

THE DIET OF SKIERS WITH REGARD TO THE FREQUENCY OF DINNERS

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Annotation. The aim of the present study is the assessment of the dietary habits of Greek alpine ski athletes, with regard to the consumption of specific food groups as well as the evaluation of their compliance with the official dietary recommendations of international organizations. The sample consisted of 65 Greek skiers, both experienced and inexperienced. Three groups of trainees participated: 1) a group of students of Athens, elective skiing –28 people, 2) a group of students of Athens, specialization skiing – 21 people, 3) group of experienced skiers - 16 people. The sample taking was based on the following criteria: a) the skiers had to be Greek, b) to be over 18 years old, c) the questionnaires had to be completed anonymously in their leisure time. The questionnaires were given to the participants, including the following subjects: frequency of daily dinners, daily intake of cereals – baked products, daily intake of dairy products, daily intake of animal protein, daily intake of seafood, daily intake of fatty food, daily intake of vegetables – juice – fruit and daily intake of sweets. Taking into account the results, we are driven to the following conclusions: the update of information of skiers concerning the intake of wrong food is considered necessary. It is ascertained that the majority of people (83%) in all three groups (elective, specialization, experienced skiers) have 4-5 dinners daily. The majority of people in three groups have less than 3 servings daily: of animal protein, dairy products, vegetables, fruit and juice.

Key words: Alpine ski, skiers, questionnaires, dinners, prevention.

Introduction

The diet and physical activity play a crucial role in the health of people of all ages. The new lifestyle in the developing and the developed world induces changes both in eating habits and physical exercise, which are considered responsible for the spread of obesity and its consequences, not only in our country but in most developed countries. The modern eating attitudes, the modern lifestyle, the lack of physical exercise and our indifference to a healthier diet prove that, unfortunately, it is very difficult for someone to escape the daily bad eating habits which the majority applies. There are only a few examples, such as vegetarians, people interested in healthy and biological products and people involved in championship (the latter are driven more by need and not by personal awareness or choice). So, only vegetarians or champions eat correctly and in a healthy way? The right diet is the cornerstone of physical performance. Former researches have shown that the combination of sufficient physical activity and healthy diet is a key factor for our health throughout our lives (7, 8, 10, 11, 12, 14, 15, 18, 19, 20, 24, 28).

Purpose

The aim of the present study is the assessment of the dietary habits of Greek alpine ski athletes, with regard to the consumption of specific food groups as well as the evaluation of their compliance with the official dietary recommendations of international organizations.

Methodology

The sample

The sample consisted of 65 Greek skiers, both experienced and inexperienced. Three groups of trainees participated (Table1): 1) a group of students of University of Athens, elective skiing – 28 people, 2) a group of students of University of Athens, specialization skiing – 21 people, 3) a group of experienced skiers - 16 people. The sample taking was based on the following criteria: a) the skiers had to be Greek, b) the skiers had to be over 18 years old, c) the questionnaires had to be completed anonymously in their leisure time.

Table 1.

Three groups of skiers and somatometric characteristics.

SKIERS GROUPS	MEN		WOMEN		TOTAL			
	M	SD	M	SD	M	SD	MIN	MAX
ELECTIVE SKIING	(N=14)		(N=14)		(N=28)			
AGE (years)	20,86	1,61	22,29	2,64	21,57	2,27	18	28
WEIGHT (kg)	79,36	10,52	59,00	7,67	69,18	13,75	50	100
HEIGHT (m)	1,82	0,07	1,71	0,04	1,77	0,08	1,62	1,93
BMI (kg/m ²)	23,78	2,03	20,15	2,15	21,96	2,76	17,31	26,85
SPECIALIZATION SKIING	(N=10)		(N=11)		(N=21)			
AGE (years)	22,10	0,88	23,00	2,45	22,57	1,89	21	27
WEIGHT (kg)	73,90	5,82	54,09	4,28	63,52	11,28	48	87
HEIGHT (m)	1,77	0,07	1,67	0,07	1,72	0,08	1,55	1,90

