

# Analysis of the Physical Condition of the *Pencak Silat* Athletes

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**ABSTRACT.** This study aims to determine the level of physical condition of athletes in the sport of Pencak Silat KONI Banjarnegara in preparation for the Kedu Pekalongan and Banyumas Sports Week (PORDULAONGMAS). The method in this research is using descriptive analysis method. The population in this study were athletes of the KONI Banjarnegara pencak silat with a sample of 21 people. The data collection technique used a test to measure the physical condition. Based on the test results measuring the physical condition of the athletes of the Banjarnegara Regency pencak silat in general are in the quite good category. As for the physical condition specifically, the average cardiovascular endurance is 38.1 which is in the moderate category, the average arm muscle endurance is 52.86 in the very good category, the average grip strength of the right hand is 25.71 with the poor category. and the average left hand grip strength 23.05 is in the enough category, the average back strength is 78.5 in the very good category, the average leg strength is 110.67 in the enough category and the average leg power is 35.05 included in the sufficient category, the average abdominal strength was 52.86 very good, the average agility 20.47 was in the enough category and the average flexibility was 14.40 in the poor category.

**Keywords:** Analysis, Physical Condition, Athletes, Pencak Silat.

## 1. INTRODUCTION

Pencak silat is one of the sports and martial arts as well as the popular culture of the Indonesian nation from the past until now [1] which needs to be maintained so that its existence is not lost or recognized by other countries, as has happened to some indigenous Indonesian cultures that are recognized by other countries today [2]. Pencak silat has values that can be studied and preserved as stated by Agung Nugroho (2004) that pencak silat is a self-defense system that has four values as a unit, namely ethical, technical, aesthetic, and athletic values. The sport of pencak silat is currently growing rapidly, because it has received positive attention from all circles of society and the government [4]. This is what causes pencak silat to become one of the original sports from Indonesia which is starting to go global, this can be seen from the emergence of pencak silat classes at fitness centers and the emergence of extracurricular pencak silat in schools and student activity units on campus both on an international and regional scale according to the values. -the values contained in pencak silat, and the

number of pencak silat schools that have emerged both in rural and urban areas in Indonesia [4] [2]. Likewise, the development of pencak silat in Banjarnegara is very rapid, this can be seen from the number of silat schools including; loyal heart, raga teak, son of the pesantren, panca hikmah [5].

Pencak silat in the study of sports achievement gets the attention of coaches, coaches, and athletes. Achievements in the sport of pencak silat really need guidance starting from the availability of training facilities and infrastructure, training programs, health programs, to regulating balanced nutrition. Achievement in sports can be achieved by planning a training program that has clear goal settings and involves several parties such as athletes, parents, sponsors, and coaches [2]. Each sport has one or more dominant physical components, but basically all physical components will be given to athletes to support the dominant components in certain sports [6] [7] [2].

Seeing pencak silat specifically in the achievement study for Banjarnegara Regency, the essence of performance sports is the management of coaching to achieve achievements in various

competitions, both national and international. Support is needed so that they are able to deliver athletes to excel [8], for this reason this research will analyze the physical condition of Banjarnegara athletes in preparation for the Kedu, Pekalongan, and Banyumas Sports Week (DULONGMAS), this is because pencak silat is one of the the mainstay achievement sport branch of Banjarnegara [9]. It is even more interesting that Banjarnegara benefited from a long history of martial arts warriors and the full support of the Banjarnegara Regent because the teachings of pencak silat are in line with the vision of Banjarnegara Regency to create dignified and prosperous human beings [10].

The achievements of the Banjarnegara sport of pencak silat in the last five years were that in 2015 Dulongmas donated 7 gold, 6 silver and 1 bronze. 2016 Pon Jabar 1 gold and 1 bronze, Popnas 2017 2 gold. In 2017 Kejurprov / PraPorprov 3 gold, 2 silver and 1 bronze. Porprov 2018 2 gold, 2 silver and 3 bronze. Popda SMP 2014 1 gold, 2 silver and 2 bronze. Popda SMP 2015 1 gold, 3 silver and 1 bronze. Popda SMP 2016 2 gold and 2 bronze. Popda SMA 2014 4 gold, 1 silver and 1 bronze. O2SN 1 gold. Popda SMA 2015 2 bronze. Popda SMA 2016 1 gold, 1 silver and 2 bronze. O2SN 2 gold. 2018 2 gold. Popda SMA in 2019 won 4 silver 1 bronze medals [11].

