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PREVALENCE AND CHARACTERISTICS OF DIETARY SUPPLEMENT USERS IN KHORRAMABAD CITY, SOUTHWEST OF IRAN: A DESCRIPTIVE CROSS-SECTIONAL STUDY

Khatereh Anbari[1], Koroush Ghanadi[2], Sam Bemani[3], Zia Obeidavi[4,*]

[1]*Social Determinant of Health Research Center, Lorestan University of Medical Sciences, Khorramabad, IRAN*

[2]*Department of Internal Medicine, Lorestan University of Medical Sciences, Khorramabad, IRAN*

[3]*Lorestan University of Medical Sciences, Khorramabad, IRAN*

[4]*Student Research Committee, Lorestan University of Medical Sciences, Khorramabad, IRAN*

ABSTRACT

In recent years, using a variety of dietary supplements in the daily diet has increased rapidly around the world. The aim of this study was to determine the frequency of dietary supplements consumption and tendency causes and related factors with its usage in adults referred to health care centers of Khorramabad city in 2015. In this cross-sectional study, the study population included all adults (over 18 years) referring to health service centers in Khorramabad in a 6 month period. The method of sampling was multistage sampling and the data collection instrument was a multi-sectional questionnaire. In this study, 171 people (48.9 percent) of subjects had a history of regular usage at least one of dietary supplements that this usage was once a day in 138 people (80.7 percent) and two or three times a day in 28 people (16.4 percent). In examining distribution frequency of different supplements usage in consumers of dietary supplements, it is also observed that the most frequency of dietary supplements usage is related to iron (70.5%) and Folic Acid (70.5%), then, calcium (30.1%), multivitamin (25.4%), calcium- vitamin D (17.3 %), vitamin B complex (16.8%), vitamin D (15%), vitamin B6 (15%), vitamin C (9.5 %) and vitamin A (9.2 %), respectively. On the other hand, the least frequency of dietary supplements usage was related to Chrome, Magnesium, and Potassium (each 2.3%). Differences in taking dietary supplements based on sex, educational level, marital status, occupation, place of residence, body mass index, smoking history, current physiological conditions, and chronic diseases were statistically significant (P<0.05). According to the fact that tendency to take dietary supplements was more in lower ages, therefore it is necessary to provide training and nutritional strategies appropriate for different age groups about the proper use of nutritional supplements.

KEY WORDS
Dietary supplements, Health care centers, Adults, Khorramabad

INTRODUCTION

Today, tendency to use supplements such as multi-vitamins and minerals is increasing in different communities [1-5]; so that in 2001, the prevalence of dietary supplements usage is reported 5.56% in general population of America [6], in 2007, it was reported 26% in Sweden population, and in 2008, it was reported 49% in Italy general population [7, 8]. Since enactment of Dietary Supplement Health and Education Act of 1994 (DSHEA) in 1994, it was reported that there are about six hundred plants of dietary complement manufacturers that they nearly produce four thousands types of this product. Annual sales of these products is estimated 4 billion USD [9]; in 1998, this amounts to 13.9 billion USD and, in 2006 it was 21.3 billion USD [10].

In fact, using dietary supplements have been always demanded as correct or incorrect beliefs for strengthening body security system, relieving fatigue and reducing stress or boredom as arbitrarily and/or to describe or prescribe by feeding counselors and doctors. Results of a study about causes of using dietary supplements have shown that 48% of consumers believed that using these products is an easy way to stay healthy and preventing disease [11]. On the other hand, medical and feeding knowledge determines using dietary supplements for people in special age and in terms of need, on the same basis, using iron supplements is recommended for women of fertile age and pregnant women and nursing mothers in our care country program, they are freely available for these vulnerable groups. Also, using calcium and vitamin D is recommended for preventing and reducing the risk of brittle bone in adults, middle-aged, and in some other cases in terms of the conditions. Results of previous studies have shown that taking supplements is effective for preventing some diseases, for example, prescribing folic acid during pregnancy is effective for reducing the risk of creating neural tube deficiency in embryo [12].

