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A Study on Footballers: Is the Mediterranean diet a Good Defender of the Gastrointestinal System?

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Abstract

In football, diet has a highly important role in the development of performance. Assessing the nutrition-related knowledge of footballers and increasing their awareness may affect their health and performance. In this study, which was carried out for this purpose, whether the Mediterranean diet had an effect on the gastrointestinal health of professional footballers was investigated. The sample of the study included a total of 196 active licensed male footballers who were professional players in the 2nd and 3rd football leagues of Turkey. The mean age of the participants was 23.46±4.18 and their mean experience in licensed football was 11.73±5.07 years. The adherence of the participants to the Mediterranean diet was assessed using the Mediterranean Diet Adherence Screener, while the frequencies of gastrointestinal symptoms were examined using the Gastrointestinal Symptom Rating Scale. The data were transferred to the SPSS 26.0 program and analyzed using Pearson's Correlation Analysis, Independent-Samples T-Tests, One-Way ANOVA and descriptive statistics. According to the results of the analyses, no significant relationship was found between adherence to the Mediterranean diet and gastrointestinal symptoms (p>0.05). While the gastrointestinal symptom scores of the participants did not vary significantly based on their league tiers or positions (p>0.05), their Mediterranean diet adherence scores varied significantly based on their league tiers (p<0.05). Consequently, it was determined that the adherence of the participants to the Mediterranean diet increased as their league tier increased, but adherence to the Mediterranean diet did not create any positive or negative effect on their gastrointestinal system symptoms.

**Some of the data in this research were presented as a summary at the 1st International Congress on Nutrition in Sports and Exercise.*

Keywords: *Footballers, Mediterranean diet. Good Defender, Gastrointestinal System*

INTRODUCTION

The Mediterranean diet is defined as the entirety of the similar dietary habits of people living around the Mediterranean Sea including a rich set of components, higher amounts of dietary fibers and frequently consumed fermented foods (Sofi et al., 2010; Eker & Karakaya, 2018). This diet involves the consumption of fruits-vegetable rich in pulp, whole grains, poultry animals with low saturated fat content, oil seeds, olive oil, fish and moderate amounts of alcohol (Estruch, 2010; Sikalidis et al., 2021). With its high proportions of fats and vegetables, it is also considered a more acceptable option with applicability in the long term compared to low-fat diets (Tosti et al., 2018). It is also preferred because it is a dietary model that has low contents of saturated fats and animal proteins that affect gastrointestinal health negatively, as well as high contents of antioxidants, phytosterols, probiotics, fibers and monounsaturated fats that affect the gut microbiota positively. The effects of the Mediterranean diet in the prevention of cardiovascular diseases have been frequently emphasized and studies on the topic have highlighted the significant place of this dietary model in the context of obesity, insulin resistance, type 2 diabetes and autoimmune diseases (Tosti et al., 2018; Machowicz et al., 2020; Muscogiuri et al., 2020).

The gastrointestinal system is a complex and sensitive system that plays an important role in the main functions of the body. This system, which contains gastrointestinal organs, not only facilitates the absorption of nutrients by digesting foods but also contributes to energy production in the body. It also has an important role in terms of general health as it helps eliminate waste from the body (Collins et al., 2021). The role of a healthy and balanced diet in the performance of all these functions of the gastrointestinal system is highly important.

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Particularly in terms of the formation of a diverse gut microbiota, it is believed that factors such as physical activity, genetics, age and diet are determining (Ayyıldız & Yıldıran, 2019). Considering these factors, the reciprocal relationship between diet and the gastrointestinal system is apparent.

Athletes may experience various symptoms in their gastrointestinal system related to high-intensity exercise. Frequently encountered exercise-related gastrointestinal symptoms include nausea, heartburn, reduced appetite, abdominal cramps, diarrhea and constipation. In studies conducted with athletes, it has been reported that dietary interventions constitute the foundation of treatment in the resolution of problems in the gastrointestinal system. Studies have also shown that the Mediterranean diet is among these dietary interventions and it is associated with lower rates of cardiovascular mortalities (Keys et al., 1986; Estruch et al., 2013; Delgado-Floody et al., 2020).

