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The Effect of Social Media and Internet Use on Patients Using Over-the-Counter Vitamin Supplements

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ABSTRACT

Introduction: Social media and internet platforms have transformed access to health information, often encouraging the unsupervised use of over-the-counter (OTC) vitamin supplements. This trend raises concerns about the reliability of online health content and its influence on health behaviors. This study aimed to evaluate the role of social media and internet use in patients' decisions regarding OTC vitamin supplementation.

Methods: A cross-sectional survey was conducted among 216 patients attending an internal medicine outpatient clinic. Participants were grouped into two categories: those who independently initiated supplementation and those who were influenced by social media. Demographics, health information sources, social media habits, and supplementation practices were recorded. Serum 25-hydroxyvitamin D and vitamin B12 levels were measured, with deficiencies defined as <20 ng/mL and <200 pg/mL, respectively. Statistical analyses were performed using SPSS version 25.0, with significance set at $p<0.05$.

Results: Among the participants, 55.1% were male and 44.9% were female, with a mean age of 40.8±11.4 years. Social media influenced 37.5% (n=81) of participants to initiate supplementation, most commonly via Instagram (33.3% of those influenced). This group was younger (40.3 vs. 41.4 years; $p=0.001$), had higher educational attainment (95.1% vs. 76.3% university graduates; $p<0.001$), and reported greater daily social media use (>3 h: 76.5% vs. 54.8%; $p=0.006$). While no significant difference was found in vitamin D levels ($p>0.05$), the social media group had higher vitamin B12 levels (median, 358 vs. 308 pg/mL; $p=0.006$) and a lower prevalence of deficiency (1.2% vs. 8.9%; $p=0.022$).

Conclusion: Social media significantly influences public health behaviors, particularly by promoting OTC vitamin use. Although some users may experience benefits, unsupervised supplementation poses risks. Physician guidance and stricter regulation of online health content and influencer marketing are essential to safeguard public health.

Keywords: Vitamin B12, vitamin D, social media, public health

Introduction

Social media are widely used interactive platforms where individuals search for, use, and create online content. Over the past two decades, it has become an integral part of daily life, displacing traditional media such as television, radio, and newspapers as the primary sources of information (1). Through real-time updates and personalized content, it has also transformed how individuals access health-related information.

In healthcare, social media platforms, blogs, and media-sharing sites provide valuable tools for disseminating knowledge and promoting disease prevention. However, outdated or inaccurate information may lead to misleading health decisions (2,3). Although these platforms enable healthcare professionals to reach large audiences, concerns about content reliability persist.

Approximately 75% of Internet users currently seek health information through social media and search engines, forming virtual communities to share experiences and advice (4). The parallel growth of e-commerce has facilitated the unregulated use of OTC products, dietary supplements, and vitamin complexes, often marketed as safe and effective, but consumed without medical supervision, posing public health risks (5).

Social media influencers further promote unsupervised use of supplements among adolescents and young adults. A 2021 analysis found that only 4% of medical posts on Instagram originated from

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verified accounts and that only 1% displayed a Supplement Facts label (6), emphasizing the need to ensure the reliability of online health information.

Therefore, this research aimed to investigate the impact of social media and internet use on patients who take over-the-counter (OTC) vitamin supplements.

Methods

Patient selection and data collection:

A total of 216 subjects who were using OTC vitamin supplements and who were visiting the internal medicine outpatient clinic were included in the study after meeting the inclusion and exclusion criteria.

Inclusion criteria:

1) Patients who visited the internal medicine clinic between September 15 and September 30, 2025, and used OTC vitamin supplements.

2) Being 18-65 years of age.

3) Giving consent to participate in the study and complete the survey form.

Exclusion criteria:

1) Being <18 years or >65 years.

2) Having history of skin, liver, kidney, stomach, pancreas, or intestinal diseases.

3) Having history of using medications that inhibit the absorption of vitamin D or B12 levels.

4) Pregnancy or lactation.

5) History of gastrointestinal surgery or malabsorption syndromes.

6) Active malignancy or chronic inflammatory diseases.

7) Cognitive impairment or inability to complete the questionnaire.

The exclusion of individuals with chronic or inflammatory diseases was intended to reduce potential confounding effects on vitamin metabolism, absorption, and serum levels. This approach allowed for a more homogeneous study population and enabled a clearer interpretation of the relationship between OTC supplement use and measured vitamin concentrations.

