Bangladesh Journal of Medical Education Vol.-16, Issue-02, July, 2025
ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI: https://doi.org/10.3329/bjme.v16i2.83119

Original Article

Dietary Supplements Use among Medical Students of Bangladesh

*F*atema Johora[1], *Satabdi Ghosh*[2], *Jannatul Ferdoush*[3], *Asma Akter Abbasy*[4], *Tarafder Shahniam Ahmed*[5], *Asiya Ferdous*[6], *Fatiha Tasmin Jeenia*[7], *Kazi Sabiha*[8], *Mst. Arifa Shirin*[9], *Sabiha Mahboob*[10], *Syeda Rubayat Hilmi*[11], Priyanka Moitra[12], Mohsena Aktar[13], *Sarmin Sultana*[14], *Mithun Chandro Bhowmik*[15], Nargis Akhter Choudhury[16], *Nazla Shamsuddhoha*[17], *A. B. M. Masud Jahid*[18]

Abstract

Introduction: The use of dietary supplements (DS) is increasing globally. Intense debate surrounds the benefits of individual high-dose micronutrient supplementation among well-nourished individuals**.** Demographic and lifestyle factors such as monthly income, educational status, sedentary lifestyle and smoking status were reported to correlate with dietary supplement use. Dietary supplement use among medical students is of particular research interest as they are the future prescribers. Objective: To find out the prevalence and associated factors of DS use among the medical students. Materials and Methods: This descriptive cross-sectional study was conducted in the Department of Pharmacology & Therapeutics of 18 medical colleges of Bangladesh including both government and non-government medical colleges. A structurred questionnaire survey was conducted among the 3rd year and 4th year MBBS students of studied medical colleges who agreed to participate the study, and total 2629 medical students participated in this study. Results: The overall prevalence of DS use was 39.25%. The most-used DS were Vitamin C (31.41%) and multivitamins-minerals (24.92%). In 34.30% cases, DS were recommended by physician**.** Academic knowledge (58.72%) was the most common source of information, followed by prior experience (44.08%). The most common reason for taking DS was for improvement of overall health (41.47%). Supplement intake was significantly associated with gender (p = 0.015), marital status (p = 0.007), nationality (p = <0.00001) and types of medical colleges (p =0.032). Female students **(**41.00%**),** married **(**50.38%**),** foreign nationality (49.52%) and students studying in government medical colleges (41.00%) took significantly more DS. Conclusion: The prevalence of supplement use was among medical students was similar to values reported previously in the literature. It would be better to review the undergraduate medical education in regards of DS for encouraging better and safer prescribing of supplements in future.

Keywords: *Dietary supplements, medical students, mineral, vitamin*

1. Associate Professor, Department of Pharmacology & Therapeutics, Army Medical College Bogura, Bogura cantonment
2. Assistant Professor, Department of Pharmacology & Therapeutics, Khwaja Yunus Ali Medical College & Hospital, Enayetpur, Sirajganj
3. Professor & Head, Department of Pharmacology & Therapeutics, BGC Trust Medical College, Chattogram
4. Associate Professor, Department of Pharmacology & Therapeutics, Brahmanbaria Medical College, Brahmanbaria
5. Prof. (CC) & Head, Department of Pharmacology & Therapeutics, Army Medical College Bogura, , Bogura cantonment
6. Lecturer, Department of Pharmacology & Therapeutics, Jamalpur Medical College, Jamalpur
7. Associate professor, Department of Pharmacology & Therapeutics, Chattogram International Medical College
8. Assistant professor, Department of Pharmacology & Therapeutics, United Medical College, Dhaka
9. Associate professor, Department of Pharmacology & Therapeutics, Shaheed Ziaur Rahman Medical College, Bogura
10. Assistant professor & Head, Department of Pharmacology & Therapeutics, Armed Forces Medical College, Dhaka
11. Associate professor, Department of Pharmacology & Therapeutics, Z.H. Sikder Women's Medical College, Dhaka
12. Assistant Professor, Department of Pharmacology & Therapeutics, Manikganj Medical College, Manikganj
13. Associate Professor, Department of Pharmacology and Therapeutics, Comilla Medical College

Bangladesh Journal of Medical Education 2025; 16(2); Johora et al., publisher and licensee Association for Medical Education.

