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Original article

The effect of nutrition course on the nutrition knowledge level

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Abstract. *Study Objectives:* It is a well-known fact that knowledge about athletes 'and coaches' nutrition is very important. There are several studies on the nutrition of athletes. In this study, to determine the athletes' nutritional knowledge levels; it was conducted to determine the sports knowledge scores of the students, the future coaches of today's athletes, studying in the Faculty of Sports Sciences. *Methods:* 394 students voluntarily participated in the study. "Sports Nutrition Knowledge Scale (SNKS)" was used to determine students' sports nutrition knowledge scores. Independent samples-t test was used to compare the groups, and One-Way ANOVA test was used to determine the difference between the departments. *Results:* The mean knowledge score of the students who took the nutrition course was determined as 37.11% and the mean knowledge score of the students who did not take the nutritional course was determined as 22.67%. It was determined that the difference between the nutritional knowledge mean score of the students who took and did not take a nutritional course was in favor of the students taking a nutritional course. While the nutritional knowledge mean scores of male students were 30.23%, the mean of nutritional knowledge of females was 29.50%. No difference was found in the comparison of the nutritional knowledge score means of male and female students. The mean of nutritional knowledge scores among the departments in the teaching department was found to be 32.52% in the coaching department and 27.01% in the management department. When the sub-dimensions were evaluated, there was a significant difference in micronutrients, sport nutrition, supplement, and alcohol sub-dimensions. *Conclusion:* It was determined that the nutritional knowledge levels of the students who took both nutrition courses and those who did not take the nutritional courses were found to be poor, while the nutritional knowledge total scores of the students who took the nutritional courses were higher. For this reason, it is thought that it will be beneficial to increase the nutrition course duration and to add these course to the standard education as a compulsory course to keep the nutritional knowledge levels of the students who can coach in the future.

Keywords: Students, Nutrition knowledge, Nutrition course

Introduction

Nutrition is one of the basic needs for human survival. In addition, nutrition has become a subject of constant research and new developments to ensure that athletes struggle better both in individual and team games, a continuous increase in performance, and maintain this increase (1). Nutrition is considered as one of the most important factors for athletes. Athletes can keep their diet under control provided that they have sufficient knowledge about the subject, which can have a positive effect on their performance (2).

Sports nutrition; is a specialization area where nutrition science and exercise science are related and put into practice. The main goal in sports nutrition is to ensure adequate and balanced nutrition of the athlete, thus protecting the health and performance of the athlete (3). Regular and balanced nutrition is important

for the athlete in several ways. Many situations that affect the athlete directly or indirectly can be achieved through balanced nutrition, such as increasing performance, preventing weight loss and overweight, preventing discomfort caused by electrolyte losses in the body, regular functioning of the digestive system, and renewal of energy sources during recovery (4).

At a time when nutrition and sports nutrition are so important, a good many different types of research are conducted on the subject. In the last 20 years, major developments in the field of sports nutrition have followed each other. The fact that sports nutrition has become a popular topic in the world and our country has brought with it plenty of misinformation and beliefs (5). Accurate nutritional knowledge is essential for high performance, which is a common goal of professional athletes, coaches, strength and fitness coaches, and sports teams from the field of sports (6). It is important to evaluate nutritional knowledge at different times so that the sports dietitian can determine the nutritional knowledge level of the athletes, provide nutrition education for the subjects that the athletes are lacking, and develop strategies for increasing nutritional knowledge. Thus, to set individual goals to increase the performance of the athlete; to give effective suggestions; it will be possible to help treatment plans in eating disorders (7).

Nutritional status and forms vary in complex social structures. Misinformation by all segments of society becomes accepted as correct in time. In this case, knowledge, attitude, and wrong beliefs are the main factors in behavioral change. Knowledge is not behavior, but it is an important factor since it is the main factor that determines healthy eating habits (8). They stated that conferences or educational activities that students voluntarily participate in nutrition increase their breakfast rates and improve their eating behavior (9).

Nutrition knowledge is an important factor in the nutritional habits of children, young people, and therefore the whole society. The negative effects of inadequate and unbalanced nutrition on health can only be eliminated with the right nutrition knowledge and the conversion of this knowledge into behavior. Therefore, it is known that the education to be given to the individual/society is also a dynamic process and it should be continuous to adapt to the differences due to the constantly changing conditions (10). Especially university years are the periods when individuals gain wrong eating habits and carry risks in terms of protecting and improving health. Young people leaving their families during the first years of university education begin to obtain unhealthy eating habits during the adaptation phase of this new environment (11,12).

