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EVALUATION OF VITAMIN PRESCRIBING BY PHYSICIANS AT A UNIVERSITY HOSPITAL

Burcu Güney[1], Önder Sezer[2], Hamdi Nezih Dagdeviren[2]

[1]Saray State Hospital, Van, Turkey

[2]Trakya University Faculty of Medicine Department of Family Medicine, Edirne, Turkey

Correspondence:

Önder Sezer (e-mail: ondersezerdr@gmail.com)

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Ankara Yıldırım Beyazıt University Faculty of Medicine

Department of Family Medicine

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Abstract

Objectives: Vitamins are frequently included in physicians' prescriptions. Our study aims to determine the physicians' knowledge about vitamins and nutrition, detect the factors affecting their vitamin prescribing, and gain information about their vitamin prescribing behaviors.

Materials and Methods: Our study included 368 physicians who volunteered to participate in the study. We prepared and used a questionnaire, which consisted of 7 questions about sociodemographic data, 13 questions about nutrition knowledge, 13 questions about physicians' attitudes towards prescribing vitamins, and seven questions about the factors affecting the vitamin prescribing behaviors of physicians.

Results: The most frequently recommended supplements by physicians were vitamin D (62.50%), vitamin C (56.25%), and vitamin B12 (54.89%). Physicians with 11 years or more years in the profession ($p<0.001$) and internal medical sciences physicians ($p<0.001$) gave more correct answers to the knowledge questions. About the frequency of prescribing and recommending vitamins to their patients as supplements, 93 (25.27%) participants said they never did that, 242 (65.76%) said they rarely did that, and 33 (8.97%) said they frequently did that. 90 physicians (24.46%) stated that they prescribed vitamins only upon the patient's request. Only 37 (10.05%) participants considered themselves competent in terms of nutrition knowledge about vitamins. Female physicians used vitamin supplements more ($p<0.001$). Moreover, 305 (82.88%) physicians said that patients who requested vitamin supplements were mostly women.

Conclusion: We found that the majority of our participants gave a negative response to the requests to prescribe vitamins as supplements. Participants considered themselves lacking in nutrition knowledge about vitamins.

Keywords: Vitamins, inappropriate prescribing, physician's role, physicians.

Introduction

Vitamins are the basic organic substances that are necessary for the body and act as catalysts in our body. The prevalence of vitamin use has been increasing all over the world. Vitamins are prescribed to patients for treating deficiencies, and they have commonly used supplements in the absence of deficiencies.[1] Most people may believe that vitamin use is safe, even if the vitamins are not effective. Physicians may also agree to vitamin use by patients who are not diagnosed with vitamin deficiency, saying that "it probably won't help, but it won't hurt either". In addition, studies are reporting that most physicians recommend dietary supplements containing vitamins to their patients, whether they use them themselves or not.[2,3]

While there is a lot of advertising about the potential benefits of vitamins, there is less awareness of their possible adverse effects. Literature reviews about vitamin supplements reveal that some vitamins may even have harmful effects on individuals by increasing the risk of cancer. [4-6] According to some studies, the excessive intake of some vitamins through diet causes toxicity in rare cases. Moreover, the excessive intake of some vitamins in the form of drugs may cause hypervitaminosis.[7,8] In this respect, it is important for public health that physicians provide accurate information to their patients about nutrition. For physicians to successfully fulfill their duties of both providing information to their patients about nutrition and being role models, they must first have sufficient knowledge. At this point, physicians are the ones who will support adequate nutrition, promote the use of appropriate vitamins, and prevent inappropriate use. When physicians promote rational vitamin use and prevent the inappropriate use of vitamin supplements, this becomes an effort toward promoting public health.

Our study aims to determine the physicians' knowledge about vitamins and nutrition, detect the factors affecting their vitamin prescribing, and gain information about their vitamin prescribing behaviors.

Materials and Methods

We conducted our study with physicians working at Trakya University between April and August 2020. A total of 594 physicians working at the Trakya University Faculty of Medicine formed the universe of our study.

We obtained informed verbal consent from the participants and asked them to fill in the questionnaire prepared by the researchers. Working in non-prescribing units (Basic Medical Sciences, Public Health, etc.) was the exclusion criterion. We included 368 physicians that volunteered to participate in the study.

The questionnaire consisted of 40 questions. Seven questions were about sociodemographic data, 13 questions were about nutrition knowledge, 13 questions were about physicians' attitudes towards prescribing vitamins, and seven questions were about the factors affecting the vitamin prescribing behaviors of physicians.