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

Original Article

14. Assistant Professor, Department of Pharmacology & Therapeutics, Gazi Medical College, Khulna
15. Assistant professor, Department of Pharmacology & Therapeutics, Dinajpur Medical college, Dinajpur
16. Assistant Professor & Head, Department of Pharmacology & Therapeutics, Habiganj Medical College, Habiganj
17. Assistant professor, Department of Pharmacology & Therapeutics, Medical College for Women and Hospital, Dhaka
18. Associate Professor and Head, Department of Pharmacology and therapeutics, Army Medical College Cumilla

Address of correspondence: Dr. Fatema Johora, Associate Professor, Department of Pharmacology & Therapeutics, Army Medical College Bogura, Bogura Cantonment, Bogura.
E-mail: fatemajohora.0801@gmail.com

Introduction

Dietary supplements are the products intended for ingestion that contains a "dietary ingredient" intended to add further nutritional value to (supplement) the diet.[1] The different supplements used include multivitamins, multi-minerals, amino acids and individual vitamin and mineral supplements such as vitamin A, B-complex, C, magnesium and zinc. These products are available in many forms (tablets, capsules, gelatin capsules, soft gels, liquids, chewable preparations and powders). A well-balanced diet remains the optimal approach to ensure adequate intake of essential micronutrients. However, there are many situations when supplementation has an important role in treating diseases caused by vitamin and mineral deficiencies.[2] Vitamin A deficiency is considered one of the most prevalent micronutrient deficiencies worldwide and the major cause of preventable childhood blindness low- and middle-income countries. Vitamin A supplementation programs targeted at children aged 6–59 months are implemented in many developing countries. By improving immune function, vitamin A reduces mortality associated with measles, diarrhea, and other illnesses.[3] In developing countries, provision of iron and folic acid supplements to women of reproductive age is viewed as one of the most important nutrition interventions.[4] Favorable role of calcium is evident in people of all ages, not only in the postmenopausal women and elderly population but also in childhood and adolescence.[5] Daily low-dose multivitamin supplementation has been linked to reductions in the incidence of cancer and cataracts, especially among men. Intense debate surrounds the benefits of individual high-dose micronutrient supplementation among well-nourished individuals.[2] Randomized trial evidence does not support use of vitamin, mineral, and fish oil supplements to reduce the risk of non-communicable diseases.[6] Several trials have reported potential adverse effects from supplementation with high-doses of β-carotene and vitamin E, raising concerns about dietary supplementation at much higher levels than the RDA.[7] Calcium is a double-edged sword, which may be both potentially crucial and perilous.[8, 9] Studies demonstrated that calcium could prevent osteoporosis and osteoporotic fracture or improve BMD, but simultaneously also revealed the increase of the occurrence of cardiovascular diseaseas[10] and increase in urine calcium level and subsequently in the risk of urinary calculi.[11]

Worldwide prevalence of DS usage ranges from 22% to 53%.[2] Vitamins and mineral supplements are the most commonly used DS by populations worldwide.[6] An increase in self-care as well as DS use had been observed during the earlier days of COVID-19 pandemic.[12, 13]. Demographic and lifestyle factors such as monthly income, educational status, sedentary lifestyle and smoking status were reported to correlate

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

with DS use.[2, 6, 14] Use of supplements appreciably reduces the prevalence of inadequate intake for most nutrients but also increases the prevalence of excess intake for some nutrients.[6]

Bangladesh has a higher prevalence of micronutrient deficiencies.[15] The micronutrients depletion situation in Bangladesh is growing day by day and this could be a source of motivation or reason for high DS patronage.[16, 17] Increased prescription of dietary supplements has been observed in different studies conducted in Bangladesh. [18, 19]. This may be influenced by growing access to digital learning among students, as seen in ICT-related surveys in Bangladesh.[20] There are several studies conducted in Bangladesh focusing the usage of DS and associated factors among diverse population.[16-19,21,22.] But there is no reported data on medical students. Their prescribing attitudes and drug choice behavior, which were previously explored in junior doctors, underscore the need to evaluate DS use among future prescribers. [23] Dietary supplement use among medical students is of particular research interest as they are the future prescribers. It is assumed that individuals who have a greater degree of education about health, such as medical students, have greater knowledge and are more selective regarding DS use than the general population. Problem-based learning approaches in pharmacology education have shown varying implementations, which may impact how medical students understand the applications and limitations of dietary supplements.[24]. Moreover, awareness of adverse drug reactions among medical students could influence cautious DS usage.[25,26.] Cautious approach of pharmacy students regarding dietary supplements use was observed in a study conducted in Pakistan.[27] Medical students and physicians in Bangladesh have shown positive attitudes towards research, which may impact their evidence-based use of DS. [28, 29] In addition, they can, in their future medical practice, have an influence on patient beliefs and uses of DS as well as an influence on the general population.[30] Hence, current study was conducted to find out the prevalence and associated factors of DS use among the medical students of Bangladesh.