To prevent negative behaviors such as unhealthy nutrition with the work to be done, and since the athletes learn the nutrition knowledge mostly from the school and their coaches, in the light of the nutrition information supported by scientific studies, it is widely believed that the training of athletes and trainers, seminars, course, panel, etc. Moreover, it would be beneficial to emphasize activities on the importance of nutrition in print and visual media (13,14). Considering these situations, the purpose of the study was to determine the nutritional knowledge score means of the students studying in the Faculty of Sports Sciences.

Materials and Methods

Participants

A total of 394 students, 229 males and 165 females studying at the Faculty of Sport Sciences at Niğde Ömer Halisdemir University voluntarily participated in the study.

Experimental Design

The scale, originally used in the study is "The Nutrition for Sport Knowledge Questionnaire" (NSKQ), which was developed in 2017 by Trakman et al. (16), Adrienne Forsyth, Russell Hoye and Regina Belski to evaluate the nutritional knowledge of adult athletes. The Sports Nutrition Knowledge Scale was found to be valid and reliable in Turkish by Çırak and Çakıroğlu in 2019 (17). The reliability level of the study was determined as (α = 0,908). As a result of its evaluation, Sports Nutrition Knowledge Scale consists of 68 items and weight control (3 items), macronutrients (22 items), micronutrients (12 items), sports nutrition (11 items), supplements (11 items), and alcohol (9 items) titled 6 sub-dimensions. The items of the scale are multiple choice and 3-point Likert type (I agree, disagree; I›m sure - I›m not sure; effective- ineffective).

Knowledge scores were calculated from the correct answers and the overall performance (68 items accepted as 100) in NSKQ should be evaluated using the scoring system; «Weak» knowledge (0-49%), «average» knowledge (50-65%), «good» knowledge (66-75%) and «excellent» knowledge (75-100%) were evaluated through the scoring system.

Statistical analysis

The obtained data were analyzed through SPSS 22 package program. Independent samples-t test was used to compare two groups, and the One-Way ANOVA test was used to determine the difference between departments. Tukey test from Post Hoct test was used to determine which group the difference originated from.

Results

It was determined that the number of people participating in the study was 394 and their mean and standard deviation of age was 21.24±2.10 years. While the knowledge score percentages of the students taking nutrition lessons were included in the 'good' information classification, the information score percentages of the students who did not take nutritional lessons were included in the 'weak' information classification.

Table 1. Distribution of nutritional scores by gender

Variables	Gender	N	Mean±S.D.	p
Total score	Male	229	30.23±11.26	.510
	Female	165	29.50±10.56	
Weight check	Male	229	1.68±1.42	.180
	Female	165	1.48±1.35	
Macronutrients	Male	229	11.13±4.61	**.009***
	Female	165	9.95±4.04	
Micronutrients	Male	229	6.09±2.99	**.031***
	Female	165	6.76±3.05	
Sports nutrition	Male	229	4.71±2.92	.844
	Female	165	4.65±2.59	
Supplement	Male	229	3.29±2.43	.818
	Female	165	3.35±2.56	
Alcohol	Male	229	4.40±3.45	.373
	Female	165	4.09±3.28	

*p < .05

When table 1 was analyzed, according to the gender variable, it was clear that there was a significant difference in the macronutrients and micronutrients of athletes' nutritional knowledge scale were in favor of females, and as for in macronutrients they were in favor of the male.

When Table 2 was examined, it was stated that there was a significant difference in 6 sub-dimensions and total score according to the nutritional course taking variable and the difference is in favor of the students taking nutritional courses.

According to the information given in Table 3, it was seen that the students studying in the teaching department have higher levels of nutrition than those studying at the coaching and management depart-

Table 2. Distribution of nutrition points according to taking nutrition courses

Variables	Taking Nutrition Courses	N	Mean±S.D.	p
Total score	Yes	198	37.11±8.22	**.000***
	No	196	22.67±8.29	
Weight check	Yes	198	1.98±1.46	**.000***
	No	196	1.21±1.21	
Macronutrients	Yes	198	12.75±3.62	**.000***
	No	196	8.50±4.10	
Micronutrients	Yes	198	7.79±2.58	**.000***
	No	196	4.93±2.77	
Sports nutrition	Yes	198	5.87±2.82	**.000***
	No	196	3.48±2.18	
Supplement	Yes	198	4.41±2.37	**.000***
	No	196	2.21±2.07	
Alcohol	Yes	198	5.68±3.47	**.000***
	No	196	2.86±2.62	

