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ANALYSIS OF DIETARY SUPPLEMENTS USAGE AMONG RECREATIONAL ATHLETES IN CANTON SARAJEVO

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Abstract
The aim of this study was to investigate habits and opinions on dietary supplements intake among male fitness users with nonprofessional sport background from Sarajevo - Bosnia and Herzegovina. Overall, sample consisted of 564 participants aged 18-40. Designed questionnaire was used to gain results in 7 largest fitness facilities in Sarajevo. Descriptive cross-sectional analysis was used to analyze results of the questionnaire. Dietary supplements were used by 71,81% (n = 405), of which 46,81% (n = 264) used them on daily basis, while 25.00% (n = 141) participants consumed supplements occasionally. Whey protein (50.37%) was most common choice, followed by amino acid (17.78%) and creatine (14.07%). Muscle gain (59.75%) was the main reason for supplementation usage with 40% of subjects (n=303) enquiring basic information's about supplements trough web search. Therefore, we conclude that additional effort in educating consumers and employees working with fitness users is essential.

Key words: **proteins, recreation, exercise, dietary habits**

Introduction

Over the last few years the leading problem of society is hypokinesis (Ćirić et al. 2015). In a society, where great number of people want it all: youth, healthy body, good looks, business success, energy, happiness etc., gyms are presented as places that can give you all of that. Gyms can be found in almost every corner, which enables everyone to do sports and to spend their time in a quality manner.
To get into shape, gym users often use dietary supplements. Industry of dietary supplements is one of the fastest growing industries in the world. Dietary supplements are defined as products which supplement normal diet and are sources of vitamins, minerals and other substances with nutrient of physiological effect (Wiens et al., 2014; Aljaloud & Salam, 2013; Šoški et al.,2016; Nabuco et al., 2017). Studies have shown that dietary supplements are most commonly used by top-level athletes in range of 48% to 99% (Petróczi et al., 2008; Baylis et al., 2001; Wiens et al., 2014;Diehl et al., 2012). However, recreational athletes reported regular use of these products in range of 36% to 85% (Goston, J. L., & Correia, M. I. T. D., 2010; Nabuco et al., 2017; Attlee et al., 2017; Salami et al., 2017). Prevalence of dietary supplements consumption is higher among male population than female (Tian, et al., 2009).
Most common reasons for using supplements in fitness consumers are muscle gain, strength, and physical performance (El Khoury, D., & Antoine-Jonville, S., 2012, Bianco, et al., 2014). These results indicate that recreational athletes, as well as top level athletes, consider that usual diet cannot provide desired improvement (Bishop, 2010), which is closely related to quality information which most recreational athletes get from their fitness coaches (Burns, et al., 2004). Since it has great effect on health, education around dietary supplement usage is very important issue. A small number of studies conducted in terms of habits, knowledge and usage of dietary supplements in recreational athletes and fitness consumers in Bosnia and Herzegovina was reported. Therefore, the aim of this study was to conduct a research on habits, trend of use of and attitudes towards dietary supplements among male recreational athletes (fitness consumers) in Canton Sarajevo.

Materials and methods

This cross-sectional study was carried out in 7 largest gyms in the Canton Sarajevo, the biggest city in Bosnia and Herzegovina, from December 2015 to February 2016.

Selection of participants

Inclusion criteria: male fitness consumers aged 18 to 40, who visit the gym regardless of their socio-economic status. All subjects signed formal consent after they have

been informed about the purpose and the aim of the research. The sample of subjects (n=564) is calculated in the following equation (Goston, J. L., & Correia, M. I. T. D., 2010):

$$n = \frac{p \cdot (1-p) \cdot z^2}{e^2}$$

where ***p*** estimated the proportion of individuals who use supplements (35%), ***z*** the normal distribution (defined as 1.96 for research with 95% confidence), and ***e*** the margin of error (4%) (El Khoury, D., & Antoine-Jonville, S., 2012).

Questionnaire

A specifically designed questionnaire was used to collect data for the research. The administered questionnaire consisted of 7 items. The first group of questions includes gender and sport related feature, frequency of work-out during the week. Second part of the questionnaire included questions related to usage of supplements. In this part, subjects answered the questions whether they use the supplements and if, yes, which one do they use, the reasons for using them, their priorities and the sources of information on supplements.

Statistical analysis

Statistical data analyses were performed using SPSS 21.0 for Windows (SPSS Inc., Chicago, USA). Descriptive statistics which includes terms of frequencies and percentages were used.

Results

This study was focused on the usage of dietary supplements among men (n = 564) recreational athletes in Sarajevo, Bosnia and Herzegovina. As shown in *Table 1*, great number of subjects (53.19%) work-out 5 or more times a week. Almost 40% of subjects (303/564) got basic information about supplements through Internet, 21.81% of them got information from their fitness coach, 12.23% of them got information from shops, which sell supplements and 10.11% of them got information from their friends. Dietary supplements were used by 71,81% (n = 405), of which 46,81% (n = 264) uses them every day while 25.00% (n = 141) of them sometimes use supplements as shown in *Figure 1*.