The results of other studies have shown that in healthy individuals, using small amounts of some minerals, including Selenium may reduce the incidence of cardiovascular and some cancers [13, 14]. Dietary complements can be used based on need as an aid in meeting food needs along with unbalanced diet. In fact, access to a daily balanced diet may not be available all days of the week or months and in the long-term effects of some nutrition shortage will be obvious, but what is important is arbitrary usage of these supplements that sometimes they are along with special effects and drug interactions [15]. Certain groups of society, such as athletes or people who have weight loss diet, may use arbitrarily dietary complements. In a study in Southern African, the cause of arbitrary use of dietary supplements is mentioned to maintain physical health and preventing the occurrence of diseases [16].

As it is clear, there are some motives for explosive growth of dietary supplements; therefore, many studies are conducted across the world about dietary supplements and causes of tendency and related factors of

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***Corresponding Author**
Email:
ziaobd@gmail.com

its usage; among studies in these areas, Najmabadi et al., study can be referred. These researchers in their study entitled nutritional supplement use among adults in different areas of west Tehran showed that 42% of population used one of dietary supplements, which this amount was 11.3% in men and 88.7% in women. Also, taking different types of multi-vitamins, multi-vitamin combined with minerals reported 38% cases, taking calcium supplements and vitamin D in 30.1%, iron supplements in 27.1% and omega supplements in 4.9% cases. In this study, age group under 30 and age group 31-41 were the highest users of dietary supplements and recommendation to take dietary supplements in 75.5% cases were done by doctor or dietary consultants [17]. Radimer et al., study in America is among other studies that are done in this context, it was done on national health and feeding data in America during 1999 through 2000, its results was that 52% of participants had a record of receiving one type of supplement during the past month, 35% of them had a record of taking multi-vitamin. In this study, female gender, older age, education higher than diploma, non-Hispanic white race, average physical activity, non-smoking and well-being feeling by taking supplements were the most important prediction factors of taking dietary supplements, and most people used supplements daily at least for 2 years [18]. Another study that is referable in this context is the study of Hui-Jing Shi et al., in 2005 that showed residence in the city, female sex and high education level has significant relevance with more taking dietary supplements in Japan. Also, reducing stress and improving fatigue and maintaining body health are among reasons to take dietary supplements. In this study, multi-vitamins (49.5%), vitamin Bcomplex (27.1%), vitamin C (26.7%) and minerals (29%) were the highest amount for consumption, low percentage of people mentioned about taking Magnesium, Zinc and Selenium. Also, in this study, results showed that people who faced 2 mental stressors or more during the day and faced lack of social protection mentioned taking dietary supplements 2 times more than other people [12].

According to what has been referred so far, in the present study, it was tried to determine the frequency of dietary supplements consumption and tendency causes and related factors with its usage in adults referred to health care centers of Khorramabad city in 2015.

MATERIALS AND METHODS

In this cross-sectional, descriptive study, under study population included all adults (up to 18 years) referred to health centers in Khorramabad city from middle of June through the middle of December in 2015, they referred for receiving service and health care in this period of time. Criteria for entry into the study were an age older than 18 years and giving consent to participate in the study.

The sample size was determined 348 people based on previous studies [6] with approximate estimate of 41% taking dietary supplements in patients referred to health centers and with 5% typel error and the accuracy of 0.04 and considering Design Effect about 1.2.

$$n = \frac{z\left(1-\frac{\alpha}{2}\right)^2 p(1-p)}{d^2} \simeq 350$$
$$z\left(1-\frac{\alpha}{2}\right) = 1.96 p = 14\% 1-p = 86\%$$

The sampling method was multi stage sampling. In such a way that at first, Khorramabad city was divided into 5 categories of North, South, East, West and Central; then each point of every health care center was considered as a cluster and one cluster was randomly selected among clusters and then in next stage based on times of referrals of each center, samples were determined proportional to referred population. Then under study samples were determined based on available referrals to different units of health care centers and each day one of units including vaccination unit, family health unit, environment and occupational health unit, laboratory, consulting, etc. were investigated.

In this study, a multi-part questionnaire was a tool for collecting information; first part includes participants' demographic data such as age, sex, marital status, education, occupation, place of residence, etc. Also, in this part, there are questions regarding history of smoking, aerobicphysical activity during last seven days, history of using food diets for reducing and increasing the weight and history of being affected (such as hypertension, blood fat, the diabetes, brittle bone, joint disease, heart disease, depression, etc.), as well as the current physiological conditions of an individual (including pregnancy, nursing mother, professional sports). In the second part of the questionnaire, some questions about taking dietary supplements are raised that at first three general questions about taking any of dietary supplements during life, during last year and during last month were asked and then consuming any of dietary supplements were asked in separated times.

