

## ORIGINAL SCIENTIFIC PAPER

# Factors Determining the Choice of Healthy Diet by Kazakh Athletes of Various Sports

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## Abstract

According to the World Health Organization (WHO), 40-60% of human health depends on a lifestyle in which 25-30% is devoted to a rational diet. Therefore, by meeting physiological needs in accordance with a rational diet, athletes can adapt more quickly to the applied physical load and achieve better sport results. The aim of the study was to describe and compare the factors that determine the healthy diet of athletes of various sports. The study, which aimed to assess the factors determining healthy diet, involved 157 students of physical education and sports studies from the University of Almaty. Respondents were divided into 3 groups - sports games (volleyball, football, basketball, tennis) (n=85), endurance sports (long distance running, skiing, road cycling, triathlon) (n=22), and combat sports (wrestling, judo, karate, boxing) (n=50). The questionnaire by Steptoe et al. (1995) was employed to establish the opinion of the investigated subjects on the factors that determine healthy and rational dietary choices of student athletes. Our research has shown that among the factors that determine the healthy diet of athletes of various sports, the main ones are health, the character of the chosen sport, and the athlete's body composition. Factors such as current trends, the popularity of the food consumed, and the influence of family and friends are less important. The athletes we studied noted their efforts to eat and live healthy, most of them were satisfied with their health and their body mass. A greater variety in respondents' responses was observed when assessing the composition of food supplements, the impact of discount special offers on product selection. The responses received on adherence to the diet indicate that the athletes studied do not always observe the correct diet.

**Keywords:** athletes, students, sports, health, rational, healthy nutrition

## Introduction

The choice of rational and healthy diet for athletes is determined by many factors, one of the most important being the motivation to consume health-friendly foods, taking into account the specifics of the chosen sport. Other factors influencing diet and habits include national traditions, family members, friends, current trends, and popularity (Azizbekian et al., 2010). The choice of a healthy diet for elite athletes also depends on the nature and duration of physical exercise, the amount of energy spent, the time required for recovery, and

preferences of food (Pasalic et al., 2012; Jeukendrup, 2017).

Most authors point out that the relationship between nutrition and health is particularly close, because a rational diet determines the proper functioning of all body systems and organs (Vorobyeva et al., 2011; Likus et al., 2013). Sports medicine doctors and coaches need to be well aware that strengthening of health requires a regular, healthy, and balanced diet first and foremost (Lisicki, 2010; Nazni & Vimala, 2010). According to the World Health Organization (WHO), 40-60% of human health depends on a lifestyle, 25-30% of which is



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devoted to a rational diet. Therefore, by meeting physiological needs, adhering to the principles of rational and proper nutrition, athletes can adapt to the experienced physical loads more quickly and achieve better sports performance (Boguszewski et al., 2013; Turner, 2018). Therefore, data on the factors that determine a healthy diet are needed to properly organize the training of athletes, maintain high working capacity, and control the course of recovery processes (Szygula et al., 2009; Ubeda et al., 2010; Tutelyan et al., 2011). Many athletes, striving for high sport results, are also students. The study years is a phase of a young person's social life, characterized by a heavy mental load, lifestyle changes, and a change in diet. Therefore, the diet of physically active students striving for high sport results is receiving a lot of attention from researchers (Papadaki et al., 2007; Skibniewska et al., 2009; El Ansari et al., 2011; Dobrovolskij & Stukas, 2012; Otaraly et al., 2020).

If a person engages in active sports during the study years, the physiological needs of the body increase significantly. The constant lack of time can disrupt the diet or make it inferior (Satalic et al., 2007). Sports science extensively studies the role of nutrition in the promotion of the adaptation of athletes' bodies to physical exertion, increasing work capacity, and the speed of recovery after physical exertion. An important role in promoting these processes is played by a rational diet and the use of various food supplements (Jeukendrup, 2017).

The theory of balanced nutrition includes the general principles of nutrition, and the specifics of nutrition depend on the type of sport, the type of physical activity in which a person is engaged, lifestyle, and occupational activity (Crosland, 2007). For example, the nutritional habits of an endurance athlete, the composition of the food ration is significantly different from the diet of speed and strength athletes. The former need to get more carbohydrates and fats in their diet, while the latter need more protein. Endurance athletes need to replenish their energy reserves even during physical exertion. Players' physical activity is characterized by a more rapid change in intensity, so their energy spending is lower, and the main source of energy during physical activity is carbohydrates (Burke et al., 2011).

