Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.47750/jptcp.2023.30.11.036

The Relationship with Nutritional Habits, Weight Adjustment and Performance in Female and Male Weightlifters

Orhan Ahmet Şener[1*]

[1]Selcuk University Faculty of Sport Sciences, Konya/Türkiye

***Corresponding author:** Orhan Ahmet Şener, Selcuk University Faculty of Sport Sciences, Konya/Türkiye

Submitted: 16 March 2023; Accepted: 17 April 2023; Published: 05 May 2023

ABSTRACT

The aim of this study is to determine the relationship between dietary habits, weight adjustment and performance in male and female weightlifters. Age, weight, education level, national and international success, monthly income level, weight loss status, adequate nutrition, level of knowledge about nutrition, fluid consumption, diet before the competition and whether they use ergogenic materials A questionnaire was applied to indicate that they did not use it. The square test in statistical operations was used. Nutritional deficiency has not been reported in terms of education level, monthly income level, competition category, weight, national or international in male and female weightlifters at the national and international level. Again, there were no differences in weight reduction in terms of education level, monthly income level, competition category, weight, whether it is national or international in male and female weightlifters at the National and International level. As a result of this study, the following recommendations can be made: The daily nutritional levels of more male and female weightlifters should be observed in more detail and associated with weightlifting performance. Weight adjustment practices related to male and female weightlifters can be correlated with performance by making more detailed measurements. The competition performances of both male and female weightlifters after their diets should be correlated. Athletes' awareness training on nutrition should be planned and implemented without considering the whole of society.

Keywords: *Nutrition, Gender, weightlifters, weight loss*

INTRODUCTION

When high levels of loading in training are accompanied by malnutrition, it leads to organic problems in athletes of both sexes. Anemia, mineral loss, menstrual disorders in women and other nutritional disorders are observed. These disorders are not the same among athletes (Hall and Lane 2001, Onywera et al 2004, Farajian et al 2004, Smolak et al 2000). Adequate and balanced nutrition is one of the factors that ensure the development of a person's physical structure, physiological activities, mental and spiritual abilities in accordance with their normal potential. It is very important that the nutrition is adequate and suitable for the needs of the body in young people. However, income and expenses within the social structure, customs and traditions evaluated within the cultural structure are the determining factors of the nutritional status of the individual (Aksu et al., 2021; Sarıoğlu et al., 2012). Nutrition is the ability of a person to take and use the substances necessary for a long, growing, developing, healthy and productive life. A balanced diet consists of taking different

nutritional components in desired proportions to meet the energy and nutritional needs of the person (Atan and İmamoğlu, 2020). Weightlifting is one of the main sports in which nutritional deficiencies are reflected on performance, as is the training in which loads are performed at maximal intensity. Low calorie intake from food leads to loss of muscle mass, menstrual disorder, increased sense of fatigue, and ultimately decreased athletic performance (Ainsworth et al., 2000). Athletes reduce their body weight by limiting their daily energy consumption and gain advantages compared to competitors in all sports branches according to weights (Hall and Lane 2001). Many athletes spend most of their time in intense training and competitions without taking the necessary care to minimize the negative effect of food restriction on their performance (Hall and Lane 2001). Low calorie intake will restrict athletes from reaching their performance goals. It is known that there is a significant relationship between the level of knowledge about nutrition and inadequate nutrition habits (Burke 1995). Cuspiti et al (2000) reported that athletes have better nutritional attitudes and knowledge levels when compared to ordinary individuals, suggesting the positive effect of sports on their nutritional knowledge and eating habits (Cuspiti et al 2000).

