The Somatotype of Martial Athletes in the Fighter Category Against Achievement

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Abstract

This study aims to determine the effect of the somatotype of the Tarung Derajat martial arts athlete in the Fighter category on achievement. Quantitative descriptive research using survey method. Anthropometric manual tests and measurements to determine the athlete's body type. The research sample consisted of 8 male athletes and seven female Tarung Derajat Fighters in the West Kalimantan category, held at the Salat Mujahidin, Pontianak City. The data obtained in the field is the results of the somatotype measurement test and the achievement of Tarung Derajat athletes, then analyzed using descriptive percentages. The study results were 46% with endomorph mesomorph body type, 40% central, 7% endomorph, and 7% ectomorph mesomorph with local, national, and international achievements. The conclusion is that there is no influence between the somatotypes of the Tarung Derajat martial arts athletes in the Fighter category on achievement.

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INTRODUCTION

Sport is a physical activity done by all ages, including children and the elderly. Various sports activities are carried out to have an ideal body (Balqis et al., 2020). Several studies have proven that sports activities affect fitness (Bile & Suhaarharjana, 2019; Chrisly et al., 2015; Dharma & Boy, 2020; Endrianto & Ma'mun, 2019; Fikri, 2017; Hadi, 2019; Hayudi & Pratama, 2019; Julianto, 2016; Majid, 2020; Prativi, 2013; Prayoga, 2020; Suryadi et al., 2021), and appropriate food intake (Kuswari et al., 2019). The results of research on hiking activities in women affect physical fitness (Firmana, 2018). Yoga, stationary bicycles, gymnastics, muscle exercises, and stretching at home are safe sports during the COVID-19 pandemic (Yuliana, 2020). Many sports can be done, one of which is a combat martial arts branch.
Tarung Derajat is a type of martial arts native to Indonesia (Putrawan et al., 2018). Came from Bandung on July 18, 1972 by one of the nation's sons, namely Achmad Drajat (Azhari et al., 2018). Aggressive and dynamic martial arts are in the form of punches, kicks, slams, blocks, locks, and dodges (Noviatmoko, 2016). The combat sport is an achievement that has just held the 2nd Southeast Asian championship in Malaysia and the XX September 2016 PON in the West Java championship, and the IFTD World Championship (Alnedral et al., 2018). The statement describes fighting sports as a branch of martial arts that has entered the championships. A lot of athlete coaching is carried out, including selecting somatotype athletes to become one of the coach's targets.

Research has shown that somatotype (Şenol et al., 2018) and good nutrition (Aini & Kemala, 2020) affect sports performance. Body composition and somatotype are considered as one of the elements of sports success (Dwiyanti et al., 2020) (Çinarlı & Kafkas, 2019; Drywień et al., 2021; Gutnik et al., 2015; Roklicer et al., 2020), physical performance (Quintero et al., 2019), and anthropometric characteristics are of great importance in many sports (Blerim et al., 2018; Espinoza-Navarro et al., 2019; Perroni et al., 2015; Petković et al., 2019). Research conducted by (Sukmawarti et al., 2019) indicates a significant relationship between somatotype and the passing accuracy of futsal players. The results of these studies reveal the importance of somatotypes in sports; somatotypes are needed to determine the athlete's body shape to know what is required by the sport.

The somatotype of the human body is influenced by many factors, namely genetics, and there are also environmental factors and cultural differences (Kaplánová et al., 2020). According to (Shazmin & Manan, 2019), the most crucial aspect that affects somatotype and body composition is nutritional intake, and this statement is supported by (Penggalih et al., 2017) macronutrient intake has a significant relationship with changes in body weight, height, mesomorphic components of the somatotype. Recent research has found a connection between the nutritional status of athletes, somatotype, and food intake on sports performance (Penggalih et al., 2019). Consuming milk, yogurt, kefir, buttermilk, soft cottage cheese, and cream with more than 20% fat can affect body type (Drywień et al., 2017). In addition, body composition can be improved by performing suspension training (Asmara et al., 2020).