In third part of the questionnaire, willingness causes to take dietary supplements are listed along with reviewing articles and scientific resources and counseling with feeding experts and participants were asked to determine importance degree of any willingness reason to use dietary supplements. Importance degree of each cause is considered as Likert scale of 5 items from very much to not at all. Score 1 is assigned to at all option and score 5 assigned to very much option.

Before completing questionnaire, questioner gave total descriptions to participants about different types of supplements and their trade and medicine names. To collect the information, questioners were trained during several meetings in the field of established questionnaire properties, details of dietary supplements

classification, method of collecting dedicated information, and how to do the job. It should be noted that feeding specialists and a pharmacist doctor were counseled for information about different types of supplements in the market and a list of dietary supplements with their trade names were prepared. At the end, after collecting data and entering them into SPSS, ratios, central indices and data dispersion were calculated. Also chi square, Man-Whitney U test and independent t tests were used to analyze data, results were reported in a 0.05 significance level.

RESULTS

In this study, 350 people were examined, 258 people (73.7%) were women and 92 people (26.3%) were men. The mean age of these participants in the study was 33.5 ± 10.5, the youngest participant was 18 years old and the oldest one was 73 years old. In this study, 69 people (19.7%) of patients were between 15 through 24 years, 154 people (44%) between 25 through 34 years, 86 people (24.6 percent) between 35 to 44 years, 16 people (4.6%) between 45 through 54 years and 25 people (7.1%) were more than 55 years. Most of subjects (74%) were married and most participants` level of education in the study (41.7 percent) was a degree of high school and diploma. In this study, 99 people (28.3%) had a university degree. Also, most of the people in the study were housekeeper (53.7 percent) and citizen (78 percent). In this study, 171 people (48.9 percent) of subjects had a history of regular usage at least one of dietary supplements that this usage was once a day in 138 people (80.7 percent) and two or three times a day in 28 people (16.4 percent). Table 1 presents frequency distribution of taking dietary supplements in terms of demographics of subjects.

In this study, the history of taking dietary supplements in smoking people was 22.8 percent, and it was 53.9 % in non-smoking people that this difference was statistically significant based on chi square test ($p < 0.01$). Also, history of taking dietary supplements in people with chronic diseases (hypertension, diabetes, osteoporosis, rheumatologic diseases, heart disease, depression and etc.) was 69.9% and in healthy individuals was 42.8% that this difference was also statistically significant ($P < 0.01$). Table 2 shows frequency distribution of taking dietary supplements in subjects by history of smoking, history of affected by chronic diseases, drug history and the history of regular physical activity (three times a week, at least 30 minutes). In addition, in this research, the most usage of dietary supplements was seen in nursing mothers and the least was related to pregnant women that these findings are statistically significant ($P = 0.029$). In men, the most usages was reported in sportsmen, especially professional ones that this difference was also significant ($P < 0.01$).

Table 1: Frequency distribution of taking dietary supplements in terms of demographics of subjects

