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Orignal article

The effect of nutrition counseling on growth development and success in star wrestlers

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Summary. The aim of this study is to investigate the feeding habits of national wrestlers. 36 volunteer male newcomer national wrestlers who were between 13-15 years old participated in the study. One group of the wrestlers in two different regions of the same age was given nutrition education and nutrition counseling by the researcher for one year. The obtained data were saved to the computer using SPSS 13.5 package program. In all tests, p <0.05 was considered significant. Group I had more length growth than the other group. The hip circumference and upper middle arm circumference were found to be larger in Group I than in Group II (p<0.05). There was a statistically significant difference between the degree of wrestlers in the competitions (p<0.05). About one in twenty athletes in Group I who received continuous nutritional counseling consumed carbohydrate, vitamin B_1, vitamin B_{12} and calcium below RDA's recommended values for adolescent children. Among group II athletes food items consumed below recommendation and percentages were; 5.9% for total energy, 41.2% for carbohydrate, 70.6% for fiber, 47.1% for vitamin A, 17.6% for vitamin E, 94.1% for vitamin B_1, 47.1% for vitamin B_2, 58.8% for vitamin B_6, 88.2% for biotin, 70.6% for folic acid, 94.1% vitamin for C, 58.8% for potassium, 100.0% for calcium, 29.4% for magnesium, 11.8% for phosphorus, 17.6% for iron, 76.5% for pantothenic acid. The athletes of the wrestling, have improved their performance and growth positively when they have adequate and balanced nutrition counseling.

Key words: star wrestlers, nutrition counseling, success

Introduction

Nutrition is one of the basic needs that affect the health of the individual, especially during adolescence (1-3). Nutrition in sports is an issue that needs to be considered carefully as it affects the general health and sports performance of the athlete (4, 5). In particular, wrestling is a sport that requires the combination of various functional characteristics that affect performance such as general muscle strength, speed, reaction time, neuromuscular coordination, static and dynamic balance, high aerobic capacity (6). Most athletes lose weight either because their weight doesn't match their weight category or to gain tactical advantage (7). Athletes use various methods such as reducing nutrient and fluid consumption, starving, vomiting consumed foods and using various medications (laxative drugs, slimming pills, diuretica), intense exercise, staying in the sauna for a long time to achieve their targeted weight in short therms (8-10). In this way, energy intake is inadequate in weight loss and the body's amino acids are converted to glucose (glyconeogenesis) to provide the necessary energy. As a result, negativities such as decrease in muscle tissue and blood pressure, increase in blood uric acid level, dizziness, anemia, and mental disorder occur. It also causes a great deal of fluid loss in the body. Loss of fluid causes negativities such as; muscle cramps, disturbance in heat regulation mechanisms, early fatigue, weakness, concentration disturbance and electrolytes imbalance (11). Conscious nutrition of athletes participating in competitions and contests in all sports is extremely important in win-

ning them (12, 13). Having energy intake appropriate to exercise, balance of energy distribution to nutrients, carbohydrate consumption, pre- and post-exercise food selection, adequate fluid intake are the factors that determine performance in terms of nutrition (14). The most important point to be considered at the age of starting weight studies is the growth age. Especially during physical development, height growth is provided by the pineal points of the bones; impacts on the pineal regions and the physical burden on them cause premature closure. As a result, bone growth and neck elongation are prevented (4).

Wrestling is one of the heaviest sports in the medium term sport branches. In order to withstand heavy training, increase performance and achieve success, it is important to recover the lost energy as soon as possible and in a balanced manner. The energy consumed in training and competitions with high loads should be met with a regular diet program. Carbohydrates are mostly used in this branch where durability is important, especially in the first half of wrestling competitions and in the first minutes of the second half. Foods rich in carbohydrates should be consumed to ensure saturation in glycogen stores in the pre-competition period (11).

