





## Research Article

## Frequency of Vitamins and Nutritional Supplements Use among Iraqi People in Baghdad City

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Received: 21 February 2023; Revised: 20 March 2023; Accepted: 23 March 2023

### Abstract

**Background:** Dietary supplements are used to provide the body with nutrients necessary for the regulation of metabolic processes, to increase the nutritional value of a typical diet, and to enhance or maintain health. **Aim:** To assess the use frequency and demographics of dietary supplements consumers in Baghdad, Iraq. **Method:** From July to September 2022, a cross-sectional study was conducted by distributing a self-administered survey to consumers attending community pharmacies in the Baghdad metropolitan area. About 150 participants took part in this investigation. **Results:** The study revealed that the majority of participants were female, constituting 58% of the total, while male subjects constituted 42% of the total. 16% of the subjects were taking multivitamins, with vitamin D3 being the most popular supplement (22.7%). Only 40% of all respondents relied on their physician's advice when using dietary supplements. 73.3% of them did not conduct any laboratory tests before or after ingesting these supplements. **Conclusion:** Significant numbers of users used calcium and vitamin D3 without obtaining lab results or being monitored by a physician; instead, they consulted the internet for information.

**Keywords:** Dietary supplements, Vitamins, Essential elements, Iraqi people, Consumption pattern.

تواتر استخدام الفيتامينات والمكملات الغذائية بين العراقيين في مدينة بغداد

الخلاصة

**الخلفية:** تستخدم المكملات الغذائية لتزويد الجسم بالعناصر الغذائية اللازمة لتنظيم عمليات التمثيل الغذائي، وزيادة القيمة الغذائية لنظام غذائي نموذجي، وتعزيز الصحة أو الحفاظ عليها. **الهدف:** تقييم وتيرة الاستخدام والخصائص السكانية لمستهلكي المكملات الغذائية في بغداد، العراق. **الطريقة:** من يوليو إلى سبتمبر 2022، تم إجراء دراسة مقطعية من خلال توزيع مسح ذاتي الإدارة على المستهلكين الذين يترددون على الصيدليات الخاصة في منطقة العاصمة بغداد. شارك حوالي 150 مواطناً في هذا الاستقصاء. **النتائج:** كشفت الدراسة أن غالبية المشاركين كانوا من الإناث، حيث شكلوا 58% من الإجمالي، بينما شكل الذكور 42% من الإجمالي. كان 16% من المشاركين يتناولون الفيتامينات المتعددة، مع كون فيتامين D3 هو المكمل الأكثر شيوعاً (22.7%). اعتمد 40% فقط من جميع المستجيبين على نصيحة الطبيب عند استخدام المكملات الغذائية. 73.3% منهم لم يجروا أي فحوصات مخبرية قبل أو بعد تناول هذه المكملات. **الاستنتاج:** استخدم عدد كبير من المشاركين الكالسيوم وفيتامين D3 دون إجراء فحص مخبري أو مراقبتهم من قبل الطبيب. بدلاً من ذلك، اعتمدوا على الإنترنت للحصول على معلومات.

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**Article citation:** Shanshal AM, Aljorani RH, Taha RN, Hussein AM. Frequency of vitamins and nutritional supplements use among Iraqi people in Baghdad city. *Al-Rafidain J Med Sci.* 2023;4:44-49. doi: 10.54133/ajms.v4i.104.