The determining factors in achieving sports achievement include the fulfillment of physical condition factors, which consist of strength, speed, agility, coordination, power, muscle endurance, heart and lung work power, flexibility, reaction speed and health for exercise [12] There is a big possibility that one of the problems that cause athletes to not achieve maximum performance is due to weakness in their physical condition [13]. Meanwhile, the selection of facilities as an external factor [14] and the regulation of physical loads and their arrangement during training must be carried out in accordance with the fitness level and physical condition of the athlete [15].

So far, it is not certain how good the physical condition of the Pencak silat athletes in Banjarnegara Regency is through the Sport science approach with the test and measurement method. This needs to be a concern for KONI Banjarnegara Regency in preparing its athletes for tournaments or competitions, especially in order to prepare for the Dulongmas Sports Week in 2021.

Based on the explanation above, the writer is interested in studying more about, how is the physical condition of the KONI athletes in Banjarnegara Regency? This research is focused on measuring the physical condition according to the dominant factors in the sport of pencak silat which will be discussed in the following method of discussion results.

## 2. METHOD

The method is a systemized way of working to facilitate the implementation of an activity in order to achieve the specified goals [16]. While the method used in this research is to use descriptive analysis method [1]–[4] which is a research that seeks to describe a symptom, event, event that is happening now [17] or research that investigates conditions, conditions or other things that have been mentioned, the results of which are presented in the form of a research report [18] with a quantitative approach that aims to describe or explain events or incidents that occur at the present time in the form of numbers. significant numbers [19] or research data in the form of numbers and analysis using statistics [20].

Population is a generalization area consisting of objects / subjects that have certain qualities and characteristics that the researcher determines to study and then draw conclusions [21]. The population in this study were the athletes of the KONI Banjarnegara pencak silat. While the sample is a part or representative of the population to be studied [22] in this study using a sample of 21 people. The data collection technique uses a physical condition measurement test which includes:

- 1) Cardiovascular endurance, a measurement of cardiovascular endurance is needed to determine the fitness level of athletes using the Multi Stage Fitness Test (MFT). Ideal fitness will affect achievement or performance [23].
- 2) Arm muscle endurance, measurement of muscle endurance is needed to determine the level of arm muscle endurance using the Push Up test [24] [25]
- 3) Strength is the capacity to recruit into the activity the maximum number of motor units of a given force [26]. While the measurement of grip strength is needed to measure the muscle strength of the right and left hands using a Handgrip Dynamometer
- 4) Back muscle strength, measurement of back muscle strength is needed to determine the level of back muscle strength using a Back Dynamometer
- 5) Leg muscle strength, is needed to determine the level of leg muscle strength using a leg dynamometer
- 6) Leg power, needed to measure the explosive power of the leg muscles using a vertical jump
- 7) Strength of the abdominal muscles, is needed to determine the level of strength of the abdominal muscles using the Sit Up test
- 8) Agility is needed to measure the agility level of athletes [27] [28] using the Illinois agility run test
- 9) Flexibility is needed to measure the level of flexibility of athletes using the Sit and Reach test [29] [30]

### 3. RESULT

#### 3.1 Multi Stage Fitness Test

Based on the calculation, it can be seen that the condition of cardiovascular endurance (VO2Max) in 21 athletes of pencak silat in Banjarnegara Regency has 1 athlete of 4.76% including in the very good category, then there are 3 athletes or 14.29% are in the good category, there are 12 athletes. or 57.14% in the sufficient category, there were 5 athletes of 23.81% in the low category and no athlete with the very poor category. More details can be seen in figure 1 below;