Improving the physical performance and success is possible by taking the right planned nutrients according to the requirements of training and competition. It is important that an adequate amount of various nutrients used in regeneration of body tissues in the diet of the individual and which serve as fuel in many processes, especially muscle contraction. This can be achieved by adequate and balanced nutrition in order to obtain nutrients in the recommended amounts according to age and sex (4).

Nutritional habits of wrestlers affect performance, therefore it is very important to know athletes' nutritional habits and to identify possible mistakes and gain the correct habits. In the literature, there are almost no studies evaluating the nutritional status of wrestlers in adolescence. This study will provide an important contribution to athletes, families and coaches in terms of the importance of adequate and healthy nutrition on the performances of athletes and to increase the interest shown to this issue. Therefore, the aim of this study is to investigate the feeding habits of national wrestlers.

Materials and Methods

36 volunteer male newcomer national wrestlers (athletes of growth and development age who train 2-3 hours at least 5-6 days a week) who were between 13-15 years old participated in the study. In order to find sufficient number of participants, wrestlers from nearby districts were selected. Therefore, they were divided into 2 groups according to the region they were trained. One group of the wrestlers in two different regions of the same age was given nutrition education and nutrition counseling by the researcher for one year (Group I: Kavak, Wrestling Training Center (n=19), Group II: Amasya Wrestling Training Center (n=7) and Ordu Wrestling Training Center (n=10).

In the first stage: nutritional status of the athletes in Group I was examined by the nutritionist and diet expert, monthly meal lists were examined and the energy and nutrients required by the athletes were calculated. The food lists of the wrestling training center were re-prepared and implemented for 1 year. In this study, demographic characteristics, frequency of food consumption and 3-day food consumption of each athlete were taken by face to face survey method. Group II athletes were not given any nutritional training or counseling. Height, weight, body mass index (BMI), waist measurements, hip measurements, waist/hip ratio, upper middle arm circumference were measured and calculated from anthropometric measurements. In addition, skinfold thicknesses (ST) (biceps ST, subsscapula ST, abdomen ST, triceps ST, subrailiac ST) were measured from 5 different regions. Body fat percentages were calculated according to Yuhazz formula.

Height: All star athletes' body weights were measured by Baster MLC weighing scale and height was measured by height meter. Attention was paid to ensure that all athletes were dressed in light clothing and weren't wearing any shoes (15).

Body Mass Index: It is a very objective criterion used to show nutritional status in both children and adults based on weighted height. BMI was calculated by using body mass index [weight (kg)/height (m^2)] standard for children aged 1–19 years (16).

Skinfold Thickness: One of the most commonly used methods in the field to determine body fat is to measure skinfold thickness with the help of caliper tool (17). ST measurements of the athletes included in the study from

five different regions (triceps, biceps, abdomen, suprailiac and subscapular) were measured with Holtain caliper by the researcher. Each measurement was repeated three times and results were averaged.

Triceps ST: While the left arm was bent 90 degrees from the elbow, place between the acromion and olecranon were marked. Measurement was made while while arm was relesased and the person was standing (18).

Biceps ST: Measurements were made from the anterior part of the left arm and the layer behind the triceps by marking the upper part of the cubital fossa (18).

Subscapularis ST: While the perseon was standing, under the inferior angle of the scapula, the natural line of the skin was measured at a 45-degree angle (18).

Suprailiac ST: Legs standing side by side with arms on the side, if necessary, slightly behind, 2 cm above the iliac bone over the midaxillary line was measured while keeping the diagonal (18).

Abdominal ST: It was measured by taking approximately 2 centimeters from the side in the vertical direction (18).

Upper Middle Arm Circumference (UMAC): While triceps ST of all athletes was measured, the individual from the marked acromion and olecranon point was measured upright and with arms free on the side, palms facing the thigh, and with a non-flexing tape without pressure on the soft t issue in UMAC (18).

