Original Article

The Effect of Blood Groups and Nutritional Habits of Different Classifications of Referees on the Success of Turkish Football Management

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Abstract

Volunteer 247 football referees in the Turkish Professional Football Leagues were included in this study which aims to evaluate the effect of blood groups and nutritional habits of different classifications' referees on the success of Turkish football management. After the demographic information (age, height, weight, education level and blood groups (based on their statements)) of the referees were taken, the total refereeing times, their classifications and their duration in their classifications, and their nutritional information habits were obtained with a questionnaire. Classification Trees Method was used to determine the factors affecting the success (classification) of the referees. The distribution of the blood groups of the referees did not differ significantly from the distribution of the general blood groups in our country. However, A RH + and 0 RH + blood groups were seen more frequently in the study group. It was determined that 86.7% of the referees with a service period of more than three years, whose blood groups were 0 Rh+ or 0 Rh-, were top classification assistant referees. In our study, it was determined that the classification and classification assistant referees did not acquire regular eating habits and observed that the level of nutrition knowledge increased with a rise toward the top classification. It can be said that these results indicate the need for nutrition education for football referees. Among the referees with a two-year period, 73.8% of those who skip meals and say I have no appetite/habit are working as classification referees, and 72.2% of those who say to lose weight working as assistant referees. 50% of those who eat 2 or 5 meals a day are classification assistant referees, and 66.7% of those who eat 3 or 6 meals a day are classification referees. It was seen that 66.6% of the three-year referees who were fed with meat meal, salad, dessert or pasta before the competition were classification and classification assistant referees, and 73.5% of those who were fed with food groups such as vegetable food, yoghurt, fruit, boiled meat or chicken, meat, meatballs, rice, compote were top classification assistant referees.

In this study, it is thought that the factors affecting the success of the referees the most are their dietary habits and the duration of the refereeing, and some blood groups are thought to be effective on the success of the referees.

Keywords: Success, Nutritional Habit, Football Referee, Blood Group, Football Management.

INTRODUCTION

In order to achieve the highest level of sportive success in all sports branches, talented athletes must be determined on time and correctly and start long-term and systematic work. Countries take their share of the successes that are achieved in sports, regardless of the field, and go the way of owning the success. Therefore, at the national level, country sports administrations make the necessary research and investments in order to achieve success in every field related to sports. These investments do not only cover the training of athletes but also include finding and selecting the staff who will manage the sport, training and increasing their performance. In terms of sports practice, it has been reported that talent training is as important as talent selection for superior success (Güçlüöver et al, 2019, Karaca et al,2021). There is a continuous improvement in performance values and efforts to unearth talented athletes and good referees who can manage sports competitions. In these studies, it is concluded that it is important to select the athletes and direct them to certain branches, to determine the time/age of start of the exercises required by the sports branches, and to direct the relevant children and young people of the appropriate age to various sports branches as much as possible (Sevim, 2000). Talent selections and appropriate training at an early age increase performance (Toker, 2001,Ilkım et al.2021). In addition, systematic long-term studies should be carried out with timely and

correct talent selection to maximize the sportive performance of all sports branches and other sports-related elements and to achieve success. This results in the determination of the appropriate age and training in each sports branch for the selection and orientation of the athletes (Yagmur, 2011).

Concordantly, the relationship between nutrition and sportive performance in humans has been a matter of interest for many years, and this has led to many studies. In recent years, researches have been carried out based on the use of food products in general. The issue of nutrition of sports, which is popular today, and its leading players, athletes and referees, has taken its place in popularity by strengthened with the science of anatomy, physiology and biochemistry. (Ergen, 2007).

It is thought that the fact that many studies have been conducted on elite athletes and referees in recent years is due to the relationship between performance criteria and physiological and anatomical features. It has been stated that for success in the field of sports, more than one interrelated feature must be completed. For this reason, data obtained from both athletes and other sports-related factors will both contribute to the well-known sports physiology and help people who do not have professional concerns to interpret the changes in their bodies (Yağmur, 2011).

In the developing and changing world, the daily lives of societies and individuals in every field are constantly affected. These influences can manifest themselves at any time and on any ground. The world of sports also reveals important parameters in every field related to sports in the face of these new developments.