This research is that many athletes still do not know the body type needed in their sport. The coach should first take measurements to determine the body type of the candidate for the Tarung Derajat martial arts athlete in the Fighter category. Based on the results of research (Badaruddin & Rusli, 2019), physical and body structure contributed 89.20% to the achievement of female rowing athletes, so the results of this study provide an overview of the need for tests and measurements because this can help the
process of running a good training and achieve achievement. This study aims to determine the contribution of the somatotype of the Tarung Derajat martial arts athlete in the Fighter category to achievement.

**METHODS**

Quantitative descriptive research using survey method. Somatotype tests and measurements were carried out using manual anthropometric measurements (Chiu et al., 2021). In this study, the selection of the sample used was purposive sampling with specific considerations, so that 15 Tarung Derajat athletes consisting of 7 men and 8 women in the category of fighters in West Kalimantan Province were used as samples. Implementation of research in the Satlat Mujahiddin Pontianak City. The data obtained in the field is the results of the somatotype measurement test and the achievement of Tarung Derajat athletes, then analyzed using descriptive percentages to analyze. Microsoft Excel software-assisted calculations in determining body type calculations for Tarung Derajat athletes in West Kalimantan.

**FINDINGS AND DISCUSSION**

**Findings**

The research carried out a somatotype measurement test for Tarung Derajat athletes in June 2021. Anthropometric tests and measurements were carried out in several body parts, including using a scale to measure body weight. A microtome staturmeter to measure height and fat thickness by measuring the triceps, subscapular, and supraspinal used a skinfold caliper. A sliding caliper was used to measure the humerus and femur width, and the tape measure measured the calf and biceps width. The percentage of anthropometric tests and measurements for Tarung Derajat martial arts athletes in the Fighter category shows that the body type that Fighter athletes mainly own is the endomorph-mesomorph body type, with a total of 7 athletes from the total. Fighter athletes with a significant body type are four sons and two women with a percentage of 40%, an endomorph body type is one female with a percentage of 7%, and an ectomorph-endomorph body type is 1 female with a percentage of 7%. The somatotype of the Tarung Derajat, martial arts athlete, can be seen in table 1.

<table>
<thead>
<tr>
<th>Somatotype</th>
<th>Athletes</th>
<th>Persentase</th>
<th>Modus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Central</strong></td>
<td>Male: 4</td>
<td>Female: 2</td>
<td>40%</td>
</tr>
<tr>
<td><strong>Endomorph</strong></td>
<td>-</td>
<td>1</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Endomorph-Mesomorph</strong></td>
<td>3</td>
<td>4</td>
<td>46%</td>
</tr>
<tr>
<td><strong>Mesomorph</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Mesomorph-Ectomorph</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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Based on table 2, somatotypes and achievements of the Tarung Derajat martial arts athletes in the Fighter category with an endomorph-mesomorph body type, five athletes have local achievements, 1 national and 1 international. Fighter athletes with a central body type, 4 local achievements, and 2 national achievements, with an endomorph body type, there is 1 national achievement athlete. Furthermore, 1 athlete with local achievements has an ectomorph-endomorph body type.

Table 2. Somatotype and achievement

<table>
<thead>
<tr>
<th>somatotype</th>
<th>Athletes</th>
<th>Local</th>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fighter</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Endomorph</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Endomorph-Mesomorph</td>
<td>7</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Mesomorph</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Mesomorph-Ectomorph</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ectomorph</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ectomorph-Endomorph</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>6</td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

Graph 1. Somatotypes and achievements

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Discussion

Anthropometry is used as a measuring tool for predicting the type of human body associated with sports (Balqis et al., 2020; Rifki et al., 2020). Previous research on anthropometry has become a key instrument for finding body changes (Gajardo-Burgos et al., 2018). The results of anthropometric measurements of 57 elite wrestlers showed no significant difference between the style and weight of the freestyle wrestlers and the Greco-Roman elite characterized by endomorphic mesomorphy (Kaplan & Yıldıran, 2018). The explanation above provides an overview of all sports that require anthropometric tests and measurements to determine the athlete's body shape to determine what is needed.

