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Original article

Investigation of sports-trained students' eating habits according to some parameters before and during the coronavirus outbreak

Yunus Yıldırım[1], N. Ezgi Müftüoğlu[1], Osman İmamoğlu[2]

[1]Faculty of Sports Sciences, Mersin University, Mersin, Turkey; [2]Yaşar Doğu Faculty of Sports Sciences, Ondokuz Mayıs University, Samsun, Turkey

Summary. *Study Objectives:* The aim of this study was to investigate the eating habits of university sports trained students according to some parameters during the coronavirus pandemic. *Methods:* The questionnaires filled out by a total of 333 students studying at Mersin University Faculty of Sport Sciences were evaluated. Independent t-test, paired t-test, one-way variance analysis, and LSD tests were used in statistical processes ($p>0.05$). *Results:* Students' pre-pandemic eating habits scores are significantly lower than those of the pandemic eating habits ($p<0.001$). The difference between the scores of students who made changes in nutrition and those who did not change was found statistically significant ($p<0.05$). The difference in nutritional habits scores according to the team and individual sports status is statistically insignificant ($p>0.05$). During the pandemic process, the nutritional habits scores significantly changed according to whether or not students skip meals and the number of daily meals ($p<0.05$). Again, nutritional habit scores vary significantly depending on the state of use of supplements ($p<0.001$). Watching television and following coronavirus news on the internet exposure to coronavirus news in social media has been shown to affect eating habits ($p<0.01$). *Conclusion:* During the coronavirus pandemic, it was determined that there was little change in the nutritional habits of students who received sports training at the university. Students' eating habits are at moderate risk. The risk level of eating habits decreased in those who used supplements in their diet. Sports-trained students ' eating habits were similar according to gender, team and individual sports status, while daily skipping meals, the number of meals eaten daily, the state of use of supplement products, monitoring news of the coronavirus on social media, and exposure were observed to vary according to the state.

Key words: Nutrition, Athlete, Student, Eating habit

Introduction

Nutrition is the use of a sufficient amount of nutrients necessary for a person to grow, develop, and live healthily and productively for a long time. Adequate and balanced nutrition is the intake of all the nutrients required for the growth of the body, the renewal, and functioning of the tissues in sufficient quantities and the required ratio, and the proper use in the body. Nutrition is essential for growth, sustaining life, and maintaining health (1). Nutrition is an activity that should be done consciously to obtain the nutrients that the body needs in sufficient quantities and at appropriate times to ensure growth and development, to protect, maintain, improve and enhance the quality of life (2,3). It has been stated that the most effective way to combat COVID-19 individually is to eat regularly, especially to consume vegetables and fruits,

to sleep regularly, to keep body weight in balance, and most importantly to try to keep physical activity in life at every free time (4,5). Irregular meals and a pattern of snacking between meals, a habit of eating outside the home, and a way of eating on the run are notable features of eating habits. Many factors influence these habits. The family socio-economic situation, education, press, media, etc. (1,6).

In addition to the number of main and intermediate meals, the type and amount of food they consume in these meals, the place where food is purchased; the way people eat includes situations such as adequate chewing of food in the mouth, in which state of feeling they consume food, whether their preferences for consuming food are cold or hot. Again, factors such as education, income level, culture, nutritional knowledge, place of residence, and climate of the region influence and guide eating habits (7,8). University students ' nutritional status has been the target group of many studies in recent years (9). Especially in studies on the eating habits of young people in our country, students generally do not pay attention to main and intermediate meals and eat one meal, never consume eggs, vegetables, milk, and dairy products, they consume more foods such as tea, bagel, and bread at breakfast. It has been determined that they pay attention to meals being satisfying rather than being healthy while choosing food, that economic contribute to the problem of insufficient and unbalanced nutrition, and students staying in dormitories are not well-fed due to poor dormitory conditions (10-12).