The sports administrations of the countries also follow the new developments in accordance with these parameters and go to the way of implementation. Nowadays football is one of the most popular sports branches. It can occupy the public for days not only with the beautiful plays of the football players, but also with the behavior of the spectators and fans, and the decisions of the referees. Football referees, especially in terms of sports management, should be able to withstand the game time in order to make appropriate decisions during the competition. For this, at the beginning of the season, the necessary sports governing boards, by requesting the evaluation of the physical form of the referees, determine the limitations of inclusion in all-season match assignments. As a result, referees need special and adequate physical preparation to manage all matches (Muscella & et al, 2021).

Referees also need to have a dynamic of high intensity and intermittent loading in order to increase their sportive success (Özdamar, 2021). For this reason, sports administrations attach importance to the success of the referees and their performance at the highest level at the national and international levels, just like other sports branches, as they make extraordinary contributions to the promotion of countries.

In order to be successful in a sports field, both hereditary and acquired predispositions must be suitable for the sports activity. Nutrition is an important element for the continuity of these criteria (Ersoy, 2006). Therefore, the relationship between nutrition and sportive performance has been a matter of interest for many years (Ergen, 2007).

In this study, which we have done on football referees of different classifications in Turkish football management, it is aimed to investigate whether blood groups and nutritional habits have an effect on the sports success of the referees. There are many factors that affect athletic success. Some of these can be listed as body muscle type, human behaviour, psychology, nutritional habits, genetics, and technical-tactical knowledge. Because, in order to identify and develop athletes, talent selection in sports requires a timely and well-planned organization for each sports branch and a study based on scientific findings (Ersoy, 2012). In addition to these parameters, it is also important to consider the relationship between the differences in blood groups and nutritional habits. For this reason, it is thought that the effect of the variability of blood groups and nutritional habits may be important and original in the achievement of the national and international status of the referees in Turkish Football management. Thanks to the football referees included in the study, this study provided the opportunity to reach and examine many successful referees in this regard. Our limitation in this study is the scarcity of literature information about our study subject, which has made it difficult to discuss the difference in blood groups in particular. However, it will be meaningful in terms of shedding light on the studies that can be done in this field in the future. It is thought that our study will be supported by research to be conducted in different sports fields.

OBJECTIVE

In this study, it is aimed to investigate whether the blood groups and nutritional habits have an effect on the sports success of the referees in Turkish Football management in obtaining their national and international status.

METHOD

This study consists of male individuals who are football referees in different classifications in Turkey. 247 referees were included in the study. The demographic information of the referees (age, height, body weight), blood groups, length of service in refereeing (years), classifications and duration of service in the classification (years) and nutritional information habits were determined by a questionnaire.

Data Collection

Before the data were collected, necessary legal permissions were obtained from the relevant institutions from the Gaziantep University Clinical Research Ethics Committee (dated 06.03.2019 and decision numbered 2019/72).

Age, Height and Body Weight Measurements

It has been reported that measurements should be done according to standard techniques and based on the age of the referees and their identity information in years, their height was measured with a stadiometer (SECA, Germany) with a precision of 0.01 m, body weight was measured by the subjects in standard sportswear (shorts, t-shirt) on an empty stomach without shoes, and between 08.00 - 10.00 in the morning and data were obtained in line with their statements.

Blood group

The blood group information of the referees was obtained with the information collection form prepared on the basis of their own statements.

Determination of eating habits

The nutritional habits questionnaire was developed by taking the previous studies as an example as a result of the literature review on the subject (Parlak, 2009; Duman, 2011; Yıldırım, 2009). All of the data belonging to the referees were obtained through a questionnaire form in line with their own statements (via e-mail).

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Statistical analysis

Classification Trees Method was used to determine the factors affecting the classifications (success) of the referees.