Sports that emphasize balance are suggested to have an endomorphic body (Top et al., 2018). The mesomorph body type tends to be owned by all combat sports athletes except for taekwondo athletes (Noh et al., 2018). A study of 20 Serbian male judokas had an average endo-mesomorphic somatotype (Milošević et al., 2016). The categories of mesomorphic endomorphic (-90 kg, -100 kg, >100 kg), mesomorphic ectomorphic (-60 kg, -73 kg, -81 kg), and judo athletes weighing -66 kg were ectomorphic mesomorphic and all-female athletes were endomorphic mesomorphs, except for category 52 (Drapsin et al., 2020). Meanwhile, according to (Kouamé et al., 2017), ecto-mesomorph in girls and boys gives the best performance on the quality of endurance. The somatotype of male rowing athletes is mesomorphic-endomorphic, whereas female players are more endo-mesomorphic (De La Fuente et al., 2019). Another opinion states that the characteristics of international stand-up rowers show that their low body fat percentage and high muscle mass thus have a balanced mesomorphic somatotype (Castañeda-Babarro et al., 2020). Swimming athletes with disabilities have an ectomorphic mesomorphic somatotype (Penggalih et al., 2019). The somatotype of elite padel players can be defined as endo mesomorphic (Sánchez-Muñoz et al., 2020; Stanković et al., 2020).

In sports, the game reveals that the goalkeeper exhibits a profile of endomorph-mesomorph (Gorla et al., 2017), outfield center back, balanced ectomorph at center-back, balanced mesomorph midfielder, and forward meso-ectomorph (Caballero-Ruíz et al., 2019; Cárdenas-Fernández et al., 2019), the results of a study (Kaplánová et al., 2020) that Slovakian mesomorphic football players are balanced and Saudi Arabian have mesomorph-endomorph somatotypes. Ultramarathon runners have an endomorphsomatotype (Belli et al., 2016), triathlon mesomorph cyclists and corridor swimmers are ectomorphs (Rivas et al., 2015). Basketball is ectomorphic mesomorph (Rivera-Sosa, 2016), different results basketball is mostly endomorphic, and soccer is most often ectomorphic (Gutnik et al., 2015). Based on this explanation, somatotypes in sports have different types due to the needs in the sport. Tarung Derajat is an open skill...
sport that requires speed to move and carry out attacks. In general, the ectomorph body type tends to support this martial art because a tall and thin body shape will reduce the movement made. Mesomorph is also needed. This statement aligns with the information (Noh et al., 2018) that combat athletes tend to be mesomorphs. The results of research conducted by (Dwiyanti et al., 2020) also showed that the somatotypes of takraw and soccer athletes were not appropriate. Based on the results of the data that has been analyzed using anthropometric tests and measurements to measure the body type of the Tarung Derajat martial arts athlete in the Fighter category and the athlete's achievement data, 46% have 5 local, 1 national, and 1 international achievement with an endomorph-mesomorph somatotype. Central 40% consists of 4 local while 2 national, 7% endomorph with national achievement and 7% ectomorph-endomorph with local achievement.

Explanation of some of these studies so that this research can reference somatotypes in martial arts. The results of this study provide evidence of the dominant endomorph-mesomorph in the Tarung Derajat martial arts category in the Fighter category. This is different from the lightweight type of female judo, which has somatotype ectomorph mesomorph and mesomorph ectomorph in male athletes (Roklicic et al., 2020).

CONCLUSION

Based on the results of the discussion, endomorph mesomorph somatotypes have a high percentage of fighters in the category of 46%, central 40%, endomorph 7%, and ectomorph mesomorph 7% with local, national, and international achievements, so it can be concluded that somatotype does not have a significant influence on achievement in Tarung Derajat martial arts branch in the Fighter category. The limitations of this study are the small research sample, recommendations for further research using a more comprehensive sample and population.

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