Although research data on the nutrition of athletes is sufficient, information on the determinants of a healthy diet is still lacking. In Kazakhstan, the issue has also not been sufficiently addressed. An analysis of the literature on the nutrition of Kazakh athletes shows that their eating habits are often improper due to too little consumption of vegetables and fruits, products are often chosen based on taste without paying enough attention to their usefulness (Mustafin, 2012), therefore the expected impact of the training effect may not be achieved, even if the volume and intensity of exercise is chosen correctly. Therefore, in order to achieve high sports results, the nutrition must be adapted to the needs of the specific sport. This problem has not been sufficiently studied in the scientific research of the said country. We have tried to reduce this insufficiency in our work (Yerzhanova et al., 2020; Milasius et al., 2021). The relevance of this study is related to the insufficiently solved problem of the rational nutrition of Kazakh athletes. We believe that the data of this study will help determine the factors of rational and healthy nutrition choice by Kazakh athletes from various sports groups.

The aim of the study is to describe and compare the factors that determine the choice of healthy diet by athletes of various sports.

## Methods

### Participants

The cross-sectional study, which aimed to assess the factors determining healthy diet, involved students of physical education and sports studies at the University of Almaty. Respondents were divided into 3 groups – game sports (volleyball, football, basketball, and tennis) ( $n=85$ ), endurance sports (long distance running, skiing, road cycling, and triathlon) ( $n=22$ ), and combat sports (wrestling, judo, karate, and boxing) ( $n=50$ ). The athletes under study were divided into sports groups using the classification of the World Sport Encyclopedia (2003). The average age of the subjects in the game sports group was  $19.5 \pm 0.9$  years, height -  $186.4 \pm 2.7$  cm, weight -  $75.6 \pm 3.36$  kg, body mass index (BMI) -  $21.8 \pm 2.5$  kg/m<sup>2</sup>. The average age of endurance training subjects was  $20.6 \pm 0.97$  years, height -  $175.8 \pm 2.4$  cm, weight -  $66.5 \pm 0.9$  kg, BMI -  $21.5 \pm 2.3$  kg/m<sup>2</sup>. The average age of the combat sports subjects was  $20.4 \pm 0.6$  years, height -  $174.7 \pm 2.09$  cm, weight -  $71.0 \pm 3.19$  kg, BMI -  $23.3 \pm 2.4$  kg/m<sup>2</sup>.

The research was approved by the Ethics Committee of the Al-Farabi University of Kazakhstan (18.05.2018, No. A-043), as well as the voluntary and written consent of the subjects was obtained. The confidentiality of the study data was ensured.

### Measurements

In order to find out the opinion of the students about the factors that determine the choice of healthy and rational diet, Steptoe et al. (1995) questionnaire was used. Each respondent filled out the questionnaire directly in writing. The content of the questionnaire included questions on students' socio-demographic situation (gender, age), physical development (height, body mass, BMI), the extent of the respondents' physical activity, their diet, and self-assessment of health.

### Statistics

Traditional methods of mathematical statistics were used for the analysis of the research data - arithmetic means ( $\bar{X}$ ) and their mean deviations ( $S$ ) were calculated. The  $\chi^2$  (Chi-square) criterion was applied for the reliability of the data difference. The change in research data was statistically significant at  $p < 0.05$ .

## Results

Analysing the respondents' responses on the factors determining the percentage distribution of healthy diet choices, it should be noted that the athletes of various sports we interviewed by us stated that such choice is determined by their health status. 63.55% of players, 54.54% of endurance sports athletes, and 86.0% of combat sports athletes answered this question in the affirmative (Table 1). Assessing the subjects' responses on the influence of sports activities on healthy eating choices, a reliable difference between the players' responses and the responses of combat sports athletes ( $p=0.001$ ) was observed, while endurance sport athletes' responses stating that athletic activity has or does not have effect were distributed evenly (50% each).