FINDINGS

Table 1. General Descriptive Statistics Regarding the Classifications of the Referees

Variables		Frequency	Percent (%)	Valid (%)	Cumulative (%)
Education levels of referees	High school	9	3,6	3,6	3,6
	Bachelor's Degree	197	79,8	79,8	83,4
	Master's Degree	38	15,4	15,4	98,8
	Doctorate	3	1,2	1,2	100,0
Referee periods in the classification of referees	1 year	43	17,4	17,4	17,4
	2 years	118	47,8	47,8	65,2
	3 years	52	21,1	21,1	86,2
	4 years	29	11,7	11,7	98,0
	5 years	5	2,0	2,0	100,0
Numbers and percentages of referees regarding their classification	Top Classification	26	10,5	10,5	10,5
	Top Classification Assistant	46	18,6	18,6	29,1
	Classification	96	38,9	38,9	68,0
	Classification Assistant	79	32,0	32,0	100,0
Numbers and percentages in the classification	1-5 years	170	68,8	68,8	68,8
	6-10 years	55	22,3	22,3	68,8
	11-15 years	15	6,1	6,1	97,2
	16 years and above	7	2,8	2,8	100,0
Referees' blood groups	O RH+	67	27,1	27,1	27,1
	O RH-	15	6,1	6,1	33,2
	A RH+	95	39,5	38,5	71,7
	A RH-	10	4,0	4,0	75,7
	B RH+	33	13,4	13,4	89,1
	B RH-	5	2,0	2,0	91,1
	AB RH+	18	7,3	7,3	98,4
	AB RH-	4	1,6	1,6	100,0

Table 2. General Descriptive Statistics of Referees' Nutritional Habits

Variables		Frequency	Percent (%)	Valid (%)	Cumulative (%)
Number of meals per day	1 meals	2	,8	,8	,8
	2 meals	85	34,4	34,4	35,2
	3 meals	143	57,9	57,9	91,3
	4 meals	16	6,5	6,5	99,6
	5 meals	1	,4	,4	100,0
Data on skipped meals	Morning	47	19,0	19,0	19,0
	Afternoon	87	35,2	35,2	54,3
	Evening	6	2,4	2,4	56,7
	Mid-morning	22	8,9	8,9	65,6
	Afternoon	17	6,9	6,9	72,5
	Night	68	27,5	27,5	100,0
Reasons for skipping meals	Habit	55	22,3	22,3	22,3
	There is no time	80	32,4	32,4	54,7
	Losing weight	53	21,5	21,5	76,1
	I have no appetite	59	23,9	23,9	100,0

Daily water consumption (Day/Glass)	1-2 cups	34	13,8	13,8	13,8
	3-4 cups	27	10,9	10,9	24,7
	4-6 glasses	61	24,7	24,7	49,4
	6-8 glasses	42	17,0	17,0	100,0
	More	83	33,6	33,6	100,0
The time between the competition and the meal	I don't pay attention	20	8,1	8,1	8,1
	2 hours	34	13,8	13,8	21,9
	2-4 hours	160	64,8	64,8	86,6
	More	247	100,0	100,0	
Types of food consumed before the competition	Vegetable	74	30,0	30,0	30,0
	Vegetable food/yoghurt/dessert	52	21,1	21,1	51,0
	Meat dish/salad/dessert	18	7,3	7,3	58,3
	Boiled chicken/meat/meatballs/rice/compote	41	16,6	16,6	74,9
	Pasta	62	25,1	25,1	100,0
Pre-competition energy-boosting food intake	Yes	103	41,7	41,7	41,7
	No	144	58,3	58,3	100,0

