

## Development of Karate Physical Test Instrument Category Comparison (Kumite) Ages 14-17 Years

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### Abstract

These failures need to be corrected through practice, this is important to support performance when on the field. To increase the ability to exercise can be determining factors for a person's ability. Means there are several essential factors to improve performance in order to achieve optimal sports performance. Based on the background of the problem and the suitability of the focus of the study, this research is oriented to the preparation of a series of physical tests: How is the preparation of an effective physical test instrument model for athletes in karate? Produce physical test norms of karate athletes aged 14-17 years to identify athletes in the karate sports competition category (Kumite)? Karate is a technique that gives everyone the freedom to use a fist or defend themselves barehanded. Karate is a martial arts branch that has been known for a long time in Indonesia and is a sport that is quite popular with the general public, both in large cities and in small areas. The method used to develop or validate Development products is in the form of a test which includes physical test measurements that can be used to identify karate athletes in the match category (kumite) aged 14 to 17 years. The basic consideration of this type of research and development is used to develop karate physical test instruments. The leg length factor has a dominant effect on karate play. The weight factor in this study is very influential in the game because the more relaxed the body is more freely in moving. The ideals in the body are very influential in karate motion skills. Reaction time test by Androi, Hexagone Obstacle Test, Hurdle Jump, Quick Strike, in this case the training method conducted by the researcher is the right method to measure and improve a physical ability of karate athletes, especially the kumite sparring category, age range of 14-17 years. Anaerobic capacity is determined by the maximum capacity of oxygen consumption and psychological capacity against physiological difficulties. How to train and measure the anaerobic abilities of karate athletes with Rust (Anerobic Running based anaerobic sprint test).

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## INTRODUCTION

Sports coaching in Indonesia in addition to forming Indonesian people who are physically and mentally healthy, also cultivates and fosters honesty, sportsmanship (Hasbunallah, 2018).

Increased progress in the field of sports must be balanced with an increase in human resources. In this case through the efforts and coaching and development of sports, sport has a role in national development needs to be fostered and developed. Through training centers or clubs it should improve spiritual health, character, discipline, sportsmanship, and the development of sports achievements that can arouse national pride in promoting sports, as well as efforts to encourage people to actively participate in sports activities (Utami 2015).

Sports achievements need to be carried out through athlete coaching as early as possible by way of talent search and monitoring, nursery, education and sports training achievements through extracurricular activities. Maximum achievement in sports can be achieved if a solid foundation starts from elementary school. This means coaching to lay a solid foundation must be done as early as possible. Because this is what determines a child's physical, mental, emotional, social and sport performance (Siswanto, Rahayu, Fakhrudin, 2017).

To reach the peak achievement, a trainer is expected to be able to guide athletes by providing training programs that fit the needs of athletes (Alsahbana, Soetjipto, 201).

The goal in a sports coaching is to achieve maximum achievement. In the world of sports, achievement is one of the factors in the success of sports development. In other words sports performance is an indicator that can be used directly to see the status or level of achievement and success in sports (Effendi 2016).

Karate is a branch of martial arts that has developed in Indonesia. Karate self-defense sports, like other martial arts sports, although known and impressed with a lot of violent violence in them, but become one of the favorite branches of martial arts and is loved by the world

community, including in Indonesia, from children to teenagers (Danardono, 2015).

Karate sport in the world is shaded by an organization called WKF (World Karate Federation). Karate in Indonesia is an empty-handed martial sport under an organization called FORKI (Indonesian Karate-Do Sports Federation). FORKI's goal is to develop karate-do as an art sport, as well as self-defense science to foster a noble and open personality for every Indonesian citizen (Indrajaya, Ismalarasi, 2017).

Karate match, used a variety of attacks to get as much value as possible in order to win a match. One of them used by karateka is kick. Kicks have features in a karate match. Kick techniques that are launched by karateka who enter and are right at the target get a greater value than the technique that is right at the target that can produce value (Nenggar, 2014).

