INVESTIGATION OF THE RELATIONSHIP BETWEEN BODY WEIGHT AND NUTRITIONAL EDUCATION HABITS OF ELITE CYCLISTS COMPETING IN DIFFERENT CATEGORY

INVESTIGAÇÃO DA RELAÇÃO ENTRE PESO CORPORAL E HÁBITOS DE EDUCAÇÃO NUTRICIONAL DE CICLISTAS DE ELITE CONCORRENTES EM DIFERENTES CATEGORIAS

INVESTIGACIÓN DE LA RELACIÓN ENTRE EL PESO CORPORAL Y LOS HÁBITOS DE EDUCACIÓN NUTRICIONAL DE CICLISTAS DE ÉLITE QUE COMPETEN EN DIFERENTES CATEGORÍAS

İbrahim Kubilay TÜRKAY [1]
Oğuzhan TİRYAKİ[2]

ABSTRACT: The aim of this study is to examine the relationship between body mass indexes and nutritional habits of national cycling athletes. In 2020-2021, 20 elite/national cyclists, including 10 sprinters and 10 hill climbers competing in the Turkey Cycling Spindle Team, participated voluntarily. The averages of age, height and body mass indexes of the cyclists participating in the study were respectively for sprinters; 23.40±2.68 years, 1.76±0.04 meters and 23.31±1.68 kg/m2, while for hill climbers it is 24.10±3.64 years, 1.76±0.05 meters and it was determined 21.39±1.02 kg/m2. The data obtained in the study were analyzed in computer environment. Spearman Correlation analysis was applied for the research results. In the study, it was seen that the BMI values of the athletes were normal and the sub-headings of their eating habits were above the average. In addition, no relationship was found between BMI and eating habits and total scores.

KEYWORDS: Cycling. Elite athlete. Body weight. Nutrition education.

RESUMO: *O objetivo deste estudo é examinar a relação entre os índices de massa corporal e os hábitos nutricionais de atletas nacionais de ciclismo. Em 2020-2021, 20 ciclistas de elite / nacionais, incluindo 10 velocistas e 10 hill climbers competindo na Equipe de Ciclismo da Turquia, participaram voluntariamente. As médias de idade, altura e índice de massa corporal dos ciclistas participantes do estudo foram, respectivamente, para velocistas; 23,40 ± 2,68 anos, 1,76 ± 0,04 metros e 23,31 ± 1,68 kg/m2, enquanto para os hill climbers foi 24,10 ± 3,64 anos, 1,76 ± 0,05 metros e foi determinado 21,39 ± 1,02 kg/m2. Os dados obtidos no estudo foram analisados em ambiente computacional. A análise de correlação de Spearman foi aplicada para os resultados da pesquisa. No estudo, verificou-se que os valores de IMC dos atletas estavam normais e os subtítulos de seus hábitos alimentares estavam acima da média. Além disso, não foi encontrada relação entre o IMC e hábitos alimentares e escores totais.*

PALAVRAS-CHAVE: *Ciclismo. Atleta de elite. Peso corporal. Educação nutricional.*

[1] Suleyman Demirel University, Isparta – Turkey. Assistant Professor, Faculty of Sport Science. ORCID: https://orcid.org/0000-0001-7694-3804. E-mail: ibrahimturkay@sdu.edu.tr
[2] Suleyman Demirel University, Isparta – Turkey. MA, Faculty of Sport Science. ORCID: https://orcid.org/0000-0002-9581-7632. E-mail: oguzhan_50_tr@hotmail.com

RESUMEN: *El objetivo de este estudio es examinar la relación entre los índices de masa corporal y los hábitos nutricionales de los ciclistas nacionales. En 2020-2021, participaron voluntariamente 20 ciclistas de élite / nacionales, incluidos 10 velocistas y 10 escaladores que compiten en el equipo de huso ciclista de Turquía. Los promedios de los índices de edad, estatura y masa corporal de los ciclistas que participaron en el estudio fueron respectivamente para los velocistas; 23,40 ± 2,68 años, 1,76 ± 0,04 metros y 23,31 ± 1,68 kg / m2, mientras que es de 24,10 ± 3,64 años, 1,76 ± 0,05 metros y se determinó 21,39 ± 1,02 kg / m2. Los datos obtenidos en el estudio se analizaron en entorno informático. Se aplicó el análisis de correlación de Spearman para los resultados de la investigación. En el estudio se observó que los valores de IMC de los deportistas eran normales y los subtítulos de sus hábitos alimentarios estaban por encima de la media. Además, no se encontró relación entre el IMC y los hábitos alimentarios y las puntuaciones totales.*

PALABRAS CLAVE: *Ciclismo. Atleta de élite. Peso corporal. Educación nutricional.*

Introduction

Between the First World War and the end of the 1950s, cycling was available to the public everywhere. Later, cycling was replaced by motorized driving and seemed to be heading towards an all-time low. Since the 1970s, the advantages of cycling have been emphasized first by cycling activists and later by politicians and policy makers. Social scientists, urban planners, and public health experts have tried to highlight the positive effects of cycling to the public from an economic, social, and physical perspective.