Statistical analysis of the data obtained in the study was performed using SPSS 20 (Statistical Package for the Social Sciences, version 20, serial no:10240642). We employed non-parametric tests in our study because we found that the data from the questionnaire were not suitable for normal distribution.

Descriptive statistics, chi-square analysis test, Mann-Whitney U test, and Kruskal Wallis test were used as statistical methods. Statistical significance level (p) was shown together with the relevant tests and was considered significant when $p<0.05$ and insignificant when $p\geq0.05$.

Results

We conducted this study with the physicians who worked at the Trakya University Faculty of Medicine, wrote prescriptions for their patients, and volunteered to participate in our study between April 1, 2020, and August 31, 2020. We evaluated the data of 368 physicians that answered the questionnaire in full. We found that 54.62% (n=201) of the participants were female, and 45.38% (n=167) were male. The median age was 30 (mean 32.36±6.719) (minimum age 24, maximum age 52).

We evaluated the participants' answers to 13 knowledge questions and saw that the question with the highest correct answer was "Which is the best source of vitamin C?" with 95.11% (n=350). The question with the lowest correct answer was "Which is the best source of B2 (riboflavin)?" with 52.99% (n=195). The median of correct answers was 9 for the 13 knowledge questions.

Table 1 presents a comparison of the correct answers given to the knowledge questions by physicians in terms of gender, years in the profession, work unit, and age. According to this table, the correct answers of the physicians, who worked in the internal medical sciences units, who were older, and who had more than 11 years in the profession, were statistically significantly higher.

We asked the physicians: "Do you prescribe vitamins to patients and/or families who request that you prescribe vitamins as supplements, although vitamin therapy is not required?", two hundred seventy-eight of them (75.54%) answered "no", and 90 (24.46%) answered "yes". When asked about the gender of the patients who requested vitamin supplements, 305 (82.88%) answered "female" and 63 (17.12%) answered "male".

For the question "Do you recommend vitamin supplements when patients do not have a deficiency diagnosis, medical treatment indication, or request?" Ninety-three physicians (25.27%) answered "never", 242 (65.76%)

answered "rarely", and 33 (8.97%) answered "often". Table 2 shows the factors that physicians consider while prescribing vitamins.

Table 1. Comparison of physicians' characteristics and correct answers to knowledge questions

	Answers	n (%)	Median of correct answers	Min-Max	p-value
Gender	Male	167 (45.38)	9	3-13	0.143*
	Female	201 (54.62)	9	4-13	
Years in the profession	Less than a year	36 (9.78)	9	3-11	<0.001**
	1-5 years	202 (54.89)	9	4-11	
	6-10 years	51 (13.86)	9	6-12	
	More than 11 years	79 (21.47)	10	5-13	
Work unit	Internal medical sciences	280 (76.08)	9	3-13	<0.001*
	Surgery	88 (23.92)	8	4-11	
Age	24-30	217 (58.97)	9	3-11	<0.001**
	31-35	68 (18.48)	9	6-12	
	36-40	33 (8.97)	10	5-13	
	41 and above	50 (13.58)	10	8-12	

(n: number of physicians; %: percentage of physicians, Min: minimum, Max: maximum, *Mann-Whitney U; **Kruskal-Wallis)

To the question "Do you give nutrition counseling to patients with a diagnosis of a vitamin deficiency?" 354 (96.19%) physicians answered "Yes" and 14 (3.81%) answered "No".

To the question, "Do you think that you have sufficient nutrition knowledge to be able to give nutrition counseling to your patients about vitamins?" One hundred ninety-six physicians (53.26%) answered "partially sufficient", 135 (36.69%) answered "insufficient", and 37 (10.05%) answered "sufficient". To the question "Do you think that you received sufficient education on vitamins and nutrition in medical school?" 266 physicians (72.29%) answered "No", and 102 (27.71%) answered "Yes".

We found a statistically significant relationship between the physicians' gender and their use of vitamins ($p<0.001$). Female physicians stated that they used vitamins more frequently than male physicians.

We found a statistically significant relationship between the physicians' use of vitamins and their prescribing and recommending of vitamins to patients ($p=0.002$). Physicians who used vitamins regularly and every day had a significantly higher rate of recommending supplements ($p=0.002$).