Waist/Hip Ratio: Waist and hip circumference of all athletes were measured. The athletes' waist circumference were measured between the lowest rib and the crystalline waist with their arms on both sides and their feet adjacent, while the hip circumference was measured with a non-stretching tape at the points passing through the maximum circumferential coats in the same position. During the measurement, care was taken to ensure that the athletes were dressed in light clothing (18).

Yuhazz Body Fat Percentage Calculator: Body fat percentages and lean tissue masses of adolescents were calculated using ST sums measured from five different regions and Yuhazz's equation (18).

Yuhazz Equation: Fat % = 5.783 + 0.153 (Triceps + Subscapularis + Abdominal+ Suprailiac)

Food consumption: Food consumption was observed by the same author and the amounts of daily energy and nutrients of patients were calculated for 3 consecutive days for first week. Then, mean amounts of macro and micro nutrients were calculated by using Be Bi S® (19) programme with this observational data. Energy requirement of the patients were calculated by the Schofield equation (20). In addition, taking into account of the stress factors, such as fever, stress, status (daily activity, physical capacity, sick-abed patients, etc.) necessary additions were added to Basal Metabolism Energy (BME) (21).

In the second stage: The 3-day food consumption, food consumption frequency and anthropometric measurements of the athletes in Group I and Group II were taken. In this study, demographic characteristics, frequency of food consumption and 3-day food consumption of each individual were taken by face to face questionnaire method. Of the anthropometric measurements, only height, weight and BMI were re-measured.

Energy and nutrient intake RDA (Recommended Dietary Allowances) according to consumption <67% to be inadequate, between 67-133% to be sufficient and> 133% to be considered to be more (22).

Statistical Evaluation of Data: The obtained data were saved to the computer using SPSS 13.5 package program. Continuous variables were given as mean ± SD, median and range, and categorical variables as numbers and percentages. Chi-square and Fisher exact chi-square tests was used in cross tables. The difference between the groups was compared using student t test. In all tests, p <0.05 was considered significant.

Results

The mean age of the groups I and II was 13.79 ± 0.71 and 14.24 ± 0.90 years, and there was no statistically significant difference between the mean ages (p> 0.05).

There was no difference between the body weights (kg), height (cm) and BMI (kg/m^2) values at the beginning and end of the study (p<0,05). However, the difference in length growth between the athletes in Group I (4.05 ± 1.58 cm) and Group II (2.52 ± 2.12 cm) was statistically significant compared to Group I (p=0.019). Star wrestlers in Group I had more length growth than the other group (Table 1).

The mean values of waist circumference, hip circumference, upper middle arm circumference (cm) of the athletes in Group I and II were 73.52±7.38 cm, 69.41±8.29 cm; 86.31±9.96 cm, 77.76±11.11 cm;

Table 1: Evaluation of Anthropometric Measurements of Star Wrestlers

Descriptive Information		Group I (n:19) X ± SD	Group II (n:17) X ± SD	p
Age		13,79 ± 0,71	14,24±0,90	P>0,05
Waist Circumference (cm)		73.52± 7.38	69.41 ± 8.29	P>0,05
Hip Circumference (cm)		86,31±9,96	77,76±11,11	**0,020***
Waist/Hip Ratio (cm)		0.85±0.11	0.89±0.13	
Upper Middle Arm Circumference (cm)		27,86±4,13	24,76± 2,90	**0,013***
Yuhazz Fat %		10,07±1,20	9,68±0,90	P>0,05
Weight Category (kg)		55,94 ± 16,36	49,94 ± 15,78	P>0,05
Weight (kg)	Beginnind	52.36 ± 14.01	49.73± 15.05	P>0,05
	End	56.95 ± 15.17	52.36 ± 15.38	P>0,05
Weight (kg)	Difference	4.59±2.95	2.62±4.45	P>0,05
Height (cm)	Beginning	155.15 ± 12.94	154.00 ± 13.46	P>0,05
	End	159.21 ± 12.55	156.52 ± 13.10	P>0,05
Height(cm)	Difference	4,05 ±1,58	2,52±2,12	**0,019***
BMI (kg/m²)	Beginning	21.23 ± 2.55	20.41 ± 2.78	P>0,05
	End	22.02 ± 2.90	20.82 ± 2.93	P>0,05
BMI (kg/m²)	Difference	0.78±1.02	0.41±1.72	P>0,05

p<0.05*

27.86±4.13 cm, 24.76±2.90 cm, waist / hip ratio was found to be 0.85±0.11 cm and 0.89±0.13 cm (Table 1). The hip circumference and upper middle arm circumference were found to be larger in Group I than in Group II (p<0.05) (Table 1).

