

Dietary Supplements Trends Among University Students In Turkey

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Abstract

The demand for dietary supplements has skyrocketed during the COVID-19 pandemic. People are increasingly looking for ways to maintain and improve their health, and dietary supplements are seen as a way to provide additional nutrients. This study aims to gain a better understanding of the dietary supplement habits of Turkish university students. The students' opinions were surveyed by distributing a questionnaire via e-mail and the WhatsApp program. The results showed that about half of the students avoided consuming food supplements for reasons including, cost (19.2%), unnecessary food items (13.3%), and lack of knowledge about their benefits (25.8%). The results showed that students are more likely to consume supplements for health-related reasons (18.2%) such as preventing deficiency, improving general health (30.3%), increasing energy levels, and improving performance (17.2%). 29.3% of the study participants consumed vitamin D supplements more than any other type of supplement. Vitamin B12 (20.7%) and multivitamins (16.2%) were the next most popular supplements consumed by the study participants. The study indicates that there is a need to better educate students on the importance of dietary supplements and how they can help improve their overall health.

Keywords: Dietary supplements, university, Turkey, students

1. Introduction

Dietary supplements (DSs) play an important role in maintaining health and preventing diseases. The Food and Drug Administration (FDA) has defined DSs as capsules, tablets, soft gels, powders, gel caps, or liquids containing vitamins, minerals, herbs, amino acids, proteins, and enzymes [1]. By taking certain supplements, the body will get the vital nutrients and substances it needs to function, while other supplements can help prevent diseases. Furthermore, DSs may protect against nutritional deficiency, promote health, enhance performance, boost immunity, and reduce stress, among other benefits [2, 3]. DSs can

help to fill nutritional gaps and provide essential nutrients that may be missing from the diet. They can also help to improve overall health and well-being, aid in weight loss and management, and provide additional energy and endurance [4, 5]. Vitamins are essential micronutrients, defined as organic compounds synthesized by the body in small quantities that are not adequate to meet physiological needs, and their absence causes deficiency syndrome [6]. For example, vitamin A plays an essential role in vision, and in case of a deficiency, a person may develop night blindness [7]. One of the functions of vitamin D is to maintain calcium homeostasis and healthy bones, and if

the deficiency occurs, children develop rickets and adults with osteomalacia and osteoporosis [8, 9]. In addition to vitamins, mineral nutrients are essential to human functions. Total parenteral nutrition studies have shown that minerals are necessary in microgram amounts each day. For example, use zinc supplements to avoid various types of skin lesions and various immunologic defects. Additional use of iron supplements is to avoid anemia [6, 10].

There are many reasons why people use dietary supplements mostly to mention and to improve their overall health. In addition, to increase their energy, reduce inflammation, improve digestion, and get more vitamins and minerals. Some people use DSs to help prevent or treat specific health conditions, such as heart disease, diabetes, or cancer. Moreover, athletes and bodybuilders may use DSs to enhance their physical performance. Besides, some people use DSs to replace missing nutrients in their diet, such as vitamins and minerals. On top of that, some people use DSs to improve their mood or reduce stress [3, 11, 12]. According to a previous study conducted on adults, the most common reasons for using DSs were 45% to improve overall health and 33% to maintain health [11]. Some people need to use DSs, such as pregnant women, elderlies, athletes, and students that they need DSs for different reasons. Athletes need DSs because DSs enhance their training adaptations and reduce the possibility of training interruption due to reducing injury or illness. Also, DSs such as creatine and caffeine enhance the athlete's performance in training [13]. In addition, athletes should take vitamin C to improve athletic performance and to avoid fatigue and muscle weakness [14]. Pregnant women need nutrients during pregnancy due to the growth of

