

Article

Patterns and Predictors of Vitamin and Mineral Supplement Misuse Among Medical Students at the University of Babylon: A Cross-Sectional Study

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Abstract: *Background:* Globally, the misuse and consumption rate of minerals and vitamins without a prescription among medical students was high, demonstrated at 88%. Several factors influencing misuse, including the confidence of students in their background knowledge of medicinal information which may result in assumption they can safely medicate. *Objectives:* The present study aimed to assess the popularity of self-prescribed vitamin and mineral supplement practice among medical students from different colleges in Babil Province, as well as to determine whether gender has an effect on this practice. *Methods:* A survey was performed at the University of Babylon between December 2024 to April 2025. Students from various medical colleges who consented to participate were included. Categorical data were expressed as frequencies and percentages. The Chi-square test was used to determine gender differences concerning supplement types misused, the rationales for use, and the experience of supplements related side effects. *Results:* A total of 127 medical students (response rate = 99%) partook in the survey. The majority of participants (85%) were aged 21-25 years, predominantly female (75.6%), and from urban areas (67.7%). The extent of inappropriate practice of supplements among medical students was 77.17%. Combination supplements were most commonly misused by both males (54.8%) and females (51%). *Conclusions:* The present study emphasized that a high proportion of undergraduate medical students engaged in the improper use of supplements. Furthermore, the findings emphasized a significant impact of gender variation upon the basic rationales for such misuse.

Keywords: Medical Students, Mineral Supplements, Misuse, Prevalence, Self-Prescribed, Vitamin.

Introduction

Medical students are increasingly combating the inappropriate use of dietary supplements as a means to boost immunity and compensate for nutritional deficiencies in the human body [1], [2]. Globally, dietary supplements are extensively consumed among different populations, including the elderly, athletes, and medical students [3], [4]. The misuse and consumption rate of minerals and vitamins without a prescription among medical students was high, as demonstrated at 88% [5]. Another study conducted among pharmacy students demonstrated that the prevalence of self-medication was

50% within one month. Furthermore, the dietary supplements and painkillers were the most commonly prescribed medication [6]. Several factors influencing misuse, including the confident of students in their background knowledge of medicinal information which may result in assumption they can safely medicate [7]. Medical students are often exposed to worrying environment and tend to adopt unhealthy lifestyles, that consequences to the development of chronic disease [8]. Moreover, the medical students are influenced by their families and their friends, who may encourage or motivate them to misuse mineral and vitamins [9]. The primary reason for medication misuse among medical college students is a lack of adequate scientific knowledge regarding the safety of these medications. This knowledge gap may result in detrimental effects or toxicities when these medication are self-prescribed without medical consultation [10]. Across-sectional study conducted by Abdalfattah and her colleagues demonstrated that 43.6% of college students utilized nutritional supplements for weight loss without a prescription, and as a consequence, 40% indicated experiencing adverse effects [11]. Correspondingly, another study conducted among UAE students found that the desire to improve physical performance provoked 44.9% of students for misuse of vitamin D [12]. The present study aimed to assess the popularity of self-prescribed vitamin and mineral supplement practice among medical students from different colleges in Babil Province, as well as to determine whether gender has an effect on this practice.

Materials and Methods

Study design and setting:

A survey which was cross-sectional was performed amongst undergraduate medical students at the University of Babylon between December 2024 to April 2025. Medical students from different colleges and at any academic stage who approved to partake were included in the study. Medical students who refused or were unable to complete the questionnaire were excluded from the study. A structured online questionnaire was developed based on literature reviews regarding misuse of vitamin as well as mineral supplements amongst medical students [2], [13], [14]. The questionnaire consisted of three domains. The first domain included an explanation of the study's purpose, details on how participants' confidentiality would be preserved, and a signed consent form for participation in the study. The second domain comprised the participants' demographic information, such as age, gender, residence, college, academic stage, and living status. Finally, the third domain included seven questions concerning the participants' clinical status, weight status, frequency of supplement use, type of supplement misused, justifications for using the supplements, presence or absence of side effects resulting from supplement use, and the type of side effects experienced by the participants.

