

## EVALUATION OF VITAMIN AND DIETARY SUPPLEMENT USE HABITS CONCERNING ACTUAL NEEDS AND THE INFLUENCE OF THE MEDIA

### *Vitamin ve Gıda Takviyesi Kullanım Alışkanlıklarının Gerçek İhtiyaçlar ve Medya Etkisi Açısından Değerlendirilmesi*

Metin Deniz KARAKOÇ<sup>1</sup>  Demet Döndü KASIM<sup>1</sup> 

<sup>1</sup> Department of Medical Pharmacology, Faculty of Medicine, Pamukkale University, DENİZLİ, TÜRKİYE

#### ABSTRACT

**Objective:** In recent years, the use of vitamins and other supplements has become increasingly widespread worldwide. The aim of this study is to evaluate the habits related to vitamin and dietary supplement use among the general population. Specifically, the study investigates whether the consumption of these products corresponds to actual health needs and explores the extent to which media influence affects individuals' decisions to use such supplements.

**Material and Methods:** A descriptive cross-sectional survey was conducted using a structured questionnaire administered to adult participants from various demographic backgrounds. The survey included questions regarding participants' frequency and purpose of vitamin and dietary supplement use, sources of information influencing their decisions, perceived benefits, and whether their use was based on medical advice or personal preference. Descriptive statistics were used to analyze usage patterns, and chi-square tests were performed to assess associations between demographic variables and supplement use behaviors.

**Results:** A total of 400 individuals participated in the study. Immune support was the most common reason for use (88.9%;  $p<0.0001$ ). The most preferred place to purchase the products was found to be pharmacies (52.2%;  $p<0.0001$ ). Among male individuals, the most cited reason was brand reliability (78.7%), whereas among female participants, personal recommendation (92.2%) was the most influential factor ( $p<0.0001$ ). Media influenced 75% of users, particularly younger adults ( $p=0.00043$ ). While 90% of the users reported some benefit, 7.5% experienced adverse effects.

**Conclusion:** The findings indicate widespread and often unsupervised use of vitamin and dietary supplements, with media influence and peer recommendations playing a substantial role in product choice. Despite high usage rates, consultation with physicians remains insufficient. These results highlight the need for improved public education and regulatory measures to promote safe and evidence-based supplement use.

**Keywords:** : Vitamin, dietary supplement, media, adverse effects, herb-drug interactions

#### ÖZ

**Amaç:** Dünya genelinde son yıllarda vitamin ve diğer besin takviyelerinin kullanımı giderek yaygınlaşmıştır. Bu çalışmanın amacı, genel popülasyonun vitamin ve besin takviyesi kullanımına ilişkin alışkanlıklarını değerlendirmektir. Özellikle bu ürünlerin tüketiminin gerçek sağlık ihtiyaçlarına dayanıp dayanmadığı ve bireylerin bu takviyeleri kullanma kararlarında medyanın ne ölçüde etkili olduğu araştırılmıştır.

**Gereç ve Yöntemler:** Farklı demografik özelliklere sahip yetişkin katılımcılara uygulanan yapılandırılmış bir anket aracılığıyla tanımlayıcı kesitsel bir araştırma yapılmıştır. Anket; katılımcıların vitamin ve besin takviyesi kullanım sıklığı ve amacı, kararlarını etkileyen bilgi kaynakları, algılanan faydalar ve bu ürünleri kullanmalarının tıbbi öneriye mi yoksa kişisel tercihe mi dayandığı gibi soruları içermektedir. Kullanım desenleri tanımlayıcı istatistiklerle analiz edilmiş, demografik değişkenlerle takviye kullanım davranışları arasındaki ilişkileri değerlendirmek için ki-kare testleri uygulanmıştır.

**Bulgular:** Çalışmaya toplam 400 kişi katılmıştır. Takviye kullanımında en yaygın nedenin başıbağlılığı desteklemek olduğu belirlenmiştir (%88,9;  $p<0,0001$ ). Ürünlerin en çok temin edildiği yerin eczaneler olduğu saptanmıştır (%52,2;  $p<0,0001$ ). Erkek katılımcılarda en sık belirtilen tercih nedeni marka güvenilirliği (%78,7) iken, kadın katılımcılarda en etkili faktör kişisel öneri (%92,2) olmuştur ( $p<0,0001$ ). Medya, özellikle genç yetişkinlerde olmak üzere kullanıcıların %75'ini etkilemiştir ( $p=0,00043$ ). Kullanıcıların %90'ı belirli faydalar gördüklerini, ancak %7,5'i yan etki yaşadıklarını belirtmiştir.

**Sonuç:** Araştırmamız vitamin ve gıda takviyelerinin yaygın şekilde ve çoğunlukla denetimsiz kullanıldığını göstermektedir. Ürün tercihinde medya etkisi ve çevresel öneriler önemli rol oynamaktadır. Yüksek kullanım oranlarına rağmen hekim danışmanlığı yetersiz kalmaktadır. Bu sonuçlar, toplumun bilinçlendirilmesi ve güvenli, kanıta dayalı takviye kullanımını teşvik edecek düzenleyici önlemlerin gerekliliğini ortaya koymaktadır.