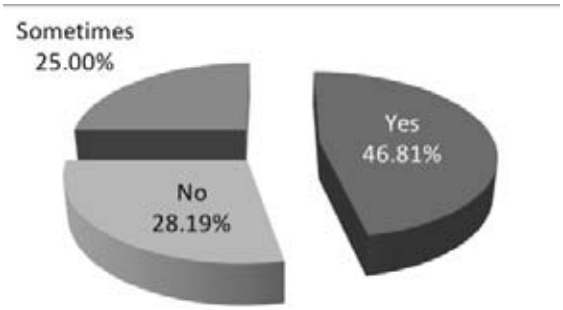

Figure 1. Intake of nutritional supplements

Three most common used supplements by subjects (n = 405) are Whey protein (50.37%), amino acid (17.78%) and Creatin (14.07%). The most common reason for usage of supplements is improvement of muscle gain (59.75%). Other two reasons were: improvement of the immune system (28.64%) and reduction of body fat (11.60%). The fact that priorities, when buying supplements, are not determined by price (17.53%), but the proportion of price and quality (43.21%) and the quality itself (39.26%) is commendable.

Discussion

The aim of this research was to understand prevalence of usage and attitudes of dietary supplements intake among male recreational athletes (fitness consumers) in Sarajevo, Bosnia and Herzegovina. Our study presents one of the first studies which points to distribution and usage of supplements in recreational athletes, in Sarajevo gyms, Bosnia and Herzegovina.

Gyms are one of the key markets for distribution of supplements (Attlee et al., 2017) where 71,81% of subjects use supplements, as confirmed in this research. These results are almost equal to the ones achieved in USA 84.7% (Morrison, Gizis, & Shorter, 2004), Montenegro 81% (Šoški et al. 2016). However, results are significantly higher in relation to the studies conducted in Brazil 51.5% (Rossi & Tirapegui, 2016), Lebanon 36.3% (Khoury & Antoine-Jonville, 2012), Spain 56.14% (Oliver et al. 2008). These variances in results can be attributed to the types of gyms in which these studies are conducted, different ways of data collection and lack of education on supplements. (Attlee et al., 2017; Khoury & Antoine-Jonville, 2012).

This study showed that the main reason for using dietary supplements is the increase of body mass (59.75%) which was expected since the most recreational athletes are male (Attlee et al., 2017). Great percentage of recreational athletes, who use dietary supplements, can be attributed to the lack of education on supplements and their potential negative effects on health. Due to previous studies (Diehl et al., 2012; Giannopoulou et al., 2013) we found that Internet (39.89%) and fitness coaches are the primary source of information for recreational athletes. These results are troublesome, because the quality of information comes from "questionable" sources. Keat, Saad, & Phing, 2017 claim that most fitness coaches have very little knowledge about specialized sport nutrition and their advice should be taken with great care. Salmi et al. 2017 showed that even 63% of supplement users said that they had at least one of the seven side effects.

This desire for being „bigger "and „more muscular "neglects the fact that illnesses such as heart diseases and diabetes type 2, are related to the increase of body mass. Similar to previous studies, our study showed that supplements that are most commonly used are Whey protein 50.37% and Whey aminos 17.78%. (Attlee et al., 2017; Morrison et al., 2004; Goston, J. L., & Correia, M. I. T. D., 2010). Although Whey proteins and amino acids are

Table 1. Usage of and beliefs of dietary supplements among recreational athletes (n=564)

Response	**n**	**%**
Gender		100
Men	564	100
Women	/	/
How much do you work-out during the week?		***100***
Not at all	57	10,11
1 do 3 trainings	63	11,17
3 do 5 trainings	147	26,06
5 and more trainings	300	52,66
From whom do you get your information about supplements?		***100***
Internet	225	39,89
Fitness coach	123	21,81
Protein shop	69	12,23
Friend	57	10,11
Magazine	72	12,77
Club	18	3.19
Do you use supplement?		***100***
Yes	264	46,81
No	159	28,19
Sometimes	141	25,00
Which supplements do you usually use?		***100***
Whey protein	204	50.37
Whey aminos	72	17.78
Creatin	57	14.07
Glutamic acid	33	8.15
Fish oil	15	3.70
Pre-workout	12	2.96
Testosterone boosters	12	2.96
Reasons for using supplements?		***100***
Increase of body mass	242	59.75
Improvement of immune system	116	28.64
Reduce of body fat	47	11.60
Where do you buy supplements?	***405***	***100***
Supplement Shop	303	74.81
Sport club	49	12.10
Internet	25	6.17
Dealers/forums	15	3.70
Coach	13	3.21
What are your priorities when buying supplements?	***405***	***100***
Proportion of price and quality	175	43.21
Quality	159	39.26
Price	71	17.53

included in many metabolic processes and therefore are relevant for synthesis of several body structures, their consumption without a well-planned and organized training does not necessarily lead to the increase of body mass and strength. Many authors consider that top-level athletes need extra proteins used in their regular diet or as a supplementation (Maughan, King & Lea, 2004; Fox et al., 2011; Williams M., 2005), while recreational athletes and periodical gym users do not need additional supplements in their diet. (Duran et al., 2013; Campbell et al., 2007).
Recreational gym users are under a lot of influence of Internet and social media. Therefore they get the wrong image in the process of creating a „perfect body". One of the biggest problems is the quality of supplements, which includes lower quality that comes with the lower price. The fact that amateur athletes, included in this research, do not consider price more important than quality, although economic factor can significantly influence the choice of supplements, is commendable.

Conclusion

The new trend of health improvement is included by a great number of people in recreational work-out and sports. Great number of people who visit gyms, use dietary supplements and without adequate knowledge or real need for them. Results obtained in this study point to the fact that 71.81% of subjects use dietary supplements, and basic information are received mostly from the Internet (39.89%). Therefore, it is necessary to invest additional efforts to educate not only healthcare workers but all people that work with recreational athletes in fitness centers and gyms, in order to establish a safe and rational use of supplements.

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