Original article

Investigation of Retired Elite Athletes' Food Addiction

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Summary. The aim of this study is to examine the food addiction levels of retired elite athletes in terms of various variables. The research is a descriptive cross-sectional study. The sample group of the study, fencing, football, basketball, volleyball, athletics, handball, tae-kwon-do, badminton and tennis, who ended their sports career at least 3 years ago, 51 men (53.1%) and 45 women (46.9%) average age 33.75 ± 5.88 total 96 constitute the national athlete. In the study, Yale Food Addiction Scale consisting of 27 questions developed by Gearhardt et al. in 2009 and adapted to Turkish by Bayraktar et al. In 2012 was applied to the participants in the study. Food addiction was detected in 39 of 96 participants participating in the study. When the data obtained in the study were examined, it was determined that the athletes who retired after exercising at the elite level experienced higher levels of problems with food addiction compared to other members of the society.

Key words: Food addiction, elite athletes, after retirement.

Introduction

Nutrition is the ability of organisms to take and use the items that are necessary for their growth, development, survival and for a healthy and productive life. (1). Many academic studies are conducted on nutrition, which is one of the most important issues in human life, and ideas for a more balanced and healthy diet are put forward (2, 3, 4, 5, 6, 7). Detailed and serious studies are being carried out on how these studies, which are aimed at balanced and healthy nutrition, should be in athletes with different eating habits than sedentary individuals (8, 9, 10, 11). Considering that individuals doing sports consume more energy than sedentary individuals, the role of nutrition in the performance of athletes stands out (12). Nutrition in sports refers to adequate nutrition in order to reach the body composition necessary for performance and to continue training (13). There are also many academic studies showing that the nutritional habits of athletes are directly related to their performance (14, 15, 16, 17). Genetic structure, appropriate training and nutritional habits are important factors in athlete performance. In addition, the physiological and psychological characteristics of the individual, training quality, environmental factors and health are also considered as important factors (18). Among these factors, which is the most important research area of sports sciences, it is a fact that unhealthy individuals who do not have the habit of proper nutrition have difficulty in achieving success in sports (19, 20). Many academic studies on the importance of nutrition in athletes are included in the literature, but studies on the nutritional habits of people who have quit sports are not often encountered. The main purpose of this study is to examine the eating behaviors of athletes who have lived with a different nutrition method compared to sedentary individuals for many years after quitting sports. Studies show that there is a strong relationship between nutrition and eating disorders and psychology (21, 22) It is known that individuals who quit sports experience psychological problems after quitting sports (23, 24, 25, 26, 27). The effects of these psychological problems on food addiction in individuals who have had a

different eating habits compared to sedentary individuals for many years make scientific inquiry necessary. The concept of food addiction has been on the agenda in the scientific literature in recent years (28, 29, 30). It has been suggested that eating can turn into a kind of addiction, especially in obese and overeating people, and it is stated that the behaviors observed in these individuals can coincide with the basic symptoms frequently observed in addiction (31). Food addiction has been defined as the intense and abnormal consumption of some "super palatable" foods that are high in calories and glucose. Some studies have reported that individuals with food addiction have difficulty controlling eating behavior (32). Addiction can be explained as the inability to stop or control an item or attitude (33). Eating disorder can be explained as the continuation of the individual's relationship with food in a way that limits his / her daily life. Defined as a different type of addiction in recent years, food addiction has become an important research topic for many studies (34).

Although the diagnosis of food addiction is not yet widely accepted, there are some draft criteria suggested by Gunnars et al. The regular presence of 4 or 5 of these symptoms suggests that the person may have food addiction (35). These symptoms are listed as follows:

- Unsuccessful attempts to reduce or stop eating
- Not being able to stop yourself when starting to eat these foods and eating more than necessary
- Always feeling guilty while consuming certain foods, but soon find yourself consuming these foods
- Hiding from people around that they consume unhealthy foods
- Making frequent excuses as to why one should eat the foods that are craved
- Feeling craving for some foods despite feeling stuffy
- Feeling of being too full after consuming these foods

Not being able to control the consumption of these foods, knowing that they cause physical harm, Gearhardt et al. reported that among individuals with food addiction, the most common of these symptoms are attempts to fail their characteristics, and to continue eating behavior despite physical harm. These two symptoms are also common in individuals with binge eating disorder. (36). Food addiction is defined with substance addiction criteria, using behavioral and neurobiological studies (37). Food addicts tend to eat without physiological hunger, unlike non-addicted people (38).

