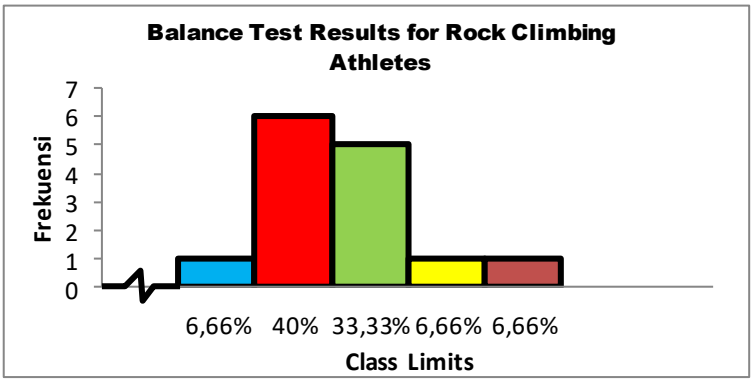

Figure 9. Histogram of Balance Test Results for Rock Climbing Athletes

i. Durability

The results of data collection on the physical condition of rock-climbing athletes on the endurance test are presented in the following table:

Table 11. Balance Test Results

Category	Conversion	Results	Percentage
Very good	52.4-56	1	6.66%
Good	48.3-52.3	3	20%
Fair	44.2-48.2	5	33.33%
Poor	40.1-44.1	3	20%
Very poor	<36-40	3	20%
		15	100%

Based on the results of the flexibility test for rock-climbing athletes in the table above, which amounts to 15 people, it is known that the results of the endurance test for rock climbing athletes in Bogor Regency in the excellent category were 6.66%, then in the good category as much as 20%, then in the sufficient category as much as 33.33%, then in the under as much as 20% category, and then in the less category as much as 20%. The following is presented in the form of a histogram to make it easier to understand the table:

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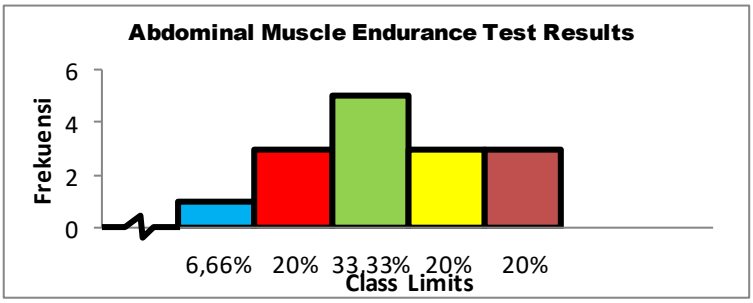

Figure 10. Histogram of Abdominal Muscle Endurance Test Results for Rock Climbing Athletes

DISCUSSION

This study aims to analyze the results of the physical condition of rock-climbing athletes in Bogor Regency. The results of the physical condition of the rock-climbing athletes in Bogor Regency as a whole, it is known that the percentage of physical components of rock-climbing athletes in Bogor Regency in the very good category is 13.34%, then in the good category as much as 13.34%, in the sufficient category as much as 66.66%, then in the poor category as much as 6.66. %, and then in the less category as much as 0.00%.

Every sport requires an excellent physical condition to be able to display the best performance. Physical condition is also a factor that greatly affects a person's achievement, without good physical condition, techniques cannot run perfectly (Sijunjung, 2020). Physical condition training programs must be well planned, systematically aimed at improving physical fitness and functional abilities of the body systems so that they can lead to athletes achieving better performance as expected. This means that to develop physical conditions, all of these components must be developed (Nurudin, 2015). Athletes with good physical condition values will be faster in the recovery process and during the match (Al Ayubi, 2017) so that it will make athletes move and play effectively and efficiently to perform proper movement techniques (Azidman, 2017).

Following what the researcher described above, it is very clear that rock-climbing athletes must have a good physical condition. This means that climbers must have the ability to perform physical activity during the

https://doi.org/10.29407/js_unpgri. v6i4.15324
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climb. To pursue peak achievement, well-programmed training is needed, training to shape and change the physiological response in addition to the physical elements involved in training (Sastiezy, 2018).

CONCLUSION

Based on the results of data processing and analysis of what has been described in this study, this study concludes that the physical condition of the rock-climbing athletes in Bogor Regency is in a fairly good category, even though among the rock-climbing athletes there are still those who are not in good conditions, due to some athletes. Recently joined the Bogor Regency rock climbing team. By looking at the existing results, it is hoped that athletes will always maintain and improve their physical condition, so that the training program that has been designed by the coach can run optimally.

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