



18th Annual Scientific Conference of Montenegrin Sports Academy
and 16th FIEP European Congress

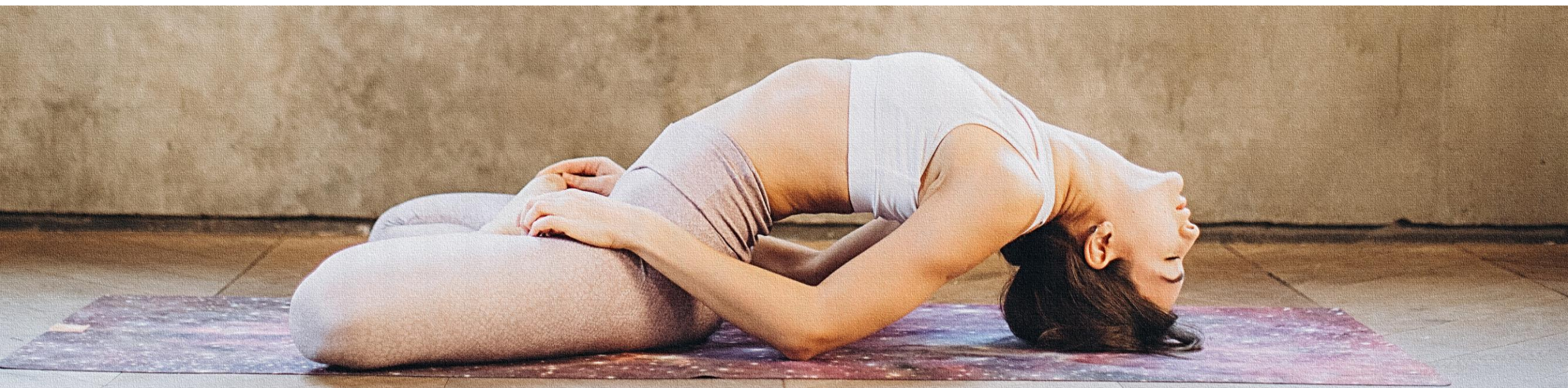
"Sport, Physical Education, Physical Activity and Health: Contemporary perspectives"

8 - 11 April 2021, Cavtat, Dubrovnik - Croatia

Hosted by Montenegrin Sports Academy



Nutritional Assessment of Female Yoga Practitioners with Different Levels of Experience



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Aim of the Study

The purpose of this study was to assess the nutrition of yoga practitioners with different levels of experience in yoga, and compare it with international official guidelines for a healthy diet.





Methods

Participants

89 female yoga practitioners

- Enrolled in a postgraduate education course (Jan 2018 - Jun 2019), 646 hrs.
- Qualification of "Yoga Teacher", organized by the BYF and the National Sports Academy, Bulgaria.
- All participants had a minimum of 2 years of yoga practice.

- **Intermediate Yoga (n=31)**
2-5 years of yoga experience (45.7 ± 13.7 months) with a mean age of 39.4 ± 7.57 years.
- **Advanced Yoga (n=58)**
>5 years of yoga experience (139.3 ± 88.0 months) with a mean age of 41.3 ± 8.15 years.



Methods

NUTRITIONAL ASSESSMENT

- Food frequency questionnaire was applied.

- Height (cm) and Weight (kg) were measured and BMI was calculated.

- Based on the results, the relative energy needs and energy intake, RPI, RCI, RFI, and the energy contribution of protein, carbohydrates and fat were calculated.

- International guidelines for a healthy diet (World Health Organization and the American Cancer Society) were applied.

WHO. (2018). Healthy diet. Fact sheet No. 394. World Health Organization. Kushi, L. et al. (2012). American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. CA Cancer J Clin, 62(1), 30-67. doi: 10.3322/caac.20140



mened that young gymnasts should not have excessive body mass because that might lead to under-performance. Moreover, overweight can decrease the technique of the gymnasts and expose them to an increased risk of injuries due to the excess load on the body structure. (British Gymnastics, 2009). Therefore, children practising gymnastics should consume a balanced amount of protein, carbohydrates and fat, which will help sustain and promote their physical abilities, as well as their optimal body mass.

