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An Investigation of Competition Techniques Training in Terms of Various Variables in Star Taekwondo Athletes

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Abstract

This study aims to examine whether the techniques used by star athletes between the ages of 11-14 during the competition differ in terms of various variables. In the study, a total of 84-star athletes, 38 female and 46 males, who competed in Taekwondo Anatolian Stars League Championship group competitions, in which athletes from different provinces participated, were examined. Match analyzes of a total of 6 groups, including (37, 44, +59 kg) women and (41, 45, +65 kg) men from the weights of the athletes who competed in the competition. After the competitions held here were filmed with the help of a camera and examined one by one, data such as which techniques they used, the penalties they received were examined by the researcher and recorded in the match analysis form. In obtaining the data, the 'Taekwondo Match Analysis' form developed by Mavi Var et al. (2015) was used and it was determined which techniques were concentrated on by looking at the differences between gender and weight. The homogeneity and variances of the data obtained in the study were tested, and since the distribution of female and male athletes did not meet the normality assumption, Mann-Whitney U test was used to test the difference between two independent samples from non-parametric tests. The Kruskal-Wallis H Test was used to test whether there was a difference between the weights between men and women. As a result, there was no statistically significant difference between gender and weight classes of female athletes, while there was no statistically significant difference between weight classes of male athletes in terms of technique scored and match score values. When the scored technique values were analyzed, it was determined that the values of 45 kg athletes were higher than the values of 41 kg male athletes and the values of 65 kg and above male athletes and this change was statistically significant.

Keywords: Match analysis, training, combat sport, weights, taekwondo

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1. Introduction

1.1. Introduction to the problem

It is aimed to examine the variables that determine the effectiveness of the techniques used by star taekwondo athletes in competitions, because it is not known how these variables affect technical performance. In particular, the analysis of the technical preferences of different age groups is important for the individualisation of training programmes. Furthermore, the impact of gender differences on competition techniques is a critical area of research to optimise the performance of female and male athletes (Bridge at al., 2014).

Taekwondo is a martial art practiced for attacking and defending the opponent by using hand and foot techniques in a systematic way. In 2000, it was recognized as an Olympic sport by the International Olympic Committee (IOC) (Moenig, 2021; Kim and Nam, 2021). The technical and tactical analysis of successful countries in Olympic, World and European championships reveals the characteristics of taekwondo at the highest level (TTF, 2024). Countries have to train taekwondo players with these characteristics, create training plans and choose technical movements. When coaches prepare taekwondo athletes, knowing the technique and system that is effective in winning the competition plays an important role in success (Song and Sheykhlouvand, 2024; Valdés-Badilla et al., 2024).

In taekwondo, the number, rate and efficiency of the number, rate and efficiency of the number of techniques and movements that the taekwondo athlete should apply in the competition play an important role as well as the physical fitness and anthropometric structure of the athletes in winning the competition (Liu and He, 2022; Sadowski et al., 2012).

Technical, tactical, physiological and psychological factors are effective on the result in taekwondo competitions. The physical fitness and anthropometric structures of the athletes are as important as the number, rate and effectiveness of the techniques and movements practiced in the competition (Aydemir and Sevinç, 2022). During the competition, athletes try to gain superiority over their opponents by using different techniques. Points are earned when a kick or punch hits the legal point zone. In order to score points from these kicks, athletes must generate enough power and apply it with the correct technique (Bridge et al., 2014).

In analyzing taekwondo competitions, country- and sport discipline-specific development trends should be taken into account and especially technical-tactical performance factors should be evaluated (Barrientos et al., 2021). In addition to

technical and tactical factors, the physiological capacity and psychological resilience of athletes also play a critical role in success. In order to achieve success, athletes need to be at their physical peak and be able to make strategically correct decisions (Liu and He, 2022; Selucik and Dilek, 2020).

As in all sports, taekwondo has certain rules to prevent injuries and to ensure that competitors fight fairly. Scoring takes place with powerful and jarring strikes with the hands and feet on the protective vest and foot strikes to the face. The percentage of use of hand and foot techniques in Taekwondo competitions is determined as: hand 30%, foot 70% (World Taekwondo, 2024).