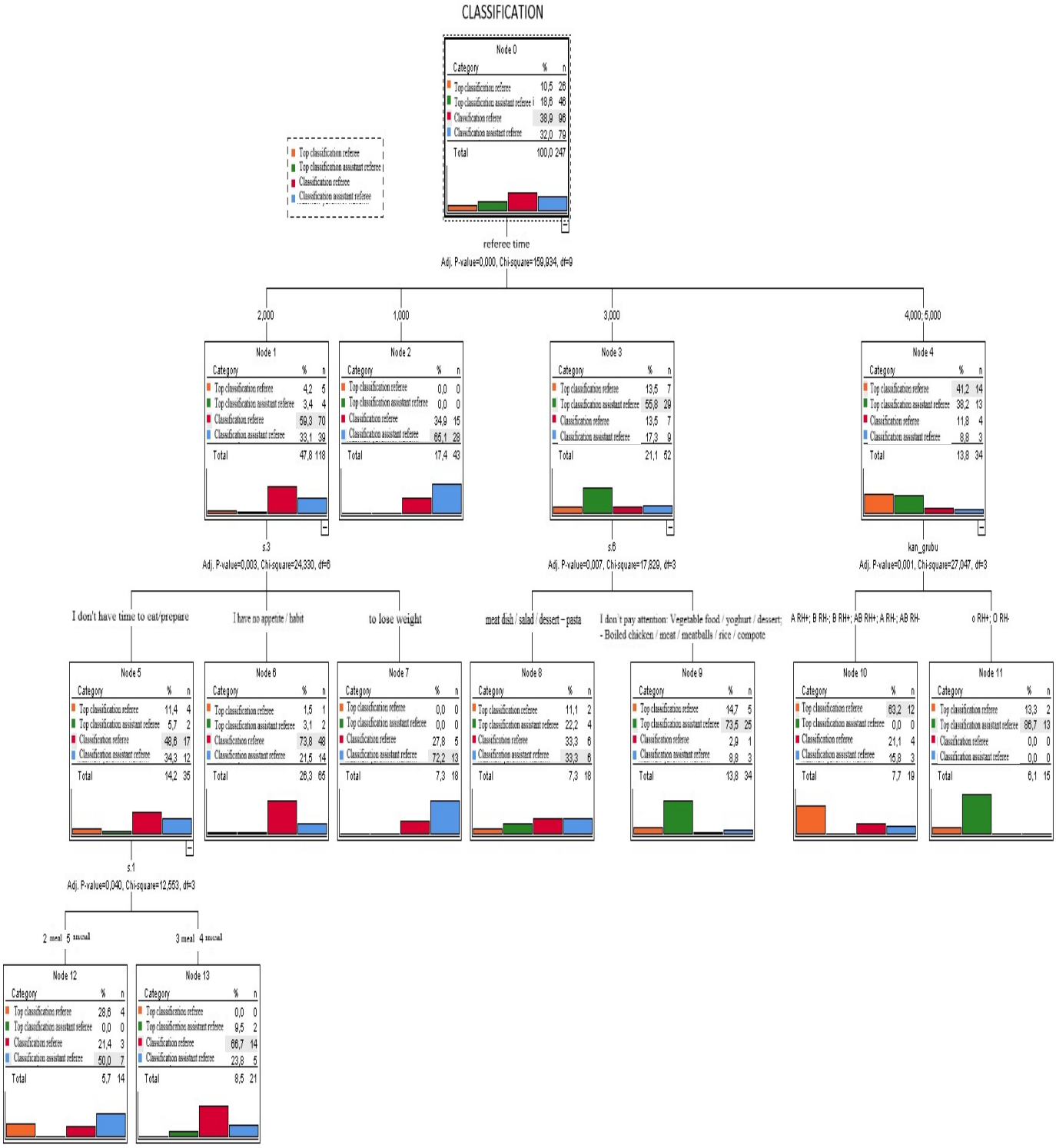

Figure 1: Representation of the factors affecting the success of the referees with the Classification Trees Method

DISCUSSION AND CONCLUSION

Our study was conducted with a total of 247 volunteer football referees, who work in different statuses in the Turkish Professional Football Leagues, including Top Classification Referee (TCR), Top Classification Assistant Referee (TCAR), Classification Referee (CR), Classification Assistant Referee (CAR), Regional Referee (RR) and Regional Assistant Referee (RAR). Technical, tactical, body type, motoric features, social behaviors, psychology, heredity and nutritional characteristics are generally accepted as factors that can affect performance in athletic success. With this study on referees, it is envisaged to provide different perspectives to the Ministry of Sports and the Turkish football management, referees, referee instructors, scientists and all people interested in this field. For this purpose, it has been investigated how much of the effect of nutritional habits and blood groups differences on the success (classifications) of the referees.

