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NUTRITIONAL EVALUATION OF JUNIOR FOOTBALL PLAYERS DEPENDING ON THE GLOBAL LEVEL OF SELF-EFFICACY OF THE ATHLETES

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Abstract

Objective: To analyze the frequency of food product consumption depending on the level of self-efficacy of football players.

Methods: The study included a group of 303 older juniors (18.17±0,61 years of age). The frequency of food consumption was classified as: several times a day (5), once a day (4), several times a week (3), several times per month (2), or rarer (1). Self-efficacy was determined using the Global Self-Efficacy Scale (GSES). The examined group included athletes with moderate (55.44%) and high (44.55%) level of self-efficacy.

Results: Spearman's analysis of correlation revealed positive correlations between the self-efficacy and the frequency of consumption of whole wheat bread ($P < 0.01$), brown rice ($P < 0.05$), high-fat cottage cheese ($P < 0.05$), and butter ($P < 0.01$), as well as the inverse correlations with the frequency of poultry meat ($P < 0.05$), and olive and plant oil ($P < 0.01$) consumption. Athletes characterized by high self-efficacy selected whole wheat bread (2.85 vs. 2.35; $P < 0.001$), brown (1.56 vs. 1.29; $P < 0.001$) and white rice (2.40 vs. 2.18; $P < 0.05$), fruits (4.00 vs. 3.79; $P < 0.05$), low-fat milk (3.38 vs. 3.05; $P < 0.05$), low-fat (2.87 vs. 2.57; $P < 0.05$) and high-fat cottage cheese (2.60 vs. 2.07; $P < 0.0001$), butter (4.22 vs. 3.99; $P < 0.05$), and sweetened carbonated drinks (2.87 vs. 2.66; $P < 0.05$) significantly more frequently than those with a moderate level; moreover, they consumed poultry meat (2.89 vs. 2.96; $P < 0.05$), sweets and pastries (3.47 vs. 3.70; $P < 0.05$) less frequently.

Conclusions: High self-efficacy promoted more balanced nutritional choices.

Key words: *self-efficacy, GSES, nutrition, athletes, football players*

Introduction

The locus of control and the level of self-efficacy are prominent among personal predispositions essential for defining the health culture of an individual [1]. Internal locus of control is associated with one's conviction on the key importance of his/her activity, while the external locus corresponds to the significant influence of external factors and others on achieving certain goals [1]. The feeling of self-efficacy enables predicting intentions and behaviors in various areas of activity, including health behaviors [1]. Dietary behaviors represent an important area of health culture, modulating both the health potential and the prevention of degenerative disorders. In individuals with higher level of physical activity, nutritional choices are also the determinants of improved exercise abilities and optimization of the results of training [2-5]. Specific nutritional needs of athletes, associated with increased requirements of energy, protein, vitamin B complex, antioxidants and certain minerals, substantiate studying the diet of athletes and its personal determinants. The comprehensive diagnostic process of athletes may promote higher efficacy of implemented nutritional interventions [6,7].

The aim of this study was to analyze the frequency of consumption of selected food products depending on the level of self-efficacy in a group of junior football players.

Methods

The study was conducted between 2010 and 2012 in a group of 303 older juniors aged between 17 and 19 years (18.17 ± 0,61), who participated in competitive football practice in sport clubs in Małopolska region. Clubs were selected on the basis of availability, with no cases of refusal to participate in the study and there was no exclusion criteria. The footballers originated from urban (66%) or rural environments (34%). They rated their material status as good (62.7%) or average (37.3%). The Body Mass Index in the group was 21.98 ± 2.02 kg/m^2. The research included qualitative nutritional assessment performed with the use of an investigative tool in the form of a author's questionnaire regarding the consumption of 33 food products. The following categories of the frequency of consumption were defined: several times a day (5), once a day (4), several times a week (3), several times per month (2), or rarer (1). Cronbach's alpha reliability coefficient for the test was 0.77. The subject of evaluation was customary, carried out at home, eating habits of young players. Self-efficacy was determined using the Global Self-Efficacy Scale (GSES) developed by R. Schwarzer, M. Jerusalem and Z. Juczyński [8]. The

10-statement GSES is constructed in such a way that the higher the score (ranging from 10 to 40 points), the higher the level of self-efficacy. Examined athletes were classified into groups of low, moderate, or high self-efficacy on the basis of temporary Polish sten (standard ten) norms [8]. The examined group included athletes with moderate (5-6 sten; n = 168, 55.44%) and high (7-10 sten; n = 135, 44.55%) level of self-efficacy. Mean GSES score of the group of sportsmen characterized by moderate self-efficacy was 27.37 ± 1.47 (raw score) or 5.51 ± 0.55 (sten), whereas the raw and sten scores of athletes with high self-efficacy were 31.36 ± 1.78 and 7.20 ± 0.45, respectively. Statistical analysis of results was conducted with PQStat ver. 1.4.2.324 statistical package. The frequencies of consumption of particular products associated with various self-efficacy levels were compared with the Mann-Whitney U-test and the multiple Dunn test. The relationship between the self-efficacy level and the frequency of consumption of various products was estimated on the basis of Spearman's coefficients of rank correlation. Test probability was considered significant at $P < 0.05$.