Athletes' ST measurements (biceps, abdomen, triceps, subsscapula, subrailiac) were determined as: star wrestlers in Group I averaged 9.34 ± 3.82; 8.90 ± 2.79; 5.34 ± 2.21; 7.48 ± 2.32; 6.33 ± 1.89; Star wrestlers in Group II were 9.34 ± 3.29; 8.67 ± 2.84; 4.15 ± 1.23; 6.72 ± 1.49; 5.92 ± 1.26. No statistically significant difference was found between the groups in terms of skinfold thickness measurements (p>0.05) (Table 1).

The mean body fat percentages of Group I and Group II were 10.07±1.20 and 9.68 ± 0.90 respectively. There was no statistically significant difference between the groups (p>0.05) (Table 1).

While the average training time of the athletes in Group I was 2 hours, the average of the athletes in Group II was 2,32 ± 0,46 hours, which made a statistically significant difference (p<0.05) (Table 2).

47.4% of Group I athletes and 53.0% of Group II athletes wrestle in free style. There was no statistically significant difference between star wrestlers in terms of wrestling competition styles (p>0.05). 84.2% of the Group I wrestlers and 23.5% of the Group II wrestlers had a degree in the competitions. There was a statistically significant difference between the degree of wrestlers in the competitions (p<0.05) (Table 3).

5.3% of Group I athletes consumed carbohydrate, vitamin B1, vitamin B12 and calcium below the recommended values for adolescent children of RDA. Among group II athletes food items consumed below recommendation and percentages were; 5.9% for total energy,

Table 2: Star Wrestlers's Training Information

Training Information	Groups	min	max	X ± SS	p
Weekly Training Day	Group I	5	6	5,84 ± 0,37	P>0,05
	Group II	1	6	5,64 ± 1,22	
Daily Training Day	Group I	2	2	2,00 ± 0,00	**0,005***
	Group II	2	3	2,32 ± 0,46	

p<0.05*

Table 3: Star Wrestlers' Styles and Competition Success Status

Styles	Group I		Group II		Total		p
	Number	Percent	Number	Percent	Number	Percent	
Free	9	47,4	9	53,0	18	50,0	
Greco-Roman Wrestling	8	42,1	4	23,5	12	33,3	
Both	2	10,5	4	23,5	6	16,7	P>0,05
Success							
Yes	16	84,2	4	23,5	20	55,6	
No	3	15,8	13	76,5	16	44,4	**0,001***

41.2% for carbohydrate, 70.6% for fiber, 47.1% for vitamin A, 17.6% for vitamin E, 94.1% for vitamin B1, 47.1% for vitamin B2, 58.8% for vitamin B6, 88.2% for biotin, 70.6% for folic acid, 94.1% vitamin for C, 58.8% for potassium, 100.0% for calcium, 29.4% for magnesium, 11.8% for phosphorus, 17.6% for iron, 76.5% for pantothenic acid (Table 4).