the fetus, so pregnant women need to take DSs to avoid diseases that may affect the fetus because of deficiencies. Deficiency of folic acid during pregnancy may cause the fetus with neural tube defects such as Spina bifida, so the US Centers for Disease Control and Prevention (CDC) recommended that pregnant women and those planning pregnancy should consume 0.4 mg/d of folic acid, which they will have it from food and folic acid supplements [15]. The elderly need to take DSs because studies have shown that their nutrient consumption from food is inadequate which may cause nutrient deficiencies [16]. For example, the elderly need 4700 mg of potassium daily to reduce the effect of sodium on blood pressure, so if the elderly do not get the daily amount of potassium they need from food, they need to take potassium supplements to complete their daily need of potassium [6]. A previous study was conducted in Saudi Arabia on male university students majoring in pharmacy on the use of DSs. 46.8% among the respondents used dietary supplements, 26.2% using DSs for health and well-being, and 20.5% for achieving nutritional goals [17]. Another study conducted on Bangladeshi undergraduate female students reported that the most common reason to use DSs is to improve their general health and well-being with 11%, while others consume DSs with their physician recommendation with 10.9% [18]. In addition to the students at the Bangladeshi University, the female students at the Saudi public University also have the same reasons for using DSs but in different percentages. 21.3% of the students use DSs for general health and well-being, and 6.1% use DSs with their physician recommendations [19]. Another study conducted in Saudi Arabia reported that the most common reasons for

female students to use DSs were 45.6% for aesthetic reasons and 42.4% for health promotion. Moreover, 43.6% of the students purchasing their DSs based on the recommendation of their doctor and dietitians, while 26.2% of them purchasing DSs based on the advice of friends and relatives, and others 26.5% through individuals' advice on social media sites. 39.1% of the participant students used more than one type of dietary supplement, 35.7% of them used only vitamin supplements, and 32.6% used more than one type of supplement together [20].

In this study, the data were gathered through a questionnaire distributed to students in some Turkish universities in order to explore their attitudes towards the use of dietary supplements and the reasons that prompted them to use these.

2. Experimental

2.1 Study Design

In this study, a cross-sectional online questionnaire was prepared using Google Form and conducted between January 15, 2023, and February 25, 2023. The questionnaire consisted of 13 questions and is divided into two main parts. The first part is about participants' socio-demographic background (nationality, gender, age, employment status, and educational level). In the second part, the participants were asked about their use of dietary supplements. The questionnaire is prepared in three different languages: Turkish, English, and Arabic. The online questionnaire has been designed to specifically meet the needs of the research question. Depending on the research question, the questionnaire has included questions related to the topic, such as demographic information, variables of interest, and questions

that measure the research objectives. The questions of the questionnaire were written in a way to be easy to understand, reasonable and appropriate to the target population, and clear and concise. Additionally, the questionnaire has been tested to ensure that it is valid and reliable where content validity, face validity, construct validity, criterion validity, and reliability have been taken into consideration.

2.2 Population and Sample

This study was conducted in Istanbul, Turkey, and involved participants from Istanbul Gelisim and Istanbul Nisantasi Universities. The questionnaire was distributed to the students from different faculties through email and WhatsApp groups. The questions were structured in a way that allowed participants to answer quickly and accurately. The questionnaire was also designed to be anonymous so that participants felt comfortable providing honest responses. The questionnaire asked participants to provide information about their socio-demographic backgrounds, academic level, and perceptions about dietary supplements. It also asked them to rate their experiences with dietary supplements in terms of satisfaction and engagement. At the end of the questionnaire, participants were asked to provide feedback on the survey, including suggestions for improvement. The feedback was used to make changes to the questionnaire to ensure that it was as effective as possible. Overall, the questionnaire provided important insights into the students' experiences with dietary supplements. It provided valuable information about their backgrounds, and perceptions of dietary supplements. The feedback was also useful for making changes to the questionnaire to improve its effectiveness.

2.3 Data analysis

All responses whether in Turkish or English language were collected and analyzed using SPSS Version 25 software. The choices were converted into numerical values for ease of calculations and analysis. The descriptive statistics of the participants such as frequencies and percentages were presented. The choices were converted into numerical values for ease of calculations and analysis which makes it easier to analyze the data quickly and accurately, as well as to compare different responses. This also makes it more appropriate to use mathematical operations and formulas on the data.

3. Results and Discussion

The study used a survey questionnaire to collect the data. The survey questions included information on the students' reasons for using

dietary supplements, their frequency of use, and their opinion on the safety and effectiveness of these supplements as shown in Table 1. This study was conducted on a sample of Turkish university students with the aim of knowing the students' attitudes towards the use of dietary supplements and the reasons that prompted them to do so. Table 2 shows that most of the participants included in the sample were females (72.2%) and the rest were males (27.8%) distributed over the first (61.6%), second (27.8%), third (8.6%), and fourth (2.0%) academic years. The number of Turkish nationals (68.2%) is more than that of non-Turkish nationals (31.8%). Private universities generally have a higher percentage of foreign students than public universities. Private universities also often offer more programs and resources that attract international students.