Type of variable		History of taking dietary supplements N (%)	Yes N (%)	No N (%)	Total N (%)	P-Value
Age	15-24	69 (19.7)	41 (59.4)	28 (40.6)	69 (100)	0.093
	25-34	154 (44)	78 (50.6)	76 (49.4)	154 (100)	
	35-44	86 (24.6)	32 (37.2)	54 (62.8)	86 (100)	
	45-54	16 (4.6)	8 (50)	8 (50)	16 (100)	
	≥55	25 (7.1)	12 (48)	13 (52)	25 (100)	
Sex	Male	92 (26.3)	8 (8.7)	84 (91.3)	92 (100)	<0.001
	Female	258 (73.7)	163 (63.2)	95 (36.8)	258 (100)	
Marital status	Married	259 (74)	139 (53.7)	120 (46.3)	259 (100)	0.006
	Unmarried	76 (21.7)	26 (34.2)	50 (65.8)	76 (100)	
	Other	15 (4.3)	6 (40)	9 (60)	15 (100)	
Education	Junior high school or less	105 (30)	44 (41.9)	61 (51.8)	105 (100)	0.006
	High school or high school diploma	146 (41.7)	71 (48.6)	75 (51.4)	146 (100)	
	University	99 (28.3)	56 (56.6)	43 (43.4)	99 (100)	
Occupation	Unemployed	42 (12)	9 (21.4)	33 (78.6)	42 (100)	0.001
	Housewife	188 (53.7)	122 (64.9)	66 (35.1)	188 (100)	
	Self-employed	32 (9.1)	13 (40.6)	19 (59.4)	32 (100)	
	Office employee	29 (8.3)	13 (44.8)	16 (55.2)	29 (100)	
	Laborer	8 (2.3)	3 (37.5)	5 (62.5)	8 (100)	
	Farmer or Stock breeder	11 (3.1)	1 (8.7)	10 (90.9)	11 (100)	
	Student	32 (9.1)	9 (28.1)	23 (71.9)	32 (100)	
	Other	8 (2.3)	1 (12.5)	7 (87.5)	8 (100)	
Place of residence	Urban areas	273 (78)	140 (51.3)	133 (48.7)	273 (100)	0.015
	Rural areas	69 (19.7)	28 (40.6)	41 (59.4)	69 (100)	
	Other	8 (2.3)	3 (37.5)	5 (62.5)	8 (100)	

Table 2: Frequency distribution of taking dietary supplements in subjects by history of smoking, history of chronic diseases, drug history and the history of regular physical activity

Type of variable		History of taking dietary supplements N (%)	Yes N (%)	No N (%)	Total N (%)	P-Value
History of smoking	Yes	57 (16.3)	13 (22.8)	44 (77.2)	57 (100)	<0.001
	No	293 (83.7)	158 (53.9)	135 (46.1)	293 (100)	

History of chronic disease	Yes	79 (22.6)	55 (69.6)	24 (30.4)	79 (100)	<0.001
	No	271 (77.4)	116 (42.8)	155 (57.2)	271 (100)	
History of regular physical activity	Yes	141 (40.3)	60 (42.6)	81 (57.4)	141 (100)	0.053
	No	209 (59.7)	111 (53.1)	98 (46.9)	209 (100)	
History of drug therapy for chronic diseases	Yes	70 (20)	50 (71.4)	20 (28.6)	70 (100)	<0.001
	No	280 (80)	121 (43.2)	159 (56.8)	280 (100)	

Reviewing distribution frequency of taking supplements in terms of body mass also indicates that the most usage of dietary supplements was regularly in people with a body mass index under 18 and the least usage was in people with a body mass index of 25 to 29.9; again this difference was statistically significant (P<0.05).

In examining distribution frequency of different supplements usage in consumers of dietary supplements, it is also observed that the most frequency of dietary supplements usage is related to iron (70.5%) and Folic Acid (70.5%), then, calcium (30.1%), multivitamin (25.4%), calcium- vitamin D (17.3%), vitamin B complex (16.8%), vitamin D (15%), vitamin B6 (15%), vitamin C (9.5%) and vitamin A (9.2%), respectively. On the other hand, the least frequency of dietary supplements usage was related to Chrome, Magnesium, and Potassium (each 2.3%).

In evaluating causes of tendency to dietary supplements usage in subjects (based on score), it is also observed that prevention diseases and health enhancement (1.77 ± 3.13), feeling of lack of salts used in daily food (1.47 ± 2.26), using in order to strengthen body security system (1.37 ±1.97) and using in order to add weight (1.24 ± 1.71) were considered as the most important factors of tendency to use them, on the other hand, taking supplements with aim of weight loss (0.47± 1.19) and using in order to increase sexual powers (0.53 ± 1.35) were considered as the most insignificant factors of tendency to use dietary supplements.

In examining the references frequency for recommending the usage of dietary supplements in under study people, it was also observed that specialists (38.7%), general practitioners (23.7%) and feeding experts (16.8%) were considered as the main recommending reference and the insignificant recommending reference was also recommendation by friends (2.3%), media (2.3%) and the Internet (2.9%).