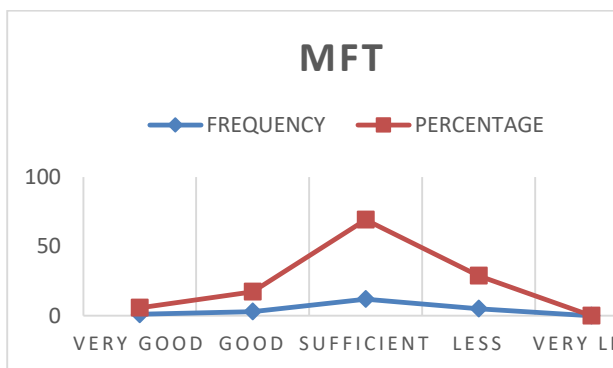


Figure 1. Multi Stage Fitness Test (MFT) Results

#### 3.2 Push Up Test

Based on the results of the calculation, it can be seen that the arm endurance conditions in 21 pencak silat athletes in Banjarnegara Regency are 19 athletes or 90.48% in the very good category, there are 2 athletes of 9.52% who are in the good category, and there are no athletes with sufficient categories less or very less. More details can be seen in Figure 2 below;

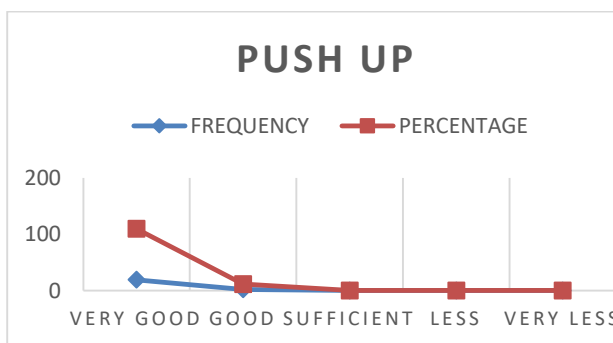


Figure 2. Push Up Test Results

#### 3.3 Handgrip Dynamometer Test

Based on the results of the calculation, it can be seen that the condition of the right handgrip strength in 21 athletes of pencak silat, Banjarnegara Regency, there are no athletes with very good categories, there are 2 athletes of 9.52% in the good category, then there are 3 athletes or 14.29% included in the category enough, and there were 6 athletes or

28.57% in the poor category and there were 10 athletes or 47.62% who were in the very poor category. There are 2 athletes in the left handgrip strength or 9.52% in the very good category, 3 athletes or 14.29% in the good category, 6 athletes or 28.57% in the enough category, there are 5 athletes or 23.81% in the poor category. and very less. More details can be seen in Figure 3 below;

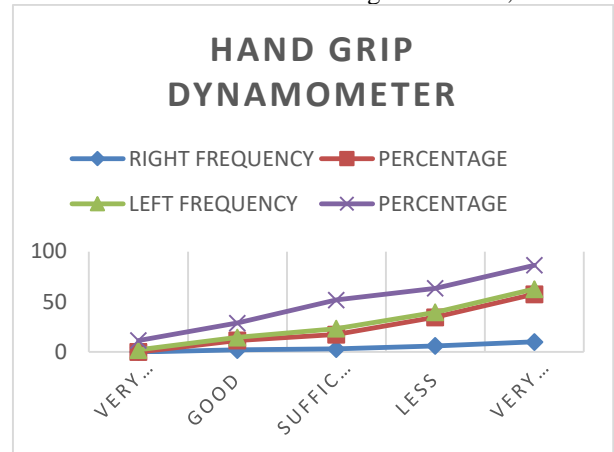


Figure 3. Handgrip Dynamometer Test Result

#### 3.4 Back Dynamometer Test

Based on the calculation results, it can be seen that the condition of back muscle strength in 21 athletes of pencak silat Banjarnegara Regency is that there are 4 athletes or 19.05% with very good categories, there are 6 athletes of 28.57% in the good category, then there are 4 athletes or 19, 05% is included in the moderate category and inadequate category, and there are 3 athletes 14.29% with very poor category. More details can be seen in Figure 4 below;

