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Analysis of the consumption of energy drinks, fruit juices and other beverages among young athletes

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Abstract

Energy drinks are very popular among young people. The aim of the study was to analyze the consumption of energy drinks on a group of young athletes after nutritional education. The study was conducted on a group of 247 young athletes in two randomly chosen sports schools in Bydgoszcz. Studies carried out in two stages (before and after nutritional education) using author's questionnaire and FFQ. EDs were consumed by 66% (I stage) and 69% (II stage) of the young athletes. Most young athletes chose energy drinks based on taste (63.5%) and price (40%). Nutritional education have made that the number of young athletes consuming EDs quite often (i.e. daily, 1-3 times a week) decreased significantly from 28.3% to 19.7%. Nutritional education also influenced the good nutritional choices of young athletes. Of the

drinks, the most young athletes consumed daily still mineral water (42%) and fruit juices (13%), with less consumption of cola-type caffeine drinks (7%). The study showed that nutritional education have reduced the frequent consumption of EDs among young athletes.

Key words: energy drinks, athletes, nutritional education, fruit juices, beverages

Introduction

Energy drinks (EDs) are a relatively new class of beverages, which may contain more than 15 ingredients come in five categories: caffeine; a sweetener of some kind (usually sugar); one or more amino acids (usually taurine, sometimes L-carnitine); vitamins B and plant/herbal extracts such as ginko biloba, guarana, ginseng etc. [1-3]. Some energy drinks also contain controversial glucuronolactone (a glucose metabolite). Energy drinks are very popular among young people. The analysis of the consumption of energy drinks showed that approx. 68% of adolescents and approx. 18% of children in 16 EU countries consuming EDs [4]. Previous research also showed that adolescents [3] and young adults [5] are eager to consume energy drinks. Energy drinks consumption among adolescent athletes was relatively high. EDs were consumed by 69% of the young athletes, 17% of whom drank EDs quite often: every day or 1–3 times a week [6]. The popularity of EDs among young athletes may be due to advertisements of the producers of these drinks, which say that EDs give energy. However, EDs are caffeinated beverages in which the sugar content is similar to cola drinks. Nutritional education are needed among young people and young athletes to differentiate EDs from other beverages addressed to athletes, e.g. isotonic beverages. Therefore, the aim of the study was to analyze the consumption of energy drinks on a group of young athletes after nutritional education. In addition, data on consumption of fruits, vegetables, water, drinks and fruit juices were collected.

Materials and Methods

The study was conducted on a group of 247 young athletes in two randomly chosen sports schools in Bydgoszcz. In the first stage, the analysis of the consumption of energy drinks on a group of 129 people was carried out. The author's questionnaire, described and used in previous studies [3], was used to analyze the consumption of energy drinks. Next, nutritional

education were carried out, including meetings and talks with a dietitian, physiotherapist, trainers and active athletes from the central leagues. After one year, the study was repeated on a group of 118 people, including analysis of the consumption of energy drinks. In addition, data on consumption of fruit, vegetables, water, fruit juices and other beverages were collected using the FFQ (Food Frequency Questionnaire). The study was carried out in the period 2017-2018.

The results were statistically analyzed. The interpretation of the results was performed with MS Excel 2010 Analysis ToolPak software, one-way analysis of variance (ANOVA) using the Tukey's post-hoc test: different letters in the same row indicate statistical significance (at least $p \leq 0.05$).

Result and Discussion

In the first stage, the analysis of consumption of EDs was made on a group of 129 young athletes (average age 14.0, 62 men, 67 women) practised mainly volleyball, basketball and football (Table 1). Some participants practised more than one sport discipline.