After obtaining informed consent, a survey was conducted to collect information on each patient's age, gender, educational level, marital status, living situation (alone or with family), employment status, physical activity habits, duration of social media use, the source of the recommendation to start vitamin supplementation, the source of the most recent medical information accessed via social media, whether they experienced an improvement in well-being after taking the supplements, any side effects from the supplements, and the duration of supplement use. Additionally, blood levels of 25-hydroxy vitamin D and vitamin B12 were measured, and social media platforms used by each patient were recorded.

The cut-off value for 25-(OH)D vitamin deficiency was determined to be 20 ng/mL (7), while the cut-off for vitamin B12 deficiency was set at 200 pg/mL (8).

Ethical approval for the study was obtained from the University of Health Sciences Türkiye, İstanbul Training and Research Hospital Ethics Committee (approval number: 234, date: 12.09.2025). The research was conducted in accordance with the principles of the Declaration of Helsinki. The informed consent was obtained through institutional procedures, and all patient data were anonymized prior to analysis.

Statistical Analysis

The normality of numerical variables' distributions was assessed using the Shapiro-Wilk test, Q-Q plots, and histograms. Comparisons of non-normally distributed variables between two independent groups were performed using the Mann-Whitney U test. The relationships between categorical variables were analyzed using Fisher's exact test or Pearson's chi-square test, as appropriate. Descriptive statistics for non-normally distributed variables were presented as median (minimum-maximum), while categorical variables were summarized as frequencies and percentages. Statistical analyses were conducted using the SPSS software package, version 25.0 (IBM Corporation, Armonk, New York, USA). Hypotheses were tested using two-sided tests, and $p<0.05$ was considered statistically significant.

An a priori sample-size calculation (two-sided test; α: 0.05; power: 0.80; Cohen's d: 0.46) indicated that 75 participants per group (n=75) were required. Because our study included 81 and 135 participants in the two groups, respectively, a post-hoc power analysis (α: 0.05, d: 0.46) yielded an observed power of 0.90, confirming adequate power to detect the specified effect.

Results

A total of 216 individuals were included in the study, of whom 55.1% were male and 44.9% were female. The mean age of the whole group was 40.82±11.44 years. Participants were divided into two groups based on their decision-making process regarding vitamin supplementation: those who made decisions independently and those who were influenced by social media. The mean age of patients who initiated vitamin supplementation on their own was 41.35±11.13 years, whereas the mean age of those who started supplementation after being influenced by social media was 40.29±11.77 years. The demographic and other characteristics of the two groups are summarized in Table 1.

Regarding education level, the majority of participants (83.3%) held a university degree or higher. The proportion of participants with a bachelor's degree or higher was significantly greater in the social media-influenced group (95.1%) than in the independent group (76.3%; $p<0.001$) (Table 1).

There were statistically significant differences between the groups regarding social media usage duration and employment rates ($p<0.05$). Among participants influenced by social media, 76.5% reported using social media for ≥3 hours, and 82.7% were employed; both proportions were significantly higher than in the independent group ($p=0.006$ and $p=0.013$, respectively) (Table 1).

Table 1. Comparison of characteristics between cases using over-the-counter vitamin complexes influenced by social media and those using on their own initiative