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## INTRODUCTION

To maintain health and well-being, adequate nutrition is required. A supplement is a type of dietary supplement used to supply the body with nutrients necessary for the regulation of metabolic processes [1]. Dietary supplements (DS) are frequently referred to as food items [2] recommended to increase the nutritional value of a typical diet and to enhance or maintain excellent health. In order to improve dietary nutrition, the Food and Drug Administration (FDA) has authorized the prescription of DSs as pharmaceutical dosages containing various vitamins, minerals, lubricants, herbal products, natural items, or a combination of them [3]. The use of DS can be for general nutritional requirements or for a specific purpose, such as aging, sports, pregnancy, enhancing cognitive or physical performance, increasing energy, reducing weight, or relieving pain, among other positive effects. Several studies indicate that consuming vitamin D, omega-3 fatty acids, and lycopene supplements can reduce the risk of developing cancer, cardiovascular disease, and type 2 diabetes [4,5]. These studies may have inspired individuals to take dietary supplements, but they should always be taken as prescribed and in the recommended dosages [6]. Unbalanced eating habits have been linked to decreased vitamins and minerals levels, which can have a negative impact on the body's metabolic processes and contribute to various illnesses such as pellagra, rickets, scurvy, beriberi, osteoporosis, and other vitamin deficiencies [7]. Dietary supplements are presently utilized more frequently than ever before due to their efficacy and safety in improving general health [8-10]. The European Union, the United States [11-14], and the nations of the Gulf Cooperation Council [15,16] all make extensive use of DSs. Moreover, nutritional supplements are presently regarded as one of the most significant trends in the healthcare industry, which has a significant impact on the global economy [17]. The utilization of DSs may be influenced by socioeconomic status, lifestyle preferences, and demographic characteristics. Numerous studies have shown that adults, physically active individuals [18,19], and the elderly [20] are more prone to users with a projected global market of 140,3 billion USD in 2020. Multiple pieces of evidence have indicated that there may be some problems. Some consumers may use them as a substitute for healthier foods rather than a supplement, which may lead to unhealthy eating patterns [21]. Palpitations, blood and liver problems, convulsions, unconsciousness, an allergic reaction, and even death are among the most significant adverse effects of an accidental overdose [22,23]. The purpose of this study is to determine the level of knowledge, attitudes, and frequency of nutritional supplement use among Baghdad, Iraq pharmacy customers.

## METHODS

### *Study design*

In Baghdad, Iraq, a cross-sectional investigation was conducted. From July 2022 to September 2022, a self-administered survey that includes general closed-ended questions was distributed to clients of Iraqi pharmacies in various metropolitan areas of Baghdad. Due to the fact that Arabic is the primary language of Iraqi subjects, an Arabic survey questionnaire was developed and validated prior to the project's launch. The first section focused on the demographics of the subjects, the second on the supplements they take, and the third on the sources of information regarding the use of vitamins and supplements. Additional open-ended questions inquired about the names of any other medications used in addition to supplements, as well as whether any adverse effects had been observed. The Al-Rafidain University College Faculty of Pharmacy's local ethical committee approved the study protocol in accordance with universally acknowledged principles and standards for medical research.

### *Data analysis*

IBM SPSS software (version 24.0) was utilized for data analysis. The prevalence of the people's use of various dietary supplements was quantified with descriptive statistics. Using the Fisher's exact test, associations between various general characteristics and outcomes were evaluated. All two-sided analyses were deemed significant when the p-value was less than 0.050.

## RESULTS

Table 1 demonstrates that 150 customers of neighborhood pharmacies were given surveys to complete and return on their own. The majority of participants, or 58% of the total, were women, while 42% of the users overall were men. Nearly 19 (12.7%) of them were thought to be under the age of 18, 34 (22.7%) were in the 19-29 age range, 35 (23.3%) were in the 30-39 age range, nearly 29 (19.3%) were thought to be in the 40-49 age range, and 33 (22%) were thought to be over the age of 50. Twelve of them had no official education, 16 (10.7%) had completed their primary education, 35 (23.3%) had completed their secondary education, and 87 (58%) had completed their college education. Regarding the prevalence of chronic diseases, 44 participants (29.3%) have hypertension; 27 participants (18% of the participants) have diabetes; 3 participants (which accounts for 2% of participants) have immune disorders; and only one participant (2% of the participants) has kidney dysfunction.

**Table 1:** Demographics of survey participants,  $n=150$ 

Parameter		<i>n</i> (%)
Gender	Female	87 (58)
	Male	63 (42)
Age	0-18	19 (12.7)
	19-29	34 (22.7)
	30-39	35 (23.3)
	40-49	29 (19.3)
	≥ 50	33 (22)
Education	uneducated	12 (8)
	Primary school	16 (10.7)
	Secondary school	35 (23.3)
	Graduated	87 (58)
Diseases	Hypertension	44 (29.3)
	Diabetes	27 (18)
	Kidney disease	1 (0.66)
	Immune disease	3 (2)