After Taekwondo became an Olympic sport, many rules were changed. The duration of the competition is 3 rounds of 2 minutes each, and 1 minute rest is given between the rounds. Points valid in Taekwondo competitions; attack on the body protector is given 2 points, attack on the face is given 3 points. In case of equality in points after the end of the third round, 1 minute rest is given and the 4th round of 2 minutes is held. In case of a golden point or 2 kyong-go or gam-jeom in this round, the competition ends without waiting for the last kick. Factors that determine the observable situation of the competition, such as tournament venue, opponent, competition rules, spectators and so on, are potential sources of anxiety for the taekwondo athlete. Some of these concerns can be thought to force the athlete to compete within certain techniques (Selucik and Dilek, 2020; Bekdaş Özden and Özcal, 2022).

2. Method

2.1. Participants

The participants consisted of a total of 84-star athletes, 38 females and 46 males, aged 11-14 years, from different provinces, who competed in the Taekwondo Anatolian stars league championship group competitions held in Kırşehir province.

2.2. Data Collection

In order to collect data in the research, the images of the 2024 Kırşehir Stars Turkey Taekwondo Championship were recorded with the video recording system. Match analyzes of a total of 6 groups, including (37, 44, +59 kg) women and (41, 45, +65 kg) men from the weights of the athletes who competed in the competition. Their matches were recorded with a video camera. A total of 84 matches, including the first rounds, semi-finals and finals, were recorded, and then the 'Taekwondo Match Analysis' form developed by Mavi Var et al. (2015) was used and it was determined which techniques were concentrated on by

looking at the differences between genders and weights. In the Taekwondo match analysis form, there are sections including the techniques used in the match, points scored, penalties received and demographic information.

2.3. Data Analysis

SPSS 22.0 package program was used to analyze the data obtained from this study. The homogeneity of the data obtained in the study and the variances were tested. Since the distribution of the number of women and men did not meet the normality assumption, Mann-Whitney U test was used to test the difference between two independent samples from non-parametric tests. Kuruskal-Wallis H Test was used to test whether there was a difference between the weights of women and men. The results were obtained by looking at the technique scored, the technique scored and the match score to determine whether there is a difference between weight and gender.

3. Findings

When the data obtained from the research are analyzed; the findings based on gender, body weight and the averages of taekwondo branch-specific techniques are presented in tables below.

Table 1. Comparison of more than two weights between genders

Gender			Thrown Technique		Points Released Technique		Match score		
	N	**%**	**X**	**Ss**	**X**	**Ss**	**X**	**Ss**	**P**
Women	38	45,2	45,32	19,22	3,74	3,42	10,66	9,18	0,70
Man	46	54,8	46,00	19,06	4,02	2,89	13,13	8,30	0,46
Total	84	100,0	45,69	19,02	3,89	3,12401	12,01	8,74	0,18

As can be seen in Table 1, when the analysis data of the number of techniques scored, number of techniques scored and match score of the athletes depending on the gender factor are analyzed, although there is no statistically significant difference in the number of techniques scored, number of techniques scored and match score of male athletes compared to female athletes, differences are observed in all of them when analyzed in percentages.

Table 2. Comparison of Female Athletes' Techniques According to Their Body Weight Across Weights

Body Weight			Thrown Technique		Points Released Technique		Match score		
	N	**%**	**X**	**Ss**	**X**	**Ss**	**X**	**Ss**	**P**
37 Kg women	12	14,3	45,75	19,61	3,83	3,95	10,67	10,21	0,99
44 Kg women	16	19,0	45,38	22,30	3,19	3,39	9,06	9,61	0,453
+59 Kg women	10	11,9	44,70	14,83	4,50	2,95	13,20	7,32	0,38

As seen in Table 2, the number of techniques scored, number of techniques scored and match scores of female athletes according to their body weight were similar to each other and no significant difference was found (p>0.05).

