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HEALTH PROFILE AND PHYSICAL CONDITION LEVEL OF GRESIK JUNIOR TAEKWONDO ATHLETES

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Abstract
This study aims to assess the health profile and level of physical condition in the Gresik Regency junior taekwondo athlete team. The total subjects used were 11 junior male taekwondo athletes (age: 12.54±2.20) and 20 junior female taekwondo athletes (age: 13.25±1.83). The athletes conducted a health test of height, weight, and body mass index (BMI), then conducted a physical condition test of 30s push-ups, t-test, sit and reach, and multistage fitness test. The analysis used descriptive analysis, and the results obtained were then grouped by gender. Athletes show results of health characteristics and physical conditions that have been grouped by gender; Men junior athelete (MJA) and Women junior athlete (WJA), namely: height (MJA: 157.3±12.4 cm, WJA: 154.65±6.87 cm), body weight (MJA: 46.49±12.13 kg, WJA: 45.58±5.68 kg), BMI (MJA: 18.49±2.43 kg/m2, WJA: 26.3±32.47 kg/m2), push-up 30s (MJA: 28.81±6.85 reps, WJA: 24.7±4.58 reps), t-test (MJA: 7.6±0.82 seconds, WJA: 8.19±0.83 seconds), sit and reach (MJA: 15.36±5.39 cm, WJA: 19.2±6.33 cm), and multistage fitness test (MJA: 7.84±2.45 seconds, WJA: 6.67±1.86 seconds). Although there are several components of athlete characteristics that do not meet the standard or are below standard, it is not the main component in determining victory, especially in the sport of taekwondo. In addition, the results of this study are expected to be valuable insights into the physiological level and physical condition that a taekwondo athlete must have, especially in male and female junior taekwondo athletes in Gresik Regency.
Keywords: *Physical Conditio;, Junior Athletes; Taekwondo.*

INTRODUCTION

Since the establishment of the World Taekwondo Federation (WTF) in 1973 (Liu & He, 2022a), Taekwondo is one of the most popular sports in the world, among which it has been developed by more than 60 million people, 6 continents, and 205 countries in the world (Fajar et al., 2022). In Indonesia itself, it has been proven to have succeeded in bringing three silver medals and one bronze medal in an exhibition at the Barcelona Olympics in 1992 (Apriantono et al., 2020; Fajar et al., 2022). Unfortunately, after successfully bringing the champion medal, Indonesia's achievements in Taekwondo actually declined (Apriantono et al., 2020). Analysis carried out to find out the physical condition of athletes from an early age is important to prepare and design a training program that is in accordance with

winning the championship. In line with that, the initial stage of measurement needs to be carried out as an indicator of determining and designing the right strategy based on data (Apriantono et al., 2020)

Taekwondo sports, especially in the East Java region of Indonesia, until now there are a lot of clubs or teams that have developed, and East Java often holds championships to produce new athletes who can compete at the national and world levels (Fajar et al., 2022).One of which is the Gresik regency taekwondo team. A lot of research has been done to determine technical and physical assessment as the basis for the needs of taekwondo athletes (Fajar et al., 2022). This sport has unique rules of technique, different from boxing or karate, although both have similar techniques, such as punches and kicks (Apriantono et al., 2020), however, the dominant martial arts sport with the technique of feet for attacking is Taekwondo (Arni & Indrayana, 2021). Taekwondo itself has two match categories, namely kyorugi (fight) and poomsae (moves), which have different rules in each number (Arni & Indrayana, 2021).

In this context, several previous studies have proven that the level of physical condition can affect the performance of taekwondo athletes. It has been proven that the level of physical condition of taekwondo athletes is directly proportional to the ranking in the 2020 national championship (Liu & He, 2022a). It has also been found that successful taekwondo athletes have a physical condition component of maximum speed that tends to be higher (Liu & He, 2022a; Marković et al., 2005). Other research shows that athletes who have good kicking technique and coordination can celebrate medals at the championships (Fajar et al., 2022; Sadowski et al., 2012). And it has been established that research on physical condition tests in junior taekwondo athletes on endurance and strength components is a very important component for sports results (Liu & He, 2022a; Miller et al., 2011). Therefore, further studies on the analysis of the physical condition of each component required by junior taekwondo athletes are still needed.