Key words: nutrition, diet, body composition, artistic gymnastics

INTRODUCTION

It is of particular importance to all athletes, young and old, to pay special attention to nutrition in order to achieve good results in sport (Nisnevich, 2009). A good and balanced diet can support consistent intensive training, while reducing the risk of injuries. Furthermore, good food choices will also promote muscle adaptations in response to the training workload (International Olympic Committee, 2012). The recommended nutrient intake in children and adolescents who are engaged in sports is different from those of non-athletes due to the additional physical exercise.

Artistic gymnastics is a strength sport which can be practised from an early age. It is recommended that young gymnasts should not have excessive body mass because that might lead to under-performance. Moreover, overweight can decrease the technique of the gymnasts and expose them to an increased risk of injuries due to the excess load on the body structure. (British Gymnastics, 2009). Therefore, children practising gymnastics should consume a balanced amount of protein, carbohydrates and fat, which will help sustain and promote their physical abilities, as well as their optimal body mass.

ORIGINAL RESEARCH

Original research

Nutrition and body composition of elite rhythmic gymnasts from Bulgaria

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International Journal of Sports Science & Coaching
2016, Vol. 11(2), 189-194
© The Author(s) 2016
DOI: 10.1080/15441000.2016.1151111
ISSN 1544-1000 print/ISSN 1544-1009 online
www.tandfonline.com/journals/tsssc20

ABSTRACT

Abstract
Rhythmic gymnastics is a sport in which special consideration is given to diet and body appearance. The purpose of this study was to assess the nutrient intake and body composition of elite rhythmic gymnasts in comparison with guidelines for female gymnasts. Twenty-one elite rhythmic gymnasts from Bulgaria were divided into three groups: First National Team, mean age 24.3; Second National Team, mean age 17.8; and Junior National Team, mean age 12.8. Body fat and muscle mass were estimated by DEXA method, and a food frequency questionnaire was applied to assess the nutrient intake. The gymnasts showed low per cent of body fat (13.0% for the First National Team, 17.0% for the Second National Team, and 15.8% for the Junior National Team) and high per cent muscle mass (44.8, 40.3, and 37.8%, respectively). They kept their weight close to the ideal one, as recommended by the coaches, and the following equation best corresponded to the recommended ideal weight: height (cm) - 118. The energy intake was lower than the calculated energy requirement, in addition to low intake of fat and carbohydrates. The relative protein intake was 1.74g/kg for the First National Team, 1.74g/kg for the Second National Team, and 1.94g/kg for the Junior National Team, and the energy contribution of proteins was higher than the recommended 15%. Rhythmic gymnasts should be encouraged to maintain their ideal weight without great variance from the health-related guidelines, and coaches should consider not only the body image, but also the norms relating to body composition in women when determining ideal weight.

Keywords

Anthropometry, body fat, diet, energy intake

Introduction

Rhythmic gymnastics is a female-only Olympic sport in which the gymnast performs movements and dances on the floor, as well as with the music, while working with a rope, hoop, ball, clubs, or ribbon. At Olympic and elite levels, this sport has been mainly dominated by Russia, Bulgaria, Belarus, and Ukraine, as well as newly successfully advancing countries, such as Spain, Italy, and Israel.^{1,2}

Special consideration is given to the body image of the competitors performing in this sport, and this demands particular adherence by the gymnasts to their diet and body composition. All of this puts pressure on the gymnasts, such as the concern of the coaches regarding the gymnast's weight, the pressure of the judges, who give a mark for aesthetic abilities and appearance, and the pressure of accumulating more weight, which may reduce their physical abilities.

JOURNAL of Applied Sports Sciences 01/2018

NUTRITIONAL STATUS AND BODY COMPOSITION OF YOUNG ARTISTIC GYMNASTS FROM BULGARIA

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ABSTRACT

Young gymnasts should not have excessive body mass because that might lead to under-performance. Therefore, children practising gymnastics should consume a balanced diet, which will promote their physical abilities and optimal body mass. The aim of this study was to compare the nutrient intake of young Bulgarian artistic gymnasts in matched groups from the National Nutrition Survey in Bulgaria (NNSB2003). The study consisted of 30 artistic gymnasts (5 to 14 years of age) from four cities in Bulgaria, and the participants were divided into three groups in accordance with the age and gender categories applied in the NNSB2003. Anthropometric measurements were taken and a food frequency questionnaire was applied in order to assess the body composition and nutrient intake of the gymnasts. The percentile scores in the height and %fat of the gymnasts were significantly lower than the 50th percentile of the international norms. The energy intake of the gymnasts did not differ significantly from those reported in the NNSB2003, whilst the protein intake, relative protein intake, and energy contribution of proteins were significantly higher than those in the same survey. The energy contribution of fats was above the recommended norms (15-30%), as provided by the WHO. The fat intake was slightly higher, and the carbohydrate intake was slightly lower than the recommended values in the literature, and therefore, the former should be reduced and the latter increased in their food.