Participation in sports and exercise recommended by the medical world in protecting and improving human health benefits individuals physiologically and psychologically. In addition to uninterrupted academic studies on the benefits of sports, there are limited studies on the lives of athletes who have been competing in competitive sports for many years after ending their careers. It is known that elite level athletes, who perform at a high level until the end of their careers, train intensely throughout their sports career. In addition to these trainings, the competitions that are constantly attended, the pressure of success, the struggle to stay on the podium for all time creates psychological pressure on the athletes, and brings a difficult process. This study examines the lifestyles of elite athletes after retirement through the food addiction variable.

Materials and Methods

The research is a descriptive cross-sectional study. The research population, fencing, football, basketball, volleyball and tennis branch in Turkey has represented the national team and individual sports constitute at least 3 years ago have ended his career. The sample group of the study, fencing, football, basketball, volleyball and tennis, who ended their sports career at least 3 years ago, 51 men (53.1%) and 45 women (46.9%) average age 33.75 ± 5.88 total 96 constitute the national athlete. In the study, Yale Food Addiction Scale consisting of 27 questions developed by Gearhardt et al. (36) in 2009 and adapted to Turkish by Bayraktar et al. In 2012 was applied to the participants in the study (39). Scale items are as follows:

- Substance taken in larger amount and for longer period than intended (Questions 1, 2, 3)

- Persistent desire or repeated unsuccessful attempts to quit (Questions 4, 22, 24, 25)
- Much time/activity to obtain, use, recover (Questions 5, 6, 7)
- Important social, occupational, or recreational activities given up or reduced (Questions 8, 9, 10, 11)
- Use continues despite knowledge of adverse consequences (e.g., failure to fulfill role obligation, use when physically hazardous) (Question 19)
- Tolerance (marked increase in amount; marked decrease in effect) (Question 20, 21)
- Characteristic withdrawal symptoms; substance taken to relieve withdrawal (Questions 12, 13, 14)
- Use causes clinically significant impairment or distress (Questions 15, 16).

In the evaluation of the scale * 17 * 18 * 23. There is no scoring in questions. These are preliminary questions for other questions. * 26 and * 27. In the questions, it gives information about the foods that the participant cannot control over eating. All questions are collected under all addiction criteria (tolerance, withdrawal, clinical symptoms, etc.). If the score is 1 or above 1, it meets this criterion and the score is taken as 1. If the score is 0, it means that it did not meet this criterion. If there is no diagnosis or for the diagnostic criteria; When calculating clinical disorders, it is taken as = 1 and symptoms should be greater than 3. This score must be either 0 or 1. If the score is 1, there is food addiction.

Statistical Analysis

IBM SPSS 26 package program was used to analyze the data. First of all, the participants' symptoms and the prevalence of food addiction were calculated. The average ages of individuals with food addiction and those without food addiction were compared using the Independent Sample T Test. The normal distribution condition, which is one of the assumptions of this test, was searched according to the kurtosis and skewness values of the groups. Kurtosis and skewness values in the range of ± 1.5 were accepted as indicators of normal distribution (40). The variance equality assumption was examined using the Levene's test. Food addiction rates in female and male participants were compared with Pearson Chi-Square analysis. The significance level was given as 0.05 in all analyzes.

Results

Food addiction was detected in 39 of 96 participants participating in the study. While 59.4% of the participants do not have food addiction, 40.6% of them have it.

Comparing the average age of individuals with and without food addiction diagnosis, there is no statistically significant difference between the two groups. ($p = 0.103 > 0.05$) Accordingly, age and food addiction variables are independent from each other.

There is no statistically significant difference between the food addiction rates of female and male participants. ($p = 0.765 > 0.05$) Accordingly, the variables of gender and food addiction are independent from each other.

Discussion

There are studies showing that athletes' physical activity levels decrease after retirement and lead a sedentary lifestyle(41). The aim of this study is to examine the lifestyles of elite athletes after their retirement, through the variable of food addiction. The studied population regrouped 96 Turkish athletes of the fencing, voleyball, basketball, football, badminton, athletics, taekwondo with data corresponding to the after retirement. Food addiction was diagnosed in 39 of 96 participants who participated in the study. The prevalence of obesity in Turkey in 2009 was determined to be 31.2% (42). Considering the direct relationship between food addiction and obesity, it become prominent to consider the relationship between human health and eating habits scientifically. In this study, which deals with how the identity of athletes who live a healthy life in the society has evolved after retirement, it can be said that the tendency of athletes towards food addiction during retirement is determined.

