

# Knowledge, Attitude and Practice of Dietitians about Nutritional Supplements in Shiraz, 2014

Afsane Ahmadi<sup>1</sup>,  
Nasrin Nasimi<sup>2</sup>,  
Farnoosh Fakoorziba<sup>2</sup>,  
Javad Rasooli<sup>3</sup>

<sup>1</sup>Research Center for Health Sciences, Department of Clinical Nutrition, Faculty of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran;

<sup>2</sup>Student Research Committee, Faculty of Nutrition and Food Sciences, Shiraz University of Medical Sciences, Shiraz, Iran;

<sup>3</sup>Department of Statistics and Epidemiology, Faculty of Public Health, Shiraz University of Medical Sciences, Shiraz, Iran

## Correspondence:

Nasrin Nasimi,  
Student Research Committee,  
Faculty of Nutrition and Food Sciences,  
Shiraz University of Medical Sciences,  
Shiraz, Iran

Tel: +98 917 7083414

Email: nasrin\_nasimi1992@yahoo.com

Received: 1 December 2015

Revised: 7 January 2016

Accepted: 8 February 2016

## Abstract

**Background:** Due to the increasing global use of nutritional supplements, dietitians play a key role in raising consumer awareness and reducing supplementary side effects. Hence, determination of the states of knowledge, attitudes and practices of this group as to common dietary supplements is important.

**Methods:** A list of all the dietitians employed in the health centers, nutrition clinics and private offices of Shiraz city was prepared; then, all the 36 qualified dietitians were referred to and the information of 25 dietitians was collected. To gather the data, we employed a 4-part questionnaire including demographic data and questions related to their knowledge, attitudes, and practices about prescribed dietary supplements. The knowledge scores of less than 50%, 50-75%, and over 75% were considered as low, medium, and good knowledge, respectively. And the classification of attitudes was determined based on quartile ranking. The data were statistically analyzed through SPSS, version19, using Chi-square and t-test statistical methods.

**Results:** Most of the dietitians had moderate (80%) and low (20%) level of knowledge, while 100% of them had a positive attitude (3<sup>rd</sup> quartile) about the role of dietary supplements in health, side effects, and food interactions. The most common supplements recommended were those for anemia and growth of children. In this study, the dietitians who had higher level of knowledge significantly used nutritional journals to increase their awareness.

**Conclusion:** Considering the key roles of dietitians and their knowledge, attitudes, and practices in the field of supplements and the results of the study, it appears that necessary measures should be taken to enhance the dietitians' knowledge.

Please cite this article as: Ahmadi A, Nasimi N, Fakoorziba F, Rasooli J. Knowledge, Attitude and Practice of Dietitians about Nutritional Supplements in Shiraz, 2014. *J Health Sci Surveillance Sys*. 2016;4(2):70-75.

**Keywords:** Knowledge, Attitude, Practice, Dietitian, Dietary supplements

## Introduction

Today, the role of nutrition in the prevention and treatment of diseases and health promotion has become clear. The aim of balanced nutrition is providing energy, proteins, and micronutrients to maintain the body health at any age; however, complementary and alternative medicines (CAM) are sometimes applied

for various reasons.<sup>1</sup>

Nutrition studies indicate the increasing popularity of CAM use in adults in recent years<sup>2-4</sup> so that 50% of the total population and 73% of the elderly in America have used CAM at least once.<sup>2</sup> From among CAMs, nutrient- or herbal-based dietary supplements are the most widely used ones.<sup>3,5</sup> In 2000, a national survey

in America revealed that 34% of the adults were receiving daily vitamin and/or mineral supplements and only 6% of them were consuming non-vitamin and/or non-mineral supplements.<sup>2</sup>

Hence, the availability of dietary supplements (which are even sold in supermarkets) and insufficient knowledge of consumers about their effectiveness, safety, and side effects have increased concerns about their use.<sup>3</sup> Eighty-five percent of American supplement users reported taking multivitamins-minerals and 13.3% of adverse effects reported were attributed to multivitamin-mineral supplements and the main reasons of which were announced to be concomitant use of supplements together or replacement of medicines by them.<sup>6</sup> While many dietary supplements appear to have good safety profiles, some can cause serious adverse reactions or drug interactions. Generally, among the severe side effects caused by taking supplements, myocardial infarction, liver failure, bleeding, convulsion, and death could be noted, while the severity of symptoms was associated with complementary ingredients, safety, drug interactions, duration of use, and age.<sup>7</sup>