A statistically significant response to the question of whether diet has an effect on body composition was obtained from the players ( $\chi^2=21.80$ ,  $p=0.001$ ). However, half of the studied endurance sports athletes tended to state that body composition may influence food choice or either may or may not influence it ( $\chi^2=8.237$ ,  $p=0.016$ ). When asked whether current trends and the product popularity influence the choice of food consumed, no statistically significant results in the re-

**Table 1.** Percentage distribution of responses to the question 'Factors determining the choice of a healthy diet'.

No.	Factors	Game sports n=85	Endurance sports n=22	Combat sports n=50
Healthy nutrition				
1	Affects	63.55	54.54	86
2	Both yes and no	30.58	45.46	12
3	Does not affect	5.87	0	2
		$\chi^2=84.835$ ; df=3; p=0.001	$\chi^2=0.182$ ; df=1; p=0.670	$\chi^2=63.160$ ; df=2; p=0.001
Sports activity				
1	Affects	55.30	50	64
2	Both yes and no	40	50	34
3	Does not affect	4.70	0	2
		$\chi^2=34.329$ ; df=2; p=0.001	$\chi^2=0.000$ ; df=1; p=1.000	$\chi^2=28.840$ ; df=2; p=0.001
Body composition				
1	Affects	36.47	50	56
2	Both yes and no	56.47	45.45	40
3	Does not affect	7.06	4.55	4
		$\chi^2=31.506$ ; df=2; p=0.001	$\chi^2=8.273$ ; df=2; p=0.016	$\chi^2=21.280$ ; df=2; p=0.001
Current trends, popularity				
1	Affects	28.24	31.83	26
2	Both yes and no	42.35	40.90	40
3	Does not affect	29.41	27.27	34
		$\chi^2=3.129$ ; df=2; p=0.209	$\chi^2=0.636$ ; df=2; p=0.727	$\chi^2=1.480$ ; df=2; p=0.477
Family members, friends				
1	Affects	68.26	40.90	46
2	Both yes and no	23.52	36.36	32
3	Does not affect	8.22	22.74	22
		$\chi^2=93.871$ ; df=3; p=0.001	$\chi^2=1.182$ ; df=2; p=0.554	$\chi^2=4.360$ ; df=2; p=0.113

sponses were obtained, but the responses of all three groups of athletes showed a prevalence of the response 'both yes and no' (Table 1).

Family members and friends often have a great influence on nutrition. 68.25% of the players we surveyed pointed out the influence of this factor ( $\chi^2=93.871$ , p=0.001). The respons-

**Table 2.** Percentage of respondents' responses to the question 'I agree with the statement'.

No.	Factors	Game sports n=85	Endurance sports n=22	Combat sports n=50
I always try to eat healthy				
1	Agree	71.78	63.65	76
2	Both agree and disagree	27.05	27.27	24
3	Disagree	1.17	4.54	0
4	Don't know	0	4.54	0
		$\chi^2=65.035$ ; df=2; p=0.001	$\chi^2=20.545$ ; df=3; p=0.001	$\chi^2=13.520$ ; df=1; p=0.001
I live a healthy lifestyle				
1	Agree	58.84	54.55	68
2	Both agree and disagree	37.64	45.45	32
3	Disagree	2.35	0	0
4	Don't know	1.17	0	0
		$\chi^2=81.071$ ; df=3; p=0.001	$\chi^2=0.182$ ; df=1; p=0.670	$\chi^2=6.480$ ; df=1; p=0.011

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**Table 2.** Percentage of respondents' responses to the question 'I agree with the statement'.

No.	Factors	Game sports n=85	Endurance sports n=22	Combat sports n=50
I am satisfied with my health				
1	Agree	67.07	50	68
2	Both agree and disagree	31.76	40.91	30
3	Disagree	1.17	9.09	2
4	Don't know	0	0	0
		$\chi^2=55.435$ ; df=2; p=0.001	$\chi^2=6.091$ ; df=2; p=0.048	$\chi^2=32.920$ ; df=2; p=0.001
I am satisfied with my body mass				
1	Agree	43.52	31.83	58
2	Both agree and disagree	42.35	54.54	38
3	Disagree	14.13	9.09	4
4	Don't know	0	4.54	0
		$\chi^2=14.141$ ; df=2; p=0.001	$\chi^2=14.000$ ; df=3; p=0.003	$\chi^2=22.360$ ; df=2; p=0.001
The composition of food is important to me				
1	Agree	32.94	45.45	58
2	Both agree and disagree	61.19	40.92	42
3	Disagree	4.70	9.09	0
4	Don't know	1.17	4.54	0
		$\chi^2=79.941$ ; df=3; p=0.001	$\chi^2=11.818$ ; df=3; p=0.008	$\chi^2=1.280$ ; df=1; p=0.258
My food choices are influenced by discounts and special offers				
1	Agree	21.19	31.81	42
2	Both agree and disagree	57.64	31.81	36
3	Disagree	20	18.19	16
4	Don't know	1.17	18.19	6
		$\chi^2=56.882$ ; df=3; p=0.001	$\chi^2=1.636$ ; df=3; p=0.651	$\chi^2=17.040$ ; df=3; p=0.001
It is important to me that the food is of natural origin				
1	Agree	68.25	63.63	76
2	Both agree and disagree	24.70	18.19	20
3	Disagree	7.05	9.09	4
4	Don't know	0	9.09	0
		$\chi^2=50.565$ ; df=2; p=0.001	$\chi^2=18.000$ ; df=3; p=0.001	$\chi^2=42.880$ ; df=2; p=0.001
I often follow a diet				
1	Agree	30.58	45.45	36
2	Both agree and disagree	38.84	36.36	42
3	Disagree	25.88	13.65	18
4	Don't know	4.70	4.54	4
		$\chi^2=21.588$ ; df=3; p=0.001	$\chi^2=9.636$ ; df=3; p=0.022	$\chi^2=18.000$ ; df=3; p=0.001