BMI (kg/m ²)	23,59	1,63	19,35	1,37	21,37	2,61	17,42	25,98
EXPERIENCED SKIERS	(N=8)		(N=8)		(N=16)			
AGE (years)	33,50	13,33	29,13	3,91	31,31	9,76	20	55
WEIGHT (kg)	77,75	6,76	59,50	9,43	68,63	12,31	48	87
HEIGHT (m)	1,77	0,07	1,65	0,07	1,71	0,10	1,55	1,84
BMI (kg/m ²)	24,72	1,80	21,93	2,65	23,33	2,62	19,47	27,55
TOTAL	(N=32)		(N=33)		(N=65)			
AGE (years)	24,41	8,38	24,18	4,03	24,29	6,49	18	55
WEIGHT (kg)	77,25	8,50	57,22	7,37	67,22	12,72	48	100
HEIGHT (m)	1,79	0,07	1,68	0,06	1,74	0,09	1,55	1,93
BMI (kg/m ²)	23,96	1,86	20,19	2,15	22,11	2,74	17,31	27,55

N – number of skiers, M – means, SD – standard deviation, MIN-MAX of the variable

The method

In this report the method of questionnaires was used. The research material was the frequency of food consumption questionnaire Willett et al. (27), following the Bielinska & Gawecki method (4).

The process

During the 2008-2009 period 65 questionnaires were administered in total, which were filled in entirely by three groups of trainees: 1) a group of students of elective skiing, 2) a group of students of specialization skiing, 3) a group of experienced skiers. The questionnaires were given to the questioned in print including the following subjects: frequency of daily dinners, daily intake of cereals – baked products, daily intake of dairy products, daily intake of animal protein, daily intake of seafood, daily intake of fatty food, daily intake of vegetables – juice – fruit and daily intake of sweets. The software Excel 2007 was used for the statistical analysis applying the percentage analogue method.

Results

The following figures (1 to 8) present the frequency of daily dinners, daily intake of cereals – baked products, daily intake of dairy products, daily intake of animal protein, daily intake of seafood, daily intake of fatty food, daily intake of vegetables – juice – fruit and daily intake of sweets.

Figure 1 show that the majority of people of all 3 groups (83%) have 4-5 dinners daily, fewer people of all 3 groups have 3 dinners daily (15%), whilst only 6% of experienced skiers have less than 3 dinners daily.

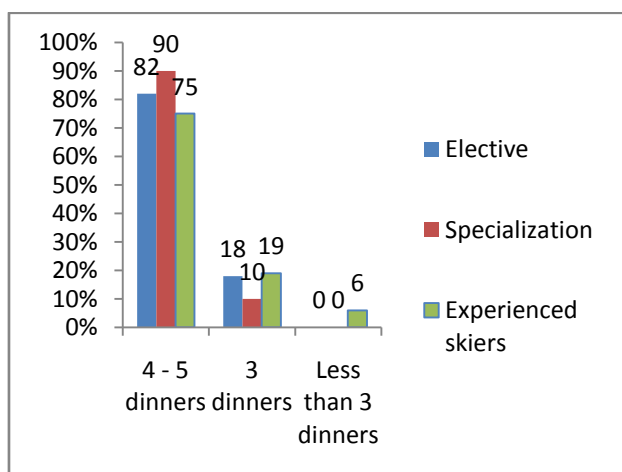


Figure 1. Daily frequency of dinners

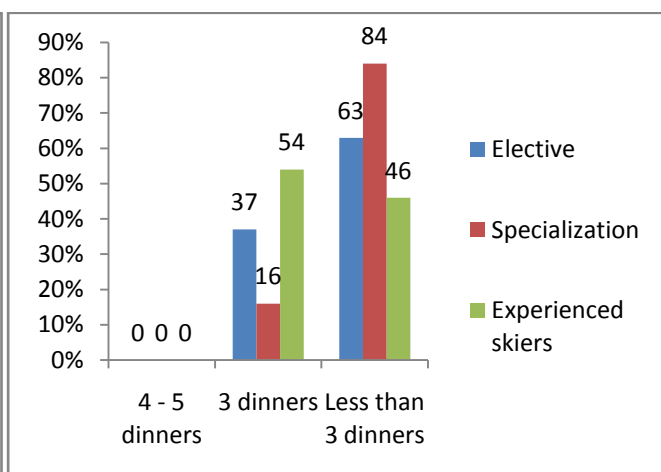


Figure 2. Daily intake of cereals – baked products

Figure 2 show that the majority of people of two groups: specialization (84%) and elective (63%) have less than 3 servings daily of cereals – baked products, whilst the experienced skiers (54%) have about 3 servings. None of the people in all 3 groups has cereals – baked products in all dinners daily.