DISCUSSION

This study was conducted in adult population referred to health care centers of different areas in Khorramabad city and the findings of the study showed that 48.9 percent of under study population use one of synthetic dietary supplements in a regular basis and especially during last year; this finding is consistent with a little difference with study conducted by Najmabadi et al., in western region of Tehran city on adult population referred to health care centers; so that Najmabadi et al., found that 42% of population used regularly at least one dietary supplement during last year [17]. While, in a study of Babanejad et al., in south of Tehran city, 26.3 percent of participants used dietary supplements that this difference is likely related to economic social situation of under study units in south part of Tehran city. In addition, consistency of this study findings with study conducted in west of Tehran can be attributed to similarity purchasing power of the populations examined, this confirms role of economic social factors [19] in dietary supplements usage.

In this study, the most frequency of different supplements consumption was related to iron and Folic Acid, calcium, multi vitamin and vitamin D. In study of Najmabadi, 38 percent of dietary supplements consumers used multi vitamins or multi vitamin along with salts, 30.1% calcium supplement with vitamin D and 27.1% used iron supplement or different kinds of hematinic, the reason of difference of this study results with our study can be resulted from gender composition of two study population, because in this study more than 70% of participants were women that naturally use iron and hematinic supplements more than men, this issue is a reason for more frequency of using iron supplements (ferrous sulfate) in the present study. In fact, taking dietary supplements is under influence of various factors such as age, sex, marital status and similar factors. Results of our study showed that there is a significant difference between taking supplements in women participants than men participants in the study. In Najmabadi study, also, difference in taking dietary supplements between men and women was statistically significant [17]. This is also seen in studies in other areas of the world such as consumer population of dietary supplements in America and studies in the United Kingdom and Poland [20, 21]. Given that iron deficiency and bone fractures in higher ages is among problems that in many cases are seen in women more than men, tendency to take calcium supplements and vitamin D in this group of society is approximately predictable. Read et al., study in seven states of America by assessing usage frequency of dietary supplements showed that 13 percent of users of calcium dietary supplements, 11% iron supplement and 12 percent used zinc supplement during last year in which women were also used more dietary supplements than men [22].

Also in the present study, frequency of taking dietary supplements in married individuals was significantly higher than single people (74 percent vs. 21.7 percent). In study of Mirmiran et al., entitled “Tehran lipid and glucose study (TLGS)” using dietary supplements in most cases was higher in married men and women than singles [23]. But unlike the results of this study, during studies on Tai people [5] and America [24], no significant relationship was recognized between marital status and usage of dietary supplements

that this case can be influenced by cultural,economic and social factors of other societies in comparison with Iran's society that have different living arrangements.

In this study, the most usage of dietary supplements in women participated was related to nursing mothers and the least usage was related to pregnant women; the lack of some necessary supplements during the pregnancy in women of this study is noteworthy. In a study of Najmabadiet al., [17], the most usage of dietary supplements was related to pregnant women and nursing mothers. The study of Kholdi et al., in 2004 also showed that 76.6 - 78 % of mothers referred to health care centers in south of Tehran used regularly iron supplement and folic acid during their pregnancy [25]. The highest cases of taking dietary supplements during pregnancy and feeding among women indicated effective role of correct recommends by doctors, specialists of feeding and health care experts; on the other hand, it seems that due to low usage of necessary supplements in pregnancy women in this study, a special attention should be paid to education and its role in taking proper supplements during pregnancy.

In addition, in this study, taking dietary supplements in sportsmen was more than other men and also frequency of usage in people with a body mass index under 18 (thin people) was significantly higher than other participants in the study. The main concern is that in taking dietary supplements should pay attention to proper and scientific recommendations of trusted group of society because taking dietary supplements in sportsmen or for fixing thin should be based on the recommendations of feeding experts and consultants. What is confirmed by reports and studies is that taking dietary supplements helps to provide especial physiological needs like sportsmen or to supply nutrition uptake though diet, also taking dietary supplements for reducing shortfall risk and reducing uptake in old age and women in the age of menopause are recommended.

Findings of this study showed that 30.1% of people use different kinds of calcium supplements and vitamin D, if taking dietary supplements is based on physiological condition, on one hand, the issue caused happiness and it is a positive point of taking supplements and as under study population are referrals to health centers, this issue can indicate success of feeding education programs and improving mothers feeding in primary health care, on the other hand, it seems that programs of improving feeding and training for providing feeding needs in different ages should be developed and some approaches should be considered for elder people and prepares for preventionof vitamin deficiency problems in older age in order to prevent disorders like osteoporosis and other disorders which can be preventable by balance and proper feeding.