Table 3. Comparison of Male Athletes' Techniques According to Their Body Weight Across Weights

Body Weight			Thrown Technique		Points Released Technique		Match score		
	N	**%**	**X**	**Ss**	**X**	**Ss**	**X**	**Ss**	**P**
41 Kg male	10	12,9	48,15 [b]	19,03	3,45	2,76	10,35	7,10	0,00*
45 Kg male	10	13,2	54,19'a	14,72	4,75	2,98	16,75	8,13	0,42
+65 Kg male	16	16,75	28,60 [c]	15,01	4,00	3,02	12,90	9,33	0,07

*P<0,05

As seen in Table 3, no statistically significant change was found in the values of technique scored and match score between weights in male athletes. When the "technique scored" values were analyzed, it was determined that the value of male athletes weighing 45 kg (54,16 ± 14,72) was higher than the value of male athletes weighing 41 kg (48,15 ± 19,03) and higher than the value of male athletes weighing 65 kg and over (28,60 ± 15,01). This change was found to be statistically significant (p<0.05).

4. Results and Discussion

In the study, the difference between gender and weight was investigated in the techniques used by star taekwondo athletes aged 11-14 years during the competition and no significant difference was found between gender in our study. This finding is consistent with other studies on the technical and tactical performance analysis of young taekwondo athletes (Son and Yang, 2022; Linhares et al., 2022; Kim et al., 2021; Selucık and Dilek, 2020; Genç, 2019; Ulupınar et al., 2021; Yıldırır, 2021).

The young age of young taekwondo athletes and their limited technical abilities are important factors affecting their performance. Although no statistically significant difference was found in our study, when the tables of male and female athletes were examined in detail, it was seen that there were differences in technique scored, technique scored and match score. The reason for this is considered to be that male athletes are faster than female athletes, they are more fearless against the impact that may come from the other side, and their combative structures and aggression levels are superior to women (Boutios et al., 2021; Gora et al., 2015).

This result may be due to the fact that young athletes are still in the developmental stage. Although it is thought that significant differences in physical and motor skills may occur during adolescence, it is seen that the effect of gender differences on technical and tactical performance in this age range is limited. In addition, the similar implementation of training and education programs between genders may also play a role in the absence of these differences (Liu and He, 2024; Sadowski et al., 2012).

When women and men were analyzed separately between the weights, no significant difference was found. Limited technical abilities in young athletes may affect the tactical dimension of their matches. The low level of defensive techniques observed in this study suggests that children are unable to effectively prevent the opponent's attacks. In recent years, the importance of defense in taekwondo among elite athletes has been increasing (Boutios et al., 2021; Kazemi et al., 2010). The reason for this is that in the increasingly changing system, apart from the aim of collecting points, they only try to be the winner of the competition, in this case, it is seen that they do the same training regardless of weight. However, it is stated that there is a difference in the upper-level technique throws of low-weight men because they have more flexibility, they use these techniques more easily against heavyweights, or they have more desire to throw that technique (Čular et al., 2010; Boutios et al., 2021). Given that it is thought that attachment movements, which connect less natural movements, do not fully mature until the end of the first decade of life (Cortis et al., 2009), it seems that sufficient opportunity is needed to develop.

Given these results, it is highly recommended that coaches focus their training on the development of children's coordinate abilities through dynamic situations. In fact, children's motor skills should be developed during competitions to avoid perceiving isolated drills as boring and irrelevant to their actual performance (Libertus, 2020). One method by which children can learn technical elements can be based on a tactical approach that encourages the young athlete to generate solutions to tactical problems by creating opportunities for athletes to develop expected skills related to attack and defense Clumpner, 2003). Recent studies show that these approaches increase children's motivation and improve their performance (Roberts et al., 2018).

5. Conclusions

As a result, it can be said that the techniques used do not differ according to gender, there is no difference in the techniques used by women depending on the weight, but the techniques used by men change according to the weight. In this case, the inexperience of the athletes in the stars group and the fact that their average age is small compared to the branch they are doing shows that there is no difference in the techniques they use, while the fact that they are in the same development period shows that there is no difference between gender. It can be said that the coaches also made the same type of training program without making gender and weight discrimination. As a result of these analyses, it is thought that it would be more efficient for coaches to determine which techniques their athletes have a tendency to use and to make their work and training plans within the framework of a program taking into account the age, gender, developmental level and weight of the athlete.

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