*p < .05

Table 3. Distribution of nutrition points According to departments

Departments	N	Mean±S.D.	F	P
Teaching (a)	120	32.72±11.34[a]	11.617	**.000***
Coaching (b)	171	27.01±10.18[b]		
Management (c)	103	31.52±10.70[a]		

*p < .05; ab: Different letters represent the differences between the group

ment. It was observed that the students of the management department have higher levels of nutrition than the students of the coaching department (p <0.05).

When Table 4 was examined, it was clear that there was a significant difference between the nutrition knowledge score mean of the departments according to the sub-dimensions variable. It was seen that the difference between the departments is more clearly revealed in post-hoc analysis.

Discussion and conclusion

This study aimed to determine the levels of nutrition knowledge of the students studying in the Faculty of Sports Sciences, the future coaches of today's athletes. In the study, the total knowledge score mean of the students who took a nutritional course was determined as 37.61, and the mean score of the students who did not take a nutritional course was 22.67. It was determined that the difference between the nutritional knowledge score mean of the students who took and did not take a nutritional course was in favor of the students taking a nutritional course. According to the nutritional course taking variable, a significant difference was detected in 6 sub-dimensions of the scale (weight control, macronutrients, micronutrients, sports nutrition, supplement, alcohol), and the difference was in favor of students who took nutrition courses.

Trakman et al., (15) found the nutritional knowledge mean score of athletes as 48.2%. Trakman et al., (16) found that the nutritional knowledge mean score of the athletes who took nutritional education was 64.65, while the nutritional knowledge mean score of the athletes who did not take nutritional education was 52. They found a significant difference in comparing the scores of athletes who took and those who did not take nutritional education and stated that the difference was in favor of athletes who took nutritional training. Yılmaz et al. (18) in their research, nutritional knowledge of university students who took nutrition courses was found to be 72.44 those who did not take nutrition courses were 78.23. They stated that there was a significant difference in favor of students who took nutrition courses.

In a study conducted on university students, Alması (19) found that the mean score of students who took a nutritional course was 67.00 ± 8.80 and those who did not take a nutritional course was 55.60 ± 13.00. He found a difference in nutritional knowledge and stated that the difference was in favor of students taking nutrition courses.

In a study on university students conducted by Vançelik et al. (20); they stated that the rate of students who have a good nutritional knowledge level among students taking a nutritional course is higher than that of students who did not take a nutritional course. It has been determined that the students who

Table 4. Distribution of nutrition scores according to sub-dimensions

Variables	Departments	N	Mean±S.D.	F	p
Micronutrients	Teaching	120	6.68±3.03^{ab}	4.195	**.016***
	Coaching	171	5.87±2.98^{b}		
	Management	103	6.83±3.03^{a}		
Sports nutrition	Teaching	120	5.67±3.03^{a}	13.364	**.000***
	Coaching	171	4.00±2.54^{b}		
	Management	103	4.66±2.56^{b}		
Supplement	Teaching	120	3.73±2.40^{a}	6.483	**.002***
	Coaching	171	2.81±2.51^{b}		
	Management	103	3.67±2.40^{a}		
Alcohol	Teaching	120	4.94±3.72^{a}	4.645	**.010***
	Coaching	171	3.73±3.10^{b}		
	Management	103	4.39±3.29^{ab}		

*p < .05; ab: Different letters represent the differences between the groups

take nutrition lessons have higher nutrition knowledge scores than those who did not take nutrition courses. Unfortunately, it is thought that athletes and coaches who have incomplete or incorrect knowledge related to sports nutrition will cause some adversities in terms of performance.

In the study conducted, the nutritional knowledge mean score of males was determined as 30.23±11.26 and the nutritional knowledge mean of females was 29.50±10.56, and no difference was found between the students. When the nutritional score distribution is analyzed according to the gender variable, a significant difference was found in the macro-nutrients in favor of males while in terms of in the micronutrients it was found to be in favor of females.

