Analysis of National Men's Sprinter Athlete Test Results in Preparation for the 2022 SEA Games

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Abstract. A sprinter is a short-distance running athlete who has an ideal physical criterion profile, namely the type of athleticism. The sprinter's ability to produce maximum speed is influenced by the physical, biomotor, physiological, and mental factors of the champion. This research is with a qualitative descriptive approach with a verifiable method. The subjects of the study were male national sprinters who attended the National Training Center (PPON). The components of the physical test include speed, strength, and endurance. Engineering Evaluation Tests include: Start reaction, Acceleration, Maximum Speed, and Speed endurance. Psychological Evaluation includes: Concentration, confidence, Control, and commitment. The research results of the physical components of speed and maximum speed were only reached by 20%, the element strength was reached by 70%, and Endurance was not achieved by 100%. The engineering component consists of a good starting reaction, bock clearance needs to develop strengthening of the leg muscles, acceleration and maximum speed are still needed practice drill technique and strengthening endurance, maintenance of speed is still needed speed endurance training. The Psychological Component of the concentration aspect is necessary the existence of programmed exercises, the aspect of Self-confidence, self-control and commitment there is a systematic improvement.

Keywords: Spinster · Ability test · Physique · Technique · Psychology

1 Introduction

A short-distance runner or called a Sprinter is an athlete who goes down in short-distance running numbers ranging from 100 m, 200 m and 400 m. This sprinter runner was born, meaning that a runner already has the genetics of being a sprinter. A sprinter is born as a sprinter, and cannot be made, what needs to be developed is the development of talent and hammering well-programmed exercises. Sprinting or sprinting is a short-distance running race number with maximum speed consisting of the reaction of start, acceleration, maximum speed, speed of endurance and finish.

To choose a talented short-distance runner there are several criteria that are considered, including: antrhopometric, physiological and mental or psychological. The criteria for posture that are high are large, the posture is small, the posture is small. All runners have the possibility of a chance to achieve achievements. The ideal body shape for a

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sprinter is a runner who has a tall posture, has long legs, and has an ideal muscular and anatomical arrangement. In addition, the sprinter must have potentials, including: (a) have a fast frequency of foot movements, (b) have good movement mobility, (c) have the ability to move again with leaning, and good foot repulsion, (d) have self-confidence, and (e) have high motivation. The highest speed is achieved at the young age of 18–24 years, but if the sprinter can practice in a disciplined manner and is carried out continuously according to growth and development according to age, then achievements will be achieved until the age limit of 30 years.

The National Training Center (PELATNAS) of athletics was held in Jakarta which was attended by 10 sprinter athletes consisting of 100 m, 200m, and 400m running numbers, THE aim of PELATNAS is to prepare superior athletes at the Sea Games championships held in Vietnam in 2022.

The National Sports Week which was held in December 2022 in Papua, as a trial event before the competition at the Sea Games which was held in 2022 in Vietnam. For 2 (two) years, Indonesian sprinter athletes have been vacuumed from participating in national and international championships due to covid 19 which until now has not been completed. This National Sports Week is a selection and evaluation event which is carried out by the Parent Organization of PB Pasi in selecting superior athletes in the selection of the core team at the Vietnam Sea games in 2022. Therefore, the parameter test is used to determine the ability of sprinter athletes whether they are physically, technically and mentally ready to improve the achievements of Indonesian sprinter athletes.

2 Method

This research method is a descriptive method with a quantitative approach and a verifiable method, namely the results of research which are then processed and analyzed to get a conclusion. The research is carried out to emphasize its analysis on numerical data (numbers) and this research method will be known significant results between the variables studied so that it will produce conclusions that will clarify the picture of the object under study.

The study sample was a 100 m, 200 m distance sprinter athlete. The number of athletes is 5 male sprinter athletes. The sampling technique uses nonprobability sampling techniques with purposive sampling techniques.

3 Result and Discussion

The speed test component consisting of the acceleration speed and the maximum speed of the five sprinters showed that the achievement target was not achieved. The achievement factor of the speed component cannot be separated from the training program that is not in accordance with the achievement target. An exercise program that is less than optimal or too light or too heavy is a factor in not achieving the targets imposed on athletes.

Regardless of whether the athlete's physical condition is good or not, the performance factors of the athlete's physical condition must be examined. Another factor related to the trainer's ability to design an exercise program to develop a varied and monotonous training pace. A sprinter must be diligent and persistent in training. The physical exercise

program created for him by the coach must be followed daily according to his schedule and load. An athlete's failure to complete the program will affect their movement and technical ability to run as a sprinter. needed to stay afloat to achieve a given performance goal (Rodrigues et al., 2020).