Material &Methods

The objective of the study was to assess the magnitude of DS use among the medical students of Bangladesh.

Study Design, Place and Population: This was a descriptive cross-sectional study conducted in the Department of Pharmacology & Therapeutics of 18 medical colleges of Bangladesh including both government (Dhaka Medical College, Armed Forces Medical College, Manikganj Medical College, Cumilla Medical College, Dinajpur Medical College, Shaheed Zaiur Rahman Medical College, Bogura and Habiganj Medical College) and non-government (Army Medical College Bogura, Army Medical College Chattogram, Army Medical College Cumilla, Army Medical College Jashore, Brahmanbaria Medical College, BGC Trust Medical College, Chattogram International Medical College, Khawja Yunus Ali Medical College, Medical College for Women and Hospital, United Medical College and Z.H. Sikder Women's Medical College) medical colleges from May 2024 to October 2024. Study was conducted among the 3rd year and 4th year MBBS students of studied medical colleges and total 2629 medical students participated in this study.

Study Instrument: A structured questionnaire was used for data collection and questionnaire was validated before survey**.** Questionnaire was adopted from an

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

earlier study conducted in Bangladesh.[16] Piloting of the questionnaire was done before commencing the survey. As English is the medium for medical education in Bangladesh, the administered questionnaire was in English.

Procedure of study: Ethical approval was taken from the Institutional Ethical Review Board (IERB) of Army Medical College Bogura. Permission was taken from college authorities and informed consent was taken from the participants of the Structured Questionnaire Survey. The respective medical colleges were clearly informed about the study and its objectives. Survey was conducted among the 3rd year and 4th year MBBS students of studied medical colleges who agreed to participate the study. Researchers explained the nature and purpose of the survey to the students during a lecture class. This self-administered questionnaire was circulated among students through both online and offline on the basis of convenience. In case of online data collection, questionnaire was linked in a google form and was distributed among study population through official Whatsapp group. To assure the quality, students filled and submitted the questionnaire quickly during end of class. Later, this web-based questionnaire was sent to students who were absent in the class through email. A reminder mail or message was given on 7th day and 15th day of the primary one. The response generated by the students was received through google drive, and it did not accept double response from same participant. To maintain confidentiality, responses were anonymous. In case of offline data collection, questionnaire was handed to the students by the researchers. To assure the quality, students filled and returned the questionnaire quickly during end of the lecture class. Participants who did not return questionnaire in time were approached again. In case of losing the questionnaire, new questionnaire was provided to them. Students who did not return back their questionnaire after three approaches were considered as non-respondents.

Statistical analysis: Data was compiled, presented and results were expressed as frequency and percentage. Chi-square test was performed to determine factors associated with supplement use. $P < 0.05$ was considered statistically significant.

Result

Table I showed that majority of study population were female (64.21%), unmarried (95.02%), Bangladeshi (92.1%), and living in college accommodation (78.13%).

Table I Distribution of demographic characteristics of respondents (N=2629)

Variables	Frequency	Percentage
Gender		
Male	941	35.79
Female	1688	64.21
Academic year		
3rd year	1299	49.41
4th year	1330	50.59
Type of institution		
Government	1522	57.89
Non-government	1107	42.11

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

Marital status		
Married	131	4.92
Unmarried	2498	95.02
Nationality		
Bangladeshi	2419	92.1
Foreigner	210	7.98
Residence		
Living with family	482	18.33
Living alone (college accommodation)	2054	78.13
Living alone (self-accommodation)	93	3.54

Overall prevalence of DS consumption among medical students was 39.25% (**Figure 1**).

