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Nutritional Knowledge and Ergogenic Aid Using Status of Competitive and Recreational Cyclists

Dilara SAK[1] Taygun DAYI[1] Erkan GÜNAY[2] Adile ÖNİZ[3*]

[1]*Department of Nutrition and Dietetics, Health Sciences Faculty, Near East University, Nicosia, Cyprus.*
[2] *Department of Coaching Education, Faculty of Sport Sciences, Celal Bayar University, Manisa, Turkey.*
[3] *Department of Biophysics, Institute of Graduate Studies, Near East University, Nicosia, Cyprus.*

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* **Corresponding Author**:
Adile ÖNİZ
E-mail Address:
adile.oniz@neu.edu.tr

ABSTRACT

This study aimed to determine cyclists' nutritional knowledge and habits and nutritional ergogenic aid usage and shed light on the relation between cyclists' nutritional knowledge and ergogenic aid usage. It was conducted in Cyprus. There were three groups (study groups: competitive cyclists-CC, recreational cyclists-RC, and control group-CG: sedentary adults). Data were collected with a questionnaire that includes three sections (the first two sections were related to general nutritional habits, ergogenic aids, and anthropometric measurements, and the last section included The Nutrition for Sport Knowledge Questionnaire-NSKQ). All data were evaluated by Statistical Package for the Social Science-SPSS version 24.0. Totally 174 adults participated voluntarily in this study (n: 58 for each group). CC and RC skipped their main meals and smoked less than CG ($p<0.05$). Although most of the participants had poor sports nutrition knowledge (60.0%), CC had the highest NSKQ score, and this result showed us that CC had more information about sports nutrition than CG ($p= 0.001$). According to ergogenic aids usage, CC (56.9%) used more than RC (39.7%) ($p= 0.000$). This study showed that cyclists (CC and RC both) -who used ergogenic nutritional aids- had lower NSKQ scores ($p= 0.027$). In conclusion, the nutritional knowledge levels of the cyclists were found to be insufficient. It was observed that cyclists had significant differences in nutritional knowledge and low level of knowledge about ergogenic supports. Thus, continuous sports nutritional education is necessary to increase their knowledge.

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INTRODUCTION

The last decade has shown us that humans need a proper level of activities for daily life as well as for healthy aging. Among possible activities, cycling is an important transportation type that is also economical and environmentally friendly. In addition, cycling is a recreational activity for amateurs and a sports branch for professional cyclists (Bopp et al., 2018). Cycling is a type of endurance sport that is defined as the ability to continue a physical action or exercise without getting tired. Thus, it needs aerobic energy systems. Generally, cyclists do this sport with low intensity and for a long period (Benardot, 2020; Bompa & Buzzichelli, 2018; Fink et al., 2018).

Endurance athletes need sufficient and balanced personal nutrition strategies to improve their energy requirements and optimize training effects (Maughan & Shirreffs, 2012). On the other hand, nutrition can play an important role in improving general health, supporting cyclists' athletic performance, and improving life quality (Pessi & Fayh, 2011). Although nutrition plays a key role in increasing cyclists' performance (Leonarda et al., 2018), consuming only regular food items may not be adequate to improve nutrient intake (Spriet, 2019). Especially endurance athletes need a higher amount of energy intake to increase their performance (Bescós et al., 2012). Thus, endurance athletes such as cyclists may need further ergogenic aids (Kerksick et al., 2018). In addition to a balanced diet, dietary supplements such as ergogenic aids are important and reliable products that might have positive effects on human metabolism (Fraczek et al., 2016; Kerksick et al., 2018; Ronsen et al., 1999). However, most athletes have low nutritional knowledge about dietary supplements -which have ergogenic roles-, and it may affect their nutritional status and hence performance (Dascombe et al., 2010; Sousa et al., 2016). In addition, even though the accessibilities to these products are so easy nowadays, there is a limited number of evidence about their effects and safety (Garthe & Maughan, 2018).

And also, many countries do not have specific laboratory tests for substances that have been prohibited in sports areas by World Anti-Doping Agency (WADA) (Garthe & Maughan, 2018). Thus, there is a necessity to determine and compare the nutritional knowledge of athletes about this subject. And also, there is a need to shed light on their ergogenic aid knowledge and usage status.