Table 1. General characteristics of participants

		N	%
Age (Year)	22-51	33,75±5,88	
Gender	Male	51	53,1
	Female	45	46,9
BMI	Underweight	21	21,87
	Normal	42	43,75
	Overweight	33	34,37
Elite Level Sport (Year)	1-4	30	31,3
	5-8	36	37,5
	9-12	16	16,6
	13-16	14	14,6
Sport	Voleyball	14	14,6
	Basketball	17	17,7
	Football	17	17,7
	Handball	12	12,5
	Badminton	8	8,3
	Athletics	10	10,4
	Tae-kwon-do	11	11,5
	Fencing	7	7,3
Smoking	Yes	28	29,16
	No	68	70,83
Alcohol Use	Yes	32	33,33
	No	67	66,67
Education	Middle School	1	1
	High school	20	20,8
	Undergraduate (2 Year)	2	2,1
	Undergraduate (4 Year)	71	74
	Post Graduate	2	2,1
Reason for Quitting Sport	Loss of Performance	19	19,8
	Psychological	22	22,9
	Physical	11	11,5
	Financial situation	30	31,3
	Marriage	2	2,1
	Family	5	5,2
	Other	7	7,3
Weight Gain After Retirement	0	7	
	1-9	31	
	10-19	15	
	20+	9	
Weight Loss After Retirement	0	1	
	1-9	27	
	10-19	6	
	20+	1	

The data obtained in the study were analyzed according to the age variable. Comparing the average age of individuals with and without food addiction diagnosis, there is no statistically significant difference between the two groups. (p = 0.103> 0.05) Accordingly, age and food addiction variables are independent from each other. When the previous studies in the field are examined; In Özkan's (43) study, no significant difference was found between the average age of food addicted individuals (36.6 ± 9.4 years) and the average age of non-food addicted individuals (39.8 ± 8.9 years). In the study of Flint et al. (44), 40 food addiction prevalence was found to be strongly negatively correlated with age. Pursey et al. (45) reported that the prevalence of food addiction is higher in people over the age of 35. Pierre-Luc Yao et al. (46) did not find any significant difference between male athletes aged (66.56 ± 12.22 years) and female (66.33 ± 9.94 years) age (66.33 ± 9.94 years) between the group who were not interested in sports and their eating habits. Zayed M Altowerqi et al. (47) found a parallelism between the eating habits of old elite athletes aged (39.73 ± 7.75 years) and the nutritional habits of overweight and obese individuals in their study. E Pihl (48) found that there is no significant difference between the nutritional habits of former elite male athletes aged (46.6 ± 7.5 years) and the physical activity group. When the data obtained in our study are examined, it can be said that similar results were obtained with the studies mentioned above. Considering that people who have done sports at elite level have been training for many years (Table 1); It can be said that the high-calorie diets they make affect the eating behavior during their retirement, but this behavior is not directly related to age.

Balaman (49) did not find a significant difference in food addiction and related factors in adults according to the gender variable in food addiction scores. Wiedemann et al. (50) examined food addiction in men and women in India and similarly found that it is not different in terms of gender. In the eating attitude research conducted by Baştürk (51), it was found that there was no significant difference between the eating attitude scores by gender. In the study conducted by Topkara (52) with university students, no significant relationship was found when

Table 2. Incidence of the Symptoms and Food Addiction Examined in Participants

	Not Available		Available	
	n	%	n	%
Substance taken in larger amount and for longer period than intended	35	36,5	61	63,5
Persistent desire or repeated unsuccessful attempts to quit	48	50,0	48	50,0
Much time/activity to obtain, use, recover	10	10,4	86	89,6
Important social, occupational, or recreational activities given up or reduced	35	36,5	61	63,5
Use continues despite knowledge of adverse consequences (e.g., failure to fulfill role obligation, use when physically hazardous)	59	61,5	37	38,5
Tolerance (marked increase in amount; marked decrease in effect)	47	49,0	49	51,0
Characteristic withdrawal symptoms; substance taken to relieve withdrawal	10	10,4	86	89,6
Use causes clinically significant impairment or distress	50	52,1	46	47,9
Food Addiction	57	59,4	39	40,6

