

Physical Profile of West Java Taekwondo Athletes for Pekan Olahraga Nasional XVIII Riau

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Abstract

Background: Taekwondo is a martial sport that is often included in competitions, especially in a national event such as Pekan Olahraga Nasional (PON) XVIII Riau in September 2012. A taekwondo athlete must have maximum physical condition in order to achieve maximum performance. West Java taekwondo athletes who will participate in this national sport event receive centralized exercises as a special preparation stage. This study aimed to determine the physical condition profile of male and female taekwondo athletes for PON XVIII Riau

Methods: A quantitative descriptive study was conducted in September 2012 to 15 West Java taekwondo athletes for PON Riau XVIII consisting of 7 male athletes and 8 female athletes. Physical conditions measured were strength, endurance, power, speed, flexibility, cardiorespiratory fitness, agility, and reaction time. The measurement results were then compared to the physical standards data from the head of National Sports Committee of Indonesia (Komite Olahraga Nasional Indonesia/KONI) and were analyzed by percentage category

Results: Characteristics in less category were abdominal muscle endurance (male 71.43% and female 100%), cardio respiratory fitness (male 85.71%), and agility (female 37.50%). Characteristics in far category were cardio respiratory fitness (female 62.50%) and agility (male 57.14%)

Conclusion: The ability of the physical condition of male and female West Java taekwondo athletes for Pekan Olahraga Nasional XVIII Riau still needs to be improved to maximize achievement. [AMJ.2015;2(1):281-86]

Keywords: Athletes, physical condition, taekwondo

Introduction

Taekwondo is a sport originated from Korea. Taekwondo is martial art that is very often competed at the national, regional, and international sport events.¹⁻³ Taekwondo is one of the sports included in the competition in the National Sport Competition (Pekan Olahraga Nasional, PON) Riau XVIII 2012. Taekwondo athletes using stance techniques such as guard position and ready stance. In addition, taekwondo athlete at the time of the defense uses rising block and knife-hand block. The same is also true when they do strike movements such as taekwondo fist and side punch as well as in kicking movement such as side kick, front kick, and jumping round kick.² Motion patterns of taekwondo athletes during a match can be grouped as follows: stances, blocks, strikes, and kicks.

According to these motion patterns, the muscle abilities need to be prioritized are arm muscles and leg muscles. Based on the pattern of taekwondo athlete motions, experts agree that physical conditions need to be trained and upgraded are: leg muscle strength, muscle endurance (leg muscles and abdominal muscles), power (leg muscles and arm muscles), speed, flexibility, cardio respiratory fitness, agility, speed, and reaction time.⁴ To improve the physical condition of taekwondo athletes in accordance to the opinion of experts, three stages are needed: the preparation stage (general preparation stage and specific preparation stage), the match stage, and the resting stage.⁴ Therefore, West Java taekwondo athletes who will attend the national sport event (known as Pekan Olahraga Nasional/PON Riau XVIII) were prepared with centralized training program that is currently at the stage of special preparation.

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Related to the request of the coach and the deal with researchers, this study measured the physical conditions of male and female taekwondo athlete who is doing training at special preparation stage. To determine the physical condition abilities of taekwondo athlete who was training at a special preparation stage, it was measured: ability of leg muscles strength with leg dynamometer, ability of leg muscles endurance with squat jumps, ability of abdominal muscles endurance with sit-ups, ability of leg muscles power with vertical jumps, ability of arm muscles with medicine ball put, ability of speed with run 50 meters, ability of flexibility with flexometer, ability of cardio respiratory fitness with Astrand (VO₂max) test, ability of agility with beam side step, ability of reaction time with whole body reaction.⁵ To predict the effectiveness of training and the achievement of athletes, all measurement results are compared with physical standards data from head of National Sports Committee of Indonesia (Komite Olahraga Nasional Indonesia/KONI).⁶ According to the experts, an athlete specially taekwondo athlete who has a physical condition in either category of good or perfect will have maximum performance to get a gold medal on any particular sport events especially PON XVIII Riau.⁷

The purpose of this study is to determine the profile of the physical condition of male and female West Java taekwondo athletes for

PON XVIII Riau at special preparation stage age. The abilities of physical conditions are leg muscle strength, muscle endurance (leg muscles and abdominal muscles), power (leg muscles and arm muscles), speed, flexibility, cardio respiratory fitness, agility, speed, and reaction time.