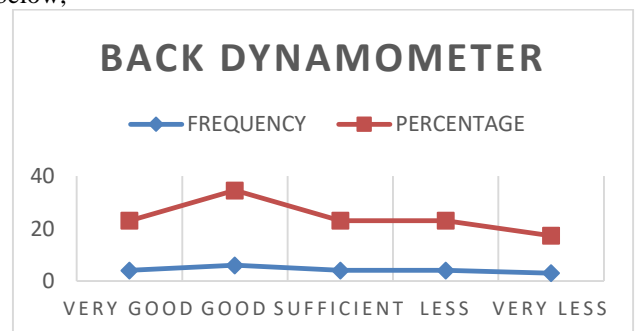


Figure 4. Back Dynamometer Test Results

#### 3.5 Leg Dynamometer Test

Based on the results of the calculation, it was found that the condition of leg muscle strength in 21 pencak silat athletes, Banjarnegara Regency, there were 2 athletes or 9.52% in the very good category, there was 1 athlete of 4.76% in the good category, there were 12 athletes or 57.14%. included in the sufficient category, there were 3 athletes or 14.29% in the low and very poor category. More details can be seen in Figure 5 below;

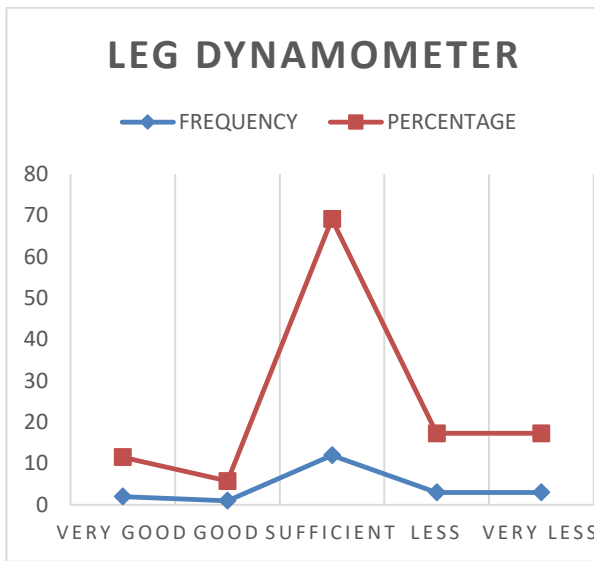


Figure 5. Leg Dynamometer Test Results

**3.6 Vertical Jump Test**

Based on the results of the calculation, it can be seen that the condition of the power of leg muscles in 21 athletes of martial arts in Banjarnegara Regency does not have very good and good athletes, there are 8 athletes of 38.10% in the sufficient category, there are 12 athletes or 57.14. % is in the poor category, there is 1 athlete or 4.76% in the very poor category. More details can be seen in Figure 6 below;

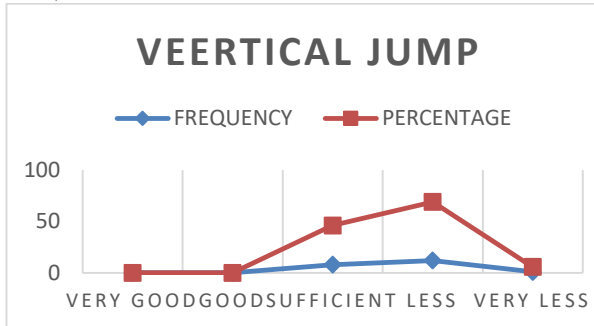


Figure 6. Vertical Jump Test Results

**3.7 Sit Up Test**

Based on the results of the calculation, it is known that the condition of the abdominal muscle strength in 21 athletes of pencak silat, Banjarnegara Regency, there are 19 athletes or 90.48% in the very good category, there are 2 athletes of 9.52% in the good category, and there are no athletes with enough, less categories. , and very less. More details can be seen in Figure 7 below;