Discussion

Starting sports at an early age is very important by nature and is one of the important factors affecting success. In our study, it was observed that star wrestlers started sports in a period as young as 13-14 years for both groups. Usually young talented wrestlers begin to

Table 4. Recommended nutrient consumption distributions of athletes according to adolescents of the same age group. (22)

Food Items	Group 1						Group 2					
	Inadequate <%67		Adequate %67-133		Excesives >%133		Inadequate <%67		Adequate %67-133		Excesives >%133	
	s	%	s	%	s	%	s	%	s	%	s	%
Energy (kkal)	-	-	11	57,9	8	42,1	1	5,9	15	88,2	1	5,9
Protein (gr)	-	-	-	-	19	100,0	-	-	10	58,8	7	41,2
Fat (gr)	-	-	6	31,6	13	68,4	-	-	17	100,0	-	-
Carbohydrates (gr)	1	5,3	13	68,4	5	26,3	7	41,2	9	52,9	1	5,9
Fiber (gr)	-	-	19	100,0	-	-	12	70,6	5	29,4	-	-
Vitamin A	-	-	5	26,3	14	73,7	8	47,1	9	52,9	-	-
Vitamin E	-	-	13	68,4	6	31,6	3	17,6	14	82,4	-	-
Vitamin B1	1	5,3	18	94,7	-	-	16	94,1	1	5,9	-	-
Vitamin B2	-	-	5	26,3	4	73,7	8	47,1	9	52,9	-	-
Vitamin B6	-	-	4	21,1	15	78,9	10	58,8	7	41,2	-	-
Biotin	-	-	-	-	19	100,0	15	88,2	2	11,8	-	-
Folic Acid	-	-	-	-	19	100,0	12	70,6	5	29,4	-	-
Vitamin B12	1	5,3	7	36,8	11	57,9	-	-	11	64,7	6	35,3
Vitamin C	-	-	7	36,8	12	63,2	16	94,1	1	5,9		
Potassium	-	-	2	10,5	17	89,5	10	58,8	7	41,2	-	-
Calcium	1	5,3	13	68,4	5	26,3	17	100,0	-	-	-	-
Magnesium	-	-	14	73,7	5	26,3	5	29,4	12	70,6	-	-
Phosphorus	-	-	7	36,8	12	63,2	2	11,8	15	88,2	-	-
Iron	-	-	12	63,2	7	36,8	3	17,6	14	82,4	-	-
Zinc	-	-	-	-	19	100,0	-	-	11	64,7	6	35,3
Pantothenic Acid	-	-	17	89,5	2	10,5	13	76,5	4	23,5	-	-

get good degrees after 6-8 years. It is important to know the anatomical, psychological and physiological characteristics of this age group well and focus on educational games to ensure the development of children by avoiding overloads that may be harmful in the future on joints and bones (4). At the beginning of the study, the mean age of Group I and II were 13.79 ± 0.71 and 14.24 ± 0.90 years, respectively, and there was no statistically significant difference between the mean ages. According to the measurement results obtained before and after the study, there was no statistically significant difference between body weight and BMI values of the athletes in both groups (Table 1) while the difference between the mean height measurements (cm) was found statistically significant. In this study, it was found that athletes who received nutritional education had more length growth. Meeting the increasing energy and nutrient needs of athletes with adequate and balanced nutrition is an important result of this positive development. Because athletes have been regularly consulted about regular eating habits, healthy eating behaviors, especially athlete nutrition. Nutrition affects the development and formation of physical structure. Nutritional deficiency, especially during the developmental period, causes poor posture. It is not possible to expect a malnourished athlete to develop his body as desired and achieve success. In a study conducted on elite athletes in our country, it was observed that only 3 of 280 athletes were on a diet and only one of them were on a diet under expert control (23,24). It was determined that wrestlers started to lose weight at an early age (adolescent period) and most of them tried to reach the desired weight by applying fast weight loss methods with very little time (1-2 weeks) before the competition. In a study conducted by Yarar et al., the first three ranks among the reasons for weight loss of athletes who had difficulty while losing weight before the competition were; the current weight being between two weight categories (38.5%), the desire to be quicker, faster, more durable than competitors by losing weight (23.6%), considering themselves inadequate in upper weight category (21.9%). In the same study it has been reported that one-third of athletes try to achieve proper weight reduction by reducing fat consumption (25). In a study conducted by Farhan et al., the highest weight loss was reported as 3.06 kg in Greco-Roman wrestling and 3.58 kg in free wrestling. The negative effects of weight loss reported as dizziness (45%), susceptibility and aggressiveness (35%) and low concentration (24%) (26). In his study on wrestlers, Bradley reported that the highest weight loss was 7.0 kg in males and 6.2 kg in females (8). When the results obtained in this study and related literature are examined, it is seen that athletes lose weight to a great extent. The aim of this study was not to assess how much weight they had lost, but it was clear that rapid weight loss during the competition would affect the growth and development of athletes in this age group.