METHOD

The type of research used is quantitative research with a descriptive method. The total subjects used were 11 junior taekwondo male athletes and 20 junior

female taekwondo athletes in Gresik regency with an age range of 10 – 17 years. The sampling technique uses purposive sampling with the criteria, namely, research subjects who have participated in championships or competitions at the district level in the last year or several years before. Research subjects who meet the criteria and are willing to be research subjects will fill out informed consent as a form of consent in following the research process from start to finish.

All subjects will be anthropometrically measured to determine the characteristic values and health profiles, namely height using a stadiometer (accuracy of 0.5 cm) (SECA, Chino, CA), body weight, and body mass index (BMI) using Tanita Segmental Body Composition (BC-545N). Furthermore, a test was carried out to measure strength (push-up 30s), agility using the T test, flexibility (flexibility) using sit and reach, and endurance (aerobic capacity/VO2max) using the Multistage Fitness Test (MFT). All data obtained will then be analyzed to find out the average of each test item. From the results obtained, it will be compared with several previous research results and analyzed as a reference to determine the quality standards of the physical condition of junior taekwondo athletes, especially in Indonesia.

RESULTS

The results of descriptive analysis of the characteristic data of the research subjects in each group can be seen in Table 1.

Table 1. Results of Analysis of Health Profile of Research Subjects

Parameter	Descriptive Statistics by Gender (mean±SD)	
	MJA (*n*=11)	WJA (*n*=20)
Age (years)	12.54±2.20	13.25±1.83
Height (cm)	157.3±12.4	154.65±6.87
Weight (kg)	46.49±12.13	45.58±5.68
BMI (kg/m^2)	18.49±2.43	26.3±32.47

Based on Table 1. Showing the results of the analysis of the average characteristics of the research subjects based on each gender. The average age of the research subjects used was in junior male athletes (12.54±2.20) and junior female athletes (13.25±1.83). The average score was high in the study subjects in junior male athletes (157.3±12.4) and in junior female athletes (154.65±6.87), while

the average weight obtained was in junior male athletes (46.49±12.13) and in junior female athletes (45.58±5.68). The average BMI score obtained was in junior male athletes (18.49±2.43) and junior female athletes (26.3±32.47). The BMI values of each study subject have been shown in Figure 1.

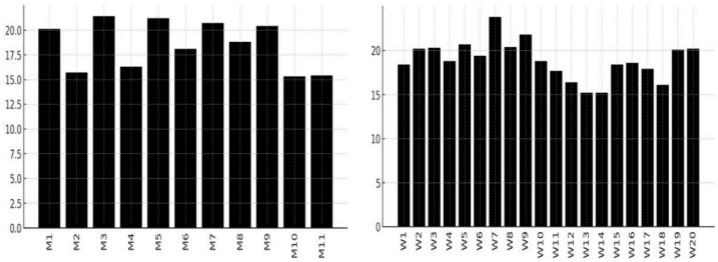

Figure 1. Body *Mass Index* (BMI) results of research subjects

Based on Figure 1 shows the overall results of the BMI scores of the research subjects, which have been grouped by gender, and will later be used as a reference for assessing health profiles in this study. The results obtained were that the BMI value was lowest in the male athlete group (15.2 kg/m2) and the highest BMI value in the female athlete group (21.4 kg/m2). Meanwhile, the lowest BMI value was in the female athlete group (15.2 kg/m2), and the highest BMI value was obtained in the female athlete group (23.8 kg/m2). The results of the average analysis of the physical condition test parameters are shown in Table 2.

Table 2. Results of Push-up 30s, T-test, Sit and Reach, and Multistage Fitness Test (MFT) Analysis Based on Examination Time

Parameter test	Descriptive Statistics by Gender (mean±SD)	
	MJA (*n*=11)	WJA (*n*=20)
Push-up 30s (rep)	28.81±6.85	24.7±4.58
T-test (s)	7.6±0.82	8.19±0.83
Sit and Reach (cm)	15.36±5.39	19.2±6.33
Multistage Fitness Test (s)	7.84±2.45	6.67±1.86

Based on Table 2 it shows the average analysis results of each test item given to the research subjects grouped by gender. The average results of the push-up test were 30s for junior male athletes (28.81±6.85) and junior female athletes

(24.7±4.58). For the average results on the t-test in junior male athletes (7.6±0.82) and junior female athletes (8.19±0.83). The sit and reach test showed results in junior male athletes (15.36±5.39) and junior female athletes (19.2±6.33). Meanwhile, the average results in the multistage fitness test (MFT) for junior male athletes (7.84±2.45) and junior female athletes (6.67±1.86). The results of the 30s push-up test scores from all research subjects are shown in Figure 2.