Ethics:

The ethical authorization for the present study was got hold of the college of pharmacy, University of Babylon, prior to its conduct. Moreover, the signed consent was acquired from the respondents prior accomplishing the online survey.

Statistics:

Data were statistically analyzed using the Statistical Package for the Social Sciences (SPSS, Version 24). The categorical data were expressed as frequencies and percentages. The Cronbach's alpha was manipulated for valuation of the reliability and internal consistency of the questionnaire. To verify when there were statistically significant variations between male and female respondents concerning the type of vitamin and mineral supplements misused, the rationales for taking supplements, and the experience of supplements-related side effects, the Chi-square test was manipulated. A statistically significance was judged when a p-value of less than 0.05.

Results

A total of 128 medical students contributed in the study. Of these, 127 students agreed to participate and completed the survey, achieving a response rate of 99%. The questionnaire demonstrated good reliability and internal consistency ($r = 0.753$). The demographic characteristics of participants were presented in Table 1. Table 1 revealed that the majority of medical respondents (85%) were aged 21-25 years, followed by 11.8 % who were between 18 and 20 years old. The lowest proportion of participants (3.1%) were between 26 to 30 years old. The majority of participants (75.6%) were female, whereas only 24.4% were male. About 67.7% of the 127 participants lived in urban parts, whilst 32.3% inhabited in rural parts. The high proportion of respondents (85.5%) were students from the College of Pharmacy, followed by 9.4% from the College of Medicine and 3.9% from the College of Dentistry. The smallest proportion of participants (0.8%) were students from the College of Nursing. Most of students (65.4%) were in the fifth academic stage, followed by 18.1%, 10.2%, and 6.3% in the fourth, second, and third stages, respectively. Concerning the living status, most of the participants (95.3%) lived with their families, whereas only 4.7% lived alone. Regarding the weight status, the majority of medical students (75.6%) had a normal weight, followed by 12.6% had an overweight, and 11.8% were underweight.

Table 1. Participants' demographic characteristics.

Variable	Frequency	Percent	
Age	18-20	15	11.8
	21-25	108	85.0
	26-30	4	3.1
Gender	Male	31	24.4
	Female	96	75.6
Residence	Rural	41	32.3
	Urban	86	67.7
College	Medicine	12	9.4
	Dentistry	5	3.9
	Pharmacy	109	85.8
	Nursing	1	0.8
Academic Stage	2nd	13	10.2
	3rd	8	6.3
	4th	23	18.1
	5th	83	65.4
Living Status	Living with family	121	95.3
	Living alone	6	4.7
Weight Status	Underweight	15	11.8
	Normal weight	96	75.6
	Overweight	16	12.6

The extent of inappropriate practice of supplements across medical students was 77.17%. Considering the frequency of supplements use, 32.28% of participants reported self-prescribed supplements monthly, 25.2% used them daily, and 19.69% used them weekly, as shown in Figure 1.

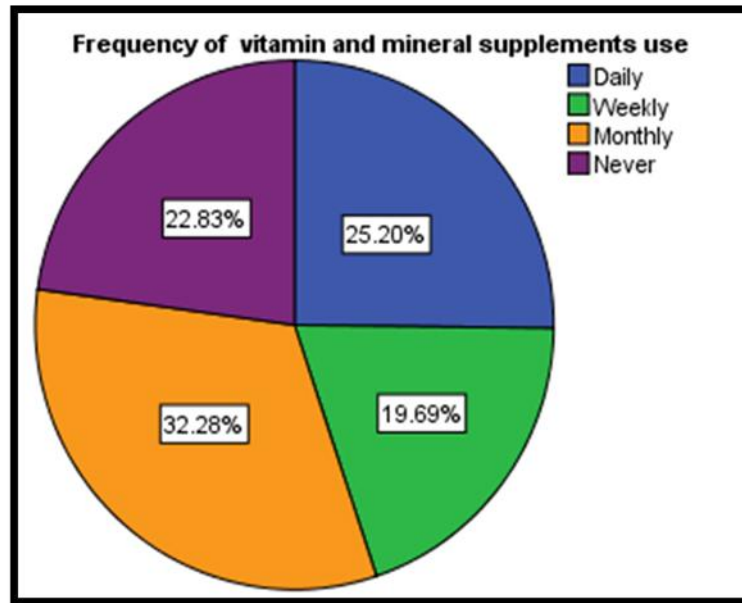


Figure 1. The frequency of vitamin and mineral supplements misuse.