Table 1. The questions of the surveyed questionnaire (n=396).

#	Question
Q1	Gender
Q2	Academic year
Q3	Nationality
Q4	Do you live alone or with others?
Q5	How many times do you use Dietary supplements?
Q6	Do you suffer from illness?
Q7	Do you think that dietary supplements are good for health?
Q8	Why do you use Dietary supplements?
Q9	Which dietary supplements do you use?
Q10	Why don't you use dietary supplements?
Q11	Why don't you use dietary supplements?

Table 2. Socio-demographic profile of the participants (n=396).

Variable		Frequency	Percent
Gender	Male	110	27.78%
	Female	286	72.22%
Academic Year	First	244	61.62%

	Second	110	27.78%
	Third	34	8.59%
	Fourth	8	2.02%
Nationality	Turkish	270	68.18%
	Non-Turkish	126	31.82%

The obtained results show that most of the students live with their families are Turkish nationals (73.7%), and some foreign students reside in Turkey with their families, while a number of foreign students choose to live with other students (14.7) or on their own (11.6%) in student dormitories are either foreign students or Turkish students from cities far from the universities in which they

study as shown in Figure 1. Living alone or away from their families may affect the nature of the food students eat, especially if the house is far from the university. Therefore, the students spend part of their time commuting, which affects their desire to prepare healthy and appropriate food.

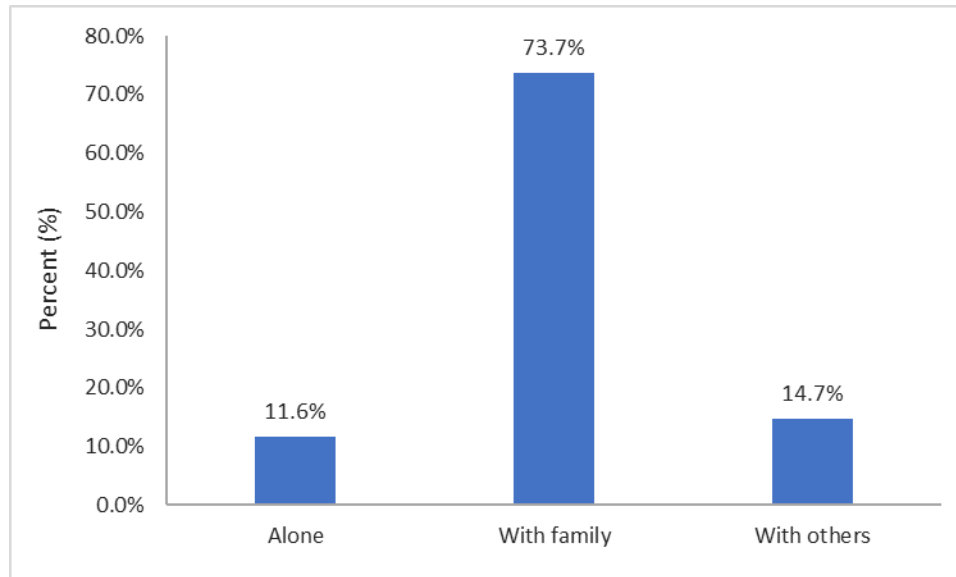


Figure 1. The living style of the participants (n=396).

Overall, the study showed that the majority of students (54.0%) did not use dietary supplements, while 33.3% of students sometimes took dietary supplements, 5.6% of these students on a weekly basis, and 7.1% of them took them on a daily basis as shown in Table 3. This percentage (54.0%) is considered somewhat strange, especially with the large increases in the use of dietary supplements among groups of society,

especially during the Covid-19 pandemic [21]. This may be due to a lack of awareness among many students, or to a lack of access to dietary supplements. It may also be due to the fact that many students do not understand the importance of dietary supplements in maintaining good health, or the potential benefits they can offer in terms of improving overall health. Additionally, the cost of dietary supplements may be prohibitive for

some people. This suggests that a significant portion of students may not be aware of the potential health benefits of dietary supplements or may not be convinced that they are necessary for their health. Additionally, some students may not be able to afford the cost of purchasing such supplements, or may simply not have the time or motivation to look into them, as the results show that about a third of the participants (37.9%) believe that supplements are beneficial for health, while 14.6% of the participants believe the opposite, whereas about half of the students (47.5%) are neutral, as shown in Table 3. The reasons they are not into dietary supplements are personal. Everyone is different and has

different opinions on supplements. Some may feel that they are unnecessary, while others may feel that they are beneficial. It really comes down to personal preference and individual beliefs. The results show that more than half of the students (57.6%) do not suffer from any disease, so it is expected that they will not resort to using dietary supplements. However, some students suffer from some diseases such as depression (21.7%), followed by migraine (10.61%), diabetes (4.0%), and menstrual irregularities (3.5%). Additionally, a small percentage of students suffer from some diseases such as underweight, asthma, hyperactivity, stress, and other diseases, as shown in Table 4.