Therefore, American Dietetic Association established aiming at determining nutritional strategies to improve health and reduce the risk of chronic diseases has raised the necessity of training nutritionists as those responsible to assess dietary adequacy, satisfying their nutritional needs through dietary modification or supplementary prescription, increasing public awareness about supplements, and reducing their side effects.<sup>8,9</sup> Thus, dietitians should have enough knowledge to identify the patterns of dietary supplement use in individual clients, evaluate the recommended efficiency of dietary supplements on individual health status, assess product safety and side effects, identify any potential interactions with other medications or another dietary supplements and monitor the individual's response to supplements.<sup>3</sup>

Dietitians are the first sources of information about dietary supplements and should be updated and have complete information in this area.<sup>9,10</sup> However, unfortunately a large number of dietitians hesitate about prescribing food supplements probably due to their limited knowledge of their effectiveness and safety. Thus, increasing their awareness in this area can be useful and helps prevent adverse events.<sup>5</sup> As stated in some earlier studies, dietitians believe that they need more education about supplements.<sup>2</sup>

Since there are much tendency towards consuming dietary supplements<sup>4</sup> and few studies have been conducted on the nutrition knowledge, attitudes and practices of dietitians in Iran, this study aimed to determine the mentioned nutritional aspects of dietitians as the major prescribers of food supplements.

## Methods

In this study, to assess the nutrition knowledge, attitudes and practices of dietitians employed in private offices, health center and nutrition clinics in Shiraz city, first a list of all the dietitians was prepared by referring to the Treatment Deputy of Shiraz University of Medical Sciences in July of 2014. To complete the questionnaire using the census method, we visited them at their workplaces and enrolled them in the study after they filled out their informed consent forms. Of all the dietitians working in health clinics or private offices in Shiraz city, 30 persons cooperated with this plan, while 6 eligible people did not accept to participate in the study. Nevertheless, from among the 30 dietitians participating in the project, 5 people did not complete the questionnaires; they were excluded from the study to avoid error and bias. Thus, since the completion of more than 50% of the questions in each section of the questionnaire (knowledge, attitude and practice) was considered as the inclusion criteria, totally 25 questionnaires were analyzed in this project.

The questionnaire had 4 sections: The first section of the questionnaire consisted of demographic questions including gender, educational level, workplace and duration of employment, and questions about sources of information, referrals, and educational workshops.

The second section included questions related to dietitians' knowledge of vitamin-mineral and herbal supplements. To standardize the questions of this section, they were handed to three associate professors of the faculty of nutrition of Shiraz University of Medical Sciences in the form of a separate questionnaire and their views of the validity of the content, relevance to the theme, and clarity and simplicity of the questions based on the objectives of the project were assessed and applied in the form of 3 options of essential, useful but non-essential, and non-essential.

To investigate their level of knowledge, a total score of 24 was considered based on the 24 questions on knowledge. The levels of knowledge were classified into 3 categories of low (a score of less than 12 or 50%), medium (a score of 12-18 or 50%-75%), and high (a score of over 18 or 75%) level of knowledge.

The third section contained questions related to the dietitians' attitudes about the role of supplements in health, side effects, and food interactions. In this section, the positive and negative questions concerning attitude were designed according to the questionnaires of previous similar studies based on attitude determination, and the ratings were done according to the Likert scale, i.e. for the analysis of positive statements, the scores of 5, 4, 3, 2, and 1 were attributed to completely agreed, agreed, indifferent, disagreed, and completely disagreed statements,

respectively, and vice versa for negative statements. To assess the attitudes, we considered a total score of 120 according to the 24 questions related to attitude and 5 options for each question in the questionnaire. Here, quartile ranking system was employed for determining the state of attitudes. Then, the attitude levels of the individuals were determined as the scores of less than 30 (25%), 30-60 (25%-50%), 60-90 (50%-75%), and over 90 (75%) for negative, indifferent, positive, and completely positive attitudes, respectively.<sup>11</sup>