**Anahtar Kelimeler:** Vitamin, besin takviyesi, medya, yan etkiler, bitki-ilaç etkileşimleri



Correspondence/Yazışma Adresi:

Department of Medical Pharmacology, Faculty of Medicine, Pamukkale University, DENİZLİ, TÜRKİYE

Phone/Tel: +905058429151

Received/Geliş Tarihi: 27.10.2025

Dr. Metin Deniz KARAKOÇ

E-mail/E-posta: mdkarakoc@pau.edu.tr

Accepted/Kabul Tarihi: 30.01.2026

## INTRODUCTION

Vitamins are carbon-containing organic molecules required in small quantities for physiological cell function, growth, and development. Currently, thirteen vitamins are recognized: A, B1, B2, B3, B5, B6, B7, B9, B12, C, D, E, and K. They are essential nutrients that the body must obtain from dietary sources, as each plays a distinct role in maintaining human health.<sup>1</sup> While vitamins comprise a specific group of compounds, dietary supplements encompass a broader category, including minerals (e.g., magnesium, calcium, selenium), amino acids (e.g., glutamine, L-carnitine, arginine), herbal extracts (e.g., olive leaf extract, aloe vera extract, echinacea extract), and other bioactive compounds intended to complement the diet. The human body cannot synthesize most vitamins, amino acids, and minerals, necessitating their intake through diet or supplementation. Herbal extracts are also widely used, primarily to enhance vitality, boost immunity, and protect against diseases.<sup>2,3</sup> Given their critical roles in cellular metabolism, immune function, and disease prevention, the consumption of these substances has long been advocated to promote well-being.<sup>4-6</sup>

In recent years, the use of vitamins and dietary supplements has significantly increased worldwide. This trend can be attributed to various factors, including heightened health awareness, aging populations, and the widespread availability of nutritional products.<sup>7</sup> Additionally, shifts in dietary habits, increased prevalence of chronic diseases, and concerns regarding nutrient deficiencies have further contributed to their growing popularity. However, despite their perceived benefits, the necessity of routine supplementation for the general population remains a topic of debate among healthcare professionals.<sup>8,9</sup> One critical aspect influencing the widespread consumption of dietary supplements is the role of media. Traditional and digital media platforms actively shape public perceptions by promoting health-related information, often emphasizing the advantages of supplement use. Advertising, promotions, marketing campaigns, and user success stories often reinforce the belief that supplements are essential for maintaining optimal health, even when they are not medically necessary.<sup>10,11</sup> Individuals' reliance on these products based on incorrect or incomplete information, without adequate scientific guidance, may lead to inappropriate use that could further jeopardize their health. This situation raises the question of whether vitamins and dietary supplements provide significant health benefits or pose a risk to human health when used indiscriminately. While some studies support their efficacy in preventing deficiencies and managing specific conditions, others raise concerns about potential adverse effects, including toxicity, drug interactions, and metabolic imbalances.<sup>12-16</sup>

Given the conflicting perspectives, it is crucial to examine whether individuals are making informed choices regarding supplementation or are merely influenced by external factors such as media portrayals and commercial interests.

This study aims to investigate the patterns of vitamin and dietary supplement use concerning actual physiological needs and the extent of media influence on consumer/patient behavior. By analyzing the motivations behind supplementation and assessing the alignment between usage habits and scientific recommendations, this research seeks to provide a comprehensive understanding of the implications of dietary supplement consumption in modern society. The findings may offer valuable insights into public health policies, consumer education strategies, and the responsible use of nutritional supplements.

## MATERIALS AND METHODS

The research was conducted between 1.03.2025-30.04.2025, in Pamukkale University, Faculty of Medicine Hospital, with individuals aged above 18 who had at least basic literacy skills. Study data were collected using a 15-item evaluation questionnaire titled "evaluation of vitamin and dietary supplement use habits concerning actual needs and the influence of the media." No specific sampling method was employed. Participants were recruited through convenience sampling using an online questionnaire administered via Google Forms. The survey link was emailed to personal email addresses of adults aged 18 years and older. To reduce selection bias, participation was voluntary and anonymous, no incentives were offered, and no specific demographic subgroup was intentionally targeted. A total of 400 usable responses were obtained in the study. Only fully completed questionnaires were included in the analysis; therefore, no missing data were present. The questionnaire was designed by the authors based on the study objectives and relevant literature. Before implementation, the questionnaire was pilot tested on 12 medical students to evaluate its clarity, relevance, and feasibility. Feedback obtained from the pilot study was used to refine the final version of the questionnaire. The questionnaire included four questions regarding the sociodemographic characteristics of participants, such as age, gender, education level, and employment status. Additionally, 11 questions addressed various aspects of vitamin and/or dietary supplement use, including usage habits, reasons for use, product and vendor selection criteria, the average monthly cost of these products, perceived benefits or harms, the presence of any chronic disease requiring continuous medication, consultation with a healthcare professional, and the influence of media on product usage. Medications containing vitamins and minerals that were prescribed by a

physician for indications such as anemia, asthenia, avitaminosis, or pregnancy were not included in the evaluation.