No statistically significant difference was found between the athletes in Group I and Group II in terms of waist circumference, hip circumference, upper middle arm circumference (cm) average, waist / hip ratio. The hip circumference and upper middle arm circumference were found to be larger in Group I than in Group II ($p<0.05$) (Table 1). Training, activity frequency and nutrition styles between groups may have an effect on this difference. When the average difference values of height (cm), weight (kg) and BKI (kg/m^2) between the beginning and end of the study were examined, only the average height difference was statistically significant ($p<0.05$) and the length elongation of the athletes in Group I was significantly higher (Table 1).

Body fat percentage, besides being a health criterion, is accepted as an important determinant of sport performance (27). Also, the skinfold thickness of the athletes (biceps, abdomen, triceps, subsscapula, subrailiac) were measured and body fat percentages were calculated (Group I: 10.07% Group II: 9.68%) and no statistically significant difference was found between the groups (Table 1). The body fat ratio of some wrestlers participating in the Olympics was found to be 12.7% in a study conducted by Açıkada (27). In his study on the athletes selected to the Wrestling Training Center, Arabacı found the average fat % of the wrestlers as 9.3 (28). The main reason of the difference between the studies is that the wrestlers have different body structure, the frequency of training and activity and the age groups are different, but it is parallel with the literature. The average daily training time of the athletes in Group I was 2 hours, whereas the mean Daily training time of the athletes in Group II was 2.32 ± 0.46 hours, and this difference was statistically significant ($p<0.05$) (Table 2).

It was found that 47.4% of the athletes in Group I were in free wrestling, 42.1% were in Greco-Roman wrestling, 10.5% were in both wrestling styles. It was found that 52.9% of the athletes in group II were in free wrestling, 23.5% were in Greco-Roman wrestling and 23.5% were in both wrestling styles. There is a direct proportion between athletes' eating habits and performance. Both in amateur and professional sports, success in sports can be achieved with good usage of nutrition and energy balance. In fact, athlete nutrition is directly in line with the endless development of science. It is important that nutrition-related information is known and applied by athletes and coaches (29). 84.2% of the star wrestlers in Group I and 23.5% of the star wrestlers in Group II had a degree in the competitions, and a statistically significant difference was found between the scores of the star wrestlers in the competitions ($p<0.05$) (Table 3). In a study conducted by Koç on wrestlers in 2014, 72.2% of athletes stated that there is a relationship between adequate, balanced nutrition and success (30).

Increased energy needs of athletes due to physical work can be met by increasing nutrient intake and regulating according to certain principles. The daily energy needs of active athletes are between 3000 and 7000 calories according to the age, sex, working style and duration of the athlete. 55-60% of daily energy should be provided fromcarbohydrates. 25-30% should be provided from fat and 10-15% should be provided from proteins (29). In a study conducted on 103 athletes, Paker and Ersoy found that the ratio of energy coming from carbohydrates was between 49.8% and 66% (31). It is stated that in the United States, 43-54% of athletes' energy (32) and in England 43-45% of athletes' energy are provided from carbohydrates (33). In a study conducted on 419 athletes in the Netherlands, it was found that 50% of daily energy of endurance athletes, 45% in team sports and 40% in strength sports are carbohydrates (34). About one in twenty athletes in Group I who received continuous nutritional counseling consumed carbohydrate, vitamin B1, vitamin B12 and calcium below RDA's recommended values for adolescent children. Among Group II, food items consumed below recommendations were approximately; one or two out of every twenty athletes for total energy, two out of five athletes for carbohydrate, seven out of ten athletes for fiber, one out of every two athletes for vitamin A, five or six out of ten athletes for vitamin E, nine out of ten athletes for vitamin B1, one in two athletes for vitamin B2, six out of ten athletes for vitamin B6, nine out of ten athletes for biotin, seven out of ten athletes for Folic Acid, nine out of ten athletes for vitamin C, five or six out of ten athletes for potassium, all athletes for calcium, one out of every three athletes for magnesium, one out of ten athletes for phosphorus, two out of ten athletes for iron, eight out of ten athletes for pantothenic acid.