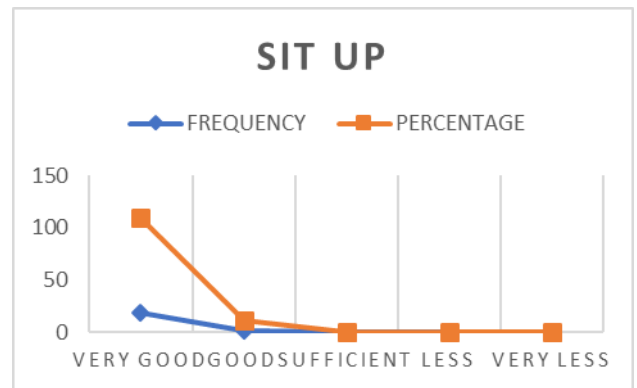


Figure 7. Sit Up Test Results

**3.8 Illinois Aglity Test**

Based on the results of data analysis, it can be seen that the condition of agility in 21 athletes of pencak silat, Banjarnegara Regency, there are no athletes with very good categories, there are 2 athletes or 9.52% in good categories, there are 12 athletes of 57.14% in the enough category, there are 6 athletes. athletes or 28.57% were in the poor category, and 1 athlete or 4.76% were in the very poor category. More details can be seen in Figure 8 below;

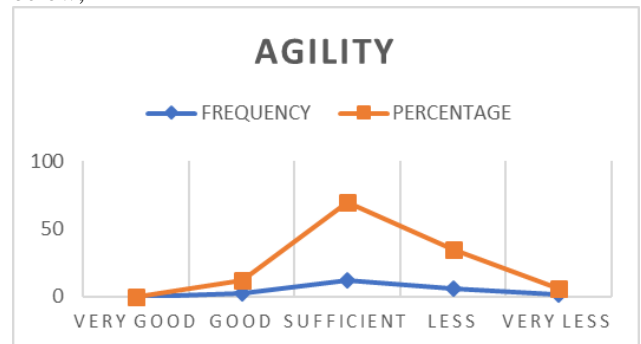


Figure 8. Illinois Aglity Test Results

**3.9 Sit and Reach Test**

Based on the results of data analysis, it was found that the condition of flexibility in 21 athletes of pencak silat, Banjarnegara Regency, there were no athletes with very good categories, there were 2 athletes or 9.52% in good categories, there were 5 athletes of 23.81% in the enough category, there were 4 athletes. athletes or 19.05% are in the poor category, and 10 athletes or 47.62% are in the very poor category. More details can be seen in Figure 9 below;

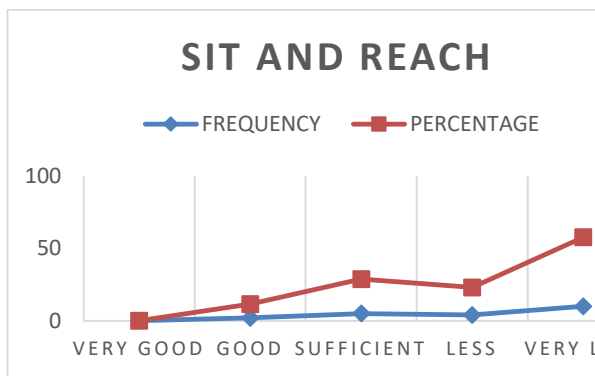


Figure 9. Sit and Reach Test Results

3.10 Overall Physical Condition

The results of the overall physical condition test will be described as follows:

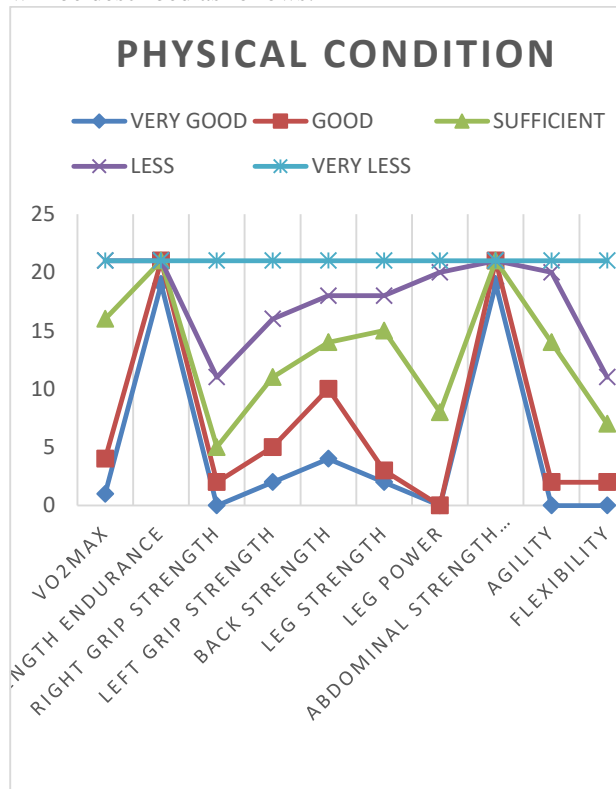


Figure 10. Overall Physical Condition Test Results

Based on Figure 10 above, it is known that the average physical condition of cardiovascular endurance is 38.1, including the moderate category, the average arm muscle endurance is 52.86 in the very good category, the average grip strength of the right hand is 25.71. with a less category and 23.05 average left hand gripping strength, the average back strength of 78.5 is in the very good category, the average leg strength is 110.67 in the moderate category and the average leg power 35.05 is in the moderate category, the average abdominal strength is 52.86 very good, the average agility 20.47 is in the enough category and the average flexibility is in the poor category.

4. DISCUSSION

Cardiovascular endurance is related to the workability of the cardiac system [31]. Cardiovascular endurance whose work system uses oxygen is called cardiovascular aerobes while endurance in its work system that does not use oxygen is called anaerobic cardiovascular. The energy system in the sport of pencak silat is predominantly using anaerobic metabolism which has the side effect of lactic acid [32]. In this martial arts sport, excellent physical condition is needed or the athlete must have a good vo2max capacity. Based on the test results, it is known that the cardiovascular endurance condition of the athletes of pencak silat in Banjarnegara Regency on average is 38.1, including the sufficient category.

Hand grip strength and arm muscle endurance are the most needed physical conditions in pencak silat, considering that strength is the ability of a group of muscles to hold a maximum load [33] while muscle endurance is the capacity of a group of muscles to perform continuous contractions while holding a load. submaximal load within a certain period of time [34]. Based on the test results, it is known that the average muscle strength of the Banjarnegara pencak silat athletes is 25.71 in the low category, for the lefthand grip strength is 23.05 in the sufficient category, while the average endurance of the arm muscles is 52.86. is in the very good category, hand muscle strength and arm muscle endurance function as the main factors in performing dings and punches in the basic movements of pencak silat.

Then the leg muscle strength in pencak silat which functions as a resistance in maintaining the balance of the athlete when doing movements and resistance or the stance which is supported by abdominal strength and back strength. Based on the test results, it is known that the average leg muscle strength of the Banjarnegara pencak silat athletes is 110.67 in the good enough category, while the average leg power is 35.05 in the moderate category. The average abdominal strength of the Banjarnegara martial arts athletes was 52.86 in the very good category, while the average back strength was 78.5 in the good category.

Flexibility is indispensable for pencak silat athletes in movement, flexibility is a necessary requirement for the continuation of motion for humans. This is because the movements shown can be more harmonious and rhythmic if supported by good body flexibility [35, p. 519]. In pencak silat, flexibility for athletes greatly supports performance in producing rhythmic and harmonious movements.

5. CONCLUSION

The physical condition of the athlete is one of the

important aspects of sports performance, after which the technique and tactics can run optimally if the athlete has a very good level of physical condition. The aspect of physical condition is the most important part in all sports, especially to support other aspects such as; mentality, techniques, tactics and strategies in competing or competing [36]. Physical condition in performance sports is a fundamental part, this is because physical condition is very supportive of other aspects.

Based on the results of the research and discussion above, it can be concluded that: the physical condition level of the Banjarnegara athletes with a good physical condition is the backmuscle strength, abdominal muscle strength, and arm muscle endurance. However, special attention and training is needed on the physical components of cardiovascular endurance, flexibility, leg muscle power, leg muscle strength and hand muscle strength.

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