### Statistical Analysis

Statistical analysis of the data was conducted using the Statistical Package for the Social Sciences (SPSS) version 31.0. Descriptive statistics, such as mean, frequency, and percentage (%), were used to examine the relationships between variables, along with the chi-square ( $\chi^2$ ) test. Chi-square tests were used to evaluate associations between categorical variables, as the study outcomes and demographic characteristics were expressed as frequencies and percentages. The assumptions of the chi-square test were checked prior to analysis, and expected cell frequencies were adequate for the majority of comparisons. When necessary, appropriate adjustments were made. A p-value of  $<0.05$  was considered statistically significant. The research is a descriptive cross-sectional study. It was initiated with the approval of the Pamukkale University Non-Interventional Clinical Research Ethics Committee (22.01.2025-E.643293). Throughout the study, the principles of the Declaration of Helsinki were followed.

## RESULTS

A total of 400 individuals who met the study's inclusion criteria participated in the research. Table 1 presents the distribution of participants according to socio-demographic characteristics, including age, gender, education level, and employment status. The majority of the study population was between 31 and 60 years of age ( $n=284$ ; 71%), held a university degree ( $n=292$ ; 73%), and were employed in predominantly sedentary occupations, such as office work or driving.

**Table 1:** Distribution of participants according to sociodemographic characteristics

| Parameter                | Total      |            |
|--------------------------|------------|------------|
|                          | n          | %          |
| <b>Gender</b>            |            |            |
| Female                   | 192        | 48         |
| Male                     | 208        | 52         |
| <b>Age range</b>         |            |            |
| 18-30                    | 68         | 17         |
| 31-44                    | 156        | 39         |
| 45-60                    | 128        | 32         |
| 60+                      | 48         | 12         |
| <b>Education</b>         |            |            |
| Primary school           | 44         | 11         |
| High school              | 64         | 16         |
| University               | 292        | 73         |
| <b>Occupation status</b> |            |            |
| Student                  | 52         | 13         |
| Housewife                | 32         | 8          |
| Retired/unemployed       | 40         | 10         |
| Sedentary jobs*          | 224        | 56         |
| Active jobs**            | 52         | 13         |
| <b>Total</b>             | <b>400</b> | <b>100</b> |

\*office jobs/driver/etc. \*\* farmer/sportsman/tradesman/etc.

In response to whether they had ever used any vitamin or dietary supplements, 53% of participants ( $n=212$ ) reported regular use, while 37% ( $n=148$ ) stated that they had used such products in the past but were not currently using them. Additionally, 36% of respondents ( $n=144$ ) reported the simultaneous use of multiple products. In our study, it was determined that participants who used supplements ( $n=360$ ) spent an average of 19.5 United States Dollars (USD) per month on these products. Participants' motivations for initiating supplement use and their criteria for choosing specific products are presented in Table 2. Table 3 displays the distribution of preferred vitamin and dietary supplements according to sociodemographic characteristics.

Upon evaluation by gender, no statistically significant differences were observed in the place of product procurement, the influence of media, the perceived benefit from the product, or the experience of notable adverse effects ( $p>0.05$ ). However, a significant difference was found between male and female participants regarding their prioritization criteria when selecting vitamin and dietary supplements ( $p<0.0001$ ). For male participants, the most cited reason was brand reliability (78.7%;  $n=148$ ), whereas for female participants, personal recommendation was the most influential factor (92.2%;  $n=142$ ). Moreover, the proportion of participants who consulted a healthcare professional before using supplements was markedly higher among women (95.3%;  $n=164$ ) compared to men (20.8%;  $n=43$ ) ( $p<0.0001$ ).

When analyzed by age group, no statistically significant differences were observed in criteria for product selection, perceived benefit, or the experience of adverse effects related to supplement use ( $p>0.05$ ). However, media influence on the decision to use vitamin and dietary supplements was significantly more prominent among individuals aged 18--44 compared to those aged 45 and above ( $p<0.0001$ ). Participants within the 18-44 age group were more inclined to purchase supplements online, whereas those aged 45 and older primarily buy these products from physical outlets such as pharmacies, supermarkets, or herbal shops ( $p<0.0001$ ). Additionally, individuals aged 31-60 (85.9%;  $n=158$ ) were significantly more likely to consult a healthcare professional before supplement use compared to participants in other age groups ( $p<0.0001$ ).

Individuals with a primary school education or lower were found to predominantly prefer pharmacies (81.8%;  $n=27$ ) as their source for obtaining vitamin and dietary supplements ( $p=0.03$ ). Notably, the majority of participants who reported experiencing a significant adverse effect associated with supplement use were university graduates (96.3%;  $n=26$ ) ( $p=0.032$ ). No statistically significant differences were identified among educational level groups in terms of product selection criteria, consulting a healthcare professional, or perceived benefit from supplement use ( $p>0.05$ ).