In our study, consumption levels that appear to be normal or more are the amounts that athletes in this age group should take. This age group who we call adolescent, are in growth and development ages. At the same time, their active exercise increases their energy and nutrient requirements. These athletes who consume many nutrients and energy under RDA requirements become risky to other health problems and thus their performance may be affected.

The deficiency of micronutrients such as iron, zinc, iodine and B complex vitamins adversely affects growth, working capacity, mental and visual function and psychomotor functions (1, 4). When 33, aged between 14-16, adolescent athletes' nutrient consumption was examined, it was reported that they were undernourished from iron sources (35). Young athletes need iron, calcium, phosphorus minerals 50-80% more than adults (36). Increased energy needs of athletes due to physical work can be met by increasing nutrient intake and regulating according to certain principles. Daily intake of less than one-third of RDA for some of the B vitamins in the diet (B1, B2 and B6), vitamin C and other vitamins leads to a significant decrease in Vo2max and anaerobic threshold in less than 4 weeks (37). Because B group vitamins have important roles in the metabolism of carbohydrate, fat, protein and energy as coenzyme in the body (1, 4).

Daily energy needs of active athletes according to the athlete's age, gender, working style and duration is between 3000 and 7000 calories, 55-60% of daily energy should come from carbohydrates, 25-30% from fat and 10-15% should come from proteins (4,29). In a study conducted on female runners (n = 103), the ratio of energy coming from carbohydrates was reported as 49.8% - 66% (31), and 43-54% (32) in US athletes. In their study on 419 athletes in the Netherlands, endurance was reported as 50% in athletes, 45% in team sports and

40% in strength sports (34). In another study conducted on 44 adolescent tennis athletes, 4-day food consumption was taken and RDA comparisons were made, it was found that 50% of athletes receive carbohydrate at the recommended levels (38). Insufficient carbohydrate consumption leads to premature emptying of glycogen stores in the muscle and liver; it causes insufficient glycogen storage in muscles and the use of protein stores as energy other than fatigue formation. High carbohydrate intake of athletes in their diets is necessary (55%-70%) to ensure the continuity of glycogen stores (4).

In a study conducted at the University of Nigeria, it was reported that female and male students receive 300% more protein than the amount recommended by FAO/WHO (Nnanyelugo et al., 1987). In sports branches such as boxing, karate, wrestling, Taekwondo, judo lactic acid accumulation is seen in the body in a short period. Glycogen stores are used as energy sources. In general, however, athletes mostly include proteins in their nutrition program substantially. The protein taken over requirement has negative consequences in terms of health (4).

When the nutrient intake of Polish athletes was examined, it was found that diet fat intake was higher (39). These results are similar to the values of the athletes in Group II.

In this study, Group I athletes who received nutritional education in accordance with physiological and physical activity needs who who did not make uncontrolled and unscientific weight control diet, were fed more balanced than the athletes in Group II who were on their own or with only their coach's (who reduces what they eat, makes them eat only salad) knowledge. Growth of athletes in Group I was not affected and they were more successful.

Conclusion

The athletes of the wrestling, known as ancestor sport, have improved their performance and growth positively when they have adequate and balanced nutrition lists prepared by the dietitian according to their needs.

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