The fourth section contained questions related to the dietitians' practices of dietary supplements and the most common reasons for their prescription. To evaluate the practices, we categorized the names of several combinations of vitamins, minerals, and herbal ingredients frequently presented in the form of supplements into a 3-part questionnaire according to the target groups. These 3 parts included the consumption of at least once a month, once every 3 months, and no consumption, to which the scores of 3, 2, and 1 were given for analysis, respectively.<sup>12</sup> Furthermore, the dietitians were asked to include the most common reasons for prescribing the supplements.

Finally, the data were analyzed in SPSS software, version 19, using Chi-square and T-test. In addition, descriptive statistics and statistical tables were utilized to display the results.

## Results

In the present study, the nutrition knowledge, attitudes, and practices of the mentioned dietitians were determined concerning dietary supplements and the following results were obtained:

Of the 25 dietitians participating in the project, 84% were female and 64% and 36% had bachelor's and master's degrees, respectively. Also, 56%, 28%, and 16% of them were working at health centers, private offices, and nutrition clinics delivering services to 1-30 year old people. Most of the dietitians chose reported that they use nutritional journals, brochures of advertising companies, and individual experiences as their first to third priorities, respectively, to learn more about dietary supplements.

60% of the participants in the project had not participated in any workshops about dietary supplements before and most dietitians (96%) believed holding workshops related to dietary supplements

have a great impact on their practices and that they would surely attend the workshops.

The minimum, maximum, and average scores of knowledge obtained by the dietitians were 70.85 (from 120), and  $78.2 \pm 4.03113$ , respectively. 20% and 80% of them had low and medium level of knowledge about dietary supplements. (Table 1) All the dietitians (100%) had positive attitudes (3<sup>rd</sup> quartile) towards the role of dietary supplements on health, side effects, and food interactions with supplements (Table 1).

The men and dietitians with a master's degree had slightly better knowledge and lower attitudes towards dietary supplements, but the relationships were not significant. Nevertheless, there was a significant relationship ( $P=0.049$ ) between more experienced dietitians and their lower attitudes (in the range of positive attitudes) towards dietary supplements, but no significant relationship was found between knowledge and work experience.

The dietitians with higher level of knowledge used to use nutrition papers, brochures of advertising companies, the Internet, personal experience, and colleagues' recommendations as their first to fifth priorities, respectively, to increase their knowledge. Moreover, the relationship between higher level of knowledge and the use of nutrition journals was significant ( $P=0.021$ ).

Most clients referring to the study dietitians included people with weight management difficulties (48%), patients (24%), and adolescents over 14 years old (12%) and fewest clients were preschool children (8%), children under 4 years of age, and pregnant women (4%), while there were no referrals in the elderly group.

As shown in Table 2, the most common supplements recommended by the study dietitians included those for anemia (containing folic acid-iron and iron alone) and growth supplements (complexes containing Zn-B<sub>complex</sub>-vitamin C and B<sub>complex</sub> alone). Of the supplements mentioned, glucosamine chondroitin, B<sub>12</sub>, B6-cysteine, Q10 and herbal supplements such as whortleberry extract, green tea, garlic tablet, and Musyilium were less prescribed by the dietitians.

According to the dietitians (based on a question in the questionnaire), recommendations for using supplements for anemia treatment and prevention, child growth, and skin and hair health were ranked

**Table 1:** The relationship among knowledge, attitude with workplace of dietitians

		Knowledge		Total	Attitude
		Low	Medium		High
Workplace	Nutrition clinic	50.0%	50.0%	100%	16.0%
	Private offices	14.3%	85.7%	100%	28.0%
	Health center	14.3%	85.7%	100%	56.0%
Total		20.0%	80.0%	100%	100%