	Use of vitamin supplementation			
	Self-initiated use (n=135)	Use influenced by social media (n=81)	Total (n=216)	
	n (%)	n (%)	n (%)	p
Gender				
Male	79 (58.5)	40 (49.4)	119 (55.1)	0.191*
Female	56 (41.5)	41 (50.6)	97 (44.9)	
Mean age ± SD	41.35±11.13	40.29±11.77	40.82±11.44	**0.001**⁺
Educational level				
High school or lower	32 (23.7)	4 (4.9)	36 (16.7)	**<0.001***
University degree or higher	103 (76.3)	77 (95.1)	180 (83.3)	
Duration of social media use				
Less than 1 hour	26 (19.3)	7 (8.6)	33 (15.3)	**0.006***
1-3 hours	35 (25.9)	12 (14.8)	47 (21.8)	
3 hours or more	74 (54.8)	62 (76.5)	136 (63)	
Marital status				
Single	66 (48.9)	48 (59.3)	114 (52.8)	0.139*
Married	69 (51.1)	33 (40.7)	102 (47.2)	
Living arrangement				
Alone	53 (39.3)	32 (39.5)	85 (39.4)	0.971*
With family	82 (60.7)	49 (60.5)	131 (60.6)	
Active sports status				
Active	44 (32.6)	36 (44.4)	80 (37)	0.081*
Inactive	91 (67.4)	45 (55.6)	136 (63)	
Employment status				
Unemployed	29 (21.5)	10 (12.3)	39 (18.1)	**0.013***
Employed	87 (64.4)	67 (82.7)	154 (71.3)	
Retired	19 (14.1)	4 (4.9)	23 (10.6)	
Where did you last obtain medical information on social media?				
Medical doctor accounts/websites	52 (38.5)	26 (32.1)	78 (36.1)	**<0.001***
Social media influencers (non-medical)	22 (16.3)	42 (51.9)	64 (29.6)	
Social media platforms patients are subscribed to	53 (39.3)	7 (8.6)	60 (27.8)	
Pharmaceutical company websites/pages	8 (5.9)	6 (7.4)	14 (6.5)	
Did you experience an improvement in overall well-being after using vitamin supplements?				
Yes	74 (54.8)	54 (66.7)	128 (59.3)	0.086*
No	61 (45.2)	27 (33.3)	88 (40.7)	
Have you experienced any side effects from the vitamin complexes you started without consulting your doctor?				
Yes	2 (1.5)	2 (2.5)	4 (1.9)	0.602*
No	133 (98.5)	79 (97.5)	212 (98.1)	
How long have you been using vitamin supplements?				
Less than 1 month	36 (26.7)	20 (24.7)	56 (25.9)	0.524*
1-3 months	59 (43.7)	31 (38.3)	90 (41.7)	
More than 3 months	40 (29.6)	30 (37)	70 (32.4)	
Vitamin B-12 level				
Low	12 (8.9)	1 (1.2)	13 (6)	**0.022***
Normal	123 (91.1)	80 (98.8)	203 (94)	
Mean vitamin B12 level ± SD	333.31±116.02	343.93±92.21	338.62±104.68	**0.006**⁺
25-hydroxy vitamin D level				
Low	34 (25.2)	13 (16)	47 (21.8)	0.115*
Normal	101 (74.8)	68 (84)	169 (78.2)	
Mean 25-hydroxy vitamin D level ± SD	26.01±7.97	26.18±6.69	29.10±7.34	0.054⁺

*p value obtained from Pearson chi-square or Fisher's exact test, ⁺p value obtained from Mann-Whitney U test. SD: Standard deviation

A significant difference was observed between the groups in the preference for medical information sources on social media ($p<0.001$). Among individuals influenced by social media, 51.9% relied on non-medical social media influencers, compared with 16.3% in the independent group ($p<0.001$). Conversely, 39.3% of participants in the independent group preferred patient platforms, compared with only 8.6% of participants in the social media group. No statistically significant differences were observed between groups in general well-being, adverse effects, or duration of vitamin supplementation ($p>0.05$; Table 1).

The mean vitamin B12 level of the patients included in the study was 338.62±104.68 pg/mL. In the group that initiated vitamin supplementation on their own, the mean level was 333.31±116.02 pg/mL; in the social media-influenced group, it was 343.93±92.21 pg/mL. Vitamin B12 deficiency was significantly more common among patients who used supplements independently than among those influenced by social media ($p=0.022$). No significant differences between groups were observed in vitamin D levels or deficiencies ($p>0.05$) (Table 1).

The usage rates of social media channels among the 216 participants are presented in Table 2. The vast majority (97.2%) reported using search engines (e.g., Google, Yandex) to obtain information. Among social media platforms, Instagram was the most frequently used (84.7%), followed by Twitter (70.4%), YouTube (62.5%), Facebook (34.7%), personal blogs (28.2%), and TikTok (9.3%). Among the 81 individuals who began using vitamin supplements under the influence of social media, Instagram was the preferred platform (33.3%), followed by Twitter (19.8%), YouTube (16%), TikTok (12.4%), search engines such as Google (9.9%), and Facebook (8.6%) (Table 2).