Yılmaz et al. (18) determined the nutritional knowledge mean of females as 75.36 and the nutritional knowledge mean of males as 76.53. When the mean of nutritional knowledge and nutritional attitudes were compared according to the gender variable, no significant difference was found between the groups although the mean of females was higher. In his study on university students, Ata (21) found that the nutritional knowledge means of females were 65.55 and the nutritional knowledge means of males were 60.95. When the mean scores of nutritional knowledge according to gender variable were compared, a significant difference was found and stated that the difference was in favor of female students. Coşkun (22) determined the nutritional knowledge score means of males as 69.8 ± 21.56 and the nutritional knowledge score mean 81.50 ± 18.76.

Koldaş (23) stated that there is no significant difference in the comparison of the nutrition knowledge level of males and females in their study on students studying in the School of Physical Education and Sports. Murathan et al., (24) stated that the nutritional knowledge score of females was 25.75 and that of the males was 26.12 in the study conducted on the nutritional knowledge levels of males and females, whereas the mean of the nutritional knowledge of males was higher than that of females, but there was no statistically significant difference. Labban (25) determined that the mean nutritional knowledge of females was 38.37 and the mean of nutritional knowledge score of males was 37.29.

Tütüncü et al. (26) compared the nutritional knowledge scores between male and female students in their study. As a result of the research, they stated that there was no statistically difference in the gender variable. El-Sabban et al. (27) stated in their study on Kuwaiti university students that nutritional knowledge score means were not different in terms of gender. In his study, Erten (28) determined the mean nutritional knowledge of females as 26.95±4.16 and males as 23.78±3.69. He determined that there was a significant difference in the mean of nutritional score according to gender, and stated that this difference was in favor of girls.

Barzegari et al., (29) and. Süel et al. (30) stated in their study that there was no difference in the mean score of nutritional knowledge according to gender. Vançelik et al., (20), in their study, the nutritional knowledge mean score of female students was 10.9 ± 2.1, and the nutritional knowledge mean score of male students was 9.5 ± 2.4. They stated that there was a difference between the nutritional knowledge score mean according to gender, and this difference was in favor of female students.

It is known that especially women always want to be thinner, have the idea of being liked as well as the idea of going on diet more. For this reason, it is known that the nutritional intake and calorie knowledge levels are higher than the males. They think that the higher mean score of female students› nutrition knowledge than males may be the result of women being more interested in this issue than men.

When the findings were evaluated according to the departments, it was found that the nutrition knowledge score of the teaching department was 32.72, the coaching department was 31.52, and the sports management department was 27.01.

In the study conducted on the students of School of Physical Education and Sports, Murathan et al., (24) determined that the teaching department took the first place in the nutrition knowledge level of the students, while the coaching section took the second place and the sports management section took the third place. Özdoğan et al. (31) found that students› nutritional knowledge levels were low in their study on the students studying in the sports sciences departments of universities.

In studies conducted on various departments, Ata (21) determined the nutritional knowledge score mean of the students of the Faculty of Education as 58.05 and the nutritional knowledge score mean of the students of the Faculty of Health Sciences as 71.65.

Şanlıer et al., (31) ensured that the nutritional knowledge mean scores of the basic nutrition education courses given to students studying in the health sciences were higher than those studying in other departments. In another study, it was found that although the female students were more knowledgeable, the nutritional knowledge of the youth was insufficient and therefore, the insufficient information could not turn into habits and behaviors (32). In another study conducted by Mazıcıoğlu et al. (33) on 3rd and 4th grade students at a university, it was found that 47.2% of the students took nutritional courses and 52.8% of them did not take any nutritional courses during their education. In addition, 31.6% of students reported that the nutritional education or courses they took had a positive effect on their eating habits.

It is known that only the knowledge of training and physiology is not sufficient for those studying at the department coaching. It is thought that every trainer should have a good nutritional level knowledge since it is important to adjust the nutritional status to maintain the performance and high performance of athletes. For this reason, it is our suggestion to increase the number of hours of nutrition courses of the students studying in the coaching department and to make the nutrition lessons compulsory.

As a result, the nutritional knowledge score percentages of students who took a nutritional course and did not take a nutritional course were found to be weak, while the nutritional knowledge score percentages of students taking a nutritional course were higher. It may be thought that nutrition courses are elective courses, students who select the courses are closely interested in the courses, and they are active in sports. It is thought that it will be beneficial for athletes and coaches to take nutrition education and to emphasize the importance of this issue in print and visual media.

Conflict of interest

The authors declare that there is no conflict of interest about this manuscript

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