**Table 2:** The frequency of administration of dietary supplements by dietitians

Supplement	Frequency	At least 1 times a month	1 time in 3 months	Never	Total
Glucosamine-chondroitin-		6(24%)	1(4%)	18(72%)	25(100%)
Ca-mg-zn		12(48%)	2(8%)	11(44%)	25(100%)
Ca-mg-zn-D <sub>3</sub>		14(56%)	1(4%)	10(40%)	25(100%)
Zn-B <sub>complex</sub> -vitamin C		17(73.9%)	4(17.4%)	2(8.7%)	23(100%)
B <sub>complex</sub>		20(83.3%)	1(4.2%)	3(12.5%)	24(100%)
Folic acid- Iron-vitamin C-B <sub>12</sub>		16(64%)	2(8%)	7(28%)	25(100%)
Folic acid- Iron		20(80%)	2(8%)	3(12%)	25(100%)
Iron		16(66.6%)	4(16.7%)	4(16.7%)	24(100%)
Folic acid		14(58.3%)	3(12.5%)	7(29.2%)	24(100%)
B <sub>12</sub>		4(16%)	3(12%)	18(72%)	25(100%)
Cysteine - B <sub>6</sub>		5(20.9%)	2(8.3%)	17(70.8%)	24(100%)
Omega 3-cod liver oil		11(45.9%)	5(20.8%)	8(33.3%)	24(100%)
Q <sub>10</sub>		3(12%)	5(20%)	17(68%)	25(100%)
Vitamin E		7(28%)	6(24%)	12(48%)	25(100%)
Green tea pill		4(16%)	5(20%)	16(64%)	25(100%)
Garlic pill		5(20%)	5(20%)	15(60%)	25(100%)
Bilberry extract		1(4%)	3(12%)	21(84%)	25(100%)
Musylyum		7(28%)	1(4%)	17(68%)	25(100%)
Syrup Barij		14(56%)	2(8%)	9(36%)	25(100%)

the first, second, and third priorities, respectively. On the other hand, almost half of the dietitians (about 56%) insisted on recommending imported foreign supplements.

## Discussion

From the results obtained, it can be inferred that the majority of the dietitians had moderate level of knowledge about prescription of supplements and their useful and adverse effects on their consumers' health, and none of the participants in the project had a great knowledge of dietary supplements. On the other hand, their great desire to participate in workshops related to dietary supplements was indicative of their feelings of need to improve their knowledge of supplements. In a study conducted on dietitians in California City, it was shown that the experts previously attending the courses of supplements had significantly higher level of knowledge.<sup>2</sup>

Given that dietitians are considered as the major prescribers of supplements, their attitudes about supplements are important. In a study carried out in 2006, the majority of dietitians (over 80%) believed that a dietitian should be able to be accountable, discuss about supplements, and inform the public.<sup>2</sup> According to another study conducted on American dietitians, 80% of them believed that food supplements can play an effective role in protecting public health and preventing and treating chronic diseases.<sup>5</sup>

For this reason, in the present study, dietitians' attitudes about the role of dietary supplements in health, as well as their side effects and food interactions were assessed. Due to the dietitians'

positive attitudes shown in this study attesting the effectiveness of dietary supplements on health and based on previous similar studies,<sup>2,5</sup> knowledge enhancement in this regard can verify the positive role expected from supplements.

The insignificant relationship between higher level of knowledge and lower attitudes of the men and dietitians with a master's degree is due to the low number of the groups in the study population.

Although no significant relationship was found between knowledge and more work experience, it was revealed by an investigation conducted in 2006 that the dietitians aged over 40 years with greater work experience had a higher level of knowledge.<sup>2</sup> The difference between this study and the similar research can be justified by 2 reasons: low number of the samples and workshops relevant to supplements.

In this study, the dietitians with more work experience had significantly lower attitudes towards food supplements (within the range of a good attitude) that may be due to the lack of effective training workshops to create a positive attitude about supplements.