The ergogenic aid is a method to increase athletes' physical performance (Kerksick et al., 2018). According to the literature, there is an important relationship between athletes' nutritional habits, nutritional ergogenic aid usage, and their nutritional knowledge (Condo et

al., 2019; Jovanov et al., 2019). Some studies reported that education about nutrition and ergogenic aids is essential to provide optimal physical performance (Couture et al., 2015; Molinero & Márquez, 2009). On the other hand, there are a limited number of studies that aimed to determine endurance athletes' nutritional knowledge and nutritional ergogenic aid usage (Condo et al.. 2019; Jovanov et al., 2019; Pessi & Fayh, 2011). From this point, the present study is aimed to determine the relationship between endurance athletes' nutritional knowledge, habits, and nutritional ergogenic aid usage.

METHODS

Study Group

This study was conducted between December 2020 - May 2021 on the island of Cyprus. Competitive cyclists (CC) -who cycle as an endurance sport, compete regularly in the season, and have continued training in the Corona Virus Pandemic-, recreational cyclists (RC), and sedentary people formed the universe of this study. Because of the limited universe size, all physically active adult cyclists (≥19 years) in the national cycle federation were invited. Participation was voluntary, and 58 CC participated in the presented study. Matching the number of participations, researchers invited RC (n: 58) -who cycle as a hobby- and sedentary individuals (control group/CG) (n: 58) -who do physical activity for less than 150 minutes per week and sit or lay down more than seven hours in a day-. There were 174 participants in this study with ethical compliance (Near East University Scientific Ethical Committee, 24/12/2020; NEU/2020/86-1235).

Data Collection Tools

All data were collected using a questionnaire that had three sections. The first two sections were developed by researchers to determine participants' general nutritional habits, nutritional ergogenic aid usage, and anthropometric measurements such as body weight and height.

Body Mass Index (BMI) was calculated from these measurements according to the formulation (kg/m^2) of the World Health Organization (Nuttall Frank, 2015). Section three of the questionnaire was composed of The Nutrition for Sport Knowledge Questionnaire (NSKQ). NSKQ was developed by Trakman et al. (2017) and validity and reliability studies for the related population were conducted by Cirak & Cakiroglu (2019).

The Nutrition for Sport Knowledge Questionnaire-NSKQ

There are six subgroups and 68 items in this questionnaire. Weight management (3 items), macronutrients (22 items), micronutrients (12 items), sports nutrition (11 items), supplementation (11 items), and alcohol (9 items) are subgroups. Answers are given on a triple Likert scale, such as 'agree, disagree, not sure' or 'yes, no, not sure' or multiple choices. Each correct answer provides a +1 point to a participant. The maximum point of this questionnaire is 68. Scores of participants are evaluated by percentage and '0.0-49.0%' means poor, '50.0-65.0%' moderate, and '66.0-75.0%' good, and '≥76.0%' excellent nutritional knowledge status (Cirak & Cakiroglu, 2019; Trakman et al., 2017).

Data Analysis

Statistical Package for the Social Science version 24.0 was used for analysis. The number (n) and percentage (%) of qualitative data and the mean ($\bar{x}$) and standard deviation (SD) of quantitative data were determined with descriptive statistics. The compliance of the data to normal distribution was evaluated by the Levene test. In addition, the comparison of the data was evaluated with Pearson Chi-Square, Independent Sample t-test, One Way ANOVA, and Post Hoc; Bonferroni test. $p<0.05$ shows statistical significance.

RESULTS

There were two studies, and one control group in the present study (n: 58 for each group), and all of them completed the study phase (n: 174). The mean age of participants was 35.38±11.87 years (min. 19-max. 64). Majority of participants (69.5%) were males. Competitive cyclists (CC) and recreational cyclists (RC) skipped their meals less than the control group (CG). On the other hand, RC seemed to have skipped more than CC, though not reaching statistical significance. In addition, both CC and RC smoked less than CG. Similar to meal skipping, RC smoked more than CC ($p= 0.001$; Table 1).