Table 3. Comparison of Age Between Food Addicts and Healthy Individuals

	Diagnosis of Food Addiction	N	M	SS	t	sd	p
Age	**Not Addicted**	57	34,56	6,00	1,647	94	,103
	Addicted	39	32,56	5,57			

Independent Sample T Test

Table 4. Comparison of the Prevalence of Food Addiction Between Genders

		Diagnosis of Food Addiction						
		Not Addicted		Addicted		Chi-Square Test		
		n	%	n	%	χ^2	sd	p
Gender	Female	26	57,8%	19	42,2%	,090	1	,765
	Male	31	60,8%	20	39,2%			

Pearson Chi-Square Test

gender and eating attitudes were examined in a study comparing the relationship between eating attitudes and adult attachment styles by gender. Pierre-Luc Yao et al. (46) did not find a significant difference in eating habits according to age and gender in the study of lifestyle and self-definition changes of former athletes after retiring from sports. Li Liu et al. (53) did not find a significant difference in their nutritional habits in the study on the lifestyle of Chinese men and women. When the data obtained in the study were examined, there was no statistically significant difference between the food addiction rates of female and male participants ($p = 0.765 > 0.05$). Accordingly, the variables of gender and food addiction are independent from each other. It is known that people who have exercised at an elite level are subject to high-calorie diets to show high performance. Considering that the diets specific to athletes are not designed specifically for women or men, but according to their body structures and sports discipline; It can be said that gender is not an effective factor on food addiction.

Healthy Nutrition and Obesity Counseling in a study performed on volunteers admitted addiction to eating frequency unit in Turkey was found to be 28.57%. This ratio is greater than the norm score. The norm score, that is, the expected food addiction rate among the public is 11.6%. As a result of the systematic examination of 25 studies in which 196,211 young adults (individuals younger than 35 years old) were included in 2014, the prevalence of food

addiction was found between 7.8% and 25%, with an average of 17% (54). It was found that retired Turkish athletes considered in this study have a higher level of food addiction (40.62%) than the general population. It can be said that the body mass indexes of the active athletes in the branches in our study are generally within normal BMI limits (55, 56, 57). Stirling, Cruz, & Kerr, (58) stated in their study that elites who quit sports experienced muscle loss and increased weight gain. In the study conducted by Buckley et al. (59) on the lives of elites who quit sports, they found that the body structures and lifestyles of retired athletes changed after they quit sports and that their eating habits negatively affected their health. In the study of Marquet et al. (60), it was found that athletes who quit sports (mean age: 40.4 y ± 6.9) were 4.2 kg / m^2 overweight compared to the general population. In the study conducted by Stephan and Bilard with Olympic athletes who quit sports in 2003, they stated that athletes had problems with weight gain (61). In the study conducted by Cooper and Winter (62) by obtaining qualitative data with 6 retired swimmers, the results showing that the athletes had eating disorders were included. In the data obtained in this study, it is seen that the prevalence of food addiction is high in the sample group. It can be said that people who quit sports have a tendency to continue their eating habits as they did during their sports life. In a study conducted by Konttinen et al. In 2010, they observed that they display a positive attitude between depressive symptoms and emotional eating, but negative in terms of physical activity (63). The fact that retired athletes are not as popular as they were in sports, socially and psychologically, their social recognition and awareness levels decreased, and their physical activity levels decreased following the end of their careers for many years can be considered as one of the factors that explain high food addiction. In addition, Wiss et al. (64) suggested that various foods have a neurobiological effect on individuals that can lead to reward pleasure. Considering that the achievements of elite athletes create neurobiological pleasure, the fact that retired athletes have achieved a life without success can be considered as one of the factors that create food addiction.

Conclusion

When the data obtained in the study were examined, it was determined that the athletes who retired after exercising at the elite level experienced higher levels of problems with food addiction compared to other members of the society. Feeding retired athletes with high-calorie diets throughout their careers and not being able to control them during their retirement has been evaluated as a factor that can lead to eating disorders. In addition, it was concluded that the physical activity levels of retired athletes, which are one of the factors that cause food addiction, decrease, and this prevents them from maintaining a healthy diet. In the study, it was concluded that food addiction did not differ in terms of gender and age variables. In future studies, it is recommended to obtain data from a higher number of retired athletes and to support the data with qualitative data.

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