Regular training has a negative effect on calorie balance and critically affects body composition. It would be interesting to search for a nutritional orientation targeting excess energy expenditure (Cabral et al 2006). Calorie restriction is common in weight-classed sports. However, in both physical performance and health issues, it is the low fat percentage of male athletes that makes using such strategies extremely dangerous (Cabral et al. 2006). When the energy consumption of Brazilian male weightlifters is taken into account, it has been reported that especially male athletes are below their daily needs. In order to compensate for this deficiency, it is possible to increase the daily energy consumption either by the energy density of the meals or by the number of daily meals (Cabral et al. 2006). This type of behavior is not always observed in athletes such as elite weightlifters, as there are dietetic records where carbohydrate consumption is below the recommended level. He suggested daily energy consumption of up to 4,000 kcal, which presents a specific situation for evaluated athletes whose daily CHO consumption, is between 400 and 600 g (Costill 1988). Carbohydrate consumption is strongly recommended before, during and after exercise (Marins et al 2004). Before exercise, simple carbohydrate sources should be edible only 5 minutes before the competition, thus avoiding hypoglycemia will be possible (Cabral et al 2006). During exercise, carbohydrate consumption delays the formation of fatigue, protects glycogen, and results in low circulation averages of pro-inflammatory cytokines, which are indicators of injuries and diseases in the body. After exercise, carbohydrate beverage intake is necessary to accelerate muscle and liver glycogen resynthesized (Marins et al 2004). Especially in high-intensity sports activities, carbohydrate metabolism is high. Restrictions on carbohydrate consumption will lead to a decrease in glycogen stores, which impairs the ability to work and leads to fatigue (Saunders et al. 2004).

Considering that weightlifting represents high-intensity interval activity, it is clear that appropriate carbohydrate consumption is important for high-quality training (Saunders et al 2004). Cabral et al (2006) reported in their study that only one male and one female athlete had an inadequacy in which the protein intake in the diet of Brazilian weightlifters met their needs. Many athletes believe that they should get more protein than the normal population. However, it is necessary to take appropriate amounts of energy and protein, and thus an increase in muscle mass occurs (Bishop et al 2002). Cabral et al (2006) reported that protein deficiency and related training ability and recovery level decreased, especially in female weightlifters. In the long run, excess protein can lead to health problems such as hypercalciuria, which indicates excess calcium in the urine, dehydration, which indicates water loss, and an increase in kidney and liver work, which has a high specific dynamic effect and therefore increases oxygen consumption (Lemon 1991). High protein consumption with clinical manifestations due to its excess has not been seen in athletes on the consistent Olympic weightlifting team. Fat

consumption of less than 35% of the daily energy total can lead to health problems along with a decrease in physical ability. Possibly, in male athletes who should not keep their fat percentages below 5%, the athletes' lower calorie consumption resulted in lower body fat percentages (Mahan et al 2002). Eating disorders develop and health problems related to energy deficiency and food intake occur in athletes who keep their fat percentage lower than recommended (Ainsworth et al 2000). The model recommended by Fleck (1983) (10-12%) was used as the reference body fat percentage for male weightlifters, and the model of Heyward and Stolarczyk (2000) (12-16%) was used for female athletes. However, body composition fluctuations will be wider, with a width ranging from 5 to 12% in male athletes and 10-18% in females, respectively (Wilmore and Costill 2012).

It focuses on the habits that determine the nutrition regime, which is an important part of training and high performance goals, the quality of the necessary foods, nutrients and supplements, as well as the determination of when the meals will be consumed, the balanced nutrition program according to the needs of the training and the energy consumed. It seems important to raise awareness about which eating habits should be exhibited both in sports and in normal life. There is no study in the literature investigating the direct relationship between the eating habits of Turkish weightlifters and their performance. Thus, the aim of this study was to investigate the relationship between dietary habits, weight adjustment and performance in elite male and female weightlifters.

METHOD

Participants

Voluntary participation approval forms of 27 male and 16 female athletes working in the preparation camps of the Turkish National Weightlifting Team in Ankara and Konya in 2014 in the youth and adult categories were collected and included in the study.

Data Collection Tools

Records of official male and female athletes' jerking, snatching and total lifts in national and international competitions were obtained from the Turkish Weightlifting Federation. A questionnaire was applied to the weightlifters' age, weight, education level, national and international success, monthly income level, weight loss status, whether their nutrition was sufficient, their level of knowledge about nutrition, fluid consumption, type of diet before the competition and whether they used ergogenic substances.