Figure 3 show that the majority of people of all 3 groups (57%) have less than 3 servings of dairy products daily. Fewer people in all three groups (33%) have about 3 servings of dairy products daily, whilst only 7% of the experienced skiers group has dairy products in all dinners daily.

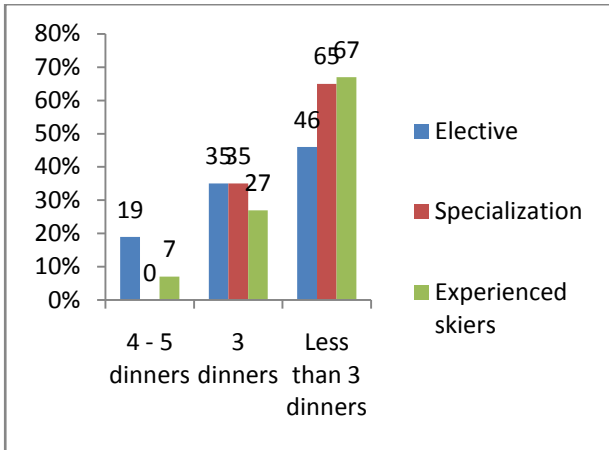


Figure 3. Daily intake of dairy products

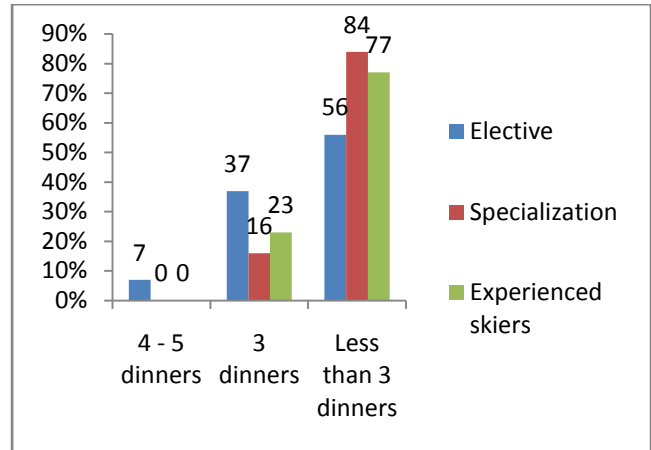


Figure 4. Daily intake of animal protein

Figure 4 show that the majority of people of all 3 groups (69%) have less than 3 servings of animal protein daily. Fewer people in all 3 groups (31%) have about 3 servings of animal protein daily, whilst nobody in all 3 groups has animal protein in all dinners daily.

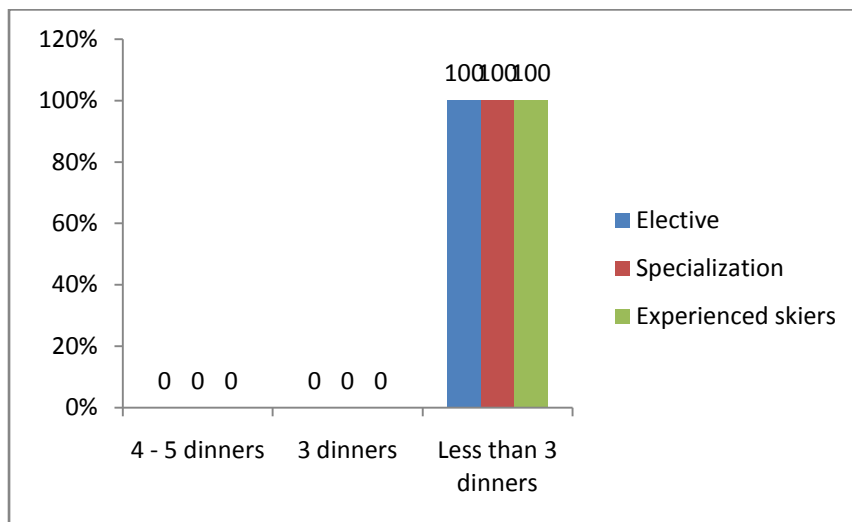


Figure 5. Daily intake of seafood

Figure 5 show that the majority of people in all 3 groups have less than 3 servings of seafood daily, whilst no one in all 3 groups has seafood in all dinners or in about 3 servings of daily.