Table 1
Participants' General Habits and Backgrounds

	Competitive cyclists (n: 58)		**Recreational cyclists (n: 58)**		**Control group (n: 58)**		**Total (n: 174)**	
Skip the meal	**n**	%	**n**	%	**n**	%	**n**	%
No	27	46.6	24	41.4	13	22.4	64	36.8
Sometimes	16	27.6	14	24.1	17	29.3	47	27.0
Yes	15	25.9	20	34.5	28	48.3	63	36.2
Total	58	100.0	58	100.0	58	100.0	174	100.0
p_1			*0.050*					

Table 1 (Continued)

	Competitive cyclists (n: 58)		Recreational cyclists (n: 58)		Control group (n: 58)		Total (n: 174)	
Skip the snacks	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
No	10	17.2	4	6.9	7	12.1	21	12.1
Sometimes	27	46.6	35	60.3	25	43.1	87	50.0
Yes	21	36.2	19	32.8	26	44.8	66	37.9
Total	58	100.0	58	100.0	58	100.0	174	100.0
p_2			*0.220*					
Smoking								
No	53	91.4	46	79.3	37	63,7	136	78.1
Yes	5	8.6	12	20.7	21	36.2	38	21.8
Total	58	100.0	58	100.0	58	100.0	174	100.0
p_1			*0.001**					

p_1: Pearson Chi-Square test
p_2: Fischer Exact test
**: Statistically significance*

There was statistical significance between body weight and body mass index (BMI). According to the Bonferroni test, CC had a lower BMI than RC (p= 0.020; Table 2).

Table 2
Participants' Anthropometric Measurements

	Competitive cyclists (n: 58)	Recreational cyclists (n: 58)	Control group (n: 58)	Total (n: 174)	p
	$\bar{x}$±SD (min-max)	$\bar{x}$±SD (min-max)	$\bar{x}$±SD (min-max)	$\bar{x}$±SD (min-max)	
Body height (cm)	175.43±7.48 (158.00-198.00)	173.22±8.05 (158.00-190.00)	167.58±8.52 (150.00-190.00)	172.09±8.66 (150.00-198.00)	*0.001**
Body weight (kg)	73.74±10.98 (52.00-114.00)	77.70±12.44 (50.00-110.00)	68.32±15.20 (40.00-93.00)	73.16±13.46 (40.00-114.00)	*0.001**
BMI (kg/m^2)	23.92±2.94 (17.60-34.80)	25.83±3.47 (19.71-35.65)	24.34±4.80 (15.67-37.25)	24.70±3.88 (15.67-37.25)	*0.020**

p= One Way ANOVA; Bonferroni Post-Hoc test: Body weight [RC-CG (p= 0.001)], BMI [CC-RC (p= 0.020)].
**: Statistically significance*

The highest NSKQ score was found in the group of CC (30.46±9.07), RC (27.46±7.72), and CG (24.15±10.13) followed NSKQ scores. The difference was statistically significant (p= 0.001). According to the Bonferroni test, CC had a higher score than CG (p= 0.001). Most of the participants (>60.0%) had poor sports nutrition knowledge, according to NSKQ for each group. On the other hand, excellent knowledge status was not reported (in all groups) in the current study (Table 3).

Table 3
Participants' NSKQ Scores and Sports Nutrition Knowledge Status

	Competitive cyclists (n: 58) $\bar{x}$±SD (min-max)	**Recreational cyclists (n: 58) $\bar{x}$±SD (min-max)**	**Control group (n: 58) $\bar{x}$±SD (min-max)**	**Total (n: 174) $\bar{x}$±SD (min-max)**	**p_1**
NSKQ score	30.46±9.07 (5.00-48.00)	27.46±7.72 (16.00-46.00)	24.15±10.13 (2.00-44.00)	27.36±9.34 (2.00-48.00	*0.001**

Classification of sports nutrition knowledge

Classification	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**p_2**
Poor (0.0-49.0%)	36	62.1	44	75.9	45	77.6	125	71.8	
Moderate (50.0-65.0%)	19	32.8	13	22.4	13	22.4	45	25.9	*0.196*
Good (66.0-75.0%)	3	5.2	1	1.7	0	0	4	2.3	
Total	**58**	**100.0**	**58**	**100.0**	**58**	**100.0**	**174**	**100.0**	

p1: One Way ANOVA; Bonferroni Post-Hoc test: NSKQ score [CC-CG (p= 0.001)]
p2: Fischer Exact test
**: Statistically significance*

It was observed that CC (56.9%) used more nutritional ergogenic aids than RC (39.7%) (p= 0.000). The main cause for using ergogenic nutritional aid in CC was mostly (93.6%) to increase physical performance. On the other hand, RC used ergogenic nutritional aids mostly to increase physical performance (52.2%) and prevent diseases (26.1%) (p= 0.000). Nearly half of the RC (47.8%) started to use nutritional ergogenic aid with the suggestion of health professionals. However, most of the CC (72.7%) started with their coaches' suggestions and internet sources (p= 0.017; Table 4). In addition, it was determined that CC and RC -who had lower NSKQ scores- used more ergogenic nutritional aids than others who had higher scores (p= 0.027). This shows that ergogenic aids are used haphazardly by athletes (Table 4).

