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Research report

Nutritional supplement use among fitness club participants in Tehran, Iran ☆

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ABSTRACT

The aim of this study was to assess nutritional supplement use among fitness club participants in Tehran, Iran. A cross sectional study was conducted in 24 fitness clubs throughout the city of Tehran, Iran. A total of 1625 fitness club participants were recruited to participate in this study. They were asked to complete a self-administered pre-tested questionnaire. Descriptive statistics and chi-square test were performed to determine the characteristics of participants, reasons for supplement use, sources of information and also the influential advisors regarding nutritional supplement use. A high prevalence rate of nutritional supplement use (66.7%) was reported. Overall, multivitamin–mineral (43.8%) and iron tablets (30.5%) were the common nutritional supplements used and only a small number of participants used illegal substances (0.5%). Younger participants were more likely to use ergogenic aids, whereas, older participants were more likely to use vitamin D. Males were more likely than females to use creatine and amino acids, whereas, iron tablets and mint water were more common among females. Also, males were more likely to use nutritional supplements for increasing energy, whereas, females were more likely to use nutritional supplements for nutritional deficiencies. In conclusion, a high prevalence rate of nutritional supplement use was seen among participants.

Introduction

There is no clear definition for supplements (Maughan, Depiesse, Geyer, & International Association of Athletics Federations, 2007) and different definitions are available. According to the Dietary Supplement Health and Education Act of 1994 (Dietary Supplement Health, 1994), a dietary supplement is "a product (other than tobacco) taken by mouth, is intended to supplement the diet and bears or contains one or more of the dietary ingredients such as a vitamin, a mineral, an herb or other botanicals, an amino acid, or a dietary substance for use by man to supplement the diet by increasing the total daily intake". Van Thuyne, Van Eenoo, and Delbeke (2006) reported that dietary supplements (minerals, vitamins, trace elements & other components) could be one or more nutrients in a concentrated form, which are available in a normal and balanced diet. The global market for supplements has increased during the recent years (Crowley & FitzGerald, 2006; Maughan, King, & Lea, 2004) and a high prevalence of supplement use was seen not only in the United States and Europe (Skeie et al., 2009; Timbo, Ross, McCarthy, & Lin, 2006), but also in Asian countries (Kim et al., 2010; Tee, 2002; Tian, Ong, & Tan, 2009). It has been reported that the highest rate of nutritional supplement (NS) use is among athletes (Braun et al., 2009; Dascombe, Karunaratna, Cartoon, Fergie, & Goodman, 2010; Erdman, Fung, & Reimer, 2006; Huang, Johnson, & Pipe, 2006; Maughan et al., 2004). This tendency for NS use was also seen among people who are exercising in gyms (Goston & Correia, 2010; Morrison, Gizis, & Shorter, 2004).

Different prevalence rates of NS use have been reported by physically active people ranging from 13.8% to as high as 88.4% (Ebrahimi, 2009; Erdman, Fung, Doyle-Baker, Verhoef, & Reimer, 2007). Ebrahimi (2009) found that 13.8% of athletes in sport clubs of Qom, Iran used performance enhancing drugs (PEDs), including vitamins, steroid hormones and amino acids. Around 36.8% of Brazilian gym participants used nutritional supplements, of which products rich in protein, isotonic drinks, carbohydrates, phytotherapeutics and multivitamin–minerals were the most commonly used supplements (Goston & Correia, 2010). Males usually used nutritional supplements which had plentiful amounts of protein, carbohydrate and amino acids, whereas, females mostly used

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natural and phytotherapeutic supplements, multivitamin–minerals and meal replacement products (Goston & Correia, 2010).

Froiland, Koszewski, Hingst, and Kopecky (2004) reported that 61.0% of varsity athletes in Lincoln, USA, used nutritional supplements. Energy drinks (73.0%), calorie replacement products (61.4%), multivitamins (47.3%), creatine (37.2%) and vitamin C (32.4%) were the common nutritional supplements among these athletes. Considering athletes' sex, male athletes were more likely to use ginseng, dehydroepiandrosterone (DHEA), energy drinks, amino acids, weight gainers and hydroxy-methyl-butyrate (HMB), whereas, female athletes were more likely to use multivitamins and calcium. Among gym participants18 years and above in Long Island, New York, Morrison et al. (2004) found that a majority (84.7%) used NS. The most commonly used NS were multivitamin–minerals (45.0%), protein shakes or bars (42.3%) and vitamin C (34.7%). Another study among Australian athletes reported that 87.5% of them used NS, of which minerals, vitamins and iron tablets were the most prevalent supplements (Dascombe et al., 2010). Similarly, about 88.4% of high-performance Canadian athletes with a mean age of 19.96 ± 3.91 years used NS (Erdman et al., 2007). Sport drinks (22.4%), followed by sport bars (14.0%), multivitamin–minerals (13.5%) and proteins (9.0%) were the most prevalently used NS. The large variation in the prevalence of NS use might be due to the differences in the definition of nutritional supplements.