Among other findings of this study is high frequency of dietary supplements in ages 15-24 and 25-34 and also 45-54. In various studies, the most common age for taking dietary supplements was in children, middle-aged and aged people [20]. In this study, level of taking dietary supplements was the least in ages upper than 55 years (12%), in the study of Najmabadi, only 10 percent of under study population in age of 45-59 years and only 1.4 percent of 60 years old people and older take dietary supplements [17]. While, similar studies in other countries [20, 27] showed that middle-aged group take dietary supplements more than youth group.
In the present study, frequency of taking dietary supplements in people with chronic diseases or those that use drug because of chronic diseases are significantly higher than otherparticipants. In Pietruszka et al. (1999) study in central and eastern regions of Poland; it is also shown that taking dietary supplements is more common and abundant in adults with healthy problem and also in adults in condition of drug usage [26].

In addition, reference for recommending dietary supplements in under study population was general and specialists doctors in 62.4% cases, feeding counselors and experts in 16.8% cases and willful usage and personal information in 6.9% cases. In Najmabadi et al., study, reference for recommendation was doctor or feeding in 75.5% cases and willful usage was 20.1% cases [17]. Fortunately, the findings of this study showed that taking dietary supplements is very little in willful cases; this can be resulted from under study population that this population was among those who refer to health care centers. Other results of this study indicate that the highest causes of tendency to take regular dietary supplements are preventive imagination of different kinds of diseases and health improvement, feeling of low dosage of these materials in daily food and consuming them for strengthening body security system and also as an aid in diet. In Najmabadi et al., study in Tehran, usage reasons were largely maintaining health and preventing mentioned shortages.

CONCLUSION

Finally, it is mentioned that this study faced with some limitations; in fact, as under study population was formed by those who refer to health care centers, thus, people was randomly selected through those who refer to different parts of health care centers to receive different services; therefore, different physiological conditions like young sportsmen and loss weight was less often seen that this case was among limitations of researchers in this study. Other limitation of this study is type of this study because cross-sectional studies are not so strong to determine causality and by doing this kind of studies, determinant effect of effective factors on taking dietary supplements cannot be proved.In the end, according to the fact that tendency to take dietary supplements was more in lower ages, therefore it is necessary to provide training and nutritional strategies appropriate for different age groups about the proper use of nutritional supplements.

CONFLICT OF INTERESTS
The authors declare no conflict of interests.

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The authors report no financial interests or potential conflicts of interest.