**Table 2:** Distribution of participants' vitamin/dietary supplement use and preference criteria

| Parameters                                                                                        | n          | %          | p       | $\chi^2$ |
|---------------------------------------------------------------------------------------------------|------------|------------|---------|----------|
| <b>Reason for use? *</b>                                                                          |            |            | <0.0001 | 385.5    |
| Supporting immunity/protecting from diseases                                                      | 320        | 88.9       |         |          |
| Healing my current disease                                                                        | 84         | 23.3       |         |          |
| Improving sleep quality                                                                           | 8          | 2.2        |         |          |
| <b>What kind of products do you prefer? **</b>                                                    |            |            | <0.0001 | 380.6    |
| Vitamins/minerals and combinations                                                                | 302        | 83.9       |         |          |
| Herbal products                                                                                   | 168        | 46.7       |         |          |
| Protein/amino acid supplements                                                                    | 58         | 16.1       |         |          |
| Animal based products (collagen/chondroitin/propolis)                                             | 8          | 2.2        |         |          |
| <b>Where do you get your products most often?</b>                                                 |            |            |         |          |
| Pharmacy                                                                                          | 188        | 52.2       | <0.0001 | 87.2     |
| Online sales sites (internet)                                                                     | 128        | 35.6       |         |          |
| Market/marketplace/herbalist                                                                      | 44         | 12.2       |         |          |
| <b>What is the most important criteria when choosing a product?</b>                               |            |            | <0.0001 | 185.3    |
| Brand reliability                                                                                 | 190        | 52.8       |         |          |
| Recommendation                                                                                    | 90         | 25.0       |         |          |
| Content quality                                                                                   | 44         | 12.2       |         |          |
| Price                                                                                             | 36         | 10.0       |         |          |
| <b>Did the media have an impact on your decision?</b>                                             |            |            | 0.00043 | 15.52    |
| Yes, it was very influential                                                                      | 119        | 33.1       |         |          |
| Yes, it was somewhat influential                                                                  | 151        | 41.9       |         |          |
| No, it had no impact                                                                              | 90         | 25.0       |         |          |
| <b>Have you consulted a specialist before using supplements?</b>                                  |            |            | 0.673   | 0.18     |
| Yes                                                                                               | 184        | 51.1       |         |          |
| No                                                                                                | 176        | 48.9       |         |          |
| <b>Did you experience the benefits you expected from the product(s) you most recently used?</b>   |            |            | <0.0001 | 399.1    |
| Yes, absolutely.                                                                                  | 76         | 21.1       |         |          |
| Yes, I benefited partially.                                                                       | 248        | 68.9       |         |          |
| No, I didn't benefit from it.                                                                     | 32         | 8.9        |         |          |
| No, on the contrary, it damaged my health.                                                        | 4          | 1.1        |         |          |
| <b>Have you ever experienced any notable adverse effects as a result of using these products?</b> |            |            | <0.0001 | 260.10   |
| Yes                                                                                               | 27         | 7.5        |         |          |
| No                                                                                                | 333        | 92.5       |         |          |
| <b>Total</b>                                                                                      | <b>360</b> | <b>100</b> |         |          |

In the sections marked \* and \*\*, participants marked more than one option. \*52 participants marked two options together. \*\*114 participants used two products simultaneously, and 31 participants used three different products simultaneously.

**Table 3:** Distribution of vitamin & dietary supplement use according to the sociodemographic characteristics

|                    | Vitamin & minerals |      | Herbals |      | Protein & amino acids |      | Animal based products* |     | Total      |
|--------------------|--------------------|------|---------|------|-----------------------|------|------------------------|-----|------------|
|                    | n                  | %    | n       | %    | n                     | %    | n                      | %   | n          |
| <b>Gender</b>      |                    |      |         |      |                       |      |                        |     |            |
| Male               | 162                | 86.2 | 88      | 46.8 | 29                    | 15.4 | 5                      | 2.7 | 188        |
| Female             | 140                | 81.4 | 80      | 46.5 | 29                    | 16.9 | 3                      | 1.7 | 172        |
| <b>Age range</b>   |                    |      |         |      |                       |      |                        |     |            |
| 18-30              | 135                | 87.1 | 79      | 51   | 21                    | 13.5 | 2                      | 1.3 | 155        |
| 31-44              | 125                | 81.2 | 66      | 42.9 | 26                    | 16.9 | 4                      | 2.6 | 154        |
| 45-60              | 24                 | 80.0 | 12      | 40.0 | 4                     | 13.3 | 1                      | 3.3 | 30         |
| 60+                | 18                 | 85.7 | 11      | 52.4 | 7                     | 33.3 | 1                      | 4.8 | 21         |
| <b>Education</b>   |                    |      |         |      |                       |      |                        |     |            |
| Primary school     | 30                 | 90.9 | 10      | 30.3 | 1                     | 3    | 0                      | 0.0 | 33         |
| High school        | 47                 | 85.5 | 24      | 43.6 | 9                     | 16.4 | 0                      | 0.0 | 55         |
| University         | 225                | 82.7 | 134     | 49.3 | 48                    | 17.6 | 8                      | 2.9 | 272        |
| <b>Occupation</b>  |                    |      |         |      |                       |      |                        |     |            |
| Student            | 38                 | 82.6 | 22      | 47.8 | 9                     | 19.6 | 0                      | 0.0 | 46         |
| Housewife          | 22                 | 91.7 | 5       | 20.8 | 1                     | 4.2  | 0                      | 0.0 | 24         |
| Retired-unemployed | 28                 | 87.5 | 11      | 34.4 | 2                     | 6.3  | 1                      | 3.1 | 32         |
| Sedentary jobs**   | 172                | 82.7 | 106     | 51.0 | 36                    | 17.3 | 6                      | 2.9 | 208        |
| Active jobs***     | 42                 | 84.0 | 24      | 48.0 | 10                    | 20.0 | 1                      | 2.0 | 50         |
| <b>Total</b>       |                    |      |         |      |                       |      |                        |     | <b>360</b> |