Football is one of the most popular sports branches in the world and this situation creates a high demand from the capacity of footballers (Steffl et al., 2019; Sarıakçalı et al., 2022). Therefore, footballers are expected to meet physical demands and preserve the best physical form throughout the entire macro-cycle (preparation, pre-match, in-match) (Staśkiewicz et al., 2022; Ceylan et al., 2016). During training or matches, footballers use both anaerobic and aerobic systems and they have different energy and nutrition requirements depending on the nature of training sessions and competitions, as well as different periods. For this reason, diet has an important role in the optimization of performance (Collins et al., 2021). In a study conducted with footballers, it was stated that dietary habits can affect the performance and health of footballers (Mujika & Burke, 2010). Dietary habits that are considered in this context include the Mediterranean diet (Kerksick, 2018). According to Collins et al., the Mediterranean diet is becoming increasingly popular among footballers as it meets their energy needs and supports their general health. In recent years, it has been observed that the Mediterranean diet has positive effects on the gastrointestinal health and performance of footballers. In a study carried out with footballers in Portugal, it was seen that the Mediterranean diet not only improved the gastrointestinal health and endurance performance of footballers but also affected their body composition in both the short term and long term (Sofi et al., 2014; Baker et al., 2019). It was stated that this diet can also increase athletic performance due to the diversity of carbohydrates in its contents (Philippou et al., 2017; Çetin et al., 2023). In their study examining the reasons for the adoption of the Mediterranean diet as a nutritional model by footballers, Clark et al. (2016) reported that both the performance of footballers on the pitch and their gastrointestinal health could be effective on their performance. In this study, which was carried out to examine these variables, it was aimed to provide guiding information for the optimization of the gastrointestinal health of professionals with the Mediterranean diet to contribute positively to their performance. Another purpose of this study was to contribute to the understanding of effective strategies for supporting the general health of footballers by shedding light on the potential impacts of the Mediterranean diet on their gastrointestinal health.

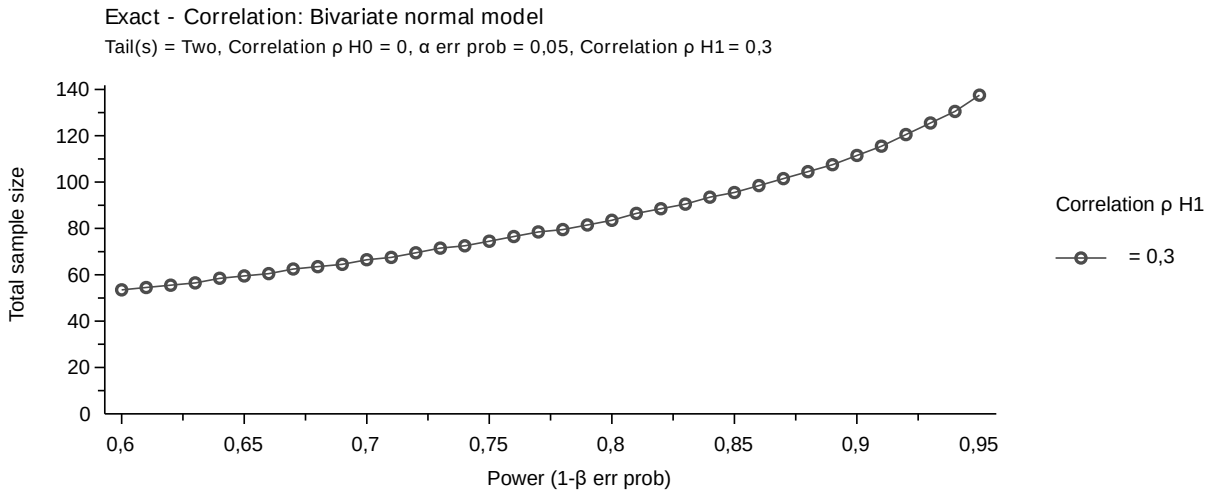
METHOD

Study Design

This study employed a correlational design, which aims to identify relationships between variables regarding an existing phenomenon (Karasar, 2007). The protocol of the study was approved by the Ethics Committee of Gazi University (Decision No: 2023-1245) and all procedures were carried out in line with the principles of the Declaration of Helsinki.