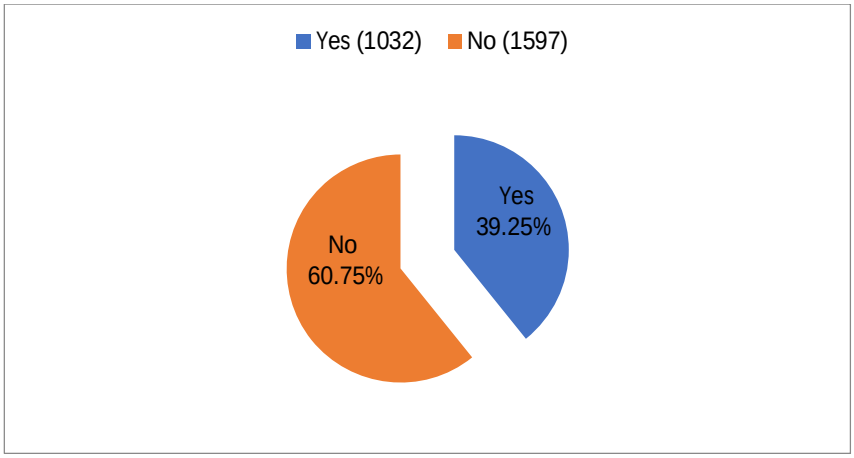

Figure 1: Overall prevalence of dietary supplement use among medical students

Table II showed that among female students, 41.00% used DS, while, it was 36.13% among male students. DS use was 40.03% among 3rd year medical students and 38.49% among 4th year medical students. Use of DS among students of government and non-government medical colleges were 41.00% and 30.68% respectively. Among married students, 50.38% used DS, while among unmarried students, 38.76% used DS. Use of DS among students of Bangladeshi and foreign nationality were 38.36% and 49.52% respectively. Among students living with family, 42.11% used DS, while it was 38.80% among students living alone (college accommodation) and 34.41% among students living alone (self-accommodation).

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

Table II Distribution of DS use among demographic characteristics of respondents (N=2629)

Variables	Frequency (N)	Percentage (%)
Gender		
Male (941)	340	36.13
Female (1688)	692	41.00
Academic year		
3rd year (1299)	520	40.03
4th year (1330)	512	38.49
Type of institution		
Government (1522)	624	41.00
Non-government (1330)	408	30.68
Marital status		
Married (131)	66	50.38
Unmarried (2492)	966	38.76
Nationality		
Bangladeshi (2419)	928	38.36
Foreigner (210)	104	49.52
Residence		
Living with family (482)	203	42.11
Living alone (college accommodation) (2054)	797	38.80
Living alone (self-accommodation) (93)	32	34.41

Table III showed that Vitamin C (31.41%) was the highest consumed DS followed by multivitamins-minerals (24.92%), calcium (21.44%), vitamin D (20.57%) respectively. And 34.30% dietary supplements were recommended by physician (**Figure 2**).

Table III Distribution of types of DS taken by respondents (N= 1032)

Supplements	Frequency	Percentage
Vitamin C	324	31.41
Multivitamins-minerals	257	24.92
Calcium	221	21.44
Vitamin D	213	20.57
Multivitamins	202	19.52
Vitamin E	195	18.93
Iron	184	17.81
Vitamin B complex	151	14.63
Folic acid	123	11.92
Zinc	108	10.44
Omega-3-fatty acid	81	7.78
Vitamin A	70	6.72
Probiotics	59	5.73
Herbal	40	3.84
Others	51	4.94

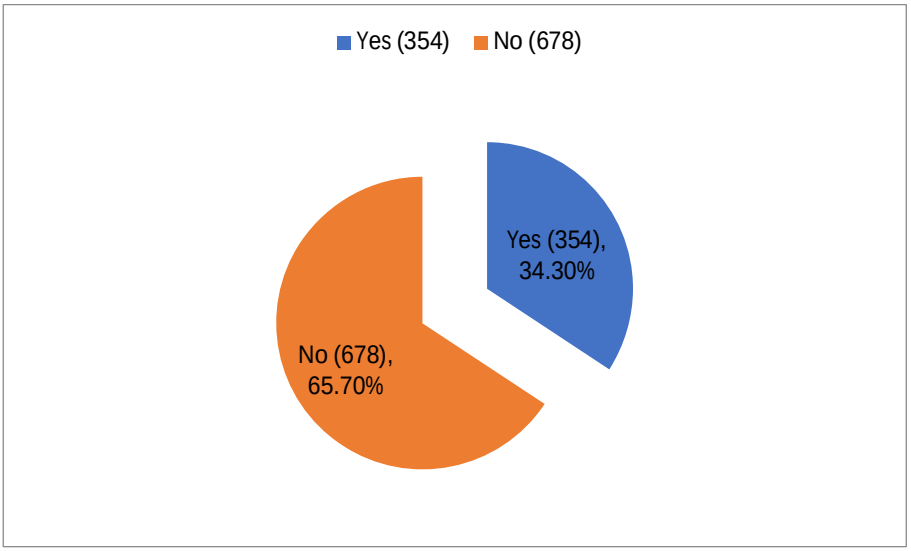

Figure 2: Recommendation of supplementation by physicians (N= 1032)

Improvement of overall health (41.47%) was the highest cited reason for DS intake followed by maintenance of health (29.94%) and prevention of health problems (25.97%) respectively (Table IV). And academic knowledge was the highest referred source of information of DS (Table V).