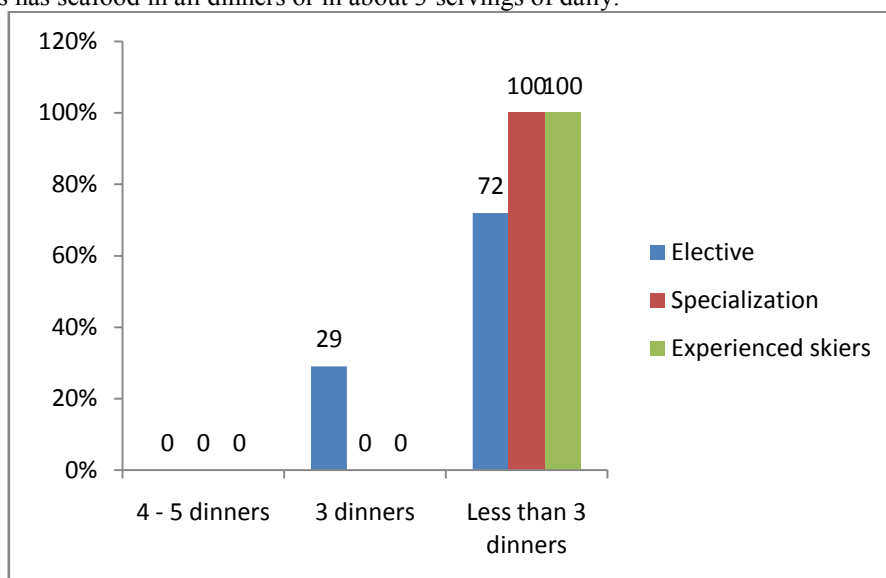


Figure 6. Daily intake of fatty food

Figure 6 show that the minority of people in all 3 groups have less than 3 servings of fatty food daily. 29% of the elective group has about 3 servings of fatty food daily, whilst no one in all 3 groups has fatty food in all dinners daily.

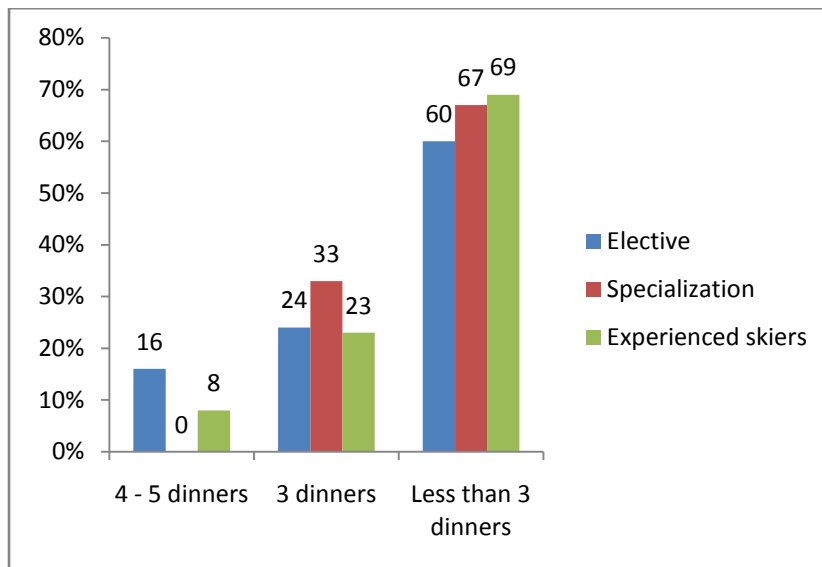


Figure 7. Daily intake of vegetables-juice-fruit

Figure 7 show that the majority of people in all 3 groups (64%) have less than 3 servings of vegetables, fruit and juice daily. Fewer people in all 3 groups (27%) have about 3 servings of vegetables, fruit and juice daily, whilst only 9% of the elective group and the experienced skiers have vegetables, fruit and juice in all dinners daily.