Table I. Characteristics of the participants

	I etap n = 129	II etap n = 118
Age (average)	14.0	14.5
Men	62	82
Women	67	36
BMI (average)	21.1	19.0
Sport		
Yes	125	95
No	4	23
Sports discipline	n	%
volleyball	114	51.8
basketball	60	27.3
football	43	19.5
swimming	18	8.2
athletics	7	3.2

Analysis of the consumption of EDs showed that as many as 66% of young athletes consumed energy drinks, 28.3% of whom drank EDs quite often: every day or 1–3 times a week (Table 2). Most young athletes chose energy drinks based on taste (63.5%) and price (40%). Mainly Tiger (53%), RedBull (32%) and Burn (25%) were selected. Knowledge of EDs ingredients was declared by 65% of respondents. The main ingredients indicated by the participants were caffeine (89.9%), sugar (70.5%) and taurine (55.8%). 27% of participants did not feel well after consuming EDs, and 11.6% admitted to mixing EDs with alcohol. Next, nutritional education were conducted, i.e. meetings and talks with a dietitian, physiotherapist and athletes. Young athletes were given current nutritional recommendations. Students were informed about the risks associated with the consumption caffeinated beverages type of RedBull and the role of adequate hydration. The role of vegetables and fruits in the diet, juices and proper consumption of proteins, fats, carbohydrates, vitamins and minerals is underlined. The difference between energy drinks type of RedBull and isotonic drinks type of Isostar were showed. In the next year, study concerning into the consumption of energy drinks was conducted again. The study showed that the number of participants consuming EDs did not decrease. However, the number of young athletes consuming EDs quite often (ie daily, 1-3 times a week) decreased significantly from 28.3% to 19.7% (Table II, Figure 1). The number of participants choosing EDs for taste and price has not decreased.

Table II. Analysis of consumption of energy drinks

	I etap n = 129	II etap n = 118
Consumption of EDs		
Yes	85[a] (66%)	81[a] (69%)
No	44[a] (34%)	37[a] (31%)
Frequency of EDs consumption		
often	**24[a] (28.3%)**	**16[b] (19.7%)**
daily	2[a] (2.3%)	1[a] (1.2%)
2-3/week	11[a] (13%)	10[a] (12.3%)
1/week	11[a] (13%)	5[b] (6.2%)
not often (less than 1/week)	**61[a] (71.7%)**	**84[b] (80.3%)**

Different letters in the same row indicate statistical significance (at least $p \leq 0.05$).

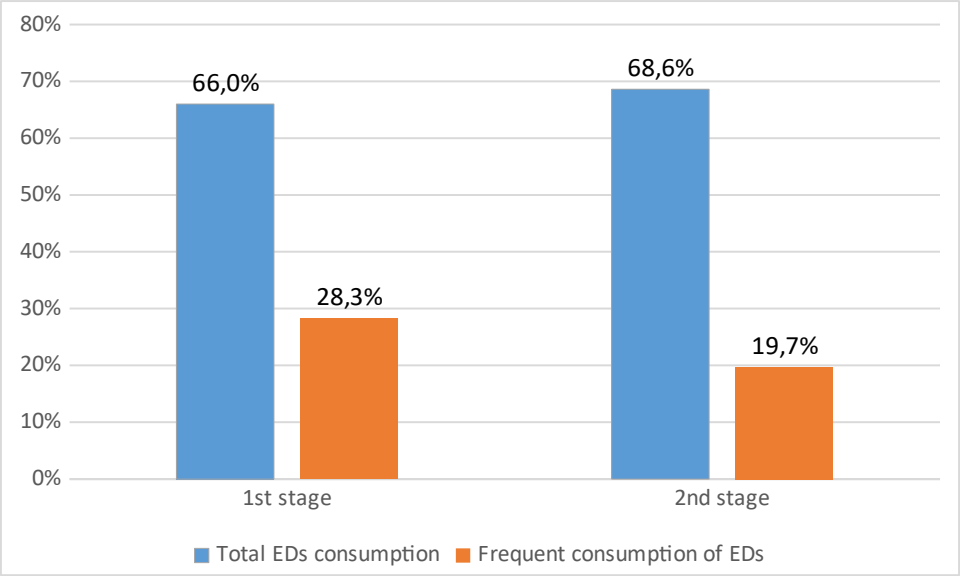

Figure 1. Consumption of energy drinks in a group of young athletes

Nutritional education could also affect the consumption of vegetables, fruits and liquids by young athletes. Of the vegetables, 21% of the participants declared daily consumption of potatoes, followed by: tomatoes (14%), cucumbers (12%), lettuce (7%), carrots and peppers (5% each). The most commonly consumed fruits daily were: apples (21%), bananas (21%), tangerines (18%) and oranges (15%). The most commonly consumed beverages daily were still water (42%), followed by coffee (14%) and fruit juice (13%) (Figure 2). Among the juices, a multifruit juice (18%), orange (17%) and apple juice (16%) were preferred daily.