Table 2 revealed the distribution difference of supplement improper utilization among males and females. Among male participants, 54.8% of 31 male students indicated utilization of combination supplements, followed by 16.1% who used vitamin C and 12.9% who used vitamin D. Similarly, the majority of female participants utilized combination supplements (51% of 96) and vitamin D (28.1%). The male and female students were identical statistically concerning the type of supplements misused ($p = 0.5$). However, a statistically significant variation was demonstrated between males and females regarding the reason that motivated use supplement misuse ($p < 0.001$). Among males, the primary motivations were to boost immunity (35.5% of 31), as a nutritional supplement (22.6%), and to improve performance or sports ability (19.4%). On the other hand, the majority of female participants reported using supplements based on physician recommendations (35.4% of 96), as a nutritional supplement (34.4%), and to boost immunity (18.8%). The p-value of 0.08 verified that there was similarity between male and female participants regarding the experience of side effects resulting from supplement misuse.

The distribution of side effects types resulting from supplement misuse by gender was illustrated in Figure 2.

Table 2. Distribution of vitamin and mineral supplement use by gender.

Variable	Male (n=31)	Female (n=96)	p-value	
Type of vitamin and mineral supplement	Vitamin B	3.2% (1)	1% (1)	0.5
	Vitamin C	16.1% (5)	11.5% (11)	
	Vitamin D	12.9% (4)	28.1% (27)	
	Calcium	3.2% (1)	1% (1)	
	Iron	9.7% (3)	7.3% (7)	
	Combination of supplement	54.8% (17)	51% (49)	
Reasons for taking vitamin and mineral supplements.	Boost immunity	35.5% (11)	18.8% (18)	< 0.001*
	Nutritional supplement	22.6% (7)	34.4% (33)	
	Enhance memory	6.5% (2)	6.3% (6)	
	Weight gain	6.5% (2)	5.2% (5)	
	Improve performance/sports	19.4% (6)	0% (0)	

Experience of side effects related to vitamin and mineral supplement use	Prescribed by a physician	9.7% (3)	35.4% (34)	0.08
	Yes	6.5% (2)	18.8% (18)	
	No	93.5% (29)	81.3% (78)	

*Statistically significant $p < 0.05$

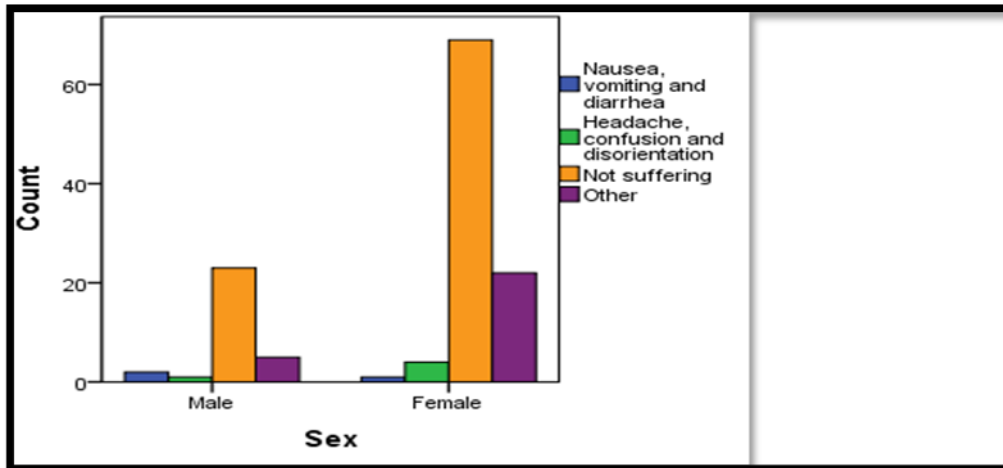


Figure 2. Distribution of side effects by gender.