Table 2. Social media usage habits among individuals using vitamin complexes

	n (%)
Social media subtypes (n=216)	
Search engines (Google, Yandex, etc.)	210 (97.2)
Instagram	183 (84.7)
Youtube	135 (62.5)
TikTok	20 (9.3)
Personal blogs	61 (28.2)
Twitter (now known as X)	152 (70.4)
Facebook	75 (34.7)
Which social media channel did you use to start vitamin supplementation? (n=81)	
Twitter (now known as X)	16 (19.8)
Instagram	27 (33.3)
Facebook	7 (8.6)
TikTok	10 (12.4)
Youtube	13 (16)
Google search engine	8 (9.9)
n=216	

Discussion

Vitamin deficiencies in adults represent a significant health issue that can negatively impact quality of life (9). Today, such deficiencies are far more common than many might expect. To address this, individuals aware of the issue often turn to OTC products and dietary supplements, integrating them into their daily routines to pursue a healthier lifestyle without medical supervision.

In 2018, a multicenter study conducted across 18 European countries evaluated the public's knowledge and awareness of the health effects of OTC medications and dietary supplements. The study found that 68% of patients regularly consumed at least one OTC medication or dietary supplement. The frequency of use of at least one OTC product or supplement varied by country. The most commonly used products were vitamins (38%), minerals (34%), cranberry juice (20%), acetylsalicylic acid (17%), and omega fatty acids (17%). Among the 18 participating European countries, Türkiye had the highest proportion of patients using at least one OTC product (94%). This finding highlights a high propensity for, and limited awareness of, OTC product use among the Turkish population (10). In our study, we found that 37.5% (n=81) of the participants had started using vitamin supplements solely because of promotion on social media.

In a 2003 Canadian study involving 306 patients with a history of cardiovascular disease, two-thirds of the participants reported using at least one OTC product per week. The most commonly used products were pain relievers (51%), antacids (21%), and laxatives (17%). Two-thirds of the participants stated that they had used OTC products at least once per week in the past six months. Additionally, multivitamins or multivitamin-mineral products were consumed at least once daily by 23% of study participants during that period (11). These studies demonstrate the frequency with which OTC products are used and obtained without a prescription in developed countries, including European countries and Canada. Therefore, identifying the channels through which individuals choose these products is important; our study focuses on social media as one such channel.

With the increasing influence of the internet and social media, patients are turning to online platforms to access health-related information. While social media provides quick, easy, and practical access to valuable resources, it also exposes users to misleading and inaccurate content (12). In a 2022 study titled "The Use of Vitamin D in COVID-19: A YouTube Study," 77 videos with a total of 10,225,763 views were analyzed. Over three-quarters of these videos contained misleading information regarding the use of vitamin D in coronavirus disease-2019. Interestingly, the primary contributors were medical professionals who maintained YouTube channels. The study found that many of the recommendations in these videos were inconsistent with current literature, including suggestions to take vitamin D supplements at doses exceeding the recommended safe levels or to deliberately expose oneself to ultraviolet radiation (13). Similarly, in a study titled "YouTube as an Information Source on the Effect of Vitamin C on Coronavirus Disease," the 50 most-viewed videos on the subject were analyzed. The study found that 54% of the videos were unreliable, 62% were low quality, and 74% were

misleading (14). Thus, it is concerning that 37.5% of patients in our study rely on social media to decide on their vitamin intake.

In Germany, Instagram is the most popular social network, and many influencers use this platform to promote dietary supplements. A recent study investigated the dietary supplements promoted by influencers on Instagram in Germany (15). The study revealed significant shortcomings in the labeling of overdose risks and potential side effects. The findings indicate that Instagram is not a reliable platform for obtaining accurate information about dietary supplements. Due to its popularity and wide audience reach, concerns have been raised about misinformation and misguidance within the community. Our study also supports these concerns: 33.3% of participants who used OTC vitamin supplements after exposure to social media reported that Instagram influenced their decision.

Another study investigated the impact of influencer marketing on the use of dietary supplements among social media users in Türkiye. The study found that influencers play a critical role in product promotion because of their substantial follower bases and the trust they have established with their audiences. The findings indicated that following social media influencers and spending more time on social media significantly increased the likelihood of using dietary supplements. The study revealed that individuals who followed influencers were approximately 18 times more likely to use dietary supplements than those who did not (16). Similar findings were observed in our study, with 64 participants (29.6%) reporting that social media influencers were their most recent source of medical information. This finding underscores the substantial role of influencers in online sales of OTC products in Türkiye and highlights their significant impact on public health.