Table IV Distribution of reasons for taking DS (N=1032)

Reasons	Frequency	Percentage
Improvement of overall health	428	41.47
Maintenance of health	309	29.94
Prevention of health problems	268	25.97
Supplementation of diet	248	24.03
Boosting of immunity	178	17.25
Skin health	178	17.25
Bone health	139	13.47
Getting for energy	98	9.5
Prophylaxis against diseases	61	5.91
Bowel/ colon health	54	5.23
Boosting of memory	52	5.04
Mental well being	52	5.04
Prevention of carries	33	3.2
Prevention of insomnia	35	3.39
Others (e.g. hair fall, neurological, weight reduction, growth stimulation, appetite etc)	70	6.78

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

Table V Distribution of sources of information regarding DS (N=1032)

Source of information	Frequency	Percentage
Academic knowledge	606	58.72
Prior experience	455	44.08
Friends and Relatives	195	18.9
Internet	179	17.35
Pharmacist	120	11.63
Social media	78	7.56
Pharmaceutical industries	33	3.2
Mass media	32	3.1

The use of supplements correlated significantly with the gender of respondents (P = 0.015). Furthermore, students enrolled in government medical colleges were more likely to take supplements, and this association was statistically significant (P =0.032). The association of nationality with supplement use was statistically significant (P <0.00001). The use of supplements correlated significantly with the marital status of respondents (P = 0.008). By contrast, supplement use was not associated significantly with academic year or residence of respondents (**Table VI**).

Table VI Association of demographic variables with DS use (N=2629)

Variables	DS users N (%) 1032 (39.25)	DS non-users N (%) 1597 (60.75)	X^2 value	P value
Gender				
Male	340 (32.95)	601 (37.63)	5.99	0.015*
Female	692 (67.06)	996 (62.37)		
Academic year				
3rd year	520 (50.39)	779 (48.78))	0.649	0.42
4th year	512 (49.61)	818 (51.22)		
Type of institution				
Government	624 (60.47)	898 (56.23)	4.616	0.032*
Non-government	408 (39.53)	699 (43.77)		
Marital status				
Married	66 (6.4)	65 (4.07)	7.16	0.008*
Unmarried	966 (93.6)	1532 (95.93)		
Nationality				
Bangladeshi	928 (89.92)	1491 (93.36)	10.1	<0.00001*

Foreigner	104 (10.08)	106 (6.64)		
Residence				
Living with family	203 (19.67)	279 (17.47)	2.74	0.27
Living alone (college accommodation)	797 (77.23	1257 (78.71)		
Living alone (self-accommodation)	32 (3.1)	61 (3.82)		

Chi square test was done, p<0.05- Significant

Discussion

The use of DS is increasing globally. Epidemiological studies mention that demographic characteristics are crucial determinants of supplement use. Several studies concluded higher proportion of supplements use among young generation, particularly students from health sciences. As medical students are the future physicians, it was interesting to explore the prevalence and associated factors of DS use among them. Current study found higher prevalence of DS use among female gender, married, foreign nationality and students of government medical colleges.

In current study, the overall prevalence of DS use among the respondents was 39.25%. Higher prevalence of DS use among medical students was observed in studies conducted in different countries.[31, 32, 33, 34] A recent study conducted among university students of Bangladesh found that prevalence of DS use was 15.6%.[35] As medical students are from higher education level and empowered with the knowledge of medicine probably that's why they took more supplements in comparison with university students.[36] Female predominance of DS use was observed in this study which was concurrent with findings of previous studies. [17, 19, 21, 31, 34] This finding can be acceptable by the fact that females are more likely to develop nutritional deficiencies than males because of their reproductive system and socio-cultural traditions and disparities.[19, 21] In this study, use of DS was more prevalent in married students and this was similar to one study conducted among medical students.[31] There was no statistically significant difference in between 3rd year and 4th year medical students (p value 0.42) regarding use of DS and that was concordance with one study conducted among pharmacy students.[37] But different findings were revealed in related literatures which stated significantly higher percentage of supplements use in senior years.[31, 33] Higher prevalence of DS use was observed in medical students studying in government institutions in comparison with those studying in non-government institutions (p value 0.032) and this observation was different from two earlier studies where the prevalence of DS use in public universities was lower than in private universities.[17, 27, 35] In Bangladesh, living facility including diet is not satisfactory in government institutions because of socioeconomic condition. Earlier study conducted in Bangladesh found out that in terms of dietary habits, there is a distinct patterns between students of government and non-government institutions, with the latter consuming a more diverse diet.[37] As current study was done among medical students and majority of the students were living in college accommodation, probably they assumed that their diet is lack of required nutrients and that's why they took supplements.[38] In our study, higher prevalence of supplement was observed in case of foreign students in comparison to Bangladeshi students and this was perhaps due to the fact that foreigner's belief of inadequacy of supplied