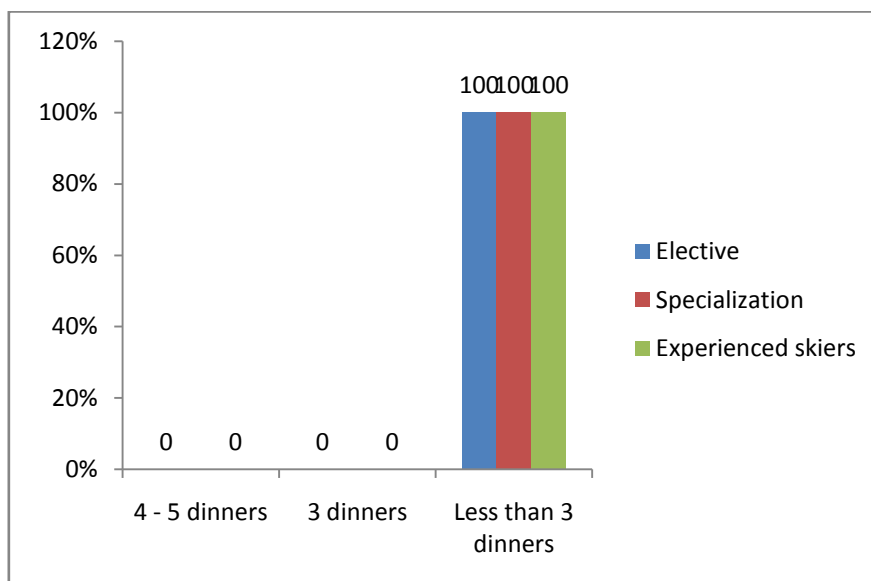


Figure 8. Daily intake of sweets

Figure 8 show that the minority of people in all 3 groups have less than 3 servings of sweets daily, whilst no one in all 3 groups has sweets in all dinners or in about 3 servings of daily.

Recapitulation

The majority of people in the specialization (84%) and elective (63%) group had less than 3 servings daily of cereals – baked products, whilst the experienced skiers (54%) have about 3 servings. None of the people in all 3 groups has cereals – baked products in all dinners daily.

The majority of people in all three groups (57%) had less than 3 servings of dairy products daily. Fewer people in all three groups (33%) have about 3 servings of dairy products daily, whilst only 7% of the experienced skiers group has dairy products in all dinners daily.

The majority of people of all 3 groups (69%) had less than 3 servings of animal protein daily. Fewer people in all 3 groups (31%) had about 3 servings of animal protein daily, whilst nobody in all 3 groups had animal protein in all dinners daily.

The majority of people in all 3 groups had less than 3 servings of seafood daily.

The majority of people in all 3 groups (64%) had less than 3 servings of vegetables, fruit and juice daily. Fewer people in all 3 groups (27%) had about 3 servings of vegetables, fruit and juice daily, whilst only 9% of the elective group and the experienced skiers had vegetables, fruit and juice in all dinners daily.

Discussion

Greek alpine ski athletes were found to consume fewer portions of high biological value protein foods (animal protein, seafood, dairy) compared to what the recommendations for these athletes suggest. Protein intake has been proven to enhance athletic performance playing a crucial role in the metabolism, both as structural molecules of the muscle tissue and as functional molecules e.g. enzymes and hormones (22, 23). In addition, these athletes' consumption of foods rich in carbohydrates as well as their intake of vitamins and minerals were below the recommended intake, since fruits and vegetables were consumed in less than 3 portions per day. Since carbohydrates are the main source of energy during exercising, the limited intake may constitute some kind of disadvantage for these athletes performance (13, 16, 26).

Proportional results were also found in the below research (9). Adolescents aged 11-14 years (N=326), belonging to organized sports federations in the Federal District, Brazil were interviewed. Subjects (N=107) provided four non-consecutive days of food consumption and 219 subjects provided two non-consecutive days of intake. The objective was to assess their nutrient and water intake according to dietary reference intake values and their energy and macronutrient intake by sex and sports groups they were engaged in: endurance, strength-skill or mixed, according to the guidelines established by the American College of Sport Medicine (ACSM). Dietary data were corrected for intra-individual variation. Total energy expenditure was higher among endurance athletes ($p < 0.001$) following their higher training time ($p < 0.001$) when compared to adolescents engaged in strength-skill or mixed sports. Total energy intake was only significantly higher among endurance-engaged females ($p = 0.05$). Protein intake of males was above the guidelines established by the ACSM for all sports groups. All male sport groups fulfilled the intake levels of carbohydrate per kg body weight but only females engaged in endurance sports fulfilled carbohydrate guidelines. Intakes of micronutrients with low prevalence of adequate intake were: vitamins B1, E and foliate, magnesium and phosphorus. Few adolescents ($< 5\%$) presented adequate intake for calcium, fiber, drinking water and beverages. For micronutrients, prevalence of adequacies was lower for females than males, except for liquids and water. Nutrition guidance is needed to help adolescents fulfill specific guidelines of macronutrient intake for their sports and to improve their intake of micronutrients and water. Special attention should be given to female adolescent athletes (9).