Key words: nutrition, diet, body composition, artistic gymnastics

INTRODUCTION

It is of particular importance to all athletes, young and old, to pay special attention to nutrition in order to achieve good results in sport (Nisnevich, 2009). A good and balanced diet can support consistent intensive training, while reducing the risk of injuries. Furthermore, good food choices will also promote muscle adaptations in response to the training workload (International Olympic Committee, 2012). The recommended nutrient intake in children and adolescents who are engaged in sports is different from those of non-athletes due to the additional physical exercise.

Artistic gymnastics is a strength sport which can be practised from an early age. It is recommended that young gymnasts should not have excessive body mass because that might lead to under-performance. Moreover, overweight can decrease the technique of the gymnasts and expose them to an increased risk of injuries due to the excess load on the body structure. (British Gymnastics, 2009). Therefore, children practising gymnastics should consume a balanced amount of protein, carbohydrates and fat, which will help sustain and promote their physical abilities, as well as their optimal body mass.

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African Journal for Physical Activity and Health Sciences (AFPHES), Vol. 22(2/2), June 2016, pp. 565-577.

Nutrition and physical development assessment of pre-school and primary school children practising artistic gymnastics

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(Received: 13 November 2015; Revision Accepted: 13 April 2016)

Abstract

Overweight amongst children is becoming more and more serious problem worldwide. The maintenance of a normal weight depends on diet and physical activity. One of the few sports which children from pre-school and primary school can practice is artistic gymnastics. The aim of this study was to assess the diet along with the physical development of pre-school and young school children practising artistic gymnastics. In the study took part 38 young gymnasts aged between 4 and 12 years. Anthropometric parameters were measured and the physical development was estimated by specialised software of the World Health Organisation. The Z-score and percentile score for each variable were calculated. The daily intake of protein, carbohydrates and fat, and the total energy intake were calculated based on a nutrition questionnaire adapted especially for children. The results showed that the protein intake was higher and the carbohydrates and fat were lower in comparison with the national population survey data for the same age group. According to BMI 72% of the young gymnasts were with normal weight and 19% were overweight. However the body mass index did not provide adequate weight assessment for young gymnasts, who had greater muscle mass. In conclusion, for better evaluation of overweight and obesity in young athletes the use of additional indicators such as body circumference, % body fat and dynamometry is recommended. In overweight children the aerobic exercises during the warm-up should increase. The nutrition questionnaire used provides a good estimation of the average level of nutrients and energy intake.

Keywords: Anthropometry, athletes, BMI, diet, energy.

How to cite this article:

Kolimechkov, S.T., Petrov, L.A., Alexandrova, A.V. & Atanasov, P.S. (2016) Nutrition and physical development assessment of pre-school and primary school children practising artistic gymnastics. African Journal for Physical Activity and Health Sciences, 22(2/2), 565-577.

Introduction

Obesity and overweight amongst children are becoming a serious problem around the world. In 2013 overweight children under the age of five were forty-two million which represents more than one quarter of worldwide children (WHO, 2015). Overweight and obesity among schoolchildren is a significant problem in Bulgaria, too. Comparative analysis shows an increase in obesity in



Results

Table 1. Anthropometric parameters (mean \pm SD)

	Intermediate Yoga (n=31)	Advanced Yoga (n=58)
Age (years)	39.4 \pm 7.57	41.3 \pm 8.15
Yoga experience (months)	45.7 \pm 13.67	139.3 \pm 88.03 ***
Height (cm)	165.4 \pm 5.85	167.2 \pm 6.24
Weight (kg)	56.9 \pm 6.74	57.2 \pm 8.12
BMI (kg/m²)	20.9 \pm 2.62	20.4 \pm 2.09