To support the immune system during the coronavirus pandemic, individuals' responsibility has been stated as choosing a healthy lifestyle, eating meals rich in fruits and vegetables, exercising in their free time, trying to maintain healthy body weight, and sleeping for a sufficient amount time (4). There are many studies conducted on the eating habits of university students. The lack of nutritional knowledge can be seen at the high school level, but also at the university level. University students who are in the transition phase from adolescence to young adulthood have to deal with the problems of university life while trying to fulfill the developmental tasks specific to the period in which they are currently situated (12,13). Many studies show that young students and especially athletes do not eat an adequate and balanced diet and that their nutrition education and nutritional knowledge levels are insufficient (14,15). Many situations that directly or indirectly affect the athlete, such as performance enhancement, preventing weight loss and excessive weight gain, preventing the disorders caused by electrolyte losses in the body, proper functioning of the digestive system, renewal of energy resources during the recovery period, can be achieved with a balanced diet (12). In a study conducted during the coronavirus process, it was stated that the healthy eating habits of first and emergency aid students should be developed (16). Staying at home due to social isolation primarily led people to inactivity. Increasing activities that require inactivity, such as sitting and lying down for a longer time, spending time on television or the computer, causes a decrease in the rate of calorie expenditure, and this brings along an increased risk for chronic diseases (17). In particular, research conducted on the eating habits of young people in our country indicates that there are very serious problems with nutrition during this period (6). Emotional eating behavior differentiation is observed in individuals under high psychological stress, and these individuals tend to eat foods that have high fat and high sugar content and are thought to reduce stress (18-20). It is also known that diets with such ingredients cause obesity and adversely affect the immune system (21). The aim of this study was to investigate the eating habits of university sports trained students according to some parameters during the coronavirus pandemic.

Materials and Methods

Participants

Participants were students studying and doing sports at Mersin University Faculty of Sport Sciences in the academic year 2020/2021. The questionnaires, in which a total of 333 students participated, were evaluated. 176 male and 157 female university students participated in the study. Surveys include a personal information form and social media exposure survey, as well as an index of eating habits. Participants were asked to answer some questions in the

personal information form and questions in the eating habits. Index survey, taking into account both the pre-pandemic situation and the situation in the pandemic process. The duration of students' internet use for educational purposes is not included in internet use.

Eating habits index

The eating habits index was developed by Demirezen (1999). It was later re-edited by Demirezen and Coşansu (2005) as six articles. The specified frequencies are evaluated as Never= 0 points, rarely =1, sometimes = 2, frequent =3, and always =4. But in the last article, the interpretation was made in reverse (always 0 points - never 4 points). According to the total score obtained from the eating habits index, the level of risk of eating habits is evaluated as indicated below.0= no risk points, 1-6= light risk points,7-12= moderate risk points,13-18= high risk,19-24 = very high risk points are indicated (22,23).

Social media exposure

Social media exposure was measured last week by asking how often they were exposed to news and information about the novel coronavirus on social media. Answer options were:" never"," once in a while"," sometimes"," usually", and" very often" (24).

Statistical analysis

SPSS 25.00 package program was used in statistical analysis. The Kolmogorov-Smirnov test was performed to test whether the data was normal distribution and it was determined that the data had normal distribution. Independent t-test, paired t - test, one-way variance analysis, and LSD tests were used in statistical analysis.

Results

The age of the students participating in the study was determined to be 20.68 years for males and 20.31 years for females. Body Mass index values were found as 23.36 kg/m^2 for male and 21.33 kg/m^2 for female (Table 1).

According to gender, the nutritional status of the students before the coronavirus epidemic and the nutritional status during the epidemic process are similar ($p>0.05$). The nutritional scores of the students before the corona virus epidemic were significantly higher than the nutritional scores during the epidemic period ($p<0.001$; Table 2).