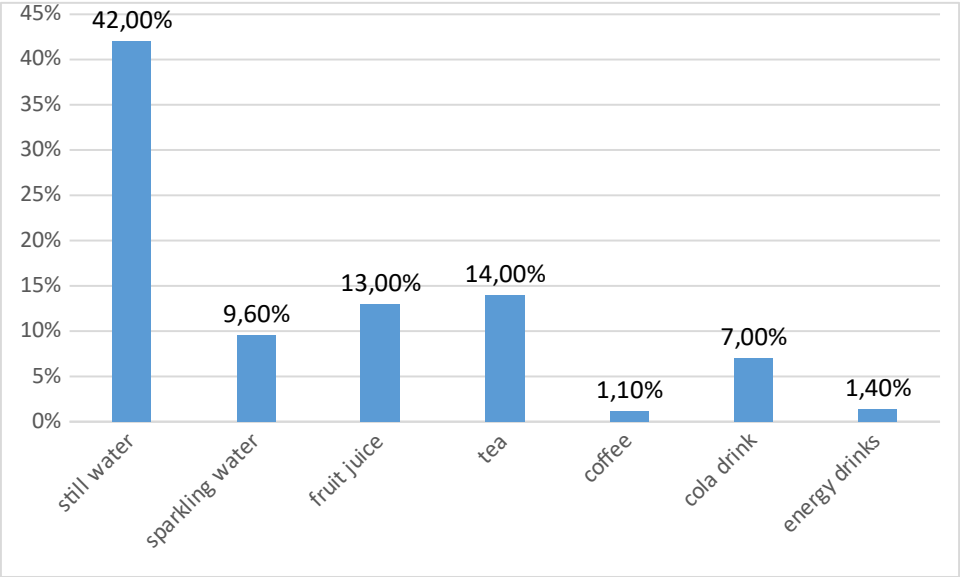

Figure 2. Consumption of water, fruit juice and various drinks in a group of young athletes

Nutritional education have reduced the frequent consumption of energy drinks. However, over 60% of young athletes consumed EDs, 20% of whom drank EDs quite often: every day, 1-3 times a week. The obtained results were similar to previous studies involving 707 students of sports schools, in which 69% consumed EDs, and 17% quite often [6]. Similar results were also obtained in EFSA studies in 16 EU countries, which showed that 68% of adolescents drink EDs [4]. Magnezi et al. demonstrated an even higher percentage of junior and senior high school students drinking EDs (84.2%) [7]. After conducting nutritional education, there was a reduction in the number of participants consuming EDs daily from 2.3% to 1.2%. These results were similar to Gallimberti et al., who reported that 1.3% adolescents (aged 11 to 13 years) in north-eastern Italy consumed EDs daily [8]. Young athletes showed knowledge of EDs ingredients, they most often indicated caffeine and sugar as the main ingredients of these drinks. Similar results obtained Magnezi et al. [7]. Nutritional education also influenced the good nutritional choices of young athletes. Of the drinks, the most young athletes consumed daily still mineral water (42%) and fruit juices (13%), with less consumption of cola-type caffeine drinks (7%). The most frequently consumed fruit was apples and bananas (21% each), potatoes (21%) and tomatoes (14%) among vegetables. A large amount of fruits and vegetables in the diet is beneficial to health. WHO recommends consuming a minimum of 400 g of fruit and vegetables per day [9]. However, the studies showed that the youth diet

does not meet these requirements. The study conducted in 38 primary schools showed that, the average daily intake of vegetables in boys was 164 g, in girls 155 g. The average consumption of fruit in boys was 194 g, in girls 185 g [10]. Also studies involving young adults [11] often indicate a lower intake of vegetables and fruits than recommendations. The study carried out on a group of approx. 400 students showed that vegetables and fruits are not consumed daily by 35.8% pupils [12].

Conclusion

The study showed that nutritional education have reduced the frequent consumption of EDs among young athletes. There is a need for a larger consumption of fruits, vegetables and juices that contain valuable nutrients and antioxidants needed in the athlete's diet. Further nutritional education are necessary because the energy drinks are still very popular among young people.

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