Despite many advances in nutritional knowledge and dietary practices, sports nutrition-associated issues, such as fatigue, loss of strength and stamina, loss of speed, and problems with weight management and inadequate energy intake, are common. Sound nutritional practices and well - designed patterns of eating are not awarded the same priority as training and many athletes fail to recognize that poor eating habits or suboptimal hydration choices may detract from athletic performance. Those who care for athletes and active individuals must take an active role in their nutritional well-being (6).

In the world bibliography a lot of writers describe the reflection of behavior in health and diet in student environment: the universities, residence, work and they underline how much corruptible is the population in various factors of risk of health (1, 2, 3, 5, 17, 21, 25). Based on the international and Greek limited bibliography is observed the deviation of results from the reality of population of students and athletes. The above element can be a motive for further deep analysis of subject in concrete environment. Also the results of present research of diet can in future be connected with the results of records in the particular sport.

Conclusions

Taking into account the results, we are driven to the following conclusions:

- 1) It is considered necessary to inform the skiers about diet through an accessible "guide".
- 2) The implementation of a suggested diet questionnaire can assist skiers regarding wrong food (avoid obesity).
- 3) It is noted that the majority of people (83%) in all three groups (elective, specialization, experienced skiers) have 4-5 dinners daily.
- 4) The majority of people in 2 groups - elective and specialization – have less than 3 servings of cereals – baked products daily, while the experienced skiers have about 3 servings.
- 5) The majority of people in 3 groups have less than 3 servings of dairy products, animal proteins, vegetables, fruit and juice daily.
- 6) The minority of people in all 3 groups have less than 3 servings of seafood, fatty food and sweets daily, while no one in all 3 groups has sweets in all dinners or in about 3 dinners daily.

References

1. Allen C.B., Higgs Z.R., and J.R. Holloway. Identifying students at risk for academic difficulty. *Professor Journal*, 1988, vol.4 (2), pp. 113-118.
2. Anderson P. Alcohol consumption of undergraduates at Oxford University. *Alcohol* 1984, vol.19 (1), pp. 77-84,
3. Bachman J.G., Johnston L.D., and P.M. O'Malley. Smoking, drinking and drug use among. American high school students: correlates and trends 1975-1979. *American Journal of Public Health*, 1981, vol.71(1), pp. 59-69.
4. Baczyk S. & L. Szczesniak. *Rational human's feeding* [Racjonalne zywienie czlowieka], PWN, Warszaw-Poznan, 1990, 200 p.