The classification Trees Method was used to determine the factors affecting the classifications (success) of referees (Breiman et al., 1984; Karabağ et al., 2010). The optimum tree formed as a result of the classification tree analysis is given in figure 1. The correct classification rate for the classification tree created in this way was found to be 76.8%. When this tree is examined, it has been seen that the factors affecting the classification or success of the referees are, in order of importance, the duration of refereeing in the classification, why they skipped meals, the meals which they skipped, how many hours before the competition they ate, how many meals a day they ate and their blood groups. When the optimum tree was examined, it was seen that the most affecting factor in the success of the referees was the refereeing time. The results of a study on football referees at the regional level support our findings, and it has been reported that success is related to age, experience and feelings of self-efficacy (Gacek & et al., 2020). In the general distribution of blood groups in our country, the most common group is "A Rh Positive" and the least common group is "AB Rh Negative" blood group (Alpdemir M., et al, 2014; Dokuyucu et al, 2014; Salduz et al, 2015). Blood groups and ratios of all referees included in the study has been identified as; (0 RH+) 27.1%, (0RH-) 6.1%, (RH+) 38.5%, (RH-) 4.0% ,(RH+) 13.4% , (BRH-) 2.0% ,(RH+) 7.3% , (BRH-) 1.6%

It can be observed that the blood group distributions of the referees included in our study create similar findings to the general blood group distributions in our country. Blood group can provide information about various influential characteristics that can identify a person. According to Dr. Peter D' Adamo, who is regarded as one of the main pioneers of the diet revolution, blood type is one of the important criteria that should be taken into account at least as much as food and rest (Gavin, 2011). In the study of the Physical Education Institute in China investigating the relationship between blood type and physical quality of temperament type, it was determined that blood groups in different sports activities showed different distribution characteristics. If an athlete belongs to the 0-type or A-type, the probability of having higher physical quality is higher, and if he belongs to the B-type, the rate of having physical quality is lower than the other groups (Jianbao & Guohua, 2014). In the study by Lippi et al., in which they investigated the effect of blood group A, B and 0 on endurance running performance in middle-aged recreational athletes, it was observed that recreational athletes with zero (0) blood group had a better performance than other groups (Giuseppe et al., 2017). On the other hand, Yağmur (2011) determined the success distribution of national wrestlers in blood groups and star categories as (ARH+) 26.6% and (0RH+) 18.5%. According to being a member of national team, (ARH+) and (0RH-) groups were found to be more successful with 83.3% of the (BRH-) blood group compared to their success in European championships. However, it was observed that the blood group (0RH+) was more successful with 30% of the athletes who won the first place in the Olympic championships. It was determined that (0RH-) blood group achieved the first three degrees (Yağmur, 2011).

In our study, it was seen that referees with (0RH+) and (0RH-) blood groups were more prominent than other blood groups. In addition to blood groups, the duration of being a referee was also found to be a factor supporting this difference. In this respect, it is noteworthy that the referees' service life and blood groups differ in order to be able to make reliable estimates of the success of referees (4 and 5 years) whose refereeing period is more than three years. When the optimum tree is examined and the blood groups are looked at proportionally, the (0 Rh+) or (0 Rh-) blood group of the referees in the upper classifications is the top classification assistant referee with a rate of 86.7%, more than half (63.2%) of the referees in the other blood group were top classification referees. Therefore, it was seen that the referees with these ratios were more successful than the other groups. The lack of studies on blood groups, especially on referees, is one of our important constraints. For this reason, examples of these studies in different sports branches are considered. According to these results, it is thought that the effect of blood groups on sportive success should be supported by broad-based studies to be conducted in different sports branches. It has been reported that the athlete's ability to improve his/her body, maintain his/her health and achieve high sportive performance will be possible with a balanced, regular and appropriate diet for that sport (Saygın, Göral, & Gelen, 2009).