The basic movements in karate have four elements namely Easel (dachi), Punch (Zuki), Kick (Geri), and Tangkisan (Uke). One of the basic movements in karate is kick, there are many types of kicks in karate which consist of Mae-Geri (kick toward the stomach or head with the forward direction), Mawashi-Geri (kick with the upper leg), Yoko Geri Kekome (kicks with the side legs by poking), Yoko Geri Keange (kicks with the side legs by fanning), Usiro-Geri (kicks with the backward direction) (Singgih, Wijono, 2018).

The principle in the committee is simple, hitting and kicking the opponent according to the target so that getting points and defending for the opponent does not enter the point. Kumite players must have a good basis for its application as well as a wealth of movement that is useful for a variety of techniques in playing committee, as for the techniques used in playing kumite namely attacking and defending including in the form of punches, kicks and defending (Suprapti, Julianti, Fahrezzy, 2018).

The role of attack techniques in kumite matches will determine the match, attack techniques that are carried out quickly and on target will be difficult to anticipate by opponents. Conversely, if an attack is carried out less well the attack will be easily anticipated by the opponent.

There are many kinds of attack techniques in kumite matches including punch, kick, fast punch and kickback techniques (Fedrian, Nurzaman, 2016).

For some people aerobic exercise such as jogging is felt to be light, because they are accustomed to jogging so the body has adapted. The training load must reach or exceed a little above the threshold limit, because too much weight will result in being unable to be adapted by the body, while if it is too light it does not affect the improvement in physical quality (Sukadiyanto, 2010) (Jurnal Kurnia, Kushartanti, 2013).

The benefits of aerobics is its effect on physical fitness, physical fitness can be obtained because aerobics involves all components of the body including the work of heart function and lung function called endurance (Candrawati, Selistyoningrum, Prakoso, Pranasari, 2016)

Power is a combination of strength and speed or mobilization of maximum muscle force with maximum speed, power or power is the ability of one's muscles to do a job with maximum strength in the shortest time possible, Eri Pratiknyo Dwikusworo, 2009 (in Tri Iswoyo and Said Junaidi (2015) .The arms are the limbs from the wrists to the shoulders.

Muscle strength is the maximum contraction produced by a muscle or group of muscles. Physiologically, muscle strength is the ability of a muscle or group of muscles to make a maximum contraction against resistance or weight. Mechanically, strength is defined as maximal force produced by a muscle or group of muscles (Bompa, 2009) (Jurnal Adhi, Sugiharto, Soenyoto, 2017).

## METHODS

The design used in this study is research and development design. According to Borg and Gall in Sugiyono (2009: 9), research and development is a method or method used to develop or validate Development products in the form of tests which include physical test measurements that can be used to identify karate athletes in the age 14 match category (kumite) up

to 17 years. The basic consideration of the type of research and development is used to develop the karate physical test instrument, because this type of research and development is product oriented and takes into consideration the substance and content according to its characteristics, its implementation is easy, clear, practical, safe, and useful and effective to help karate trainers in carrying out physical tests

## RESULTS AND DISCUSSION

The length of each interval class is 27 cm, the first interval class starts from the lowest body height 160 to 170 body height with a class length of 27 cm.  $F_2$  is the number of interval class frequencies while  $y_2$  is the middle value of the class interval. Whereas  $f_2y_2$  is the product of  $f_2$  and  $y_2$  which is used to find the average in frequency.

To find out more clearly about the height data of respondents can be seen in the historical diagram height as follows:

The number of intervason classes using the formula  $= 1 + 3.3 \times \log(n)$  is 5.59. For the frequency distribution of Reaction time test by android, the number of rounding classes is 6 classes so that the interval length can be calculated by dividing the range of data by the number of interval classes and a value of 1.24 is used, then the interval class length of 0.04 is used, the Reaction time test frequency distribution table by android PLPP Karate athlete in Central Java.