Sample Group

The power analysis method was used to determine the sample of the study and according to the results of the correlation analysis in a 95% confidence interval (1-α) and with a 95% testing power (1-β), the minimum required sample size was determined to be 138 (Graphic 1). The sample of the study included a total of 196 active licensed male footballers who were professional players in the TFF Second League (third highest tier) and TFF Third League (fourth highest tier) in Turkey. The inclusion criteria were determined as being a licensed and active footballer, being 18-30 years old and not using any medication that could affect the gastrointestinal system. The mean age of the participants was 23.46±4.18 and their mean experience in licensed football was 11.73±5.07 years.



Graphic 1. Power analysis results

Data Collection Instruments

The adherence of the participants to the Mediterranean diet was assessed using the Mediterranean Diet Adherence Screener, while the frequencies of gastrointestinal symptoms were examined using the Gastrointestinal Symptom Rating Scale. Participation in the study was voluntary and the data were collected online via the Google Forms platform.

Mediterranean Diet Adherence Screener

The Mediterranean Diet Adherence Screener (MEDAS/PREDIMED) was developed by Garcia-Conesa et al. (2020) and tested for validity and reliability in Turkish by Pehlivanoğlu et al. (2020). It is a 14-item scale where scores of ≤5 indicate low adherence, scores of 6-9 indicate moderate adherence and scores of ≥10 indicate high adherence (García-Conesa et al., 2020; Pehlivanoğlu et al., 2020). Cronbach's Alpha coefficient of the scale was found to be 0.829.

Gastrointestinal Symptom Rating Scale

The Gastrointestinal Symptom Rating Scale (GSRS) was developed by Revicki et al. (1997) to assess symptoms that are frequently encountered in gastrointestinal system disorders and its validity and reliability in Turkish were tested by Turan et al. (Turan et al., 2017). GSRS asks the respondent what they have felt and how they have felt in the last 7 days regarding gastrointestinal problems. Factor analyses of the scale revealed a 5-factor and 15-item structure. The 5 dimensions of the scale are Diarrhea, Indigestion, Constipation, Abdominal Pain, and Reflux. The items are not presented in a particular order, and items 11, 12, and 14 are about diarrhea, items 6, 7, 8 and 9 are about indigestion, items 10, 13 and 15 are about constipation, items 1, 4 and 5 are about abdominal pain and items 2 and 3 are about reflux. It is a 7-point Likert-type scale, where the response options of each item vary from "no discomfort at all" to "very severe discomfort". Higher scores indicate more severe symptoms.

Data Analysis

The data were transferred to the SPSS 26.0 program and analyzed using Pearson's Correlation Analysis, Independent-Samples T-Tests, One-Way ANOVA and descriptive statistics. The threshold for statistical significance in this study was determined as $p<0.05$.

RESULTS

In this study, no significant relationship was identified between adherence to the Mediterranean diet and gastrointestinal symptoms ($p>0.05$) (Table 1). While the gastrointestinal symptom scores of the participants did

not show a significant difference based on their league tiers ($p>0.05$), their levels of adherence to the Mediterranean diet differed significantly based on their league tiers ($p<0.05$) (Table 2). There were no significant differences in the Mediterranean diet adherence levels or gastrointestinal symptom scores of the participants based on their positions as players ($p>0.05$) (Table 3).

Table 1. Relationship between adherence to the Mediterranean and gastrointestinal symptoms

Variable		Reflux	Abdominal Pain	Diarrhea	Constipation	Indigestion
Mediterranean Diet Adherence	r	0.017	0.004	-0.008	0.056	-0.053
	p	0.815	0.958	0.909	0.432	0.458
	N	196	196	196	196	196

Table 2. Comparisons of gastrointestinal symptoms and Mediterranean diet adherence levels based on league tiers

Total Score	League	N	$\overline{X}$	sd.	t	p
GSRS	2nd League	68	22.69	10.038	0.389	0.698
	3rd League	128	22.15	7.751		
MEDAS	2nd League	68	7.07	1.806	2.004	**0.047***
	3rd League	128	6.51	2.016		

Table 3. Comparisons of gastrointestinal symptoms and Mediterranean diet adherence levels based on player positions