Considering the classifications of the referees in years it is seen that, 28 of the one-year referees (65.1%) were classification assistant referees and 15 (34.9%) were classification referees, 70 (59.3%) of the two-year referees were classification referees and 39 (33.1%) were classification assistant referees, 29 (55.8%) of the three-year referees were assistant referees of the top

classification and 9 (17.3%) were assistant referees of the classification, 14 (41.2%) of the referees with a tenure of 4 or more years are top classification referees and 13 (38.2%) top classification assistant referees. This numerical and proportional change shows that as the years of staying in the classification increase, it is directly proportional to the promotion to a higher classification. From this, it is concluded that experienced referees serve in the top leagues. The reason why the referees work in the classification and the success change in direct proportion is that there is a certain hierarchy and one cannot serve in a higher classification without having served in a lower classification for a certain year. For this reason, it has been observed that the referees working in the top leagues have a higher age factor than the referees working in the lower leagues.

In order to help maintain blood sugar concentration, maximize and improve exercise performance during exercise, sufficient food and liquid should be consumed at all stages (before, during and after) of exercise (Colombani & Mannhart, 2013; Eroğlu, 1997; TFF, 1996; Clark, 1993; Ersoy, 1995). Regarding fluid intake, it has been suggested to referees that pre-match and in-match hydration strategies, which are generally valid in sports, should be developed and necessary training should be given importance in order to prevent cognitive and physical performance loss, especially when working in extremely hot climates and altitudes (Schenk, Bizzini, & Gatterer, 2008). 2017). Arslan and Mendeş (2002) reported that students studying in the Department of Physical Education consume more fluids than students studying in other departments, and this may be due to the difference in physical activity (Arslan and Mendeş, 2002). Water consumption is very important for the referees who take an average of 8-12 km running distance in the competitions they manage. The daily fluid loss of high-level athletes only after activity is 2500-3000 ml. (Ersoy, 2006). It has been reported that water and different sugar-free beverages are important for hydration and electrolyte balance in the body (Thomas & et al., 2016; Kerksick & et al., 2017; Oliveira & et al., 2017). In this study, it was seen that 33.6% of the referees drink more than 8 glasses of water a day, and 24.7% of them drink 4-6 glasses of water. This shows that more than half of the referees (56.6%) consume 4-6 glasses of water or more per day. These rates show that most of the referees who have achieved success provide the appropriate daily fluid consumption. It has been reported that football referees spend as much energy as a midfielder during a match by running a distance of 9-13 km (Weston & et al., 2012). In addition, studies have emphasized that after the increase and diversity in the physical activities of football referees, the referees should have special nutritional needs (Schenk & et al., 2017). Carbohydrates and fats are our important energy sources. Since our body has enough fat stores, it is not necessary to consume more with diet. There is enough fat in every person's metabolism to finish a long hard run. However, Mahan (2004) reported that it will not be possible to reach maximum performance unless the muscle glycogen stores are sufficiently full, and she thinks that fats provide energy for exercises (Mahan and Escott-Stump, 2004).

Considering the results of our study, when evaluating the success of the referees whose refereeing period is two years, besides the refereeing period, it is necessary to consider how many meals a day they ate (question 1) and why they skipped meals if they were (question 3). Among the referees who have a two-year refereeing period, most of the referees (73.8%) who say "I have no appetite / habit" are classification referees, while the majority of those who say "to lose weight" (72.2%) are classification assistant referees. This means that most of the classification assistant referees among the referees whose refereeing period is 2 years, have weight problems. Although it was seen in our study that a certain group of referees had obesity-weight problems, no significant difference was found regarding the obesity-weight problem of a certain blood group. However, there are studies investigating a certain correlation between A, B and 0 blood groups and obesity (Khan et al., 2009; Liumbruno and Franchini, 2013; Rummel and Ellsworth, 2016; Sultan et al., 2017), as well as studies with uncertain results like ours. (Mendeş and Mendeş, 2018, Suadicani, Hein and Gyntelberg, 2005; Siva et al, 2012).