Table 3. Participants’ responses on the importance of DSs and their uses (n=396).

Do you think that dietary supplements are good for health?				
Strongly disagree	Disagree	Maybe	Agree	Strongly agree
42 (10.6%)	16 (4.0%)	188 (47.5%)	118 (29.8%)	32 (8.1%)
How many times do you use Dietary supplements?				
Daily	Weekly	Sometimes	Never	
28 (7.1%)	22 (5.6%)	132 (33.3%)	214 (54.0%)	

Table 4. Participants’ responses on do they suffer from illness (n=396).

Variable	Frequency	Percent
No	228	57.58%
Depression	86	21.72%
Hypertension	8	2.02%
Under weight	10	2.53%
Diabetes mellitus	16	4.04%
Osteoporosis	0	0.00%
Asthma	10	2.53%
Epilepsy	4	1.01%
Sickle cell anemia	10	2.53%

Thalassemia	4	1.01%
Rheumatoid arthritis	4	1.01%
Ulcer	0	0.00%
Irregular menstruation	14	3.54%
Migraine	42	10.61%
Obesity	4	1.01%
hormonal disorder	4	1.01%
Anemia	4	1.01%
ADHD	10	2.53%
Irritable bowel syndrome	4	1.01%
Rheumatism	6	1.52%
Iron deficiency	6	1.52%

The most common reasons for using dietary supplements included improving overall health and energy levels, increasing nutrient intake, and helping to meet specific nutrient needs. Other reasons included managing medical conditions, improving athletic performance, and boosting the immune system [22-24]. The results of the study showed that about half of the participating students did not use supplements in general, while 30.3% of the participants used them to avoid a deficiency in one of the necessary substances for the body, such as vitamins. This is one of the most common uses among users of dietary supplements. 18.2% used supplements for improving general health while 17.2% of students used them for improving performance in general and that is also considered one of the most uses of

dietary supplements among people [12, 25]. These figures indicate that a sizeable portion of students is using supplements to improve their overall health and performance. This may reflect a growing trend of students looking to improve their health and well-being through the use of supplements. Some students have difficulty remembering, so they may resort to dietary supplements to enhance their memory, as the study also shows that 13.6% of the participants use dietary supplements to improve their memory capabilities. Other reasons include increasing immunity (11.6%), doctor's recommendations (10.1%), aesthetic reasons such as enhancing hair and skin quality (9.6%), disease prevention (7.6%), and weight gain (4.0%) as shown in table 5.

Table 5. Participants' responses on why they use dietary supplements (n=396).

Variable	Frequency	Percent
To improve performance	68	17.17%
To avoid deficiency	120	30.30%
To prevent chronic disease	30	7.58%
To achieve nutritional goals	48	12.12%

To improve general health and well-being	72	18.18%
To gain weight	16	4.04%
Physician recommendation	40	10.10%
Aesthetic reasons	38	9.60%
Immune booster	46	11.62%
Memory enhancer	54	13.64%
Pregnancy	0	0.00%
Others	4	1.01%
No reason	6	1.52%
I Don't use Dietary supplements	200	50.51%

Vitamin D is the most used dietary supplement among the participants, with a rate of 29.3%. The reason may be the widespread deficiency of this vitamin among many people, as well as the role of this vitamin in increasing immunity [25]. Vitamin B12 comes in second place, with a rate of 20.7%, for the same reasons mentioned in the case of vitamin D [25]. Multivitamins come in third place with a rate of 16.2% for their role in general in improving public health, followed by iron with a rate of 12.1%, as some students, especially females, suffer from anemia and iron deficiency. It is

commonly known that a lack of iron can lead to anemia, a condition where the body does not have enough healthy red blood cells [26]. Then comes vitamin C at a rate of 8.1% for its role as an antioxidant and in the prevention of diseases. Finally, some other dietary supplements are depicted in small proportions such as zinc (5.1%), omega-3 (4.0%), calcium (3.5%), vitamin B6 (3.0%), and vitamin B1 (2.0%). The least used dietary supplements by the participants were vitamin A, vitamin B2, vitamin B7, vitamin B9, and omega-6 with a ratio of 1.0% each, as shown in Table 6.