There are five basic components of fitness, namely endurance, speed, strength, flexibility and coordination (Peter, JL Thomson, 1991). Each exercise will tend to develop a certain component of fitness. Speed is the result of stride frequency and stride length, and strength is the ability of a muscle to exert itself in performing a particular exercise or activity. The speed of a runner at full speed is directly related to the speed with which his legs swing backwards. A very strong correlation was observed between running speed in male participants and peak thigh angular speed pushing ($r = 0.98$) while peak lower leg angular velocity ($r = 0.96$) was also found to be highly correlated. Similarly in women, the peak angular velocity of the lower leg was found to be a strong predictor of running speed ($r = 0.98$). These results indicate that sprint performance is strongly correlated with movement speed in the propelling limb, at least when running at high speed. To move forward, each runner must produce a horizontal force against the ground. The runner must generate vertical force but this is only enough to allow him to reposition his feet for the next step and generate horizontal force. If the sprinter chooses to generate more vertical force, this allows more time to create a backward motion of the repositioned foot to produce a horizontal force. Maximum speed will be achieved at a distance of 50 m, while a decrease in speed or deceleration is achieved at a distance of 80 m (Krzysztof & Mero, 2013; Slawinski et al., 2017). The use of publicly available competition sprint data, usually in the form of sprint split times collected at major events by independent researchers or the research team of the International Association of Athletics Federations (IAAF), provides a potential solution to this problem. (Brosnan et al., 2017), effects of wind speed (Gómez et al., 2013), age, and sex differences in the mechanical properties of sprints (Slawinski et al., 2017), and reaction time (Tønnessen et al., 2013), step kinematics (Krzysztof & Mero, 2013), kinetics and energy of elite sprinters (in Prampero et al., 2014; Taylor & Beneke, 2012).

Endurance refers to the ability to perform work of a certain intensity over a certain period of time. Endurance results from training with a long period of time and with a certain distance. The main factor that limits and at the same time affects performance is fatigue. An athlete is considered to have good endurance if he does not get tired easily or can continue to perform in a state of fatigue. Endurance is a fitness exercise that must be developed first. Without endurance it is difficult to repeat other types of exercise to develop other aspects of biomotor. The results of the endurance component research show that all five national sprinters did not reach the target set by the coach. Endurance development training program through exercise programs using walking and running, namely continuous running and repetition or repetition exercises (Peter, JL Thomson, 1991). Specific endurance programs are developed with intensive repetition training and are the focus of athletes in the specialization or performance stages of athlete development. The speed used for this method should usually be the athlete's running frequency. Intensive rep training causes high concentrations of lactic acid in the body and should be used with caution. The results achieved by the national sprinter showed

that five athletes were able to test the strength of the back squot aspect, while in the benchpress aspect, there were two athletes who did not reach the target.

Strength and resistance training develops strength. When training causes an increase in muscle mass, this is called hypertrophy. Muscle hypertrophy has more to do with response and maximal intensity exercise than muscle endurance. The principle of reversibility suggests that when you stop strength training, you may lose some strength and lose muscle mass. The loss of muscle mass is called atrophy. Muscle atrophy is a direct result of little or no activity and can be a factor in injury rehabilitation. Maximum strength is best achieved with exercises that involve low repetition, high resistance or strength training. Strength is developed by high repetition with low resistance. Reactive strength is developed through some form of running training. This exercise is more suitable for sprinters to initiate reaction and rhythm.

Aspects of the ability to test technical abilities which consist of reaction start, block clearance, acceleration and maximal speed, as well as maintenance speed, the sprinters have done the reaction start technique is good, but it is still necessary to practice the start block repeatedly and specifically. The biomechanics aspect is needed to analyze the start reaction movement, running steps and running frequency. Reaction speed as the ability to maintain strong and fast muscles repeatedly (Jonathan A. Pye, 2009). To achieve optimal speed capability during acceleration, training methods are needed to develop acceleration abilities through in and out exercises. Speed endurance is the body's ability to carry out activities at a very fast pace under conditions of anaerobic energy production. Form interval training with a focus on anaerobic exercise.

Psychological aspects of focus, self-confidence, self-control and commitment. Concentration is an important psychological factor and can determine athletic performance (Afifuddin et al., 2020). Various problems can arise when athletes perform sports movements, especially when their concentration is disturbed during competition. These problems include a reduction in movement precision (Lu et al., 2021). Another effect is disrupted when an improper execution strategy affects an athlete's confidence. The ultimate effect of preventing athletes from achieving their "best performance" (Rooks et al., 2017). Athletes must focus on achieving optimal performance (Qiu et al., 2018). Athletes' confidence in competition is needed to keep them focused on achieving certain performances (Machida et al., 2017). This is important to achieve the expected performance (Afrouzeh et al., 2020). Self-control is needed to control an athlete's emotions. The ability to regulate emotions supports athletes to develop better strategies (Lazarus, 2000; Rogier et al., 2019). Emotion regulation plays a central role in regulating mood and mood disorders that plague athletes. According to (Gross, 2015), this is the ability of individuals to control and modulate the type of emotional response they feel to achieve a goal. Self-consideration, including your own emotions, is important in competition (Uphill et al., 2012). The validity of the theoretical model and empirical data for the psychological performance of 100-m sprinter students (Von Treuer & Reynolds, 2017). Commitment is defined as designing or setting goals to be achieved during the evaluation (Weinberg, 2013). It is difficult for athletes to perform optimally if they are not committed (Love et al., 2018). Psychology has a positive impact, according to research (Rodrigues et al., 2020) which states that pursuing achievement requires continuous effort. Another aspect of runners is self-talk. Research (Van Raalte et al., 2016) shows that self-talk

affects athletic performance. Negative talk paralyzes athletes (Hatzigeorgiadis et al., 2014).

4 Conclusion

The results of the physical test of the men's national sprinters who are members of the PPON project on average have not yet reached their optimal physical condition. The capability of the components of durability, speed and strength is still below standard. The results of the physical test clearly affect the results of the Sea Games for all national sprinter athletes who have not succeeded in obtaining good achievements. Technical components need to be specifically trained and carried out with biomechanical analysis to find motion errors and can be corrected as soon as possible. Likewise, the psychological factors of athletes need to be trained to find self-confidence, concentration, self-control and continuous commitment, because these components can motivate athletes to achieve maximum performance.

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