Methods

A quantitative descriptive study with the sample was 15 West Java taekwondo athletes for PON Riau XVIII consisting of 7 male athletes and 8 female athletes. Data is collected in September 2012 at West Java KONI office, Bandung.

Data were taken from KONI of West Java which is the result of measurements made by Sport Medicine Team of West Java KONI. The data consisted of age, gender, strength, endurance, power, speed, flexibility, cardio respiratory fitness, agility, and time reaction. The results of the data obtained and then compared with standard physical condition of KONI Pusat.

Results

Assessments were conducted in 15 West Java taekwondo athletes. Of this team, 7 male athletes with a lifespan range from 16 years to 27 years and 8 female athletes with a lifespan

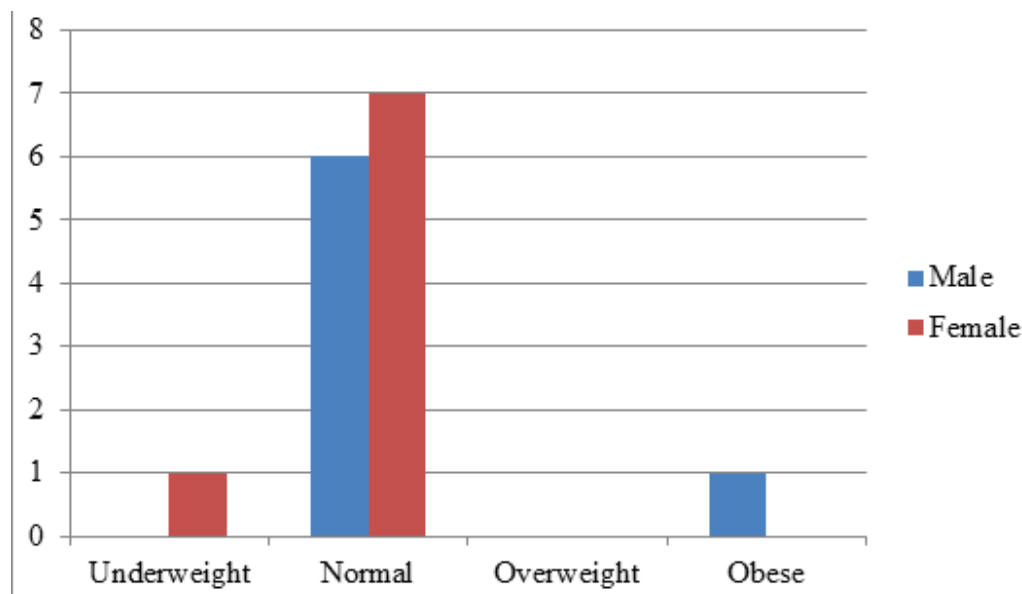


Figure 1 Body Mass Index of West Java Taekwondo Athletes for PON XVIII Riau

Table 1 Profile of the Physical Conditions of Male West Java Taekwondo Athletes for PON XVIII Riau at Special Preparation Stage

Abilities	Category Percentage (%)				
	Poor	Fairly	Good	Very Good	Perfect
Strength					
Leg Muscles	0	28.57	28.57	42.86	0
Endurance					
Leg Muscles	0	14.29	42.86	28.57	14.00
Abdominal Muscles	71.43	14.29	0	0	14.29
Power					
Leg Muscles	0	14.29	71.43	14.29	0
Arm Muscles	0	14.29	28.57	57.14	0
Speed	0	33.33	66.67	0	0
Flexibility	0	14.29	14.29	28.57	43.00
Cardio respiratory Fitness	85.71	0	14.29	0	0
Agility	28.57	57.14	0	0	14.29
Reaction Time		Slow: 14.29		Fast: 85.71	

ranging from 16 years to 28 years. Physical characteristics West Java taekwondo athletes consisting of body mass index which stratified by the World Health Organization (WHO) body mass index criteria⁸ (Figure 1). Both of male and female athletes were included in normal category.