Only 50% of the research participants were free from any type of chronic illness. According to the prevalence of supplement use, 12 subjects (8%) took B-complex vitamins, 24 (16%) took multivitamins, 5 subjects (3.3%) used herbal products, 4 (2.3%) took omega-3 fatty acids, 8 (5.3%) took a formula that combined minerals and herbal products, and 19 subjects (12.7%) took a formula that contained multivitamins and minerals. The following participants took supplements: 1 participant (0.7%) took magnesium; 22 participants (14.7%) took calcium supplements; 18 participants (12%) took iron; 11 participants (7.3%) took zinc; 11 participants (7.3%) took vitamin C; 34 participants (22.7%) took vitamin D3; 3 participants (2%) took vitamin E; 3 participants (2%) took vitamin B6; and 6 participants (4%) took vitamin B12 (Table 2). Constipation, nausea, and stomach aches were among the negative adverse effects that participants taking iron and multivitamins reported. Only one subject, though, developed palpitations while taking a multivitamin. 73.3% of the subjects, however, didn't perform any laboratory tests before or after taking any of these supplements. Among the participants, only 4.5% had their serum calcium levels checked before and after taking calcium-containing supplements, 72.2% had their hemoglobin levels checked before and after taking iron, and 47.0% had their serum D3 levels checked before and after taking vitamin D3 (Table 3). In terms of the responses to the last section of the questionnaire, the findings showed that sixty of the total respondents to this section (or 40% of the respondents) relied on the doctor as a source of counseling regarding the use of vitamins or different nutritional supplements, and fourteen of these respondents (9.3%) thought the pharmacist to be the counseling source.

**Table 2:** The frequency of dietary supplements uses by the enrolled participants

Supplements type		<i>n</i> (%)
Supplement	multivitamins	24 (16)
	Herbals	5 (3.3)
Minerals	Omega 3	4 (2.3)
	B complex	12 (8)
	Minerals & Herbal	8 (5.3)
	Multivitamins & Minerals	19 (12.7)
	Zinc	11 (7.3)
Vitamins	Iron	18 (12)
	Calcium	22 (14.7)
	Magnesium	1 (0.7)
	C	11 (7.3)
	D3	34 (22.7)
	E	3 (2)
	B6	3 (2)
B12	6 (4)	

The following sources were used by the remaining participants to learn about the use of supplements: websites (13 participants, 8.3%); books (2 participants, 1.3%); social media (26 participants, 17%); and knowledge from family and friends (33 participants, 22%). Only five participants, or 3.3% of the total, stated that consuming nutritional supplements and vitamins had a negative effect on them.

**Table 3:** Sources of information regarding the use vitamins and supplements

Variables		<i>n</i> (%)
Source of advice	Physician	60 (40)
	Pharmacist	14 (9.3)
	Internet	13 (8.3)
	Books	2 (1.3)
	Social media	26 (17)
	Family & friends	33 (22)
Side effects	Yes	5 (3.3)
	No	145 (96.7)
Lab test	Yes	40 (26.7)
	No	110 (73.3)

Table 4 shows that there were no variables linked to age, gender, or educational attainment that were related to the information source ( $P = 0.069, 0.07, \text{ and } 0.731$ , respectively). Additionally, the lab exam did not correlate with factors like age, gender, or educational attainment ( $P = 0.121, 0.073, \text{ and } 0.057$ , respectively). Additionally, there was no correlation between supplement use frequency and variables like age, gender, or school level ( $P = 0.213, 0.654, \text{ and } 0.832$ , respectively). However, there were a few cases of drug interactions, including those between metformin and iron, calcium and zinc, magnesium and

iron, calcium and metoprolol, multivitamins and amlodipine, and iron and propranolol.

**Table 4:** Association the knowledge source, lab test, and frequency of supplement use with age, gender, and education level of the participants

Parameter		<i>P</i> -value
Source of knowledge	Age	0.069
	Gender	0.073
	Education	0.731
Lab test	Age	0.121
	Gender	0.073
	Education	0.057
Frequency of supplement use	Age	0.213
	Gender	0.654
	Education	0.832