The nutritional scores of those who made changes in nutritional status and those who did not differ significantly ($p<0.05$). Nutrition scores of students doing team sports and individual sports students are similar ($p>0.05$; Table 3).

Nutritional habits scores changed depending on whether students skipped meals or not ($p<0.001$). Nutritional habit scores during the outbreak varied significantly according to the number of daily meals ($p<0.05$; Table 4).

Dietary habit scores vary significantly depending on the use of supplements in during the epidemic process ($p<0,001$; Table 5).

Watching television and following coronavirus news on the internet affected eating habits ($p<0.01$). It was observed that exposure to coronavirus news on social media negatively affected nutritional habits scores ($p<0.001$; Table 6).

Discussion and Conclusion

In this study, the age of the students participating in the study was determined to be 20.68 years for males and 20.31 years for females. Body Mass index values were found as 23.36 kg/m^2 for male and 21.33 kg/m^2 for female. Body Mass indexes of the students are at values accepted for normal healthy people.

Koldaş (2017) examined the nutritional knowledge levels of the students of physical education and sports schools in the Marmara region, who took nutrition courses. In conclusion, it was stated that the knowledge level of the students was low (25). In Yılmaz and Karaca (2019) study, the quality of life and nutritional knowledge attitudes of university-level students who are sedentary and do sports were examined. At the end of the study, he noted that individuals who were sedentary had lower nutritional information levels than individuals who were engaged in sports

Table1. Descriptive Statistics of Participants

Variables	Sex	N	Mean	Std. D.
Age (Years)	Male	176	20.68	2.21
	Female	157	20.31	2.04
Height (cm)	Male	176	177.40	6.39
	Female	157	163.88	5.79
Body weight (kg)	Male	176	73.20	9.44
	Female	157	57.36	7.87
Body Mas Index (BMI) (kg/m²)	Male	176	23.36	4.65
	Female	157	21..33	4.21

** p<0.001

Table 2. Comparison of eating habits by sex before and during the pandemic

Variables	Sex	N	Mean	Std. D.	t-test
Pre-pandemic nutritional status	Male	176	10.16	3.33	0.99
	Female	157	9.80	3.28	
Nutritional status during the pandemic process	Male	176	9.73	3.41	1.78
	Female	157	9.08	3.16	
Pre-pandemic nutritional status		333	9.99	3.19	3.31**
Nutritional status during the pandemic process		333	9.42	3.49	

** p<0.001

Table 3. Comparison of nutritional habits scores according to changes in the form of nutrition, dealing with individual and team sports

Variables	Parameters	n	Mean	Std. D.	t
Changing the form of nutrition	Yes	108	8.80	3.36	-2,42*
	No	225	9.72	3.24	
Type of sport of interest	Team sports	168	8.85	3.74	-1.71
	Individual sports	165	9.67	3.75	

* p<0.05

(26). Şener and Imamoğlu (2018) found no significant difference in nutrition scores between men and women in their study with different university students (27). According to the nutrition scores obtained in

Table 4. Nutritional Habits Scores by skipping meals and the number of daily meals during the pandemic

Variables		N	Mean	Std. D.	F/ LSD
Skipping meals	**Non-skipping meals (1)**	95	8.64	3.15	18,37** 1<2,3 2<3
	Sometimes skipping meals (2)	177	9.10	2.94	
	Mostly skipping meals (3)	61	11.59	3.66	
Number of daily meals	Two meals (1)	104	9.71	3.32	2,70* 4>2
	Three meals (2)	171	8.99	3.48	
	Four meals (3)	44	9.93	2.54	
	Five meals (4)	14	11.00	2.22	
	Total	333	9.42	3.30	

* p<0.05 and* * p<0.001

Table 5. Comparison of nutritional habit scores according to the state of use of supplements during the coronavirus pandemic