REFERENCES

[1] Roseland JM, Holden JM, Andrews KW, Zhao C, Schweitzer A, Harnly J. [2008] Dietary supplement ingredient database (DSID): Preliminary USDA studies on the composition of adult multivitamin/mineral supplements. J Food Compost Anal, 21: S69-S77.
[2] Patterson AJ, Brown WJ, Roberts DCK. [2001] Dietary and supplement treatment of iron deficiency results in improvements in general health and fatigue in Australian women of childbearing age. J Am Coll Nutr, 20: 337-342.
[3] Huybrechts I, Maes L, Vereecken C, De Keyzer W, De Bacquer D, De Backer G. [2010] High dietary supplement intakes among Flemish preschoolers. Appetite, 54: 340-345.
[4] Roseland JM, Andrews KW, Holden JM, Zhao C, Middleton A, Feinberg M. [2009] Using the USDA multivitamin/mineral calculator to apply research from the Dietary Supplement Ingredient Database (DSID) to assess nutrient intake. J Am Diet Assoc, 109: A76.
[5] Chen SY, Lin JR, Chen TH, Guo SG, Kao MD, Pan WH. [2011] Dietary supplements usage among elderly Taiwanese during 2005-2008. Asia Pac J Clin Nutr, 20: 327-336.
[6] Balluz LS, Okoro CA, Bowman BA, Serdula MK, Mokdad AH. [2005] Vitamin or supplement use among adults, behavioral risk factor surveillance system, 13 states, 2001. Public Health Rep, 120(2): 117-123.
[7] Marques-Vidal P, Pecoud A, Hayoz D, Paccaud F, Mooser V, Waeber G. [2009] Prevalence and characteristics of vitamin or dietary supplement users in Lausanne, Switzerland: The CoLaus study. Eur J Clin Nutr, 63(2): 273-281.
[8] Giammarioli S, Boniglia C, Carratu B, Ciarrocchi M, Chiarotti F, Mosca M. [2013] Use of food supplements and determinants of usage in a sample Italian adult population. Public Health Nutr, 1-14.
[9] Dietary Supplement Health and Education Act. [1994] Public Law 103-417.103rd Congress. Downloaded from http://www.fda.gov/opacom/laws/dshea.html on May 7, 2007.
[10] Nutrition Business Journal's Supplement Business Report. Downloaded from http://www.nutritionbusiness.com on May 7, 2007.
[11] de Jong N, Ocke MC, Branderhorst HA, Friele R. [2003] Demographic and lifestyle characteristics of functional food consumers and dietary supplement users. Br J Nutr, 89(2): 273-281.
[12] Shi HJ, Nakamura K, Shimbo M, Takano T. [2005] Dietary supplement consumption among urban adults influenced by psychosocial stress: Its pronounced influence upon persons with a less healthy lifestyle. Br J Nutr, 94: 407-414.
[13] Bleys J, Navas-Acien A, Guallar E. [2008] Serum selenium levels and all-cause, cancer, and cardiovascular mortality among US adults. Arch Intern Med, 168(4): 404-410.
[14] Giovannucci E, Stampfer MJ, Colditz GA, Hunter DJ, Fuchs C, Rosner BA. [1998] Multivitamin use, folate, and colon cancer in women in the Nurses' Health Study. Ann Intern Med, 129(7): 517-524.
[15] Blendon RJ, Des Roches CM, Benson JM, Brodie M, Altman DE. [2001] Americans' views on the use and regulation of dietary supplements. Arch Intern Med, 161(6): 805-810.
[16] Steele M, Senekal M. [2005] Dietary supplement use and associated factors among university students. S Afr J Clin Nutr, 18(1): 17-30.
[17] Najmabadi SH, Nojomi M. [2010] Nutritional supplement use among adults in different areas of west Tehran. Iran J Endocrinol Metabol, 12: 365-75.
[18] Radimer KL, Subar AF, Thompson FE. [2000] Non-vitamin, non-mineral dietary supplements: Issues and findings from NHANES III. J Am Diet Assoc, 100(4): 447-454.
[19] Babanejad M, Azizian M, Azizian R, Azadi T, Rajabi A, Delpisheh A. [2013] Factors affecting dietary supplement consumption in residents of Southern Tehran. Res Med, 37(2): 93-97.
[20] National Center for Health Statistics (US). National health and nutrition examination survey. US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2008. Available at: http://www.cdc.gov/nchs/nhanes.hrm
[21] Gale CR, Edington J, Coles SJ, Martyn CN. [2001] Patterns of prescribing of nutritional supplements in the United Kingdom. Clin Nutr, 20(4): 333-337.
[22] Read MH, Medeiros D, Bendel R, Bhalla V, Harrill I, Mitchell M, Schultz HG, Sheehan ET, Standal BR. [1986] Mineral supplementation practices of adults in seven western states. Nutr Res, 6(4): 375-383.
[23] Mirmiran P, Mohammadi F, Allahverdian S, Azizi F. [2002] Association of educational level and marital status with dietary intake and cardiovascular risk factors in Tehranian adults: Tehran lipid and glucose study (TLGS). Nutr Res, 22(12): 1365-1375.
[24] Tyler CV, Werner JJ, Panaite V, Snyder SM, Ford DB, Conway JL. [2008] Barriers to supplemental calcium use among women in suburban family practice: A report from the Cleveland Clinic Ambulatory Research Network (CleAR-eN). J Am Board Fam Med, 21: 293-299.
[25] Kholdi N, Johari Z. [2006] Nutritional supplement consumption during pregnancy in the south part of Tehran. 9th Iranian Nutrition congress, Tabriz; 432.
[26] Pietruszka B, Brzozowska A. [1999] Vitamin and mineral supplement use among adults in Central and Eastern Poland. Nutr Res, 19(6): 817-826.
[27] National Health and Nutrition Examination survey (NHANES) "Intake of calories and selected nutrients for the United States population. (1999- 2000), (2002- 2004) Available at: http:///www.cdc.gov/nchs/nhanes. Accessed 12 July 2007.