The enthusiasm for Road Cycling races began at the end of the 19th century and has not stopped growing since then. Some big races draw tens of millions of spectators and are watched by TV viewers all over the world. The first officially recorded race goes back to the "Parc de Saint-Cloud" in Paris on 31 May 1868, which was won by British cyclist James Moore. The first city-to-city race was held on 7 November 1869: Paris – Rouen. The winner was again James Moore, he completed 123 kilometers in 10 hours and 25 minutes. The organizers' intention was to promote the sport of cycling and show that cycling can travel significant distances. Road cycling has been part of the Olympic program since the Olympic Games were first held in 1896. (bike.gov.tr) Cyclists start together as a group. The courses take place at varying distances (approximately 260 km for Senior Men at the UCI World Championships). Road races take several different forms: point-to-point one-day races (such as Paris to Roubaix or the Tour of Flanders) or multi-lap races or stage races on a particular course such as the UCI World Championships (such as the Tour de France, the Tour of Italy). or the Tour of Spain). In addition to its aesthetic values, road racing has important features that should be investigated in terms of sports sciences. Road races are races in which not only

speed but also endurance and nutrition factors come to the fore (KAMAN *et al.*, 2017; ZINN *et al.*, 2017).

The most important reason why endurance and nutrition factors come to the fore in road races is that the races have one or more stages, and each stage is run between 90-250 km. In this sport with the above features; Physiological and physical characteristics of elite athletes are also important (MACARTHUR; NORTH, 2005; VARGAS *et al*., 2018).

Elite cyclists are characterized by both very intense training programs and high aerobic power as a natural result of their innate abilities (MONTGOMERY *et al*., 1998).

Sprinters and Hill climbers

Sprint

Sprint; It is an event that takes place in a bicycle race, usually between the last 100-400 m length, depending on many factors. In road races, each team makes great efforts to keep their sprinter in the best position. When it comes to the last meters, the task of the sprinter begins, with the help of the physical and physiological structure of his body, he comes to the fore with his explosive feature. Type 2 muscle groups work (fast twitch) (MA *et al.* 2013; ZILBERMAN-SCHAPIRA; CHEN; GERSTEIN, 2012).

Ramp

Ramp; According to the characteristic structure of the track that will be raced that day in the bicycle branch, it is the sections that go up to 1-20% slopes and where the athletes have the most difficulty. Hill climbers generally have a below-average fat percentage and a very strong cardiovascular system. One of the most important factors is the rate of maximal power generation with minimal weight. Type 1 muscle group works (slow twitch) (*et al*., 2011; ZEMPO, 2010).

Nutrition Education

Nutrition is very important in cycling, as it deeply affects the society and causes it to be examined in a multi-dimensional way (CHANG; BORER; LIN, 2017). In general, the characteristics of sprinters and hill climbers, which are two styles of road cycling, are different, as well as their diets (TIAN; ONG; TAN, 2009).

Sprinters; In addition to being strong and large athletes, they are responsible for feeding without destroying their muscle mass. Along with this, some nutritional habits have been formed (SEVIM, 2007; BURKE *et al*., 2017).

Yokuşçular; Due to their physical characteristics, they are thin, underweight and have lean muscle mass. In addition, they have a great responsibility both to prevent the increase in weight and fat percentages and to prevent muscle breakdown after intense physical activities (race) (MARTIN-MORELEDA *et al*., 2019). Slopes also have a unique eating habit (SEVIM, 2007; TILLER *et al*., 2019).

Methods

The universe of this research and the sample of the Turkish Cycling National Team were applied to 20 active athletes in the elite category, aged between 19-30, who took part in the season opening national team camp held between 30.11.2019-22.12.2019. Athletes are elite athletes who have received training on sports nutrition during their university education.

In this research, survey and measurement method for descriptive research model was applied as research method. Before applying the questionnaire and measurement method, all athletes filled in a voluntary consent form. SPSS 25 Package Program was used for the analysis of the survey data.

Establishment of volunteer groups

20 elite/national cyclists, including 10 sprinters and 10 hill climbers, voluntarily participated in the study. The averages of age, height and body mass indexes of the cyclists participating in the study were respectively for sprinters; 23.40±2.68 years, 1.76±0.04 meters and 23.31±1.68 kg/m2, while for hill climbers it is 24.10±3.64 years, 1.76±0.05 meters and it was determined as 21.39±1.02 kg/m2.

Data collection techniques

Physical Measurements:

Age, height, weight and, accordingly, body mass index were considered in the physical measurements for data collection used for the study.