Variables	N	Mean	Std. D.	F/LSD
Probiotic and Omega 3 (1)	16	6.63	1.89	9,29** 1<2,4,5 2>3,4 5>1,3,4
Vitamin D (2)	54	9.81	4.18	
Vitamin C (3)	40	8.18	2.97	
Vitamin and mineral complex (4)	74	8.59	3.21	
Non-user (5)	149	10.33	2.82	
Total	333	9.42	3.30	

** p<0.001

Table 6. Nutritional habits scores based on watching television and following coronavirus news on the internet and exposure to it on social media

Variables	Hours	N	Mean	Std. D.	F/LSD
TV + Internet use (except for educational use)	0-2 hours (1)	228	9.08	3.44	11,12** 3>1,2
	3-4 hours (2)	54	9.02	2.54	
	5 hours and more (3)	51	11.37	2.72	
Exposure to information about the coronavirus on social media	Never (1)	18	8.60	2.91	7,37** 4,5>1,2,3
	Occasional (2)	77	9.35	3.70	
	Sometimes (3)	77	9.14	3.00	
	Usually (4)	112	11.08	3.00	
	Too often (5)	49	11.56	3.09	

* p<0.05

this study (between 9.08 and 10.16), the eating habits of the students are in the moderately risky group. Because according to the scale score, 7-12 points are indicated as moderate risk (23).

In the studies of Akyol and Çelik (2020), eating habits before the epidemic and during the epidemic were not found to be statistically significant by gender (1). In contrast, students ' pre-pandemic nutrition scores are significantly lower than their pandemic nutrition scores. In this study, eating habits before and during the pandemic were not statistically significant according to gender ($p>0.05$). Students' nutritional scores before the pandemic were significantly higher than their nutritional scores during the pandemic period ($p<0.001$). During the outbreak, students paid more attention to their nutrition than in the pre-outbreak situation. But although the nutritional habit score taken during the outbreak has decreased compared to before the outbreak, it is still in the risky group. It should be kept in mind that eating habits can change in a long time. A long period of time is required for nutritional habits to change.

In the studies of Gariboğlu and Bozar (2020), it was observed that the majority of individuals who dieted before isolation could not continue their diets during the isolation period. The majority of people who gave up their diet stated that they were eating psychologically and therefore could not continue their diet (28). A study has reported that emotional eating is associated with poor diet quality and can cause excessive weight gain (29). İmamoğlu et al., (2010) found differences in the nutrition scores of students working in various sports branches in the field of physical education and stated that this was since the nutrition levels of athletes were below the desired level (30). In a study conducted by Çebi et al. (2020), it was found that students who received sports training do not consume healthy food and have habits that are not suitable for sports nutrition (31). This unhealthy eating habit can increase the risk of developing obesity, and beyond being a chronic inflammatory condition, it is often accompanied by heart disease, diabetes, and lung disease, which has been shown to increase the risk of more serious complications of Coronavirus-19 (32). Studies have shown that depression, anxiety, and increased stress levels cause dietary choices to change (19,33,34). In this study, the nutritional habit scores of the students who changed the form of nutrition were 8.80 and the students who did not change were 9.72. The difference between the scores of students who made changes in nutrition and those who did not change was found statistically significant ($p<0.05$). According to the team and individual sports, the difference in eating habits scores is statistically insignificant ($p>0.05$).

It can be stressful to constantly hear or read about the outbreak incessantly during quarantine. As a result, stress drives people to overeat, often looking for sugary "comfort foods" (35). In this study, nutritional habits scores changed depending on whether students skipped meals or not ($p<0.001$). Eating habits of those who did not skip meals during the pandemic are sometimes lower than those who skipped meals and often skipped meals. Mostly those who skip meals have the highest nutritional habit scores. During the pandemic process, it is recommended not to skip the meal eaten as in other times. A healthy diet is recommended to strengthen the immune system, providing all the nutrients needed during quarantine, lockdown, and movement control. Obviously, this can be very difficult as not everyone has easy access to food as in normal times. Athletes should try to maintain the quality of the food they use, assuming they eat healthily. In addition, they should consider changing the way they eat (adopting some forms of fasting or calorie restriction) (36). Arpa Zemzemoğlu et al. (2019) found that students skipping main meals and consumption of snacks were high (37). During the school period, students skip breakfast meals for reasons such as lack of time, lack of anyone to prepare, or simply for not feeling like it (38). It is stated that students generally do not pay attention to meals, eat a single meal, and consume more foods such as sandwiches and bagels, and economic difficulties are effective in the problem of inadequate and unbalanced nutrition (6).