Table 4
Participants' Nutritional Ergogenic Aid Usage Information

Nutritional ergogenic aid usage status

	Competitive cyclists (n: 58)		**Recreational cyclists (n: 58)**		**Control group (n: 58)**		**Total (n: 174)**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**
No	25	43.1	35	60.3	58	100.0	118	67.8
Yes	33	56.9	23	39.7	0	0.0	56	32.2
Total	**58**	**100.0**	**58**	**100.0**	**58**	**100.0**	**174**	**100.0**
p_1				*0.000**				

Table 4 (Continued)

Reason for nutritional ergogenic aid usage						
	Competitive cyclists (n: 33)		**Recreational cyclists (n: 23)**		**Total (n: 56)**	
	n	%	**n**	%	**n**	%
To increase physical performance	31	93.6	12	52.2	43	76.8
To lose weight	0	0.0	1	4.3	1	1.8
To increase muscle mass	2	6.1	4	17.4	6	10.7
To prevent diseases	0	0.0	6	26.1	6	10.7
Total	**33**	**100.0**	**23**	**100.0**	**56**	**100.0**
p_2			*0.000**			
Source of nutritional ergogenic aid suggestion						
	Competitive cyclists (n: 33)		**Recreational cyclists (n: 23)**		**Total (n: 56)**	
	n	%	**n**	%	**n**	%
Health professionals	9	27.3	11	47.8	20	35.7
Others (Coaches, internet sources, etc.)	24	72.7	12	52.2	36	64.3
Total	**33**	**100**	**23**	**100.0**	**56**	**100.0**
p_2			*0.017**			
NSKQ scores according to nutritional ergogenic aid use						
	Competitive cyclists (n: 58)		**Recreational cyclists (n: 58)**		**Total (n: 116)**	
	$\bar{x}$±SD		**$\bar{x}$±SD**		**$\bar{x}$±SD**	
Using	28.16±10.36 (n: 33)		26.65±6.92 (n: 23)		27.28±8.47 (n: 56)	
Non-using	32.21±7.66 (n: 25)		28.69±8.81 (n: 35)		30.76±8.26 (n: 70)	
p_3			*0.027**			

p_1: Pearson Chi-Square test
p_2: Fisher Exact test
p_3: Independent Samples test
**: Statistically significance*

Table 5 lists the nutritional ergogenic aids classification used by athletes in the present study. Most commonly used ergogenic aids by cyclists were sports gels (48.7%), protein supplements (40.1% BCAA, 29.2% whey), sports drinks (16.2%), electrolytes (14.5%), multi-vitamin and mineral (12.7%) supplements. Each of the athletes -who prefer nutritional ergogenic aid - used more than one nutritional ergogenic aid (Table 5).

Table 5
Nutritional Ergogenic Aids Used by the Athletes

Nutritional ergogenic aids [a]	Competitive cyclist (n:33)		Recreational cyclist (n:23)		Total (n:56)	
	n	%	**n**	%	**n**	%
Sports gels	21	63.6	6	26.6	**27**	**48.7**
Protein supplements (BCAA)	17	51.6	5	22.9	**22**	**40.1**
Protein supplements (Whey)	12	42.4	4	18.4	**16**	**29.2**
Sports drinks	6	18.2	3	13.0	**9**	**16.2**
Electrolyte supplements	3	9.1	5	21.9	**8**	**14.5**
Multivitamin	1	3.0	6	26.6	**7**	**12.7**
Mineral (Magnesium)	4	12.1	3	13.6	**7**	**12.7**
Other (creatine, glutamine, pre-workout powder)	10	30.2	6	24.0	**16**	**29.0**