Results

Statistical analysis revealed positive correlations between the raw scores of GSES and the frequency of consumption of whole wheat bread ($P < 0.01$), brown rice ($P < 0.05$), low-fat milk ($P < 0.05$), high-fat cottage cheese ($P < 0.05$), and butter ($P < 0.01$), corresponding to the consumption of these products increasing in concert with the level of self-efficacy. Moreover, inverse correlations were observed between the raw GSES scores and the frequency of whole grains ($P < 0.05$), poultry meat ($P < 0.05$), and olive and plant oil ($P < 0.01$) consumption, which corresponded to a decrease in their consumption along with decreased self-efficacy of the athletes. Employing GSES sten scale scores in analysis revealed that the correlation between the level of self-efficacy and the frequency of whole grain consumption is insignificant. The remaining analyzed coefficients of correlation proved insignificant (Table 1).

Statistical analysis confirmed that athletes characterized by high self-efficacy more frequently selected whole wheat bread ($P < 0.001$), brown rice ($P < 0.001$), and white rice ($P < 0.05$) from amongst the cereals as compared to sportsmen with a moderate level of this trait. Similarly, fruits were consumed significantly more frequently by athletes with high rather than lower self-efficacy ($P < 0.05$). Low-fat milk ($P < 0.05$), low-fat ($P < 0.05$) and high-fat cottage cheese ($P < 0.0001$) represented protein products which were significantly more frequently chosen by athletes characterized by high self-efficacy, while poultry meat ($P < 0.05$) and high-quality sausages ($P < 0.05$) were consumed significantly less frequently. In the case of fats, athletes with high self-efficacy selected butter significantly more frequently than those with moderate self-efficacy ($P < 0.05$). Additionally, the level of self-efficacy modulated the frequency of consumption of sweetened carbonated drinks and sweets/pastry: the former were significantly more frequently selected by the athletes with high self-efficacy ($P < 0.05$), while the latter were significantly more frequently chosen by sportsmen characterized by moderate self-efficacy ($P < 0.05$) (Table 2). The frequency of consuming other analyzed products was not significantly modulated by the level of self-efficacy in young football players.

Table 1. *Spearman's coefficients of rank correlation between the level of self-efficacy (expressed in GSES scale) and the frequency of food product consumption in junior football players*

Products	GSES – raw stores	GSES – sten stores
Whole wheat bread	0.2225**	0.2256**
White bread	-0.0682	-0.0503
White rice	0.0160	0.0565
Brown rice	0.1373*	0.1362*
Whole grains	-0.1238*	-0.0773
Noodles	-0.0120	0.0286
Muesli	0.0764	0.0069
Fruits	0.0740	0.0684
Vegetables	0.0039	0.0447
Low-fat milk	0.1298*	0.1218*
Fermented dairy products	0.0951	0.0628
Low-fat cottage cheese	0.1078	0.0870
High-fat cottage cheese	0.1293*	0.1708**
Cheese	-0.0145	-0.0025
Poultry	-0.1242*	-0.1363*
Pork	-0.0760	-0.0804
Beef	-0.0238	-0.0250
High-quality sausages	-0.0241	-0.0976
Fish	0.0028	0.0052
Eggs	0.0195	0.0232
Butter	0.1481**	0.1415*
Olive oil	-0.1770**	-0.1734**
Plant oils	-0.2286**	-0.2059**
Nuts	-0.0436	-0.0298
Fruit/vegetable juices	0.0292	-0.0035
Minerale water	-0.0005	-0.0355
Isotonic drinks	0.0026	0.0374
Alcoholic drinks	-0.0387	0.0098
Energy drinks	-0.0056	0.0719
Sweetened carbonated drinks	0.0406	0.0441
Fast food products	0.0956	0.0806
Sweets/pastry	-0.0701	-0.1058

*$P < 0.05$, ** $P < 0.01$

Table 2. *Frequency of selected food product consumption depending on the self-efficacy level in a group of junior football players*