Table 6. Participants' responses on which dietary supplements they use (n=396).

Variable	Frequency	Percent
Multivitamins	64	16.16%
Vitamin A	4	1.01%
Vitamin B1 (Thiamin)	8	2.02%
Vitamin B2 (Riboflavin)	4	1.01%
Vitamin B3 (Niacin)	0	0.00%
Vitamin B5 (Pantothenic acid)	0	0.00%
Vitamin B6	12	3.03%
Vitamin B7 (Biotin)	4	1.01%
Vitamin B9 (Folic acid)	4	1.01%
Vitamin B12	82	20.71%

Vitamin C	32	8.08%
Vitamin D	116	29.29%
Vitamin E	0	0.00%
Vitamin K	0	0.00%
Omega 3	16	4.04%
Omega 6	4	1.01%
Iron	48	12.12%
Calcium	14	3.54%
Zinc	20	5.05%
I don't use dietary supplements	194	48.99%

Since a large percentage of the participants did not use dietary supplements, so we asked them about the reasons behind that. The most common reasons given by the participants for not using dietary supplements were lack of knowledge about dietary supplements (25.8%). This could be explained by the fact that some of the participating students are from humanities faculties, and they may suffer from a lack of sufficient information about the nature and function of dietary supplements [2]. The financial cost of purchasing dietary supplements comes in

second place among the reasons why participants did not take dietary supplements. While 13.1% of the participants believe that the reason is that they do not need these dietary supplements. It was previously mentioned in this study that a large percentage of students do not suffer from any diseases and that they do not need dietary supplements. Besides, 9.1% of the students believe dietary supplements are unnecessary and not beneficial to health from their point of view as shown in Table 7.

Table 8. Participants' responses on why don't they use dietary supplements (n=396).

Variable	Frequency	Percent
I use dietary supplements	156	39.39%
Cost	76	19.19%
I don't have enough information about DS	102	25.76%
Not useful for health	36	9.09%
I don't need dietary supplements	52	13.13%

The study suggests that students have a limited knowledge of dietary supplements and lack of awareness of their potential benefits, and the reason may be that some of the participants in the study come from a

variety of departments and disciplines, including social sciences, as well as the majority of students are first-year students who do not have sufficient knowledge and experience. Some studies have shown that the

use of dietary supplements is affected by the educational level and living standards, age and gender, as well as the social status of individuals. Where these studies showed that some women may use dietary supplements to improve their aesthetic appearance. Many women take dietary supplements for a variety of reasons, including to improve their overall health, to boost their energy levels, to reduce stress, and to improve their overall well-being [27, 28]. In order to raise awareness among students in particular, and people in general, we believe that it is necessary for universities, schools and the media to play a more effective role in properly defining dietary supplements and their role in improving people's health, as well as directing people to the dangers of taking these supplements without medical advice.

4. Conclusion

The study suggests that there is a need to provide better education on dietary supplements and to increase awareness of their potential benefits and risks. Universities and schools could start by teaching students about the importance of a balanced diet and the risks associated with taking supplements without medical advice. The media could help by providing accurate information about the benefits and risks of taking supplements, as well as providing information on how to safely choose and use them. Additionally, teachers, health professionals, and nutritionists should be available to provide students with the necessary advice and guidance. Dietary supplements are becoming increasingly popular as people become more aware of the importance of a balanced diet and good nutrition. However, there are both

pros and cons to taking dietary supplements, and it is important to be aware of both before making a decision. By spreading advice on the pros and cons of taking dietary supplements, people will be better informed and able to make a more informed decisions about their health. The pros of taking dietary supplements include the potential to fill in any nutritional gaps in one's diet, improve overall health, and help with the prevention of certain medical conditions. Some dietary supplements can also provide energy and help with weight loss. The cons of taking dietary supplements include the potential for over-consumption of certain vitamins and minerals, the risk of taking supplements that are not regulated by the FDA, and the potential for interactions with medications. After all, by educating people about the pros and cons of taking dietary supplements, they can make an informed decision about whether or not to take them.

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