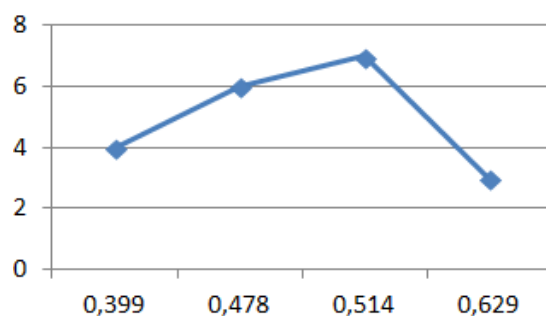


Figure 1. Reaction Time Test by Android

Based on the histogram diagram Reaction time test by android shows the lowest interval class between 20 athletes, 0.399 4 athletes, 0.478 with 6 athletes. Based on the results showed that

most athletes have between a total of 5 athletes, while at least 11.4 and 12.21 totaled 1 athlete. In figure 9.37, graphic images can be seen by athletes with intervals while at the ends of the interval both at large and small ends tend to have a small number of athletes, these results provide an overview of athlete's body weight data having normal distribution distribution.

The number of interval classes using the formula  $= 1 + 3.3 \times \log(n)$  is 5.59. For the Hexagone obstacle test frequency distribution, the number of rounding classes is 6 classes so that the interval length can be calculated by dividing the range of data by the number of interval classes and a value of 1.24 is used. Central Java.

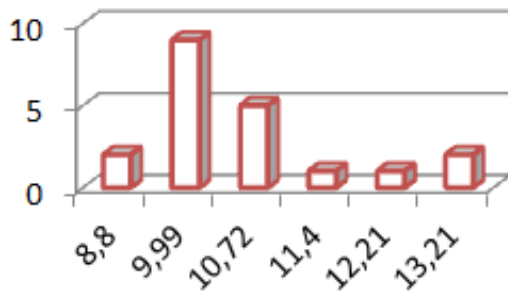


Figure 2. Hexagone Obstacle Test

Based on the Hexagone obstacle test histogram, the lowest interval class is between 20 athletes, 8.8 with 2 athletes, 9.99 with 9 athletes. Based on the results showed that most athletes had between 10.72 a total of 5 athletes, while at least 11.4 and 12.21 totaled 1 athlete. In graphic images, athletes can be seen with intervals while at the ends of the interval both at large and small ends tend to have a small number of athletes, these results provide an overview of athlete's body weight data having normal distribution distribution.

The number of interval classes using the formula  $= 1 + 3.3 \times \log(n)$  is 5.59. For the frequency distribution of Hurdle Jump used the number of rounding classes is 6 classes so that the interval length can be calculated by dividing the range of data by the number of interval classes and obtained a value of 270.94, then the interval class length of 194.95 Hurdle Jump athletes PLPP Central Java is used.

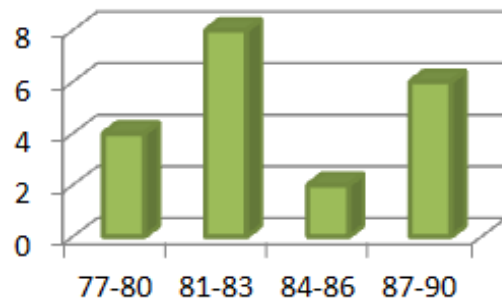


Figure 3. Hurdle Jump

Based on the Hurdle Jump histogram diagram shows the lowest interval class between 20 athletes, 77-80 of 3 athletes, 91-83 totaling 7 athletes. Based on the results showed the majority of athletes had between 81-83 a total of 7 athletes, while the fewest were 84-86 totaling 1 athlete. In graphic images, athletes can be seen with intervals while at the ends of the interval both at large and small ends tend to have a small number of athletes, these results provide an overview of athlete's body weight data having normal distribution distribution.