In this study, it was found that the dietitians with more knowledge significantly used more nutritional publications to increase their awareness. According to a research conducted on American dietitians, the dietitians announced that they had acquired their nutritional information mostly from specialized nutritional journals since they believed the information available in the nutritional magazines was more reliable.<sup>3</sup>

As mentioned, clients with weight management issues, patients, and adolescents aged over 14 years

comprised the most referrals to the study dietitians. There may be a need to prescribe supplements in obesity regimens due to calorie restriction, in diets for weight loss to increase appetite, sometimes in pathological conditions such as renal and hepatic diseases, and in adolescents because of the growth spurt.<sup>13</sup>

The elderly, pregnant women, and children under 4 years of age are from among vulnerable groups of the society.<sup>14</sup> Thus, health improvement of these groups enhances the general health of a community and reduces health care costs for the government. Although nutrition science plays an effective role in the promotion of public health level and disease prevention, unfortunately, the fewest referrals to dietitians include the mentioned 3 groups. Therefore, they should be further referred to dietitians with the collaboration of other partners of doctors and professions so that their food status can be checked by a professional dietitian.

In general, iron deficiency, protein-energy malnutrition, and growth disorders are of the most common nutritional problems in Fars province.<sup>15</sup> According to the studies performed, 28.5% of pregnant women admitted to Shiraz Nemazee Hospital have had iron deficiency anemia<sup>16</sup> and 19.7% of 6 month to 5 year old children have been reported to have iron deficiency anemia in Fars province.<sup>17,18</sup> On the other hand, according to a study conducted on 13-14 year-old boys in urban and rural areas of Fars province, it was found that the mean weights of both rural and urban groups and mean height of rural boys were equivalent to the mean weight and height of 8-11 year-old American boys. One of the reasons for the lack of growth revealed by the mentioned study was low levels of calorie, protein, fat, calcium, lysine, and methionine in the diets of urban and rural boys.<sup>19</sup> Thus, these studies are evidence of the high prevalence of iron deficiency anemia and growth disorders in Fars province. As a result, the high amounts of supplements to be prescribed for anemia and growth in this study are justified.

Although anemia and lack of growth was mentioned to be the most common reasons for prescribing supplements in this study, providing bone health (70%), refilling body reserves (67%), and protecting public health (49%) were reported as the most common reasons of prescribing supplements by American dietitians in a research conducted in 2012.<sup>20</sup> The reasons for the inconsistency of supplement prescriptions in these two studies could be the differences in the elderly patients' referrals to medical centers, attitudes about public health, and emergence of the diseases in the developing and developed countries.

In this study, herbal supplements were among the least cases prescribed by the dietitians. Also, according

to a study performed in 2003, 73% of American dietitians had either little or no knowledge about herbal supplements and only 22% of them recommended herbal supplements to their patients. Nonetheless, there was a significant relationship between higher knowledge scores and further recommendations of herbal supplements by dietitians and consumption by clients.<sup>21</sup> Thus, it is necessary to enhance the dietitians' knowledge about prescriptions, benefits, side effects, and interactions of herbal supplements so that the positive effects of these supplements can be further used.

Some Iranian dietary supplements have effects quite similar to their foreign ones. However, sometimes due to lack of their awareness of the issue, dietitians insist on the recommendation of supplements of foreign types. By informing dietitians about the effects of Iranian supplements by pharmaceutical companies, not only treatment costs can be reduced and health can be improved, but also Iranian drug manufacturers can be supported.

One limitation of this study was the lack of participation and completion of questionnaires by the dietitians that could affect the results obtained. Since in human studies, satisfaction for participation is a necessary condition to be observed, it can be considered as a limitation.

## Conclusion

Given the wide range of dietary supplements and their safety, the key role of dietitians and their knowledge, attitudes, and practices in the field of supplements, and the results obtained by this research representing that none of the study dietitians had complete knowledge about supplements despite their positive attitudes and practices, it is necessary to take measures to improve the dietitians' knowledge as the major prescribers of dietary supplements. Thus, including academic courses related to supplements and holding useful and efficient educational workshops periodically can be effective steps towards improving the dietitians' knowledge and training specialists. Since nutritional journals have been mentioned as a priority to increase the dietitians' knowledge of supplements, there should be more control on nutritional papers and reputable nutritional magazines should be introduced so that reliable and thoroughly updated applied information can be made available to dietitians.