Products	Group	X	SD	*P* (Mann-Whitney *U*- test)
Whole wheat bread	M	2.35	1.16	0.0007
	H	2.85	1.31	
White rice	M	2.18	0.81	0.0167
	H	2.40	0.80	
Brown rice	M	1.29	0.62	0.0004
	H	1.56	0.81	
Fruit	M	3.79	0.96	0.0231
	H	4.00	1.02	
Low-fat milk	M	3.05	1.19	0.0173
	H	3.38	1.00	
Low-fat cottage cheese	M	2.57	1.05	0.0210
	H	2.87	1.05	
High-fat cottage cheese	M	2.07	1.10	<0.0001
	H	2.60	1.09	
Poultry	M	2.96	0.78	0.0421
	H	2.89	0.82	
High-quality sausages	M	3.20	0.86	0.0357
	H	3.04	0.99	
Butter	M	3.98	1.15	0.0340
	H	4.22	1.03	
Sweetened carbonated drinks	M	2.66	0.99	0.0161
	H	2.87	0.96	
Sweets/pastry	M	3.70	0.97	0.0313
	H	3.47	1.07	

M – moderate level of self-efficacy, H – high level of self-efficacy
X – mean, SD – standard deviation

Discussion

Our study revealed variability in the frequency of consumption of some food products depending on the level of self-efficacy, pointing to generally limited frequency of balanced nutritional choices in the group of junior football players.

The comparison between the diet of the studied athletes and the qualitative dietary recommendations [5, 9,10] revealed low consumption of products recommended in balanced nutrition, including whole-grain cereals, vegetables and fruits, dairy products, fish, and nuts. These qualitative nutritional mistakes may promote imbalanced dietary proportions, potentially leading to deficiencies of certain nutrients, including dietary fiber, vitamin B complex, antioxidants, calcium, magnesium, iron, and polyunsaturated fatty acids. Dietary abnormalities observed in our group of young football players, as well as in other studies of male and female football players [11-16], may be reflected by deficits in exercise abilities and health status of athletes.

Statistical analyses confirmed variable frequency of consumption of some food products, revealing a tendency for more balanced nutritional choices in the group of athletes characterized by higher self-efficacy. The comparison of the frequency of consumption of various food products between the groups of athletes characterized by different efficacy levels (high vs. moderate) confirmed the findings based on the analysis of the coefficients of correlation; namely, higher self-efficacy was associated with more frequent consumption of certain whole-grain cereals, such as whole wheat bread ($P < 0.01$) and brown rice ($P < 0,05$), as well as milk, cottage cheese ($P < 0.05$), and butter ($P < 0.01$). Surprisingly, the results of statistical analysis confirmed also that the group of athletes with higher efficacy was characterized by significantly lower frequency of poultry meat consumption ($P < 0.05$). Moreover, the intergroup comparisons revealed significantly higher frequency of consumption of fruits and sweetened carbonated drinks, and lower consumption of sweets and pastry in the group of athletes characterized by high self-efficacy ($P < 0.05$). However, in general, the prevalence of positive nutritional choices amongst the athletes with high self-efficacy was higher than amongst

the sportsmen with moderate level of this trait. It must be noted, however, that the individuals with low self-efficacy were not represented in the studied group of football players. The abovementioned, more balanced nutritional choices of athletes characterized by higher level of self-efficacy may be explained by the characteristics of this trait, generally promoting health-oriented behaviors [1]. Accepting the idea that nutrition is an important determinant of health and sports achievements of athletes may explain the involvement of self-efficacy level in planning and implementation of a given dietary model. The results of our study, indicating that more appropriate dietary choices are associated with increasing level of self-efficacy, are consistent with the results of previous research [17-19]. The study of adolescents from Teheran revealed a positive correlation between the level of self-efficacy and the consumption of vegetables and fruits [18]. Moreover, an Australian study confirmed the influence of high self-efficacy on the increased consumption of vegetables and fruits, and limited ingestion of fast food products [19]. Other studies have also confirmed the role of self-efficacy as a strong predictor of nutritional behaviors [17,20]. Furthermore, a positive influence of the internal locus of control, a trait correlated with self-efficacy, on enhancing dietary balance has been revealed by other authors [21,22]. Nutritional abnormalities observed among young athletes, both in this and in previous studies, substantiate nutritional education, as well as the monitoring and rationalization of the nutritional model, taking into account the psychological characteristics of athletes.

Conclusions

1. Self-efficacy proved a predictor of nutritional choices amongst junior football players.
2. High self-efficacy of junior football players promoted more balanced nutritional choices, which were associated with more frequent consumption of certain products recommended for athlete-oriented nutrition, such as whole grain cereals, dairy products, and fruits, as well as a lower consumption of sweets and pastry.

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A – Study Design
B – Data Collection
C – Statistical Analysis
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F – Literature Search
G – Funds Collection