Statistical analysis

Dependent variables including jerking, snatching and total weights that make up the performance of weightlifters, whether they are fed adequately, whether they lose weight, whether they have sufficient knowledge about nutrition, whether they pay attention to fluid intake during training, what type of diet they use before competitions, and whether they use ergogenic substances. These independent variables are; age groups, education level, monthly income level, competition category, weight groups, national and international success. Crostabulation and X2 analyzes were used to determine the distribution and proportions of male and female weightlifter groups in different dependent variables according to independent variables. Correlation coefficients were calculated to determine the level of relationships between dependent and independent variables.

RESULTS

The answers given by the weightlifters to the question “Do you think you are getting enough nutrition?” are given in Table 1-6.

TABLE 1: Opinions of weightlifters on whether they are adequately nourished according to their education level.

	Age Groups	Yes	No	Total	
Male	Group 1 (18-19 years)	6	4	10	X2=.600, p>0.05
	2.Group (20-22 years old)	4	1	5	
	3.Group (23 years >)	8	4	12	
	Total	18	9	27	
Female	Group 1 (18-19 years)	1	1	2	X2=.213, p>0.05
	2.Group (20-22 years old)	3	6	9	
	3.Group (23 years >)	2	3	5	
	Total	6	10	16	

TABLE 2: Opinions of weightlifters on whether they are adequately fed according to their education level.

	Education level	Yes	No	Total	
Male	Middle school	4	4	8	X2=1,543, p>0.05
	High school	10	4	14	
	University	4	1	5	
	Total	18	9	27	
Female	Middle school	2	2	4	X2=1,543, p>0.05
	High school	1	5	6	
	University	3	3	6	
	Total	6	10	16	

TABLE 3: Opinions of weightlifters on whether they are adequately fed according to their monthly income levels

	Income rate	Yes	No	Total	
Male	< 1000 TL	7	5	12	X2=3.875, p>0.05
	1000-2000 TL	5	4	9	
	2000-3000 TL	6	0	6	
	Total	18	9	27	
Female	< 1000 TL	3	6	9	X2=.213, p>0.05
	1000-2000 TL	2	3	5	
	2000-3000 TL	1	1	2	
	Total	6	10	16	

TABLE 4: Opinions of weightlifters on whether they are fed adequately or not according to competition category

	Competition category	Yes	No	Total	
Male	Youth	6	5	11	X2=1,227, p>0.05
	Adults	12	4	16	
	Total	18	9	27	
Female	Youth	1	4	5	X2=.950, p>0.05
	Adults	5	6	11	
	Total	6	10	16	

TABLE 5: Opinions of weightlifters on whether they are adequately fed or not, according to weights

	Weights	Yes	No	Total	
Male	Lightweight (48.53, 58 kg)	4	1	5	X2=5.100, p>0.05
	Middleweight (63.69.75 kg)	4	6	10	
	Heavyweight (77.85, 94, 105 kg)	10	2	12	
	Total	18	9	27	
Female	Lightweight (48,53,58 kg)	2	5	7	X2=.423, p>0.05
	Middleweight (63,68,75 kg)	4	5	9	
	Total	6	10	16	

TABLE 6: Opinions of Weightlifters on whether they are fed adequately or not according to Competition level

	Competition level	Yes	No	Total	
Male	National	11	5	16	X2=0.77, p>0.05
	International	7	4	11	
	Total	18	9	27	
Female	National	2	6	8	X2=1.067, p>.05.
	International	4	4	8	
	Total	6	10	16	

The answers given by the weightlifters to the question “Are you losing weight?” are given in Table 7-12.