\* Collagen, chondroitin and propolis \*\*office jobs/driver/etc. \*\*\*farmer/sportsman/ etc.

In our study, 81.2% (n=224) of the 276 participants who were actively employed were found to work in relatively sedentary occupations, such as office-based jobs where

tasks are primarily performed while seated. No statistically significant differences were observed among occupational groups regarding perceived benefit

from supplement use or the occurrence of adverse effects ( $p>0.05$ ). For housewives, personal recommendation emerged as the most influential criterion in choosing a supplement ( $p=0.0013$ ). Additionally, housewives reported significantly higher rates of consulting a healthcare professional prior to supplement use (95.8%;  $n=23$ ) and a stronger preference for obtaining products from pharmacies (87.5%;  $n=21$ ) compared to other occupational groups ( $p=0.00044$ ;  $p=0.015$ , respectively).

## DISCUSSION

Recent decades have witnessed a marked increase in individuals' levels of stress, anxiety, and psychological burden, driven by the fast-paced nature of modern life. In parallel, there has been growing concern regarding the declining nutritional quality of food, including reduced levels of natural vitamins and antioxidants due to factors such as intensive agricultural practices and food processing.<sup>17</sup> These concerns have been further amplified by the global COVID-19 pandemic, which served as a critical turning point in public attitudes toward health maintenance and immune system support. As a result, the use of vitamin and dietary supplements has risen dramatically across the world, reflecting a shift toward preventive health behaviors.<sup>18</sup> This surge in consumption, often shaped by perceived health needs rather than clinically established deficiencies, underscores the need to better understand the motivations behind supplement use and the extent to which media influence shapes these decisions. In this context, identifying the patterns of vitamin and dietary supplement use in the population, along with the factors influencing these preferences and their associated advantages and disadvantages, is crucial for both healthcare professionals and public health.

The global use of vitamin and dietary supplements is prevalent for various reasons. Recent studies conducted across various countries have reported that the prevalence of supplement use in populations ranges from 18.8% to 91.1%.<sup>19-26</sup> The prevalence observed in our study (90%) also falls within this broad range. This considerable variation is likely due to differences in the target populations across studies, such as students, athletes, geriatric patients, and office workers. Nevertheless, a consistent finding shared by most of these studies, including ours, is the widespread global use of vitamin and dietary supplements. These products are used for a variety of purposes, including maintaining health, promoting weight loss, producing doping-like effects, and treating female infertility.<sup>2,27</sup> However, recent studies have shown that these products are primarily used to support the immune system and prevent illness, rather than to treat specific diseases.<sup>28,29</sup> In the present study, 88.9% of the participants cited

immune system support and disease prevention as the principal motivations, consistent with trends observed worldwide. Accordingly, the findings of this study align with those reported in previous research.

Our study concluded that the most commonly preferred supplements were vitamin and mineral combinations (83.9%). The results indicate that a significant portion of individuals who use vitamin and dietary supplements are employed in sedentary occupations that require minimal physical exertion. Similarly, studies conducted in diverse regions-including Pakistan, Canada, Bangladesh, and Poland-have reported consistent findings, noting that vitamin and mineral combinations are the most commonly preferred supplements.<sup>19,20,22,26</sup>

The findings of our study suggest that while a significant proportion of participants rely on professional advice-particularly from pharmacists and physicians-when selecting dietary supplements. Pharmacists' guidance may not always be entirely objective, particularly when offered by those with a financial interest in the product's sale. The fact that pharmacies were the most commonly reported source of purchase (52.2%) raises concerns about potential conflicts of interest that could influence consumer decision-making. Although over half of the participants (51.1%) reported consulting healthcare professionals, this rate aligns with previous studies, which reported consultation frequencies ranging between 25% and 50%.<sup>19,25</sup> Notably, brand reliability emerged as the most important criterion in product selection (52.8%), suggesting that in the absence of independent, science-based guidance, consumers may rely heavily on perceived brand trustworthiness when making health-related decisions. This tendency may be further reinforced by marketing strategies and media exposure, which were acknowledged by 75% of supplement users as influential, with 44% stating that the media played a major role in shaping their personal preferences. In two studies conducted in our country among different populations-healthcare professionals and university students-social media was reported to have a significant influence on vitamin and dietary supplement use.<sup>30,31</sup> These results are consistent with our findings. Collectively, findings from local and international studies highlight the urgent need for transparent, unbiased sources of information and emphasize the importance of regulating promotional practices within the supplement industry.