*** – $p < 0.001$ vs Intermediate Yoga

Table 2. Daily intake of macronutrients and energy contribution (E%) of each nutrient (mean \pm SD)

	Intermediate Yoga (n=31)	Advanced Yoga (n=58)
Energy needs (kcal/24h)	1786.0 \pm 149.7	1801.0 \pm 172.6
Relative energy needs (kcal/kg/24h)	31.6 \pm 2.80	31.7 \pm 2.60
Energy intake (kcal/24h)	1797.0 \pm 631.7	1782.0 \pm 542.4
Relative energy intake (kcal/kg/24h)	31.8 \pm 11.40	31.6 \pm 9.91
Energy needs/Energy intake	1.01 \pm 0.35	0.99 \pm 0.30
Relative protein intake (g/kg/24h)	1.25 \pm 0.41	1.23 \pm 0.42
Protein (E%)	16.4 \pm 2.42	16.0 \pm 2.78
Relative fat intake (g/kg/24h)	1.01 \pm 0.43	1.01 \pm 0.43
Fat (E%)	28.8 \pm 6.04	28.9 \pm 7.57
Relative carbohydrates intake (g/kg/24h)	4.26 \pm 1.67	4.24 \pm 1.44
Carbohydrates (E%)	54.8 \pm 6.82	55.2 \pm 9.23

Table 3. Weekly consumption of the types of food included in the FFQ, reported by the yoga practitioners (mean ± SD)

	Intermediate Yoga (n=31)	Advanced Yoga (n=58)
Fruits [g]	2380.6 ± 1487.82	2394.8 ± 1657.03
Vegetables [g]	1851.6 ± 1061.41	2027.6 ± 1312.00
Beans [g]	250.0 ± 226.94	287.5 ± 195.97
Nuts [g]	185.5 ± 171.00	186.6 ± 114.44
Fish [g]	155.4 ± 120.27	133.2 ± 126.28
Chicken [g]	90.7 ± 131.97	75.0 ± 166.23
Pork [g]	49.6 ± 178.90	42.0 ± 92.14
Beef [g]	15.6 ± 48.13	22.6 ± 59.58
Eggs [g]	226.5 ± 222.19	243.1 ± 201.03
Milk [ml]	206.5 ± 295.45	153.3 ± 338.77
Yogurt [g]	767.7 ± 570.61	854.1 ± 835.96
Cheese [g]	296.8 ± 199.56	268.0 ± 252.39
Curd Cheese [g]	61.0 ± 115.15	51.7 ± 100.42
Yellow Cheese [g]	165.3 ± 149.54	157.7 ± 191.22
Butter [g]	62.3 ± 65.51	64.7 ± 49.92
Bread [g/24h]	258.3 ± 248.09	330.5 ± 312.05
Rice [g]	240.3 ± 240.98	238.8 ± 162.77
Potatoes [g]	435.5 ± 255.01	531.0 ± 283.74
Pasta [g]	400.0 ± 280.48	305.2 ± 266.34
Baked Products [g]	60.5 ± 84.60	68.5 ± 115.90
Muesli & Cereals [g]	268.5 ± 208.56	200.0 ± 191.26
Sweets [g]	84.7 ± 71.50	103.0 ± 136.38
Chocolates [g]	91.5 ± 87.32	110.8 ± 96.61
Juice & Drinks [L]	3.9 ± 6.18	3.1 ± 5.12

600 g / day

Percentage of vegans and different types of vegetarians, who do not consume specific foods from animal origin, in the yoga practitioners

	I.Y.	A.Y.
Vegans	0.0% (n=0)	6.9% (n=4)
Fish	12.9% (n=4)	29.3% (n=17)
Meat	58.1% (n=18)	60.3% (n=35)
Eggs	16.1% (n=5)	6.9% (n=4)
Milk	51.6% (n=16)	60.3% (n=35)

28.5 g/day
6.35% of EI



Conclusions

- **The diet of yoga participants in both groups corresponded with recommendations of the WHO and American Cancer Society Guidelines for a healthy diet.**
- **Participation in yoga should be widely recommended as a practice.**
- **More detailed research is needed to reveal the effects of practising yoga on body composition and nutritional habits.**





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Hosted by Montenegrin Sports Academy



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