TABLE 7: Opinions of weightlifters on weight loss by age groups

	Age Groups	Yes	No	Total	
Male	Group 1 (18-19 years)	3	7	10	X2=4.523, p>0.05
	2.Group (20-22 years old)	3	2	5	
	3.Group (23 years >)	9	3	12	
	Total	15	12	27	
Female	Group 1 (18-19 years)	1	1	2	X2=.062, p>0.05
	2.Group (20-22 years old)	4	5	9	
	3.Group (23 years >)	2	3	5	
	Total	7	9	16	

TABLE 8: Opinions of weightlifters on weight loss according to their education level

	Education level	Yes	No	Total	
Male	Middle school	4	4	8	X2=1,485, p>0.05
	High school	7	7	14	
	University	4	1	5	
	Total	15	12	27	
Female	Middle school	2	2	4	X2=.423, p>0.05
	High school	2	4	6	

	University	3	3	6	
	Total	7	9	16	

TABLE 9: Opinions of weightlifters on weight loss according to their income level

	Income rate	Yes	No	Total	
Male	< 1000 TL		6	6	X2=450, p>0.05
	1000-2000 TL		5	4	
	2000-3000 TL		4	2	
	Total		15	12	
Female	< 1000 TL	3	6	9	X2=0,213, p>0.05
	1000-2000 TL	2	3	5	
	2000-3000 TL	2	0	2	
	Total	7	9	16	

TABLE 10: Opinions of weightlifters on weight reduction by income Competition categories

	Competition category	Yes	No	Total	
Male	Youth	4	7	11	X2=2,769, p>0.05
	adults	11	5	16	
	Total	15	12	27	
Female	Youth	1	4	5	X2=1,667, p>0.05
	Adults	6	5	11	
	Total	7	9	16	

TABLE 11: Opinions of weightlifters on weight loss by weight

	Weights	Yes	No	Total	
Male	Lightweight (48.53, 58 kg)	5	0	5	X2=5.130, p>0.05
	Middleweight (63.69.75 kg)	4	6	10	
	Heavyweight (77.85, 94, 105 kg)	6	6	12	
	Total	15	12	27	
Female	Lightweight (48,53,58 kg)	4	3	7	X2=.907, p>0.05
	Middleweight (63,68,75 kg)	3	6	9	
	Total	7	9	16	

TABLE 12: Opinions of Weightlifters on Weight Loss According to Competition Level

	Competition level	Yes	No	Total	
Male	National	7	9	16	X2=2,217, p>0.05
	International	8	3	11	
	Total	15	12	27	
Female	National	2	6	8	X2=2,286, p>.05.
	International	5	3	8	
	Total	7	9	16	

TABLE 13: Correlation coefficients of the weightlifters' jerking, snatching and total lifting weights with the variables of nutrition and weight loss.

Male				Female		
	Performance criteria			Performance criteria		

J Popul Ther Clin Pharmacol Vol 30(11):e355–e363; 05 May 2023.

Parameter	Shake	Snatch	Total	Shake	Snatch	Total
Nutrition information	,099	,360	,348	,204	,468	,342
Pre-competition nutrition	,256	,061	,251	-,051	,023	-,024
Adequate nutrition	-,337	,046	,006	-,361	-,088	-,276
Ergogenic aid	-,176	-,139	,070	-,488	,505*	,545*