The number of interval classes using the formula  $= 1 + 3.3 \times \log(n)$  is 5.59. For the Quick strike frequency distribution, the number of rounding classes is 6 classes so that the interval length can be calculated by dividing the range of data by the number of interval classes and a value of 14.21 is used, then the interval class length of 14.21 Hurdle Jump athletes from PLPP Central Java athletes is used.

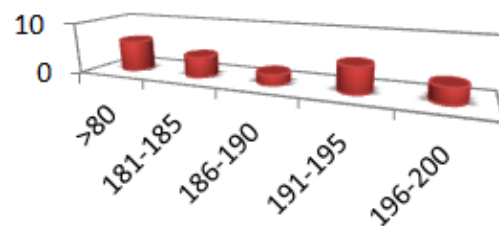


Figure 4. Quick Strike

Based on the Quick strike histogram diagram shows the lowest interval class that is between a number of 20 athletes, > 80 a number of 6 athletes, 181-185 totaling 3 athletes. Based on the results showed the majority of athletes were between 191-195 a number of 5 athletes, while the

least were 186-190 totaling 1 athlete. In graphic images, athletes can be seen with intervals while at the ends of the interval both at large and small ends tend to have a small number of athletes, these results provide an overview of athlete's body weight data having normal distribution distribution.



**Figure 5.** Anaerobik Running based Anaerobic Sprit Test (RAST)

Pre-test: Explain the test procedure for the subject. Screen health risks and get approval. Prepare forms and record basic information such as age, height, weight, gender, and test conditions. Measure and mark the course. Warm up to the standard. See more details of the pre-test procedure.

Procedure: Weigh each subject before the test to be used in calculations, followed by heating. Prepare cones at each end of the 35-meter running track. Two testers may be needed, because one person is required to calculate the time of each 35-meter round, the other counts the 10-second recovery period. The subject stands at one end of the 35m track, and starts the maximum sprint on the 'go' command. Make sure the subject runs to the maximum through the line each time. After 10 seconds, the next sprint starts from the opposite end of the 35m track. Repeat this procedure until the six sprints are complete.

Rating: Record the time taken for each sprint to the nearest hundredth of a second (using a time gate gives greater accuracy). Sprint time along with body weight can be used to calculate the maximum, minimum, and average power output along with the fatigue index.

Calculation: use the following formula to calculate power for each sprint (weight = subject weight, distance = 35m, time = seconds to run 35m). From these values, you can determine maximum and minimum power, average power, and fatigue index ((maximum power - minimum power) ÷ total time for 6 sprints)

$$\text{Power} = \text{Weight} \times \text{Distance}^2 \div \text{Time}^3$$

$$\text{Power} = \text{Weight} \times 1225 \div \text{Time}^3$$

## CONCLUSION

Based on the results of research that has been analyzed, the leg length factor has a dominant effect on karate play. The weight factor in this study is very influential in the game because the more relaxed the body is more freely in moving. The ideals in the body are very influential in karate motion skills. Reaction time test by Androi, Hexagone Obstacle Test, Hurdle Jump, Quick Strike, in this case the training method conducted by the researcher is the right method to measure and improve a physical ability of karate athletes, especially the kumite sparring category, age range of 14-17 years.

These techniques can be applied in physical enhancement exercises in the karate sports class committee at the age of 14-17 years. With the training procedure below with a gradual and improved exercise method to achieve good results. The following exercise techniques Reaction time test by android, Hurdle Jump, Hexagon Obstacle Test, Quick strike, Anaerobic Running based anaerobic sprit test (Rast) are very precisely applied in improving the Kumite technique in the Karate sport.

Anaerobic capacity is a quality that makes people able to carry out muscle work that is comprehensive as long as possible in anaerobic conditions (conditions where oxygen is not absolutely necessary in producing ATP). Anaerobic capacity is determined by the



maximum capacity of oxygen consumption and psychological capacity against physiological difficulties. How to train and measure the anaerobic abilities of karate athletes with Rust (Anerobic Running based anaerobic sprint test).

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