5. Barnes G.M., and J.W. Welte. Predictors of Alcohol use among college students in New York State. *Journal of American College Health*, 1983, vol.31(4), pp. 150-157.
6. Bonci L.J. Eating for performance: bringing science to the training table. *Clinical Journal of Sport Medicine*. 2011, vol.30(3), pp. 661-670.
7. Clark Heather R., Barker Margo E., and Bernard M. Corfe. Nutritional Strategies of Mountain Marathon Competitors-An Observational Study. *International Journal of Sport Nutrition and Exercise Metabolism*, 2005, vol.15, pp. 160-172,
8. Desbrow B., and M. Leveritt. Well-Trained Endurance Athletes' Knowledge, Insight, and Experience of Caffeine Use. *International Journal of Sport Nutrition and Exercise Metabolism*, 2007, vol.17, pp. 328-339.
9. De Sousa, E.F., Da Costa, T.H., Nogueira, J.A., and L.J. Vivaldi. Assessment of nutrient and water intake among adolescents from sports federations in the Federal District, Brazil. *British Journal of Nutrition*, 2008, vol.99(6), pp. 1275-1283.
10. Dontas AS., Moschandreas J., and A. Kafatos. Physical activity and nutrition in older adults, *Public Health Nutrition*, 1999, vol.2(3a), pp. 429-436.
11. Drewnowski A. and W.J. Evans. Nutrition, physical activity, and quality of life in older adults: summary. *Journals of Gerontology Series A: Biological Sciences and Medical Sciences*. 2001, vol.56(2), pp. 89-94.
12. Ekonomou A., Vardaki M., Koutis A., Apostolaki I., and A. Filalithis. *Study of intervention in students of Lyceum on the diet and the natural activity* [Meleti paremvasis se mathites Likeiou gia tin diatrofi kai ti fisiki drastiriotita], 2005, vol.18-19, pp. 33-48.
13. Foskett A., et al. Carbohydrate availability and muscle energy metabolism during intermittent running. *Medicine & Science in Sports & Exercise*, 2008, vol.40(1), pp. 96-103.
14. Giannopoulou Ifigenia, Fernhall Bo, Carhart Robert, Weinstock Ruth S., Baynard Tracy, Figueroa Arturo, and A. Kanaley Jill. *Metabolism: clinical and experimental*. 2005, vol.54(7), pp. 866-875.
15. Giannopoulou I., Ploutz-Snyder L. L., Carhart R., Weinstock R. S., Fernhall B., Goulopoulou S., and J. A. Kanaley. Exercise is required for visceral fat loss in postmenopausal women with type 2 diabetes, *The Journal of clinical endocrinology and metabolism*, 2005, vol.90(3), pp. 1511-1518.
16. Harger-Domitrovich S.G. Exogenous carbohydrate spares muscle glycogen in men and women during 10 h of exercise. *Medicine & Science in Sports & Exercise*, 2007, vol.39(12), pp. 2171-2179.
17. Joubert Lanae M. and Melinda M. Manore. Exercise, Nutrition, and Homocysteine. *International Journal of Sport Nutrition and Exercise Metabolism*, 2006, vol.16, pp. 341-361.
18. Kanaley J. A., Giannopoulou I., and L.L. Ploutz-Snyder Regional differences in abdominal fat loss, *International journal of obesity*, 2005, vol.31(1), pp. 147-152.
19. McMurray R.G., Harrell J.S., Bangdiwala S.I., Bradley C.B., Deng S., and A. Levine. A school-based intervention can reduce body fat and blood pressure in young adolescents, *Journal of Adolescent Health*, 2002, vol.31, pp. 125-132.
20. Molina T. Natural nutrition and diet therapy. *Revista de enfermería*, 2000, vol.23,(4), pp. p. 302-305.
21. O'Neil M.K., and P. Mingie. Life stress and depression in University students' clinical illustrations of recent research. *Journal of American College Health*, 1988, vol.36,(4), pp. 235-240.
22. Robins A. and M.M. Hetherington. A comparison of pre-competition eating patterns in a group of non-elite triathletes. *International Journal of Sport Nutrition and Exercise Metabolism*, 2005, vol.15(4), pp. 442-457.
23. Schokman C.P., I.H. Rutishauser and R.J. Wallace. Pre- and postgame macronutrient intake of a group of elite Australian football players. *Journal of the International Society of Sports Nutrition*, 1999, vol.9(1), pp. 60-69.
24. Sliwa A. Some of maintenance wholesome of students – sportsman [Niektore zachowania zdrowotne studentow – sportowcow]. *Research papers* [Zeszyty naukowe], 1995, vol.72, pp. 51-62.
25. Temple M. Trends in collegiate drinking in California 1979-1984. *Journal of studies on alcohol and drugs*, 1986, vol.47(4), pp. 274 -282.
26. Tsintzas K., and C. Williams. Human muscle glycogen metabolism during exercise. Effect of carbohydrate supplementation. *Sports Medicine*, 1998, vol.25(1), pp. 7-23.
27. Willett W.C., Sampson L., Stampfer M.J., Rosner B., Bain C. & Witschi Jet. Reproducibility and validity of a semiquantitative food frequency questionnaire. *American Journal of Epidemiology*, 1985, vol.122, pp. 51-65.
28. Wunderlich S., McKinnon C., Piemonte J., and Z.N. Ahmad. Measuring the impact of nutrition education and physical activity on older adults participating in government sponsored programs. *Journal of Nutrition for the Elderly*. 2009, vol.28(3), pp. 255 - 271.

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