For male athletes included in the perfect category was flexibility; the very good categories were leg muscle strength and arm muscles power; the good categories were leg muscle endurance, leg muscle power, and speed; the fairly category was agility; and the poor categories were abdominal muscle endurance and cardio respiratory fitness. Then the ability of the reaction time was in the slow category.

For female athletes who were in the perfect categories were leg muscle endurance, arm muscles power, and flexibility; the very good categories were leg muscle strength and leg muscles power; the good category was speed; the fairly category was cardio respiratory fitness; and the poor categories were abdominal muscle endurance and agility. Then the ability of the reaction time in most female athletes was included in the slow category.

Discussions

The results of strength component demonstrate that ability of leg muscle strength

in mostly male athletes included in the very good category (42.86%) and mostly female athletes included in either good (42.86%) and very good (42.86%). Even so, there were athletes who still had leg muscle strength in fairly categories, male (28.57%) and females (14.29%). The maximum ability of the leg muscle strength is required by a taekwondo athlete to achieve maximum performance. At the time of kick movements like side kick and jumping round kick when attacking an opponent in the game requires leg muscle strength.² Based on observations male and female West Java taekwondo athletes at special preparation stage is done appropriate weight training, namely: exercise 2–3 times a week with the intensity of 8–12 RM and do as much as 3 set.⁴ Weight training will increase the ability of muscle strength taekwondo athletes because of myofibril hypertrophy and increased of tendons and ligaments.^{4,9}

Muscle strength needs to be maintained and improved in order to achieve maximum performance especially in taekwondo athletes who has not reached the category well yet. Because in a game required this ability to perform muscular strength when kick the opponent.³

The results of endurance component indicate that leg muscle endurance athletes in mostly male athletes included in good category (42.86%) and the majority of female athletes included in perfect category

Table 2 Profile of the Physical Conditions of Female West Java Taekwondo Athletes for PON XVIII Riau at Special Preparation Stage

Abilities	Category Percentage (%)				
	Poor	Fairly	Good	Very Good	Perfect
Strength					
Leg Muscles	0	14.29	42.86	42.86	0
Endurance					
Leg Muscles	0	0	37.50	12.50	50.00
Abdominal Muscles	100	0	0	0	0
Power					
Leg Muscles	0	12.50	37.50	50.00	0
Arm Muscles	0	0	25.00	37.50	37.50
Speed	12.50	12.50	62.50	12.50	0
Flexibility	0	0	25.50	25.50	50.00
Cardio respiratory Fitness	12.50	62.50	25.00	0	0
Agility	37.50	25.00	25.00	0	12.50
Reaction Time		Slow: 25.00		Fast: 75.00	

(50.00%). Even so, there were male athletes who still had leg muscle endurance in fairly categories (14.29%). Based on observations on training program, male and female West Java taekwondo athletes had an appropriate weight training, namely: exercise 2–3 times a week, as many as 20–25 RM intensity and do as much as 3 set.⁴ Leg muscle endurance needed by a taekwondo athlete to perform maximally due to the repeatedly motion shot in a long time.⁹ In addition to maximum leg muscle endurance, also required abdominal muscle endurance abilities that taekwondo athletes could have a maximum achievement.

The results demonstrate that abdominal muscle endurance in mostly male athletes included in poor category (71.43%) and female athletes are all included in the poor category (100%). The ability of abdominal muscle endurance of male and female West Java taekwondo athletes is lacking, likely influenced by the lack of weight training which can increase abdominal muscle strength, such as sit-ups and push-ups exercises.⁹ From the above, it can explain the discovery of leg muscle endurance was good while abdominal muscle endurance were not maximized.