BCAA: Branched-chain amino acid
a: More than one answer has been given

DISCUSSION

This study aimed to shed light on a shallow area in sports science; cyclists' nutritional knowledge, status, ergogenic aids knowledge, usage status, etc. and also aimed to show insufficient matters to give inform cyclists to support their performance by increasing their knowledge. Competitive cyclists (CC) had the highest athletic nutrition knowledge scores among the groups participating in the present study (p= 0.001; Table 4). CC group skipped main meals less than the other groups when the main meal skipping rates were examined (p= 0.050; Table 1). Pendergast et al. (2016); was found similar results when they analyzed 35 original articles. They reported that sedentary adults skipped meals commonly. On the other hand, in a study -which had similar results to our study- cyclists' nutritional habits were found to be more regular than sedentary adults (da Rocha Penteado et al., 2010). Another study -which aimed to determine different endurance sports types and athletes' nutritional habits- found that cyclists' nutritional habits were better than others (Baranauskas et al., 2015). In another study that aimed to evaluate the effects of nutritional habits on physical performance in athletes from different branches, researchers reported that unbalanced and inadequate nutritional habits affected athletes' performance negatively (Debnath et al., 2019). In summary, some endurance athletes -who have unhealthy nutritional habits such as skipping meals- may be at nutrient deficiency risk. Nutrient deficiencies are directly related to physical performance (Noll et al., 2020). According to the literature, adequate and balanced meals and snacks prevent athletes from losing body muscle mass and increase their physical performance (Leonarda et al., 2018). On the other hand, some studies showed that smoking affects sports

performance negatively and may cause chronic disorders such as cancer, cardiovascular and pulmonary disorders, etc. (Chaabane et al., 2016; Lee & Chang, 2013). In this study, CC smoked less than RC and CG (p=0.001; Table 1).

Although not sufficient, we can tell that CC -who do this sport professionally- care for their performance and try to avoid some habits which can decrease their athletic performance.

Especially for endurance athletes -such as long-distance running, cycling and triathlon, etc.- high body weight decreases physical performance. Thus, a slim body type is more appropriate for these athletes (Fink et al., 2018). In the present study, CC had a lower BMI than RC (p= 0.020; Table 2). This result is in line with the literature and shows that cyclists -who cycle to compete- have a slimmer body type than RC who cycle for the hobby.

Nutrient intake and ergogenic aid use by athletes are related to their nutritional knowledge (Condo et al., 2019; Jovanov et al., 2019). Some studies reported that athletes have information pollution and what they know as principles may be wrong about sports nutrition. On the other hand, these studies showed that if their nutritional knowledge increase, it reflects their nutritional habits (Spronk et al., 2015; Trakman et al., 2016). The highest NSKQ score was found in the CC group (30.46±9.07 out of 68 points) in the present study (p=0.001; Table 3). Spronk et al. (2015); used General Nutrition Knowledge Questionnaire-GNKQ to evaluate athletes' nutrition knowledge. The mean score was found as 65.5±12.2 out of 113 points. In addition, the mean score was reported as 43.8±11.4 out of 90 points by Bird et al. (2020) when they used Nutrition Knowledge Questionnaire to determine participants' nutritional knowledge (NKQ). In this study, 62.1% of CC had poor, 32.8% moderate, and 5.2% good sports nutrition knowledge. These ranges were found in CG as 77.6%, 22.4%, and 0.0% (p= 0.196; Table 3). In another study with similar design and results, athletes' nutritional knowledge status was reported as 94.6% poor, 4.5% moderate, and 0.9% good. And for non-athlete adults, as 96.0% were poor, 4.0% moderate, and 0.0% were good (Miškulin et al., 2019). Devlin and Regina Belski (2015) designed a similar study, and they reported nutritional knowledge's important role in nutrient intake, which is related to athletes' physical performance. They underlined the importance of dietician and sports nutrition education for athletes.

These results and literature show us that there is a necessity to give regular and effective nutrition education to trainers and athletes. This nutritional education may help to increase their nutritional knowledge and physical performance.

The use of ergogenic aids -which increase exercise capacity- is common among athletes. These supplements have positive effects on energy metabolism. Thus, when an athlete needs more energy and nutrients in addition to a balanced and adequate food intake, they should use ergogenic aids via physician prescription (Fraczek et al., 2016). On the other hand, there is

a large number of unsupervised ergogenic aids in the supplement market. These products may include substances that might have a doping effect. Thus, the contents of all ergogenic aids should be checked by nutritionists and physicians. In addition, their beneficial effects must be proven, and they must have only beneficial effects on human health (Fink et al., 2018). In this study, 59.9% of the CC used nutritional ergogenic aid. Accordingly, it was determined that the athletes commonly obtained information about nutritional ergogenic aid from sources such as coaches and the internet (Table 4). Sousa et al. (2016); reported that 64.0% of the athletes stated that they used nutritional ergogenic aid. In another study, athletes using nutritional ergogenic aid (76.8%) generally obtained information about the use of nutritional ergogenic aid from social media, trainers, the internet, and their friends (65.9%). Accordingly, it was thought that the athletes did not have the proper information about the ergogenic aid products they used. Aljaloud and Ibrahim (2013); found that 93.3% of competitive athletes used nutritional ergogenic aid, 43.8% resorted to the use of nutritional ergogenic aid because they believed that it would improve athletic performance, and 6% believed that ergogenic aids also improve health. In addition, it was observed that the athletes mostly used sports drinks (88.7%), followed by the use of vitamin C (82.6%) and multi-vitamin (52%) supplements.