es of endurance sports and combat sports athletes were evenly distributed across the three choices ( $p=0.554$ ;  $p=0.113$ ).

Results of various sports athletes' responses on their dietary habits showed their attempts to eat healthy ( $p=0.000$ ). Also, the majority of respondents stated that they try to maintain a healthy lifestyle, but only the players' answer 'agree' was statistically reliable ( $\chi^2=81.071$ ,  $p=0.001$ ) (Table 2).

Responses from all studied athletes had statistical reliability addressing satisfaction of their health. Same results were obtained for players and combat sports athletes' responses in terms of body mass, but most endurance sports' athletes did not always agree with this statement. 54.54% of these athletes chose the answer 'both agree and disagree' because increased body mass in endurance sports is a limiting factor in sports performance ( $\chi^2=4.000$ ,  $p=0.003$ ).

The composition of food supplements is important for a rational diet. We found that 61.19% ( $\chi^2=79.941$ ,  $p=0.001$ ) of game sports athletes answered 'yes and no' to the question about the composition of food products, while 45.45% of endurance sports athletes and 58% of combat sports athletes preferred the answer 'yes'.

There was no unambiguous answer to the question concerning the influence of discounts of food supplements on food choices. 57.17% of the game sports athletes chose 'Both agree and disagree' answer to this question, and 31.81% of the endurance sports athletes and 42.0% of the representatives of combat sports chose the answer – 'Agree'. A significant number of respondents stated that the food should be fresh ( $p=0.001$ ). Variety of answers, from 'yes' to 'no', were provided to the question of whether athletes often follow a diet, but prevalence was observed in 'yes' and 'yes and no' responses.

## Discussion

Although scientific literature provided enough information on the nutrition of athletes of various mastery level, the issues of nutrition of athletes in Kazakhstan are not sufficiently reviewed yet. Identification of the factors that determine the rational diet of athletes can help to train them better (Nowacka et al., 2016). We have to agree with the opinion of T. Lisicki (2010) that the years during which the study was conducted are a social stage of a young person's life, associated with many challenges, including the formation of new lifestyle and eating habits, and increased physical activity, which must be compensated by a full-fledged diet. However, as Edwards & Meiselman, (2003), Papadaki et al. (2007), and Skibinewska et al. (2009) point out, during this period, quite a number of factors appear that lead to the emergence of negative lifestyle and eating habits. It can be noted that more than half of the subjects of all sports groups stated that a healthy diet is one of the main factors for successful sports activities and maintaining a suitable body composition.

The athletes, whom we studied, enrolled into university physical education and sports program, consider health, the nature of physical activity, and the composition of the body being the main factors that determine the choice of a healthy diet. Responses on factors such as current trends and the popularity of dietary supplements consumed, as well as the opinions of family members and friends, were distributed over a wider range of responses (26.0-68.26%). The subjects indicated that the least influencing factor on choosing a healthy diet is the current trends of nutrition, the popularity of products, and the greatest influencing factor is family

members and friends, this was indicated by the subjects of all sports groups (game sports - 68.26%,  $p=0.001$ ), endurance sports - 40.9%,  $p=0.554$ , combat sports - 46.0%,  $p=0.113$ ). Such position has been shared by other researchers examining this issue (Iglesias-Gutiérrez et al., 2008; Partida et al., 2018).