The market share of vitamins and other dietary supplements, whose use is increasingly driven by media influence, continues to grow annually and is projected to exceed 10 billion USD by 2026. Spending on these products is directly associated with a country's level of economic prosperity. In terms of total expenditure, the United States leads with an annual spending of 4.02 billion USD on vitamins and dietary supplements.<sup>32</sup> In



our study, it was found that individuals spend an average of 19.5 USD per month on such products. Similar studies have reported monthly per capita expenditures of 13.5 USD in Pakistan and 76.3 USD in Saudi Arabia.<sup>19,21</sup> This wide scale reveals that budget constraints are also an important factor in supplement use.

In our study, 90% of participants who used vitamins and dietary supplements reported experiencing at least some level of benefit from these products. It is expected that individuals with vitamin deficiencies may experience an improvement in their well-being due to replacement therapy or the antioxidant properties of these substances. However, due to widespread promotional content and biased guidance in the media, it is also highly likely that some users may develop inflated expectations and experience a placebo-induced sense of well-being. The potential for dietary supplements to exert such placebo effects has been demonstrated in previous studies.<sup>33</sup> On the other hand, 1.1% of the participants in the present study reported adverse health effects they attributed to the products they used. This may be partly due to the fact that many products on the market lack adequate standardization and validation. Furthermore, supplement-drug interactions are an inevitable risk for patients taking routine medications for chronic diseases, which can lead to toxicity. Indeed, it has been shown that dietary supplements can significantly interfere with the metabolism of various drugs, resulting in clinically relevant interactions.<sup>34</sup> Another important concern is the lack of restrictions on the marketing and advertisement of these products in the media, both in our country and in many others. The term "dietary supplement" may misleadingly imply that these substances are merely nutritional aids, which obscures their potential pharmacological activity. Notably, 7.5% of participants in our study reported having experienced an adverse reaction to at least one supplement they had used during their lifetime. To minimize the risk of adverse reactions and to ensure both, patient and drug safety, supplements should only be used following consultation with a physician, and the products should be manufactured under conditions ensuring standardization and high purity. Moreover, stricter boundaries should be established regarding the marketing and promotional activities related to these substances in the media.

In our study, no significant differences were identified in supplement use based on gender or the type of product used. However, while men appeared to prioritize brand reliability-likely influenced by media advertisements and promotions-women were more inclined to prefer products recommended by a physician. Supplement use and the influence of media on product preference were found to be significantly higher among individuals aged 18-44 compared to older age groups. In this age group, the primary source of supplements was online platforms,

whereas older participants tended to purchase these products from pharmacies or herbal shops. The likelihood of consulting a healthcare professional before using supplements increased with age.

Naqvi et al. (2019) reported that dietary supplement use increased with age and was significantly more prevalent among men.<sup>19</sup> Similarly, a study conducted in Canada found that supplement use increased with age, most participants consulted a specialist before use, and usage was significantly higher among men compared to women.<sup>20</sup> In contrast, a large-scale study in Japan reported that supplement use was more prevalent among older women.<sup>35</sup> Supporting the findings of our study, research from Mongolia showed that supplement use was more common among women, particularly those with higher education levels and those employed in sedentary occupations.<sup>24</sup> In Bangladesh, a study found that supplement use was more widespread among younger individuals, who often preferred such products to feel more energetic, and that their likelihood of consulting a physician was higher than that of older adults.<sup>22</sup> Contrasting several of these findings, a study from Poland, consistent with our results-reported no significant gender differences in supplement use.<sup>26</sup> However, our finding that supplement use was higher in the 18-44 age group than in older age groups contradicts some of the aforementioned studies. This discrepancy may be due to the uneven distribution of participants in our sample or the lack of a broad, representative population. Overall, both our study and the reviewed literature suggest that, in addition to media influence, factors such as education level, gender, age, and income play significant roles in supplement use.

Vitamins, minerals, and other dietary supplements are substances with pharmacological activity. This means that even when used for legitimate health purposes, they can produce toxic effects if not taken at appropriate doses. However, because supplements are classified as food products rather than medications, they are often perceived as harmless, which may contribute to their misuse. In addition to direct toxic effects, these substances have been reported to cause significant drug interactions-particularly in individuals undergoing continuous pharmacological treatment for chronic conditions such as hypertension and diabetes.<sup>7,14,34</sup> In our study, 7.5% of participants who used supplements reported experiencing an adverse effect related to the product they consumed. Similarly, a study conducted in Canada reported a high rate of drug interactions associated with supplements, with 10.1% of users experiencing adverse effects. The authors recommended the implementation of educational programs on supplement safety as a potential solution.<sup>20</sup> The frequency of adverse effects observed in our study aligns with these findings. Educational initiatives

targeting both the general public and healthcare professionals represent a rational approach to reducing supplement-related adverse reactions. However, such measures alone are insufficient. It is also necessary to standardize and purify the active ingredients in these products, ensure that marketing authorizations are issued and regulated by national health authorities, and prevent misleading or inaccurate advertising in the media.