**Conflict of Interest:** None declared.

## References

- 1 Debas HT, Laxminarayan R, Straus SE. Complementary and alternative medicine. 2006.
- 2 Hetherwick C, Morris MN, Silliman K. Perceived

- knowledge, attitudes, and practices of California registered dietitians regarding dietary supplements. *J Am Diet Assoc* 2006; 106(3): 438-42.
- 3 Lederman VG, Huffman FG, Enrione EB. Knowledge of Florida nurses and dietitians regarding dietary supplements. *Complementary therapies in clinical practice* 2009; 15(1): 38-43.
  - 4 Maddah M, Shoyooie R, Akbarian Z, Rostam Nejad M, Soleymani M. Dietary supplement use among Iranian adults: a study in northern Iran. *Med J Nutrition Metab* 2013; 6(1): 69-72.
  - 5 Lee Y-K, Georgiou C, Raab C. The knowledge, attitudes, and practices of dietitians licensed in Oregon regarding functional foods, nutrient supplements, and herbs as complementary medicine. *J Am Diet Assoc* 2000; 100(5): 543-8.
  - 6 Timbo BB, Ross MP, McCarthy PV, Lin C-TJ. Dietary supplements in a national survey: prevalence of use and reports of adverse events. *J Am Diet Assoc* 2006; 106(12): 1966-74.
  - 7 Palmer ME, Haller C, McKinney PE, Klein-Schwartz W, Tschirgi A, Smolinske SC, et al. Adverse events associated with dietary supplements: an observational study. *Lancet* 2003; 361(9352): 101-6.
  - 8 American Dietetic A. Position of the American Dietetic Association: fortification and nutritional supplements. *J Am Diet Assoc* 2005; 105(8): 1300-11.
  - 9 Marra MV, Boyar AP. Position of the American Dietetic Association: nutrient supplementation. *J Am Diet Assoc* 2009; 109(12): 2073-85.
  - 10 Wildish DE. An evidence-based approach for dietitian prescription of multiple vitamins with minerals. *J Am Diet Assoc* 2004; 104(5): 779-86.
  - 11 Gardiner P, Woods C, Kemper KJ. Dietary supplement use among health care professionals enrolled in an online curriculum on herbs and dietary supplements. *BMC complementary and alternative medicine* 2006; 6(1): 1.
  - 12 Stuber K, Bruno P, Kristmanson K, Ali Z. Dietary supplement recommendations by Saskatchewan chiropractors: results of an online survey. *Chiropractic & manual therapies* 2013; 21(1): 1.
  - 13 Mahan LK, Escott-Stump S, Raymond JL. *Krause's food & the nutrition care process*: Elsevier Health Sciences; 2012.
  - 14 Tulchinsky TH. Micronutrient deficiency conditions: global health issues. *Public Health Reviews* 2010; 32(1): 243.
  - 15 Lankarani S, Musaiger AO. The state of nutrition in Fars, Iran: a review. *Nutr Health* 1991; 7(3): 135-42.
  - 16 Karimi M, Yarmohammadi H, Kadivar R. Assessment of the prevalence of iron deficiency anemia, by serum ferritin, in pregnant women of Southern Iran. *Med Sci Monit* 2002; 8(7): CR488-CR492.
  - 17 Keikhaei B, Zandian K, Ghasemi A, Tabibi R. Iron-deficiency anemia among children in southwest Iran. *Food Nutr Bull* 2007; 28(4): 406-11.
  - 18 Kadivar MR, Yarmohammadi H, Mirahmadizadeh AR, Vakili M, Karimi M. Prevalence of iron deficiency anemia in 6 months to 5 years old children in Fars, Southern Iran. *Med Sci Monit* 2003; 9(2): CR100-CR104.
  - 19 Maleki M. Food consumption and nutritional status of 13 year old village and city schoolboys in Fars province, Iran. *Ecol Food Nutr* 1973; 2(1): 39-42.
  - 20 Dickinson A, Bonci L, Boyon N, Franco JC. Dietitians use and recommend dietary supplements: report of a survey. *Nutr J* 2012; 11(1): 1.
  - 21 Cashman LS, Burns JT, Otieno IM, Fung T. Massachusetts registered dietitians' knowledge, attitudes, opinions, personal use, and recommendations to clients about herbal supplements. *The Journal of Alternative & Complementary Medicine* 2003; 9(5): 735-46.