Scientists, while studying the nutrition and lifestyle of students and physically active individuals, are studying factors that can determine their eating habits and lifestyle. The authors, who studied the nutritional characteristics of students in Poland, Bulgaria, Denmark, and Germany, found that students living with their parents eat more properly than students living separately from their parents (El Ansari et al., 2011). Kresic et al. (2009), who studied the features of nutrition and knowledge, found that a healthy lifestyle determines the female sexuality, older age, nutrition at home, and a sufficient knowledge about nutrition. Croatian students, who have adequate knowledge of nutrition, are 12 times more likely to have a healthy diet than students who do not. In our work, we did not set the task of comparing the quality of nutrition of students living with parents and living in a dormitory, however, while processing the research data, we noticed that this factor was more clearly manifested in students living with their parents. We found similar data in the work of Urmanowska-Zyto et al. (2004) as well.

Knowledge about rational nutrition acquired during studies at the university can help a person to choose correctly the factors that determine a healthy and rational diet. Analysing the data of the questionnaire survey, we found that the majority of the subjects (68.25-76.0%) state that it is important for them that food products are natural ( $p=0.001$ ), and discount special offer do not play a significant role in their choice. After gaining this knowledge, athletes pay attention to the relationship between health and the choice of product composition when choosing foods. The data from our study is in line with the opinion of many authors (Shriver et al., 2013; Zapolska et al., 2014; Kowalczyk-Vasilev et al., 2018). We managed to find other works on this topic (Kolodinsky et al., 2007; Kresic et al., 2009; Bojanic et al., 2015) that present data on the level of knowledge and literacy of student athletes. Based on the results of their research, the authors conclude that the knowledge of professional athletes of the Balkan countries in the field of nutrition is at a satisfactory level. According to Bojanic et al. (2015) proper knowledge about rational nutrition is determined by other factors, such as health, healthy lifestyle, and diet. Scientists researching nutrition about the lifestyle of students are studying the factors that can determine their eating habits. Romaguera et al. (2011), while assessing the factors that determine the healthy lifestyle of Spanish students, found that the most effective factor is physical activity. The results of our study showed that when assessing their body mass, about 85% of respondents were satisfied or not completely satisfied with their body mass. As a rule, other authors studying the issues of athletes' nutrition also pay attention to this issue (Satalic et al., 2007; Tengvall & Ellegard, 2007; Chourdakis et al., 2010; Gazibara et al., 2013).

Athletes' rational and healthy diet requires a certain regime, at the same time it must meet the requirements of the training process. The answers of the respondents of all groups about whether they often follow a diet were almost equally distributed for each answer option - "agree", "both agree and



disagree". Proper nutrition determines the necessary adaptation of the body to physical activity and helps to achieve the highest sports results (Kouloutbani et al., 2012).

After summarizing the results of our study, we can recommend athletes and coaches to take into account the following main factors of healthy nutrition - the nature of sports activities, the diet, the composition of food products, and their energy value. Although our research data in many cases matches that of authors from other countries who studied the factors of healthy eating choices of athletes, our research data also has specific features that can be used to mark respondents' answers about the composition of food products, the influence of prices and discount special offers when choosing seafood products. However, the collection, application, and interpretation of such data face certain limitations. A valid questionnaire and objective answers for the subjects must be selected, research results must be properly processed, and objective conclusions must be drawn. Based on the data of Small et al. (2013), we believe that in order to properly assess the factors that determine the choice of a healthy diet, the students who are involved in the study should be divided into groups - those who live at home with their parents and those who live separately in a dormitory.

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#### Conflict of Interest

The authors declare that there are no conflict of interest

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## Conclusions

Our research has shown that among the factors that determine the healthy diet of athletes of various sports the main ones are health, the character of the chosen sport, and body composition. Factors such as current trends, the popularity. Based on the data of M. Small et al. (2013), we believe that in order to properly assess the factors that determine the choice of a healthy diet, the students who are involved in the study should be divided into groups - those who live at home with their parents and those who live separately in a dormitory of the food consumed, and the influence of family and friends are less important. The studied athletes noted their efforts to eat healthy and live a healthy life, most of them were satisfied with their health and their body mass. A greater variety of respondents' responses was observed when assessing the composition of food supplements and the effect of discount special offers on product selection. The responses received about the adherence to the diet regime indicate that the studied athletes do not always adhere to this regime. Although the data of our study basically matches the data of many authors, but in some aspects our data has their own specificities, which are characteristic of this country. The data of our study partially helps to solve the problem - it characterizes the factors that determine the choice of a healthy diet.

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