Table 2. Distribution of considerations when prescribing vitamins

	Most important		Important		Less important		Least important		Total	
	n	%	n	%	n	%	n	%	n	%
Efficacy	252	68.48	55	14.94	16	4.35	45	12.23	368	100
Possible side effects	25	6.80	192	52.17	127	34.51	24	6.52	368	100
Cost	26	7.07	76	20.65	155	42.12	111	30.16	368	100
Brand	65	17.66	45	12.23	69	18.75	189	51.36	368	100

Discussion

The use of vitamins as supplements has become widespread in our daily practice due to media advertisements and patients' requests. A study reporting the trends in dietary supplement use among U.S. adults with the National Health and Nutrition Examination Survey (NHANES) between 1999 and 2012 found the use of supplements to be 52%.[1] In the same vein, according to NHANES data, multivitamin-mineral products were the most frequently used type of supplement at 31%.[9] The use of supplements varies in European countries. For example, studies found that it was common in Denmark and Germany (59% and 43% of the adult population, respectively) but less in Spain and Ireland (9% and 23%, respectively).[10]

A study found that the most used supplement group in our country consisted of vitamins and vitamin-mineral complexes.[11] In a study conducted in Yalova, 50% of participants stated that they used vitamins because a physician recommended them.[12] In our study, 65.76% of the physicians stated that they rarely prescribed and recommended vitamin supplements to their patients, 25.27% never did that, and 8.97% frequently did that. When asked whether they prescribed vitamins to patients and/or families who requested prescriptions for vitamins as supplements, even though vitamin therapy was not required, 75.54% of the physicians answered "no". With these results, we determined that the majority of the physicians participating in our study rarely prescribed and recommended vitamins except for treatment.

Rational drug use is the planning, implementation, and monitoring process that ensures the safe, effective, appropriate, and economical administration of drug therapy. The majority of the physicians in our study stated that they responded negatively to patients' requests for prescriptions for vitamin supplements, and they rarely prescribed or recommended vitamin supplements. In this case, we can say that the physicians acted in line with

rational vitamin use. We determined that the factors that physicians considered most when prescribing vitamins were efficacy and brand. It seems that brand perception affects even the physicians' behavior.

One of the key strategies for promoting a healthy and balanced diet in society is to advocate for healthy nutrition through health care services. Physicians play an important role in this care. In our country, the number of studies on the nutrition knowledge levels of physicians is insufficient. Özçelik and Süroğlu conducted a study in Ankara in 2000 to determine the nutrition knowledge of physicians and found nutrition knowledge levels of 5.33%, 82.34%, and 12.33% of physicians were good medium, and insufficient, respectively.[13] Again in Ankara in 2007, Özçelik et al. conducted a study to determine the nutrition knowledge of physicians in Turkey and found that the nutrition knowledge level of 60.0% of the physicians was mediocre, that of 33.8% was poor, and that of 6.2% was good.[14] In our study, physicians gave correct answers to an average of 9 questions out of the 13 knowledge questions about vitamins. Our participants had a high rate of wrong answers to the questions regarding sources of B vitamins (except for vitamin B12). In the study by Ozcelik et al., male physicians gave more correct answers than female physicians, physicians over 41 years of age gave more correct answers than younger physicians, and physicians with 21 or more years of experience gave more correct answers than physicians with fewer years of experience.[14] Similarly, in our study, physicians over 36 years of age and physicians with 11 or more years of work experience had more correct answers. These results suggest that physicians' experience of vitamin use and nutrition has increased over the years. In our study, internal medical sciences physicians gave more correct answers than surgical unit physicians. This result may be due to differences in clinical practice and education. We can say that physicians working in surgical units have relatively less knowledge of vitamin use and nutrition. Nutrition is a crucial factor in wound healing, and it should be handled more seriously by surgery physicians and supported in education programs. There is a need for more detailed and up-to-date studies on the nutrition knowledge level of physicians in our country. We believe that identifying deficiencies and covering those deficiencies in education will benefit both physicians and patients.

The systematic review by Crowley et al. reported that although medical students wanted to receive nutrition education to develop knowledge, skills, and confidence to counsel patients, they were not supported to provide high-quality and effective nutrition care.[15] Similarly, in our study, physicians were asked, "Do you think that you received sufficient education on vitamins and nutrition in medical school?" and 72.29% of them answered "no". In other words, about three-quarters of the physicians in our study thought that they had not received adequate nutrition education about vitamins in medical school education.