Discussion

The present study demonstrated a high extent of self-prescribed vitamin and mineral supplements use within medical students (77.17%). This prevalence was approximately align with prevalence of study conducted on Saudi medical students (76.6%) (15). However, the present prevalence was higher than the previous incidence which reported with medical students in Bangladesh (39.25%), in Jordan (60.9%), and among female of medical Saudi colleges (29.77%) [16], [17], [18]. The current study demonstrated that the proportion of students who self-prescribed supplements monthly was high (32.28%) and the smallest proportion of them (19.69%) used supplements weekly. Several studies showed the prevalence of misuse of supplements among medical students but not indicated the frequency of this practice [12], [14], [15]. Regarding the type of vitamin and mineral supplements used, a high proportion of both male (54.8%) and female (51%) participants demonstrated using a combination of supplements. This was followed by the use of vitamin C among males (16.1%) and vitamin D among females (28.1%). However, the smallest proportion of both male and female participants indicated using vitamin B and calcium supplements. Conversely, both males and females were similar regarding the type of supplements ($p = 0.5$). Similarly, a Saudi cross sectional study conducted on one-thousands of undergraduate students indicated that 56% of participants used a combination of dietary supplements [19]. However, the findings of the current study disagree with those of a Japanese study, which indicated that the majority of female students used weight loss supplements, while most male students used proteins supplements for bodybuilding purposes [20]. The present study demonstrated that a statistically significant variation was indicated in the rationale for using vitamin and mineral supplements between male and female participants ($p < 0.001$). Among male medical students, the majority (35.5%) conveyed using supplements for boosting their body immunity, followed by 22.6% who self-prescribed them as nutritional supplement, and 19.4% who misused them to improve physical performance as well as sports action. these findings are harmonious with previous study conducted among during COVID-19 pandemic that reported that the majority of students used vitamin C for improving immunity [21]. Similarly, another study conducted among students indicated that the primary reason for using supplements was for improving the immune

system; however, it did not indicate whether his reason was more frequent among male or female participants [22]. However, these findings are divergent from those of a previous studies performed among students which indicated that the primary motivation for use of supplements among the majority of males for enhancing physical performance [23]. Nevertheless, among female medical students, the high proportion of them reported using supplements based on physician recommendations (35.4%), as a nutritional supplement (34.4%), and to boost immunity (18.8%). This cross-sectional results among female students revealed that the main driver for using supplements was physician authority and this reflected the trust of female students in medical recommendation as it recommended supplement to treat deficiencies of certain vitamin or mineral supplements. A cross-sectional study performed in Bangladesh aligns with the present results, showing that 34.3% of medical students used the supplements based on physician counsels [16]. In contrast, another study conducted in Iraq reported conflicting results, specifying that only 40% of medical students used supplements following physicians' advice [24]. The absence of statistically significant difference among males and female participants suggests that the side effects experienced by participants as a consequence of supplements use are influenced by factors such as dosage, type of supplements, and duration of use [25], [26], [27], [28]. Several studies and systematic review conducted among medical students revealed comparable findings, showing that both male and female students experienced similar supplement-related side effects [20], [29], [30].

Study Limitations

Several limitations were verified in the present study. Primarily, the study was conducted in a single university located in one city, that the results may not been generalized. Second, the study did not evaluate the level of knowledge regarding the supplements among medical students, nor did it investigate the sources of information correlated to their advantages and budding side effects. Finally, the design of study that was cross-sectional restricts the competence to assess a causal association concerning supplements misuse and the knowledge, attitude, and practices of medical students.

Conclusion

The current study emphasized the high extent of supplement misuse among undergraduate medical students, with the majority of participants being pharmacy students at advanced academic stages. Combination supplements were the most commonly misused by both male and female students. Though no significant gender difference was perceived concerning the type of supplements misused or the experience of supplement-related side effects, a significant variation was found in the basic rationale for use. The primary motivations among males were to boost immunity or to improve performance, while females were more likely to use supplements based on physician recommendations and for nutritional purposes.

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