DISCUSSION AND CONCLUSION

The performances, nutrition and weight loss habits of male and female weightlifters were evaluated in two groups. When high levels of loading in training are accompanied by malnutrition, it leads to organic problems in athletes of both sexes. Anemia, mineral loss, menstrual disorders in women and other nutritional disorders are observed. These disorders are not of the same form among athletes (Hall and Lane 2001, Onywera et al 2004, Farajian et al 2004 Smolak et al 2000). Weightlifting is one of the main sports in which nutritional deficiencies are reflected on performance, as is the training in which loads are performed at maximal intensity. Low calorie intake from food leads to loss of muscle mass, menstrual disorder, increased sense of fatigue, and ultimately decreased athletic performance (Ainsworth et al., 2000). In this study, nutritional deficiency was not reported in male and female weightlifters in terms of education level, monthly income level, competition category, weight, national or international. Although daily calorie calculation was not done in this study, it is thought that there is no nutritional deficiency due to different factors. It does not seem possible to compare the results of this study with the results reported for the daily caloric consumption of weightlifters in the literature. Athletes reduce their body weight by limiting their daily caloric energy consumption and gain an advantage compared to other competitors in all sports branches according to weights (Hall and Lane 2001). It has been reported that 24% of high school wrestlers go to at least one week of food restriction and 10% to one-day food restriction before competitions (Kinningham and Gorenflo 2001). İmamoğlu et al., (2010) determined that the nutritional levels of the students in various sports branches active in the field of physical education are below the desired level and they have wrong eating habits. In their study, Şener and İmamoğlu (2018a) stated that the nutrition level of the student's receiving sports training is good. In a study by Çebi et al., (2020), it was determined that students receiving sports training do not consume healthy food and have habits that are not suitable for sports nutrition. In the study of Aksu et al. (2020), healthy and unhealthy eating behaviors of wrestlers do not differ according to gender. Şener and İmamoğlu (2018b) found no significant difference between males and females in a study conducted on different university faculty students in terms of gender, meat or alternative diet, vegetable and fruit options, cereal options, mixed size and total nutrition scores. Male students are at medium risk and female students are at high risk of eating habits (Akyol and İmamoğlu, 2019). Many athletes spend most of their time in intense training and competitions without taking the necessary care to minimize the negative effect of food restriction on their performance (Hall and Lane 2001). Low calorie intake will restrict athletes from reaching their performance goals. Since the daily calorie calculation was not performed in this study, it does not seem possible to compare the results of this study with the results of the daily caloric consumption of weightlifters in the literature.

In this study, it was seen that the performance criteria were not affected by the answers given by men on nutritional knowledge, pre-competition nutrition, adequate nutrition and ergogenic assistance. In women, performance criteria were found to be effective in the Snatch style (Table 13).

CONCLUSION AND RECOMMENDATIONS

Nutritional deficiency has not been reported in terms of education level, monthly income level, competition category, weight, national or international in male and female weightlifters at the national and international level. Again, there were no differences in weight reduction in terms

of education level, monthly income level, competition category, weight, whether it is national or international in male and female weightlifters at the National and International level. As a result of this study, the following recommendations can be made: The daily nutritional levels of more male and female weightlifters should be observed in more detail and associated with weightlifting performance. Weight adjustment practices related to male and female weightlifters can be correlated with performance by making more detailed measurements. The competition performances of both male and female weightlifters after their diets should be correlated. Athletes' awareness training on nutrition should be planned and implemented without considering the whole of society.