The results of power component indicate that leg muscle power in mostly male athletes included in good category (71.43%) and the majority of female athletes fall into very good category (50.00%). Even so, there were athletes who still had leg muscle power in

fairly categories, male (14.29 %) and females (12.50 %). For those athletes who has not maximum leg muscle power yet, need appropriate weight training exercise 2–3 times a week and do as much as 12–15 RM intensity for 3 set.⁴ In addition to maximum leg muscles power, power ability which also necessary for taekwondo athletes is arm muscles power. The results demonstrate that arm muscles power on mostly male athletes fall into very good category (57.00%) and the majority of female athletes included in the perfect category (38.00%). Even so, there were male athletes who still had arm muscles power in fairly categories (14.29 %). Based on observations male and female West Java taekwondo athletes had done appropriate weight training. But for those athletes who has not maximum arm muscles power yet, still need appropriate weight training like program for increasing leg muscles power, namely: exercise 2–3 times a week, as many as 12–15 RM intensity and do as much as 3 set.⁴ Leg muscles and arm muscles power in taekwondo athletes needed for explosive movements in punching and kicking opponents. The results above show that the power of the leg muscles and arm muscles are excellent and perfect that need to be maintained and improved to achieve maximum performance.

The results of speed component demonstrate the speed of the male athletes mostly included in good category (66.67%)

and either the majority of female athletes included in good category (62.50%). Even so, there were male athletes who still had speed in fairly categories (14.29%) and female athletes who still have speed in poor category (12.50 %). Athletes who still had speed ability in poor or fairly category maybe did not do appropriate training program such exercises with interval training run at a distance of 40 meters, break 3–5 minutes, and 3–5 times as much done a week.⁴ Speed ability need to be maintained and improved in order to do some kicking and punching times in a row in the shortest possible time which can affect the success of winning.⁹

The results of flexibility component demonstrate that flexibility in mostly male athletes including in perfect category (43.00%) and the majority of female athletes are also included in the perfect category (50.00%). Even so, there were male athletes who still have flexibility in fairly categories (14.29%). It was found that the perfect flexibility skills in West Java taekwondo athletes based on field observations, the athletes had exercises with passive stretching or PNF (Proprioceptive Neuromuscular Facilitation) as much as 3–5 times a week.⁴

The results of cardiorespiratory fitness component demonstrate that cardiorespiratory fitness of mostly male athletes fall into poor category (85.71%) and the majority of female athletes included in fairly category (62.50%). To achieve maximum performance in a game, taekwondo athlete should be able to achieve the maximum cardiorespiratory fitness in order to perform the game in a relatively long time. Cardiorespiratory fitness means having the capacity of the heart, lungs, and circulatory both in delivering oxygen to the muscles so that they can work within long time.^{5,10} To maximize the ability of cardiorespiratory fitness of male and female West Java taekwondo athletes who had poor or fairly category should be improved with aerobic exercise, such as running, jogging, swimming, and other.⁴ Exercise which beneficial for improving pulmonary and heart endurance is done for 3–5 times a week, more than 1 hour workout, while exercise intensity 75–85% maximum pulse.¹¹ According to the previous explanation, it can be explained that poor cardiorespiratory fitness (VO_{2max}) was occurred because the coach did not provide intensive training to improve aerobic capacity.

The results of agility component demonstrate the agility of mostly male athletes included in fairly category (57.14%) and the majority of female athletes included

in the poor category (37.50%). In accordance with the pattern of motion of the taekwondo sport that requires agility in the game, such as the ability to change the position and direction of the body so fast. Based on results, agility on male and female taekwondo athlete needs to be improved so that they can achieve maximum category. In connection with these exercises to improve agility are running back and forth, zig-zag run, squat thrust, and obstacle race.⁴

The results of reaction time component demonstrate the ability of the reaction time on mostly male athletes included in the slow category (85.71%) and the majority of female athletes are also included in the slow category (75.00%). The results of the above calculation show both male and female taekwondo athlete has slowly reaction time. While the reaction time is necessary in taekwondo, especially when it came under attacks from opponents and then athletes have to do fast respond.² To improve the reaction time of taekwondo athletes should doing repetitive specific response exercises which suitable to taekwondo motions. Another form of exercise can be interval run training which done 3–5 times a week and as much as 3 set.⁴

Limitations of this study are limited sample size and time. A large enough and randomly selected sample, will help the analysis in this study to be more accurate.

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