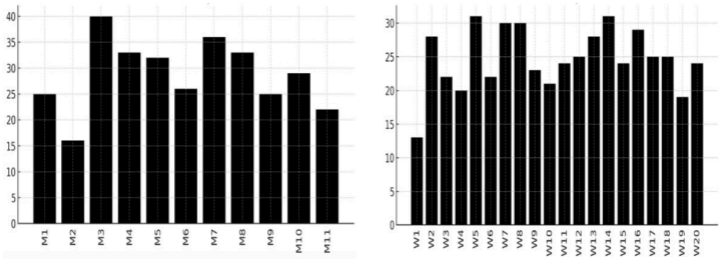

Figure 2. Results of the 30s push-up test of the research subjects

Based on Figure 2 shows the results of the 30s push-up test scores of all research subjects that have been grouped by gender. It is known that the 30s push-up test scores were lowest in the male athlete group (16) and the highest scores in the female athlete group (40). Meanwhile, the 30s push-up test score was the lowest in the female athlete group (13) and the highest score in the male athlete group (31). The results of the t-test scores from all research subjects are shown in Figure 3.

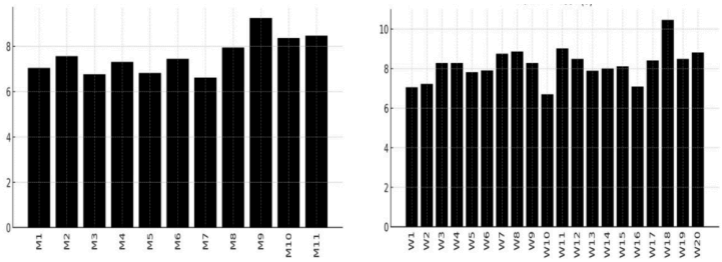

Figure 3. Results of the t-test of the research subject

Based on Figure 3 shows the results of the t-test scores of all research subjects that have been grouped by gender. It is known that the t-test score was fastest in the male athlete group (6.62 seconds) and the slowest in the female athlete

group (9.25 seconds). Meanwhile, the fastest t-test score was in the female athlete group (6.7 seconds), and the last score obtained was in the female athlete group (10.45 seconds). The results of the sit and reach test scores from all research subjects are shown in Figure 4.

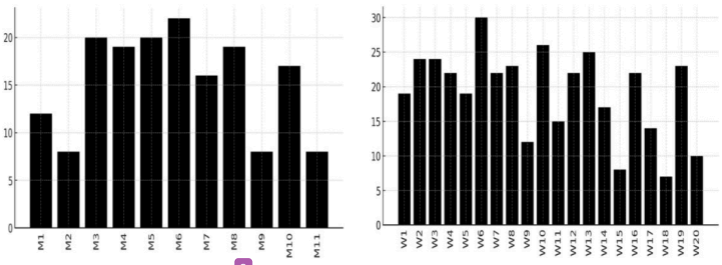

Figure 4. Results of the sit and reach test of the research subjects

Based on Figure 4 shows the results of the sit and reach test scores of all research subjects that have been grouped by gender. It is known that the lowest sit and reach test scores were in the male athlete group (8 cm) and the highest in the female athlete group (22 cm). Meanwhile, the lowest sit and reach test score was in the female athlete group (7 cm), and the highest score was obtained in the female athlete group (30 cm). The results of the MFT test scores from all research subjects are shown in Figure 5.

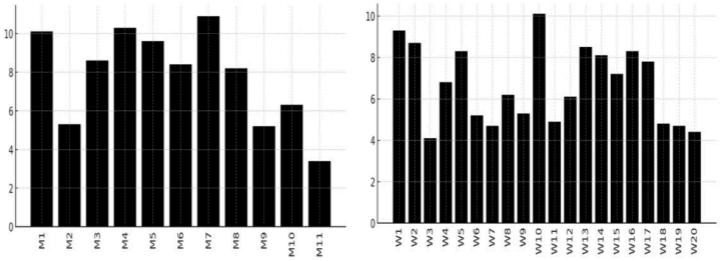

Figure 5. MFT test results of research subjects

Based on Figure 5 shows the results of the MFT test scores of all research subjects that have been grouped by gender. It is known that the fastest MFT test score is in the male athlete group (3.4 seconds) and the slowest score is in the female athlete group (10.9 seconds). Meanwhile, the fastest MFT test score was in the

female athlete group (4.1 seconds), and the slowest score was obtained in the female athlete group (10.1 seconds).