In a study conducted on track and field athletes participating in international competitions, it was found that 63.9% of them used nutritional ergogenic aids. It was stated that the most commonly used nutritional ergogenic aids were amino acids (49.3%) and vitamins (48.3%) (Tabata et al., 2020). In another study on endurance athletes, 80% of the athletes used nutritional ergogenic aid. These athletes -who declared using ergogenic aids- had moderate nutritional knowledge. It shows that athletes need an education program to increase their nutritional knowledge (Jovanov et al., 2019). In the current study, 93.6% of CC used ergogenic nutritional aids to increase their physical performance (Table 4). The most common ergogenic nutritional aids used by athletes were sports food, and medical supplements such as sports gels (48.7%), protein supplements (40.1% BCAA, 29.2% whey), sports drinks (16.2%), electrolytes supplements (14.5%), multi-vitamins and minerals (12.7%) supplements were used (Table 5).

On the other hand, Condo et al (2019); found that 54.5% of the athletes answered the 88-item Sports Nutrition Knowledge Questionnaire -SNKQ correctly, and incorrect answers were more common in the nutritional ergogenic aid section. It was seen that vitamin-mineral (70.0%) and protein supplements (65%) were used most commonly by athletes. According to the results, the nutritional knowledge of the athletes was found to be insufficient, especially in the nutritional supplement section. In a study on amateur athletes, the Nutrition Knowledge

on Sport -NKS questionnaire was used. Almost half of the participants (46.4%) stated that they used nutritional ergogenic aids. In particular, it was observed that 31.0% of them used vitamins, and 29.5% of them used amino acids. While it was stated that the athletes mostly used it to increase (39.9%) and repair (35.1%) muscle mass, it was reported that especially sports coaches (84%) suggested them to use supplements. On the other hand, 47.3% of the participants had sufficient knowledge of sports nutrition. This was revealed once again that amateur athletes and trainers do not have enough knowledge about sports nutrition (Finamore et al., 2022).

In another study, 56.3% of the competitive athletes had poor nutritional knowledge-NK, and 55.6% of them had poor nutrition practice-NP scores. At the same time, it was found that 7.2% of the participants used ergogenic nutritional aids and preferred protein powder mostly (Sunuwar et al., 2021). In the current study, low scores on the sports nutrition knowledge questionnaire, which were answered by the individuals who used ergogenic aids, showed that the athletes use ergogenic supplements haphazardly (Table 4). Wardenaar et al. (2017); reported that athletes who received dietary counseling made better choices about the use of nutritional ergogenic aids compared to athletes who did not. To produce some solutions to this problem, athletes should be better informed and educated about the possible misuse effects of ergogenic aids.

CONCLUSION

The present study showed that the nutritional knowledge levels of the CC and RC were insufficient. In addition, it was observed that cyclists had significant differences in knowledge and low level of knowledge about ergogenic supports. According to the results, ergogenic aids were mainly suggested by the trainers. From this point, it is possible to say that nutrition education is essential for both trainers and cyclists. Nutrition education can affect athletes' food choices, eating habits, and physical activity behaviors. Further, it shows us there is a need for this education by a dietician and physician for this study group. Most cyclists preferred ergogenic aids to increase their physical performance. However, ergogenic aids play a less important role than nutrition in athletic performance. Athletes should be informed about nutritional strategies which are specific to cycling performance. Besides, as a multidisciplinary group, a sports dietician, physician, and trainers should work together to provide maximum athletic performance. Nowadays, the availability of many ergogenic aids is so easy to reach. If athletes use ergogenic aids in an uncontrolled fashion, the risk of various complications may increase, and this may even result in death.

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Declaration of Conflict Interest

There is no conflict of interest to be reported.

Author contributions

The first author collected data, second author contributed to the study design, third author supported the tools selection, and the fourth author supervised the general processes. All authors contributed to the scientific outline of Ms. The first and second authors marked nutritional, third author highlighted sports background while fourth author linked health scope.

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