On the other hand, half (50%) of those who say they don't have time to eat/prepare, eat 2 or 5 meals a day, are classification assistant referees, while more than half (66.7%) of those who eat 3 or 6 meals a day are classification referees. From these values, it was concluded that most of the classification referees and classification assistant referees did not take into account the diet and did not acquire dietary habits. In the results of these questions in the top classification and top classification assistant referees, it was observed that there was no weight problem in this referee group in general (0%). Nevertheless, it was seen that this group of referees did not have any problems in terms of eating time and found the necessary time. As the success in the classification rises towards the upper classification, the rate of conscious nutrition of the referees increases significantly. As a result, it was revealed that the classification referees should receive nutrition education in order to optimize their nutrition and health, and the classification assistant referees should follow a regular diet program. In many studies that support this finding, the need for nutrition education of football referees has been pointed out (Teixeira & et al., 2014; Schenk & et al., 2017). Because, it has been suggested that the nutritional needs of football referees may differ from the athletes who train football. It is thought that the top classification referee and top classification assistant referees should maintain their existing nutritional habits. These results were similar to the results of the study of Teixeira et al., in which the daily average energy intake of 23 elite referees was examined before the competition, during the competition and after the competition, carbohydrate protein fat and water intake values (Teixeira et al., 2014). In the study of Metz et al. on the nutritional adaptations of 24 elite football referees, they evaluated the energy intake and energy types on the day of the match and on the days when there was no

competition. In this study, it was revealed that while the referees did not show a significant difference in their total daily calorie intake, fat intake and protein intake on the day of the competition and on the day of the non-competition, they took more carbohydrate-containing foods on the days of the competition (Metz et al., 2015).

Protein, which has high nutritional value and quality, is one of the main nutrients of professional athletes (Ersoy, 2006). 12-20% of the energy amount to be supplied in 1 day should be provided from proteins. Half of these should be obtained from animal sources and the other half from vegetable sources. A different dimension of the last one of our study is that more than half (66.6%) of the three-year referees (who have a three-year refereeing period) who were fed with meat meal/salad/dessert or pasta food groups before the competition became the classification and classification assistant referees. It has been observed that this group of referees consumes foods that are high in protein as well as high in carbohydrates. In the study of Moghanlou (2017) with wrestlers on excess carbohydrates, the relationship between nutritional elements and their performance was examined. Although it has been determined that the performance of wrestlers with high carbohydrate intake is higher, it has also been emphasized that the excess calories taken will turn into fat in the body and as a result, weight gain will be an inevitable end (Moghanlou, 2017). In the study of Renon et al., which aimed to analyze the eating habits and attitudes of football referees working in the Spanish second and third leagues on normal days, training days and competition days, there was no significant change in the amount of calories taken in three times, but it was observed that the referees consumed carbohydrate foods containing insufficient amounts of macronutrients (Reñón and Collado, 2015).

Among the referees included in the study, it is stated that a great majority of the referees (%73.5) who have a three-year refereeing period in the classification say they should not pay attention before the competition or those who are fed with food groups such as vegetable food/yoghurt/fruit and boiled chicken/meat/meatballs/rice/compote are the top classification assistant referees who draw attention. This showed that the top classification assistant referees, whose refereeing period in the classification is three years, generally prefer products rich in protein and also carbohydrate content before the competition.

As a result, there are many factors that affect the success of referees, who are an indispensable part of football, before, during and after the match. Making suggestions to the Ministry of Sports, Football Federation and related sports administrations in order to determine the factors that affect the referees' reaching high performance level and to maximize the refereeing success will make significant contributions to the refereeing profession and sports administrations. In our study, it was determined that the classification and classification assistant referees did not adopt a regular nutritional habit, and it was observed that the level of nutrition knowledge increased with a rise towards the upper classification. It can be said that these results indicate the need for nutrition education of football referees. On the other hand, the distribution of the blood groups of the referees did not differ significantly from the distribution of the general blood groups in our country. However, although there were referees from each blood group in the study group, ARH+ and 0RH+ blood groups were seen more frequently, providing evidence that this plays an active role in the refereeing success of individuals (approximately 17% better than subjects with other blood groups). Within the scope of determining the effects of blood groups on performance, similar studies can be applied to other individual and team athletes and larger and more demonstrable data can be obtained. It is thought that the data obtained from this study will support future studies.

Conflict of Interest

The authors have no conflict of interest to declare.

“This study was produced from the master's thesis. It was presented as a paper at the IX. International Congress of Professional and Technical Sciences.”

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