Three-factor Nutrition Questionnaire

In the study, "Three Factor Nutrition Questionnaire" was used to examine the relationship between body mass indexes and nutrition of elite cyclists: The questionnaire known as TFEQ “Three-factor eating questionnaire” in the literature measures the eating habits of individuals. With this questionnaire, it is possible to measure the degree of restriction of people's conscious eating, the level of uncontrolled eating and the degree of eating when they are emotional. The questionnaire was originally created as 51 questions, and after the validity and reliability test of the questionnaire in various populations, it took its final form with 18 questions (KARLSON *et al*., 2000; LAUZON *et al*., 2004).

Statistics and Analysis

The data obtained in the study were analyzed in computer environment. It was determined that the responses of the participants to the three-factor nutrition questionnaire showed a normal distribution, and it was decided to apply parametric tests. Descriptive statistics of cyclists were presented in the statistical processes. In the comparison of different groups, t test and nutrition Pearman Correlation analysis were applied in independent groups. Significance level was accepted as $p<0.05$.

Results

Table 1 - Descriptive Statistics of The Participants

	group	**n**	**X±sd**	**t**	**p**
Eating out of control	Sprinter	10	11.60±1.96	.128	.900
	Hill climbers	10	11.50±1.51		
Emotionally Eating	Sprinter	10	5.70±1.77	-2.034	.057
	Hill climbers	10	7.60±2.37		
Conscious eating	Sprinter	10	14.70±2.45	-.075	.941
	Hill climbers	10	14.80±3.46		
Hunger sensitivity level	Sprinter	10	9.50±2.17	-1.270	.220
	Hill climbers	10	10.90±2.73		
Nutrition total	Sprinter	10	41.50±3.69	-2.150	**.045***
	Hill climbers	10	44.80±3.16		

Source: Devised by the authors

No statistically significant difference was found between the average scores of the cyclists who received nutrition education from the sub-headings of eating out of control, eating emotionally, eating consciously, and sensitivity to hunger. A statistically significant

difference was found in the direction of the hill climbers in the comparison of the total score averages of the nutrition questionnaire (Table 1).

Table 2 - The Relationship Between Body Weight and Nutritional Habits

		Eating out of control	Emotionally Eating	Conscious eating	Hunger sensitivity level	Nutrition total
Body weight	r	-.303	-.419	.201	-.269	-.413
	p	.194	.066	.396	.252	.070
	n	20	20	20	20	20

Source: Devised by the authors

Eating uncontrolled (r=-.303, p=.194) Emotional eating (r=-.419, p=.066) Conscious eating (r=, No statistically significant correlation was found between the sub-headings of 201, p=.396), level of sensitivity to hunger (r=-.269, p=.252) and the mean of Nutrition total (r=-.413, p=.070).

Discussion

According to Table 1; It is seen that there is no statistically significant difference between the average scores of the cyclists who received nutrition education from the sub-headings of uncontrolled, emotional, conscious and hunger of the nutrition questionnaire. However, it has been statistically determined that sprinter cyclists are more uncontrolled than hill cyclists in terms of uncontrolled eating. The reason for this can be interpreted as the fact that the energy lost instantly due to the reaction of the sprinter training to the anaerobic energy system is not given much importance and consideration compared to the climbers. Since uphill cyclists cover more long and tiring tracks, just like in endurance sports, which are exemplary in other sports, the energy lost after training is high, so it should be replaced as soon as possible. For this reason, it can be said that uphill cyclists pay more attention to their nutrition. Again, according to the table; in terms of emotional eating, we can see statistically that hill climbers evaluate eating more emotionally than sprinters. We can say that the reason for this is that they think that they need more food because they spend more power. When the table is examined in terms of conscious eating; in the same way, it is statistically seen that the hikers eat more consciously. This result also supports the above results. When the sensitivity levels of cyclists to hunger are examined; It is seen that hill cyclists are more sensitive to hunger than sprinter cyclists. We can interpret the reason for this as meeting the energy need as soon as possible since the uphill cyclists consume more energy. Otherwise, we can say that

they think that the problems that will arise due to the replacement of the lost energy may affect their performance negatively. Finally, according to Table 1; When the nutritional totals of the athletes were examined, it was determined that there was a significant difference between the slopers and sprinters. Depending on the explanations we made above, the change in energy fuel use brought about by the category difference; Depending on the amount of energy consumed and the amount of energy needed, it is inevitable that the total energy will show a significant difference in favor of the slopers.

According to Table 2, it is seen that there is no statistical relationship between the body weights of the cyclists participating in the study and the total averages of nutrition in the sub-headings of uncontrolled eating, emotional eating, conscious eating, hunger sensitivity level, and the nutrition questionnaire.

Conclusion and Recommendations

As a result; In the study, when the nutritional habits of sprinter and uphill elite cyclists are evaluated, we can say by looking at the statistical data that the uphill riders are more sensitive and careful in terms of the energy they spend and need. However, it is obvious that nutrition education is very important not only in cycling but also in all sports. For this reason, nutrition education, which will be given especially from a young age, will first affect the performance of the athlete and the future of sports and then the success of his country in sports. Especially coaches and sports scientists have a great responsibility here.

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