Total Score	Position	N	$\overline{X}$	sd.	f	p
GSRS	Goalkeeper	22	20.68	6.945	0.791	0.500
	Defender	65	22.12	6.301		
	Midfielder	74	22.18	8.778		
	Forward	35	24.11	12.175		
MEDAS	Goalkeeper	22	6.68	2.147	2.208	0.089
	Defender	65	7.08	2.049		
	Midfielder	74	6.27	1.777		
	Forward	35	6.94	1.939		

DISCUSSION AND CONCLUSION

This study examined whether the Mediterranean diet had any protective effects on the gastrointestinal health of professional footballers. According to the results of the analyses, no significant relationship was found between the adherence of the participants to the Mediterranean diet and their gastrointestinal symptoms. While the gastrointestinal symptom scores of the participants did not vary significantly based on their league tiers or positions, their Mediterranean diet adherence scores varied significantly based on their league tiers.

In studies carried out about the Mediterranean diet, this diet was accepted as an optimal dietary option with various benefits (Serra-Majem et al., 2012; Tosti et al., 2018). Among studies performed with footballers, there are those that have shown better physical fitness, body composition and quality of life to be associated with the Mediterranean diet (Cabrera et al., 2015; Manzano-Carrasco et al., 2020; López-Gil et al., 2023). It is seen that physiological demands in football have increased recently. Due to this increase, to ensure that footballers meet their energy requirements, their nutrition statuses are constantly monitored by nutrition experts, dieticians and trainers (Bush et al., 2015). This situation not only contributes to the performance of footballers but may also affect their awareness levels. In this study, it was determined that the participants in the higher league tier (2nd league) had higher rates of adherence to the Mediterranean diet. It is thought that footballers on more elite levels may have increased levels of awareness and take more responsible dietary measures.

The rates of gastrointestinal symptoms in the participants of this study were similar between the 2nd and 3rd league categories. This may have resulted from the similar nutritional profiles of footballers on different levels.

On the other hand, a significant difference was identified between the 2nd league and 3rd league footballers regarding their adherence to the Mediterranean diet. This suggested that depending on the quality of the league in which they compete, footballers may have different levels of experience, different responsibilities required by their league tier and degrees of dietary knowledge, awareness and optimal practices. Abreu et al. (2021) stated that dietary strategies in professional football may differ depending on culture, habits and a set of restrictions. Renard et al. (2022) argued that optimal nutritional practices should be followed and the lack of knowledge of footballers regarding potential barriers, nutritional information and especially nutrition in sports was a significant factor. Another study revealed that the adjustment of footballers to dietary habits could be influenced by their age, beliefs, nutritional habits, education levels and experience as athletes (Thomas et al., 2016).

In football, players compete in different positions. According to the information in the relevant literature, in football, there may be position-dependent differences in terms of physical form and agility, speed, explosive power, strength, flexibility, endurance and ball-handling skills (Abbott et al., 2018; Loturco et al., 2018). In this study, the Mediterranean diet adherence levels and gastrointestinal symptoms of the participants were compared based on their player positions, but no significant difference was observed. The reason for this may be that footballers adopt the same nutritional style for years without regard to their player positions. In addition to this, because footballers are constantly traveling and working at camps, they consume the meals selected by the dietician of their club. There may not be differences in nutritional styles between different positions because there may be no position-specific nutritional plan. In the literature, it has been stated that the nutritional plans of footballers are determined based on their training programs and competition periods (Mendes et al., 2017; Karabudak, 2018; Anderson et al., 2018). It is seen that in recent years, there has been increasing interest in the design of valid nutritional approaches that could improve health and performance, especially in professional footballers. Thus, it was reported that foods and diets can increase performance or prevent injuries in footballers (Keen, 2018).

Consequently, although it is difficult to make causal and clear inferences from the results of this cross-sectional study, the view that the Mediterranean diet can have positive effects in the prevention of gastrointestinal symptoms in footballers has been supported in other results in the relevant literature. However, to investigate the effects of the Mediterranean diet on the gastrointestinal system in more depth, it is recommended that future studies monitor an annual period of diets in footballers and examine nutritional profiles in different samples.

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