DISCUSSION

Based on the findings of the health profile value reviewed from the average BMI value in junior male athletes (18.49±2.43) kg/m2 and junior female athletes (26.3±32.47) kg/m2. Differences were found when the average value was compared to the normal category based on WHO standards, namely 20.36 kg/m2 for junior male athletes and 20.22 kg/m2 for junior female athletes (Apriantono et al., 2020). So it can be concluded that the BMI of junior taekwondo athletes in Gresik Regency in junior male athletes is still not at the normal threshold or below the normal limit, and vice versa in female junior athletes, actually exceeds the normal threshold of the standard BMI that has been described. Although BMI or height and weight are important components for taekwondo athletes, they are not the determining factor in every victory (Zhu et al., 2025). This is evidenced by the results of research that explain that elite athletes tend to have a lower BMI compared to other average athletes (Wazir et al., 2019). In addition, it is known that elite taekwondo athletes have a higher percentage of body fat compared to the average taekwondo athlete (Agopyan et al., 2022). Previous studies have shown that taekwondo athletes who won medals in the Olympics in the four women's categories have a lower height compared to athletes who do not win (Cular et al., 2011). This is because athletes who are taller make it difficult for them to manage attacks due to longer lower legs, and swing cycles or movements that tend to be slow (Santos et al., 2018). Recent studies of most weight categories, the average height of Taekwondo Olympic medalists has increased over time, in line with the biomechanical advantages associated with longer lower limbs. However, in some categories, particularly the men's -58 kg and +80 kg divisions and the women's +67 kg category, the height trend seems to have stabilized, indicating the formation of an optimal range for performance (Scamardella F. et al., 2025). So it can be concluded that the lack or excess of BMI status of each taekwondo athlete is not a determining indicator in every victory, because there are still several other indicators that will play a role in each victory of the athlete.

There are several elements that can affect the performance of taekwondo athletes, namely, technical elements, tactics, as well as physical and mental demands, so that high physical fitness is an important component for taekwondo athletes (Fajar et al., 2022). Basically, martial arts such as taekwondo require a high level of physical fitness, physical characteristics (Kim & Nam, 2021), and one of them is the components of physical condition strength, agility, flexibility, and endurance, which each have an important role in their physical condition. It has been known that the results of average strength (push-up 30s), flexibility (sit and reach), anaerobic characteristics (T-test), and aerobic/VO2max characteristics (multistage fitness test) are known, especially in junior-level athletes. Focusing on the characteristics of aerobic ability/VO2max, it has been explained that the VO2max capacity in male athletes is higher than in female athletes, but no difference was found in their level of experience or competition (Iversen et al., 2025). Even so, the aerobic capacity of every athlete is an important component, especially in martial arts (Kirk et al., 2024; Yue et al., 2025). It is proven that the aerobic capacity of athletes who are at international standards shows an increase in the preparation of these athletes (Iversen et al., 2025). It has been proven that athletes with high physical fitness tend to have a chance of winning championships, especially in female taekwondo athletes (Liu & He, 2022). So, taekwondo athletes certainly need a high physical fitness component to be able to have a chance to win the championship. In this study, the physical component of flexibility tends to be lower than the results of the research conducted by Fajar et al. (2022). However, the results of another study explain that the value of flexibility in this study is included in the standards that have been explained (Kim & Nam, 2021). However, this is certainly an important note for coaches to be able to make improvements and evaluations to the training program to reach standards and increase the chances of winning the championship. On the other hand, in the physical component of strength (push-up) that the results lead to a higher value compared to the results of the research by Fajar et al. (2022).

In taekwondo competition, athletes are required to be in good physical condition, including aerobic capacity, anaerobic capacity, strength, endurance,

flexibility, agility, and speed. (Bouhlel et al., 2006; Kim & Nam, 2021). Therefore, this study intends to provide a profile of physical condition, especially in junior taekwondo athletes, to provide sports science information data based on research data, and as evaluation material for trainers in designing the best and appropriate training program for each athlete's different background.

CONCLUSION

In general, junior taekwondo athletes in Gresik Regency have a standard of physical condition characteristics that are possessed by taekwondo athletes and other martial arts. Although there are several components of athlete characteristics that do not meet the standard or are below standard, it is not the main component in determining victory, especially in the sport of taekwondo. In addition, the results of this study are expected to be valuable insights into the physiological level and physical condition that a taekwondo athlete must have, especially in male and female junior taekwondo athletes in Gresik Regency.

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