Despite the increased rate of NS use, there is no comprehensive information regarding NS use among fitness club participants in Tehran, Iran. Therefore, this study was conducted to assess the prevalence of nutritional supplement use among fitness club participants in Tehran, Iran and to determine their opinions regarding nutritional supplement use.

Methods

Participants and methods

This was a cross sectional study, to determine the prevalence of NS use among fitness club participants in Tehran, Iran. Further, participants were asked to report types of supplement, reasons for using NS, sources of information, main advisors, places for purchasing NS and opinions regarding NS use. This study was approved by the Medical Research Ethics Committee, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. From 151 eligible fitness clubs (having regular fitness programs for both males and females) throughout Tehran, only 24 agreed to participate in the current study. Notices inviting fitness club participants to register to participate in this study were placed at strategic locations throughout the fitness clubs. Of 1926 fitness club members who registered, 1625 were eligible to participate in the study. Informed consent was also obtained from the participants.

Questionnaire design

Participants were asked to complete a pretested self-administered questionnaire, which consisted of questions on socio-demographic factors (age, sex, educational level and smoking status), use of NS and illegal substances (ISs) during the past six months, reasons for using NS, sources of NS information, influential advisors, common places for purchasing NS, opinions on the level of importance for receiving NS information and also their opinions about the effectiveness of using and stopping NS on exercise performance. The participants were provided with a definition of NS which included different types of vitamins and minerals, ergogenic aids (e.g. protein powders, amino acids, energy drinks, co-Q10 and carbohydrate powders) and herbal supplements (e.g. mint water, borage and green tea). Additionally, they were asked to report the use of any type of illegal substances (e.g. anabolic androgenic steroids, growth hormone, dianabol, etc.). Pre-testing of the questionnaire was carried out 3 weeks before the scheduled data collection and conducted in two fitness clubs, to ensure that participants understood all the questions in the questionnaire.

Data analysis

Data were analyzed using SPSS for Windows, Version 18.0. Descriptive statistics were used to summarize and explain the characteristics of the variables. In addition, chi-square test with a $p < 0.05$, was conducted to assess the association between selected factors.

Results

Characteristics of participants

Out of the 1625 participants, more than half of them were females. The sample tended to be young with a mean age of 28.70 ± 8.53 years (range 18–66 y). Most of the participants (53.4%) had a university degree (bachelor, master or Ph.D). Male participants were significantly younger than female participants ($\chi^2 = 106.784$, df = 1, $p < 0.001$). No significant difference in educational level was found between male and female participants ($\chi^2 = 1.007$, df = 2, $p = 0.604$). Furthermore, 29.7% of male and female participants ($\chi^2 = 96.692$, df = 1, $p < 0.001$) were current smokers (Table 1).

Use of supplements

A majority of the participants (66.7%) used NS. Only 0.5% of the participants mentioned the use of illegal substances. Overall, 11.2% of participants used a combination of NS and illegal substances (ISs). The use of this combination was more common among male participants and only one female participant reported its use. None of the female participants used illegal substances alone, whereas it was seen among male participants (Fig. 1).

Multivitamin–minerals were the most common NS used among participants. However, iron tablets, vitamin E, creatine and calcium were also commonly used. Some participants also declared the use of herbal supplements. Only a small number of participants used

Table 1
Characteristics of Fitness club participants.

Characteristics	Male		Female		Total		*p* Value
	n	%	*n*	%	*n*	%	
Age (y)							
<30	567	78.8	490	54.1	1057	65	<0.001*
⩾30	153	21.2	415	45.9	568	35.0	
Sex							
Male	–	–	–	–	720	44.3	
Female	–	–	–	–	905	55.7	
Education							
Primary school	12	1.7	14	1.5	26	1.6	0.776
Secondary school	30	4.2	35	3.9	65	4	
High school	3	0.4	2	0.2	5	0.3	
Diploma	284	39.4	378	41.8	62	40.7	
Bachelor	350	48.6	415	45.9	65	47.1	
Master/Ph.D	41	5.7	61	6.7	102	6.3	
Smoking status							
Current smokers	304	42.2	179	19.8	483	29.7	<0.001*
Non-smokers	416	57.8	726	80.2	1142	70.3	

* $p < 0.05$.