REFERENCES

1. Ainsworth BE, Haskell WL, Whitt MC, Irwın ML, Swartz AM, et al, (2000). Compendium of physical activities: classification of energy cost of human physical activities. Med Sci Sports Exerc. 32(S9):498-516.
2. Aksu, A., Altun, S., Imamoglu, O., & Karacabey, K. (2020). Investigation of Eating Behaviors in Young Wrestlers. Postmodern Openings. 11(2);163-174 https://doi.org/10.18662/po/11.2/168
3. Akyol, P., & İmamoğlu, O. (2019). The nutritional habits of the university students according to gender. Spormetre, 17(3), 67-77.
4. Altun S.,Aksu A.,İmamoğlu O.,Erdoğdu M.Karacabey K. (2021). Investigation of The Nutritional Approaches of Student Athletes During the Covid-19 Epidemic, Pakistan Journal of Medical Health Sciences ,15(6);2032-2034. https://doi.org/10.53350/pjmhs211562031
5. Atan T.,İmamoğlu O. (2020). Nutritional Habits According to Gender, Stage of Exercise Behavior and BMI, Turkish Journal of Sport and Exercise,22(3);505-512, DOI: 10.15314/tsed.691983
6. Bishop NC, Gleeson M, Nicholas CW, Ali A. (2002). Influence of carbohydrate supplementation on plasma cytokine and neutrophil degranulation responses to highintensity intermittent exercise. Int J Sports Nutr Exerc Metab. 12(2):145-56.
7. Burke L. (1995). Practical issues in nutrition for athletes. J Sports Sci. 13:S83-S90.Cabral, C.A.C.
8. Cabral CAC, Rosado GP, Silva CHO and Marins JCB. (2006). Diagnosis of the nutritional status of the Weightlifting Permanent Olympic Team athletes of the Brazilian Olympic Committee (COB). Rev Bras Med Esporte, Vol. 12:6 – Nov/Dez, pp, 308-312.
9. Chen J, Wang J, Li K, Zhao Y, Wang S, Jiao Y& Hou X. (1989). Nutrition problems and measures in elite and amateur athletes. Am J Clin Nutr. 49:1084-9.
10. Costill D. (1988). Carbohydrate for exercise: dietary demands for optimal performance. Int J Sports Med. 9: 1-18.
11. Cuspiti A, D'Alessandro C, Castrogiovanni S, Barale A, Morelli E. (2000). Nutrition knowledge and dietary composition in Italian adolescent female athletes and nonathletes. Int J Sports Nutr Exerc Metab. 12: 207-19.
12. Çebi M, Eliöz M, Yamak B, İmamoğlu O, Aksoy Y. (2020). Investigation of food consumption frequency in sports faculty students, Progress in Nutrition. 22(2): 507-514. DOI: 10.23751/pn.v22i2.9253
13. Farajian P, Kavouras SA, Yannakoulia M, Sidossis LS. (2004). Dietary intake and nutritional practices of elite Greek aquatic athletes. Int J Sports Nutr Exerc Metab.14(5):574-82.
14. Fleck S. (1983). Body composition of elite American athletes. Am J Sports Med. 11:398-403.
15. Hall C, Lane A. (2001). Effects of rapid weight loss on mood and performance among amateur boxers. Br J Sports Med. 35:390-5.
16. Heyward V, Stolarczyk M. (2000). Composição corporal e atletas. Avaliação da composiçãocorporal aplicada. 1a ed. São Paulo: Manole,
17. Kinningham R, Gorenflo D. (2001). Weight loss methods in high school wrestlers. Med Sci Sports Exerc. 33:810-3.
18. Mahan L, Escot T, Stump S. (2002).Krause: alimentos, nutrição & dietoterapia. 10a ed. São Paulo: Roca,
19. Marins J, Agudo C, Iglesias M, Marins N, Zamora S. (2004). Hábitos de hidratación en un colectivo de deportistas de pruebas de resistencia. Selección. 13:18- 28.
20. Onywera VO, Kiplamai FK, Boit MK, Pitsiladis YP. (2004). Food and macronutrient intakeof elite Kenyan distance runners. Int J Sport Nutr Exerc Metab. 14(6):709-19.
21. Lemon PW. (1991). Protein and amino acid needs of the strength athlete. Int J Sport Nutr Met. 1(2):127-45.

22. Sarıoğlu O, İmamoğlu O, Atan T, Türkmen M, Akyol P. (2012). Examination of the nutritional habits of students in different branches of physical education, Selçuk University Journal of Physical Education and Sport Science,14(1): 88-94.
23. Saunders M, Kane M, Todd M. (2004). Effects of a carbohydrate-protein beverage on cycling endurance and muscle damage. Med Sci Sports Exerc. 36:1233-8.
24. Smolak L, Murnen S, Ruble A. (2000). Female athletes and eating problems: a meta-analysis. Int J Eat Disord. 27:371-80.
25. Şener O.A., İmamoğlu O. (2018a). Feeding Approaches on The Students of Faculty of Sport Science, Internatıonal Conference on Sports for All and Wellness Books, (Editors: Süleyman Gönülateş, M. Ali Öztürk), Alanya / Turkey, pp.401-407
26. Şener O.A., İmamoğlu O. (2018b). A survey on the individual nutrition habits of university students, Sports, and Wellness Research for All (Editors: Süleyman Gönülateş, M. Ali Öztürk), 357-369.