The findings of this study provide valuable insights into individuals' attitudes and habits regarding the use of vitamins and dietary supplements. Given the increasing relevance of the topic, the study holds both medical and economic significance. However, several limitations should be acknowledged. This research was conducted with a limited sample size, which may restrict the generalizability of the results to the broader national population. Additionally, the data were based on self-reported responses, which may be subject to individual perception and reporting bias. Future studies involving multi-center designs and larger, more diverse populations are recommended to obtain more comprehensive and generalizable conclusions.

In conclusion, this study highlights the widespread and multifaceted use of vitamin and dietary supplements in the general population, shaped not only by perceived health needs but also by media influence, economic factors, and sociodemographic variables. While many individuals report benefits from supplement use, including improved well-being and immune support, the findings also underscore important concerns regarding misinformation, placebo effects, potential adverse reactions, and supplement--drug interactions. The tendency to view supplements as harmless nutritional aids, despite their pharmacological potential, calls for stronger regulatory oversight, improved product standardization, and more accurate public education. Healthcare professionals play a critical role in guiding the rational and safe use of these products. To build on the current findings, future studies should involve broader, multi-regional populations and explore the long-term health and economic outcomes of supplement use. Such efforts will be essential for developing informed public health strategies and policies that ensure both the efficacy and safety of dietary supplements.

**Conflict of Interest Statement:** There is no conflict of interest among the authors.

**Researchers' Contribution Rate Statement:**  
Concept/Planning: MDK; Analysis/Interpretation: MDK, DDK; Data Acquisition: MDK, DDK; Writing: MDK, DDK; Review and Correction: MDK, DDK; Approval: MDK, DDK.

**Support and Acknowledgement:** No financial support received from any institution or person.

**Ethics Committee Approval:** The study protocol was approved by the Pamukkale University Non-Interventional Research Ethics Committee (Date: 22.01.2025, Number: E.643293)

## REFERENCES

1. Bayne AV, Pessi J, Bird JK, Stemmler RT, Frerichs M, Besheer A. Vitamins as excipients in pharmaceutical products. *Eur J Pharm Sci.* 2025;206:107020.
2. Fernandes FA, Carochio M, Prieto MA, Barros L, Ferreira ICFR, Heleno SA. Nutraceuticals and dietary supplements: Balancing out the pros and cons. *Food Funct.* 2024;15(12):6289-6303.
3. Aitkenhead R, Waldron M, Conway GE, Horner K, Heffernan SM. The influence of dietary supplements on exercise-induced gut damage and gastrointestinal symptoms: A systematic review and meta-analysis. *Nutrients.* 2025;17(3):443.
4. Costagliola G, Nuzzi G, Spada E, Comberiati P, Verduci E, Peroni DG. Nutraceuticals in viral infections: An overview of the immunomodulating properties. *Nutrients.* 2021;13(7):2410.
5. Huang YY, Liang YT, Wu JM, et al. Advances in the study of probiotics for immunomodulation and intervention in food allergy. *Molecules.* 2023;28(3):1242.
6. Pedrosa LF, de Vos P, Fabi JP. From structure to function: How prebiotic diversity shapes gut integrity and immune balance. *Nutrients.* 2024;16(24):4286.
7. Moses G. The safety of commonly used vitamins and minerals. *Aust Prescr.* 2021;44(4):119-123.
8. Dresen E, Pimiento JM, Patel JJ, Heyland DK, Rice TW, Stoppe C. Overview of oxidative stress and the role of micronutrients in critical illness. *JPEN J Parenter Enteral Nutr.* 2023;47 Suppl 1:S38-S49.
9. Galman A, Chikhaoui M, Bouhrim M, et al. Fitness and dietary supplements: A cross-sectional study on food practices and nutravigilance. *Nutrients.* 2024;16(22):3928.
10. Hussein AS, Hamzah SH, Rahman SKASA, Zamri ZA. YouTube™ as a source of information on vitamin D: A content-quality analysis. *Dent Med Probl.* 2022;59(2):263-270.
11. Parmar UPS, Ichhpujani P, Mahesh VA, Kumar S. Social media content analysis for nutraceuticals and glaucoma. *Rom J Ophthalmol.* 2024;68(3):258-267.
12. Hess JM. Dietary supplements are an important nutrient source for older Americans- what does this mean for dietary guidance? *Am J Clin Nutr.* 2023;118(1):3-4.
13. Loftfield E, O'Connell CP, Abnet CC, et al. Multivitamin use and mortality risk in 3 prospective US cohorts. *JAMA Netw Open.* 2024;7(6):e2418729.
14. Elvir Lazo OL, White PF, Lee C, et al. Use of herbal medication in the perioperative period: Potential adverse drug interactions. *J Clin Anesth.* 2024;95:111473.
15. Papier I, Chermesh I, Mashiach T, Gruenwald I, Banasiewicz T. Prevalence of the use of oral nutritional supplements among acute inpatients at risk of malnutrition and associated patient characteristics. *J Clin Nurs.* 2025;34(3):849-859.
16. Shahverdian A, Jafari M. Dietary supplement safety in older adults: A review of published case reports. *Sr Care Pharm.* 2025;40(1):32-49.
17. Fekete M, Lehoczi A, Tarantini S, et al. Improving cognitive function with nutritional supplements in aging: a comprehensive narrative review of clinical studies investigating the effects of vitamins, minerals,