Almost all physicians (96.19%) answered "yes" to the question, "Do you give nutrition counseling to patients with a diagnosis of a vitamin deficiency?". When asked, "Do you think that you have sufficient nutrition knowledge to be able to give nutrition counseling to your patients about vitamins?" 36.69% answered

"insufficient", 53.26% answered "partially sufficient", and 10.05% answered "sufficient". While almost all physicians in our study stated that they gave nutrition counseling to their patients, only 10.05% of them reported that they felt fully competent in terms of nutrition knowledge. In light of the data obtained in our study, it seems necessary to review the vitamin and nutrition education given in medical school education and increase its effectiveness. For the post-graduation period, providing nutrition education about vitamins, both through in-service training and during internships, will benefit both physicians and patients.

There are very few studies in the literature on vitamin use by physicians in our country. A study conducted by Bülbül et al. in Kırklareli found that 67.8% of individuals used vitamins for themselves over the last year.[16] In our study, we found that 17.12% of the physicians had never used vitamins, and 82.88% had used vitamins at least once in their lives. These results suggest that there is a high rate of vitamin use among physicians. In our study, 18.75% of the physicians stated that they used vitamins regularly, and 35.86% of them occasionally. The rate of occasional vitamin use in our study was similar to Coşkun's study, but the rate of regular vitamin use was lower. The reason for this may be that physicians are more conscious than society about vitamin use. In our study, the rate of vitamin use was higher in female physicians than in male physicians in both groups of regular and occasional vitamin use. In the literature, there are studies supporting the notion that women are more interested in vitamin use, and our study indicated similar results.[17]

There are very few studies in the world and in Turkey defining the demographic characteristics of people who use vitamin supplements. The study by Kantor et al. covering U.S. adults from 1999-to 2012 found that women (58%) were more likely to use supplements than men.[1] Similarly, Spencer et al. studied vitamin and mineral supplement use among U.S. medical students and found that women used supplements more commonly and consistently than men.[17] In our study, 83.96% of the physicians answered "yes" to the question of whether patients who requested vitamin supplements were mostly female. Consistent with the literature, the physicians in our study stated that female patients requested more vitamins than male patients. This may be due to the fact that women are more sensitive about health than men.

The study by Dickinson et al., conducted with physicians and nurses in 2007, found that the proportion who recommended supplements to their patients was slightly higher among those who used supplements themselves.[2] In our study, we found that the physicians who regularly used vitamins recommended supplements to their patients, and their proportion was significantly higher than the physicians who never used vitamins. These results suggest that when the physicians used vitamins themselves, they tended to recommend supplements to patients.

According to 2019 data from the Nutrition and Health Survey of Turkey (NHST), the most frequently used nutritional supplements in all age groups were as follows: multivitamin (1.2%) and calcium (1.2%) in the 15-

18 age group; vitamin B12 (2.9%) and vitamin D (2.2%) in the 19-64 age group; and similarly, vitamin B12 (5.5%) and vitamin D (2.8%) in the 65 and over age group.[18] In our study, we found that the most frequently prescribed or recommended vitamin supplements by physicians were vitamin D (62.50%), vitamin C (56.25%), and vitamin B12 (54.89%). We found that the most frequently used vitamins by physicians were vitamin C (35.33%), vitamin D (20.65%), and vitamin B12 (17.39%). According to the NHST, the most frequently used vitamins in society were the ones that were most frequently prescribed and used by the physicians in our study. In our study, we found that, in addition to vitamin B12 and vitamin D, physicians frequently prescribed vitamin C and used it themselves. Bulbul et al. found that the most frequently used vitamins by individuals were vitamin B12 (6.2%) and vitamin C (3.4%), and this finding was similar to our findings.[16] The frequent references to and recommendations of these vitamins on platforms such as social media affect people's preferences and increase demand. In addition, the idea that excessive use is not harmful also increases people's vitamin requests from physicians or pharmacists.

Limitations

Since it was conducted in a single university hospital, the results of the study cannot be generalized to the whole country. The majority of the participants are residents, so different results can be obtained according to the studies to be carried out in the field.

Physicians frequently refer to nutrition and vitamin knowledge in their daily practices. However, the physicians' level of education and knowledge on these issues is not sufficient. While nutrition and vitamin information increase as professional experience increases, the information given on these subjects during medical education is insufficient. In the process of protecting and promoting health, proper and balanced nutrition can only be provided with the competence of physicians. Therefore, it is necessary to eliminate the lack of knowledge immediately, especially in surgical units, in order to meet this need.

Ethical Considerations: We obtained the Ethics Committee Approval through the decision (dated 02.03.2020 and numbered 2020/125) of the Scientific Research Ethics Committee of Trakya University.

Conflict of Interest: The authors declare no conflict of interest.

(Some of the data of our work has been presented in the 20th National Family Medicine Congress, which was held on 11-14 November 2021 online.)

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