In this study, nutritional habit scores during the outbreak varied significantly according to the number of daily meals ($p<0.05$). Eating habits of those who eat five meals a day are significantly higher than those who eat three meals. There is growing evidence that the use of appropriate foods and lifestyle changes play a key role in disease resistance and health. Six steps have been proposed to help protect against respiratory

diseases (39). In general, proper sleep, moderate exercise, stress avoidance, vitamin-rich foods, fruits, and vegetables can naturally help support the immune system when dealing with viral diseases such as Coronavirus-19 (40). Micronutrients such as vitamins and trace elements are known to play important roles in both innate and adaptive immune responses, and micronutrient homeostasis is fundamental to maintaining a healthy immune system (41). While deficiencies in micronutrients can reduce immunity to disease, supplementation has been found to improve immunity against viral infections (42). Micronutrients may have the potential to increase immune function and defend against Coronavirus-19 (43). In some studies, high doses of certain vitamins such as vitamin D, vitamin C, and vitamin B12 decreased inflammation caused by the disease and shortness of breath. It has been reported that it can help shortness of breath or affect the inhibition of the virus (44-46). Vitamin D received special attention in the final months of the corona virus-19 outbreak. Vitamin D has often been suggested to play a role in reducing the risk of microbial infection (45). In the studies of Gariboğlu and Bozar (2020), it was stated that individuals mostly used vitamin C, vitamin D, and multivitamin supplements during the social isolation period. There are publications that state high doses of vitamin C supplements can be used in corona virus positive cases (47-49). Another study reported that countries with low average vitamin D levels have a higher number of coronavirus-19 cases (50). According to this study, dietary habit scores vary significantly depending on the use of supplements in during the epidemic process (p<0,001). The nutritional habit score of those who did not use supplements was found to be the highest. The risk level of eating habits has decreased in those who use supplements.

In the studies of Akyol and Çelik (2020), a significant difference was found in the frequency of exposure to information about the coronavirus-19 pandemic on social media, and the nutritional habits scores between those who had no or little exposure and those who were highly exposed. In this study, watching television and following coronavirus news on the internet affected eating habits (p<0.01). The eating habits of students who watch TV for 5 hours or more and use the internet have approached the upper limit of the moderate risk level. 7-12= points from the scale are indicated as moderate risk, 13-18= high risk (23). It is recommended that students spend less time on the internet and TV except for educational uses. It was observed that exposure to coronavirus news on social media negatively affected nutritional habits scores (p<0.001). As the frequency of exposure to information about the coronavirus on social media increases, the risk of eating habits increases.

During the coronavirus pandemic, it was determined that there was little change in the nutritional habits of students who received sports training at the university. Students ' eating habits are at moderate risk. The risk level of eating habits decreased in those who used supplements in their diet. Sports-trained students ' eating habits were similar according to gender, team and individual sports status, while daily skipping meals, the number of meals eaten daily, the state of use of supplement products, monitoring news of the coronavirus on social media, and exposure were observed to vary according to the state. It is thought that a long period is necessary for the change of eating habits. During the pandemic process, it is recommended not to miss meals as in other times, and to eat as adequate and balanced as possible.

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Correspondence
N. Ezgi MÜFTÜOĞLU
Mersin University Faculty of Sports Sciences
E-mail: ezgimuftuoglu1986@gmail.com