In our research, the majority of patients reported that their most recent source of medical information on social media was medical doctors' accounts or professional websites. This finding highlights the potential of social media platforms as powerful tools that enable physicians to educate their patients and contribute to public health. A study found that social media use was widespread among the patient group, and that potentially misleading information on these platforms was a matter of concern (17).

In our study, four of 216 participants reported drug-related side effects and subsequently discontinued use of the product. Usually, the promotional content of OTC products advertised on social media platforms does not provide sufficient information regarding potential side effects. Influencers and product promoters, primarily driven by commercial interests, often emphasize the positive effects of these products, thereby influencing the public toward those products. Crucial information regarding daily doses, costs, side effects, contraindications, and overdose risks is inadequately addressed by influencers (15).

Vitamin D and B12 deficiencies are more prevalent in the population than expected. A study at a tertiary care hospital in our country demonstrated that both B12 deficiency and falsely elevated B12 levels are associated with critical illness, which further highlights the importance of accurately measuring vitamin B12 and vitamin D levels (18). The prevalence of B12 deficiency reaches 40% in Latin America, 70% in Africa, and 70-80% in South Asia (19). Similarly, vitamin D deficiency is estimated to affect 30% to 50% of the global population (20).

Despite being common health problems readily diagnosed by routine laboratory tests, these vitamin deficiencies often remain inadequately addressed. Our study found that vitamin D deficiency was present in both groups: those who independently used OTC vitamin supplements and those were influenced by social media. Notably, despite vitamin supplementation, 21.8% of the 216 participants in our study had 25-(OH)D levels below the deficiency threshold. One possible explanation for this persistent deficiency could be insufficient vitamin D content in multivitamin complexes or a limited absorption capacity. Another contributing factor may be that many of these supplements are not approved by the Ministry of Health but by the Ministry of Agriculture, which allows them to be rapidly marketed and sold online without stringent quality control. Based on these findings, healthcare professionals should measure vitamin D levels using serum 25-(OH)D testing. When a deficiency is detected, personalized treatment protocols should be implemented to achieve optimal vitamin D levels in patients, taking into account their vitamin D status and risk factors (21).

Vitamin B12 deficiency was identified in 6% of the patients included in our study. However, the majority of participants had adequate serum vitamin B12 levels. Vitamin B12 deficiency was significantly less common among patients whose use of vitamin supplements was influenced by social media than among patients in the other group. This may be explained by the finding that the group of vitamin supplement users influenced by social media most frequently initiated supplementation based on recommendations from medical doctor accounts or websites, suggesting that they were more likely to choose an appropriate product.

Study Limitations

The cross-sectional design of this study limits causal inference. Conducted at a single center with a relatively small sample, this study's findings may have limited generalizability. In addition, reliance on self-reported data for social media use and supplement intake may introduce recall bias.

Conclusion

Over the years, it has become increasingly accepted that social media and the internet significantly influence public health. Although social media often provides individuals with easy access to information, it also contains content and product promotions that may negatively impact health. Ensuring the accuracy of health-related information on these platforms and promoting physician-guided use of supplements are crucial for safeguarding public health. Further regulation of online health content and influencer marketing practices is needed to minimize the risks associated with unsupervised supplement use.

Ethics

Ethics Committee Approval: Ethical approval for the study was obtained from the University of Health Sciences Türkiye, İstanbul Training and Research Hospital Ethics Committee (approval number: 234, date: 12.09.2025).

Informed Consent: The informed consent was obtained through institutional procedures, and all patient data were anonymized prior to analysis.

Footnotes

Authorship Contributions: Concept - Y.G., G.Y., B.K.K., M.A., M.E.P.; Design - Y.G., İ.C.Ç., M.O.T., M.E.P.; Data Collection or Processing - Y.G., G.Y., İ.C.Ç., M.O.T.; Analysis or Interpretation - Y.G., B.K.K., M.O.T., M.A., M.E.P.; Literature Search - Y.G., G.Y., İ.C.Ç., B.K.K., M.A.; Writing - Y.G.

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