## DISCUSSION

Vitamin deficiencies are quite widespread around the world and can affect people of any age [24]. Over the course of the past few years, and following the COVID-19 pandemic [17], there has been an upsurge in the use of DS. Because of their high requirements for these compounds and their susceptibilities to their deficiencies, young children, pregnant women, and breastfeeding mothers are the populations that are most generally recognized as being prone to vitamin deficiencies [25]. The current study found that females consume more DS than males do (58%), which is approximately the same as the study that was carried out in Saudi Arabia (53.6%) [16]. However, the prevalence of use was found to be lower in Malaysia, at nearly 38% [26]. According to the age of consumers, the current study revealed that adults 30-39 years old form the largest group of DS consumers at 23.3%. This age group was substantially identical to the one that was reported in studies conducted in Malaysia and Saudi Arabia [27,15]. Regarding the most common form of DS that people in Iraq consume, the prevalence of vitamin D3 was approximately 22.7% (Table 2). In Saudi Arabia, the prevalence of vitamin D3 use is likewise high, but at a higher frequency (60%) [16]. On the other hand, the DS that was most frequently utilized in Malaysia was vitamin C (15%) [28]. It is common knowledge that vitamin D deficiency is considered a global public health problem in a variety of age groups, particularly in people who are from the Middle East [29]. On the other hand, the types of dietary supplements that were most frequently consumed were B-complex (8%) and fish oil (8.92%) in Malaysia [26], and iron (50%) in Saudi Arabia [16]. Because of their pharmacokinetic properties, water-soluble vitamins cannot be handled for an extended period of time within the body and are rapidly eliminated through the urine. As a result, they

have to be taken frequently in sufficient quantities to meet the daily need [30]. On the other hand, lipid-soluble vitamins, such as vitamin D, are generally stored in the liver, and their urinary excretion is mostly limited; as a result, excessive consumption of these vitamins carries the risk of toxicity [31]. In the present study, respondents to the final part of the questionnaire stated that only forty percent of the total participants relied on the recommendation of their physician to consume vitamins or other nutritional supplements. This percentage is almost identical to the results of a study that was carried out in Dubai, United Arab Emirates (46.6%) [18]. In the meantime, the vast majority of participants (73.3% of them) did not conduct any laboratory tests before or after intake of these supplements. This attitude was also documented among consumers of DS in Saudi Arabia (55% of them) [16]. When it came to the individuals who were taking vitamin D3, fewer than half of them (47.05%) carried out serum D3 evaluation tests both before and after they consumed this supplement. On the other hand, only 4.5% of the participants who use calcium supplements carried out a blood calcium level test. Toxicity linked with vitamin D use can recover without any adverse repercussions; nevertheless, some cases of severe hypercalcemia can result in acute renal failure and require hemodialysis. Vitamin D toxicity can also be recovered without any negative implications. Many cases of vitamin D intoxication, which result in irreversible damage to the kidneys, are extremely uncommon [32]. In this context, it is important to be aware that hypercalcemia may raise the risk of cardiovascular diseases and that a high calcium level in the urine raises the risk of urinary calculi [33,34]. Even though using dietary supplements is generally believed to be safe, there is no guarantee that there won't be any unintended consequences. Incorrect use can have serious repercussions, including an increased risk of bleeding due to an overdose of vitamin E, as well as hepatotoxicity and teratogenicity due to a chronic overdose of vitamin A. Additionally, the dangers of drug-drug interactions are significant, particularly with certain drug classes, which can predispose subjects to dangerous adverse effects such as those that occur between vitamin K and oral anticoagulants [35,36]. In addition, taking an excessive amount of multivitamins is associated with a number of negative health impacts, including photosensitivity and neurotoxicity in the case of an overdose of pyridoxine, as well as congenital defects in the case of an excessive use of vitamin A in pregnant women [37]. In the current study, only a small percentage of participants (3.3% total) reported experiencing adverse effects as a result of taking nutritional supplements and vitamins. These adverse effects included nausea, stomach ache, and constipation in subjects who were taking iron and multivitamins. Only one subject experiences

tachycardia while taking many vitamins and minerals. Another study [16] made observations that were very similar to ours. Limitations of the study include the small sample size and coverage of only one governorate in Iraq, which makes it difficult to construct a final conclusion that covers all Iraqi districts.

## Conclusion

The research discovered that many of the participants took calcium and vitamin D supplements without obtaining lab results or seeing a doctor for follow-up; instead, they searched online for information. Social media and websites have the power to improve both individual and societal health, but when used carelessly, they pose significant risks to healthcare professionals [38]. The pharmacy customer should be given more information by the healthcare provider regarding the risks of taking excessive amounts of dietary supplements, especially calcium and vitamin D supplements, as well as the importance of getting the required tests performed both before and while taking supplements on a daily basis in order to lower the possibility of toxicity.

## Acknowledgement

The data presented here is part of a BSc graduation project submitted to Faculty of Pharmacy, Al-Rafidain University College. The authors would like to thank Al-Rafidain University College for supporting this project.

## Conflict of interests

No conflict of interests declared.

## Source of fund

No specific fund received.

## Data sharing statement

Supplementary data can be provided by the corresponding author based on a reasonable request.

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