- antioxidants, and other dietary supplements. *Nutrients*. 2023;15(24):5116.
18. Djaoudene O, Romano A, Bradai YD, et al. A global overview of dietary supplements: Regulation, market trends, usage during the COVID-19 pandemic, and health effects. *Nutrients*. 2023;15(15):3320.
19. Naqvi AA, Ahmad R, Zehra F, Yousuf R, Kachela B, Nehal Nadir M. Dietary supplement use among students of pharmacy colleges in the city of Karachi, Pakistan: Prevalence, opinions, and attitudes. *J Diet Suppl*. 2019;16(2):166-178.
20. El Khoury D, Hansen J, Tabakos M, Spriet LL, Brauer P. Dietary supplement use among non-athlete students at a Canadian University: A pilot-survey. *Nutrients*. 2020;12(8):2284.
21. Islam MA, Al-Karasneh AF, Rizvi M, et al. Prevalence, reasons, and determinants of dietary supplements use among undergraduate female students of health and non-health colleges in a Saudi public university. *PLoS One*. 2021;16(3):e0247295.
22. Amin MB, Aktarujjaman M, Meem AE, Hossain E, Islam MN, Roy N. Prevalence, correlates and common conditions associated with adolescent dietary supplement use: A cross-sectional survey in Bangladesh. *Public Health Nutr*. 2023;26(6):1143-1151.
23. Nakhal SA, Domiati SA, Amin MEK, El-Lakany AM. Assessment of pharmacy students' knowledge, attitude, and practice toward herbal dietary supplements. *J Am Coll Health*. 2022;70(6):1826-1830.
24. Wang Z, Li WT, Gao Y, et al. Analysis of dietary supplement use and influencing factors in the Mongolian population. *Biomed Res Int*. 2022;2022:4064588.
25. Risvoll H, Waaseth M, Halvorsen KH, Giverhaug T, Musial F. Use of dietary supplements by individuals with dementia-the caregivers' perspective. *Scand J Prim Health Care*. 2025;1-12.
26. Broniecka A, Sarachman A, Zagrodna A, Książek A. Dietary supplement use and knowledge among athletes: Prevalence, compliance with AIS classification, and awareness of certification programs. *J Int Soc Sports Nutr*. 2025;22(1):2496450.
27. Luo H, Tengku Kamalden TF, Zhu X, Xiang C, Nasharuddin NA. Advantages of different dietary supplements for elite combat sports athletes: A systematic review and Bayesian network meta-analysis. *Sci Rep*. 2025;15(1):271.
28. Liu L, Tao H, Xu J, Liu L, Nahata MC. Quantity, duration, adherence, and reasons for dietary supplement use among adults: Results from NHANES 2011-2018. *Nutrients*. 2024;16(12):1830.
29. Barretto JR, Gouveia MADC, Alves C. Use of dietary supplements by children and adolescents. *J Pediatr (Rio J)*. 2024;100 Suppl 1:S31-S39.
30. Çapaş M, Çavdar M. The effect of social media on university students' eating attitudes and behaviors. *JHS*. 2023;32(2):284-291.
31. Bellikci Koyu E, Çalık G, Kaner Tohtak G, Günsel Yıldırım G. Use of dietary supplements and related factors in healthcare workers. *J DEU Med*. 2020;34(2):141-145.
32. ReportLinker. Forecast: Vitamins in Dosage Market Size Value Per Capita in the US. Accessed date: 27 October 2025; <https://www.reportlinker.com/dataset/5685fd3acb1f2849959f77ad0d4dfca180be0989>
33. Żegleń M, Kryst Ł, Bąbel P. Diet, gym, supplements, or maybe it is all in your mind? A systematic review and meta-analysis of studies on placebo and nocebo effects in weight loss in adults. *Obes Rev*. 2024;25(2):e13660.
34. Rivas García F, García Sierra JA, Valverde-Merino MI, Zarzuelo Romero MJ. Dietary supplements for weight loss and drug interactions. *Pharmaceuticals (Basel)*. 2024;17(12):1658.
35. Tsubota-Utsugi M, Nakade M, Imai E, et al. Distribution of vitamin E intake among Japanese dietary supplement and fortified food users: A secondary analysis from the national health and nutrition survey, 2003-2009. *J Nutr Sci Vitaminol (Tokyo)*. 2013;59(6):576-583.