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

diet regarding nutrition. On the other hand, studies conducted among medical and pharmacy students of United States did not find any ethnic variation regarding supplement intake.[31] There was no statistically significant difference among students living with family, living alone (college accommodation) or living alone (self-accommodation) (p value 0.27) regarding use of supplement and that was concordance with one study conducted among students in a Egyptian university.[39]

The most commonly used supplement was vitamin C (31.41%) then followed by multivitamins-minerals (24.92%), and this was concordance with one earlier study conducted on medical students of Nigeria.[34] But that was contrary to other studies where multivitamins-minerals was the most commonly used supplement by study population.[27, 31, 35, 40, 41] Vitamin C acts antioxidant and plays a myriad of functions in optimal health and prevention of disease including potential protective effects against cardiovascular diseases, different types of malignancies, cataracts and multiple infectious diseases.[42] Dietary intake of vitamin C is a key determinant of body status and fresh fruit and vegetables are the major dietary source of vitamin C. Dietary intake can be influenced by certain cultural aspects such as traditional cooking practices and staple foods, with many staple contributing negligible vitamin C to the diet.[43] Probably for these reasons, significant proportion of medical students took vitamin C as DS. Increased use of Vitamin C was observed among medical students of Bangladesh during COVID-19 pandemic as self-medication.[44] In this study, 34.30% of respondents stated that DS were recommended by physician and this finding was similar to one study conducted among pharmacy students of Pakistan.[27] On the contrary, in a study conducted among medical students of Croatia revealed that 14.9% of respondents look for professional medical help when taking a dietary supplement.[36] Analysis of pharmacology question papers of medical colleges in Bangladesh shows that including a topic in assessments promotes student learning, so adding dietary supplements can enhance knowledge for rational use. [45]

The majority of medical students revealed the reason for using DS as improvement of overall health (41.47%), followed by maintenance of health (29.94%), prevention of health problems (25.97%) and for supplementation of diet (24.03%). In some cases, students used supplements as a way of boosting immunity (17.25%), skin care (17.25%), and bone care (13.47%). Reasons given by participants for supplement use are concordance to reasons revealed in earlier studies.[16, 19, 27, 28, 29] In the present study, academic knowledge was the most common source of information of DS among the respondents (58.72%), followed by prior experience (44.08%). These findings were coherent with one earlier study conducted among medical students of Bangladesh during COVID-19 regarding self-medication.[37] Therefore, it might be interesting to evaluate the undergraduate medical education with respect to dietary supplement teaching-learning. Internet was cited as the most popular source of knowledge among medical students in studies conducted in Poland (67.89%)[24] and Croatia (61.9%)[28], while in current study among 17.35% of students. Less frequent use of internet regarding medicine information among students of Bangladesh was also revealed in related literatures.[35, 44] Studies dealing with DS usage among university students[46, 47] have reported that family and friends were the most important sources of dietary supplement information, while among our studied medical students, it was 18.9%.

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

To our best knowledge, this is the first study to explore DS use in medical students of Bangladesh. The study has some strength as it is a large scale study and questionnaire was validated. But there are several limitations too. It was a self-administered questionnaire and subjects' responses were not validated. Researchers did not conduct a Food Frequency Questionnaire on these respondents, so we could not evaluate whether they got enough nutrients from their diet, and whether taking supplements were needed for their health. We did not correlate supplement intake with their body mass index (BMI), family income, physical exercise, smoking habit and concurrent illness.

Conclusion

The market size of dietary supplements is expanding in Bangladesh. As the evidence regarding the benefits and risks of supplements continues to emerge, it is essential to develop evidence-based national guidelines on how best to incorporate this aspect into the health-care systems. Current study found that the prevalence of usage was among students is similar to values reported previously in the literature, and Vitamin C was the most frequently used supplement. Furthermore, female gender, married, foreign nationality and students of government medical colleges were found to be associated significantly with a higher use of supplements. As academic knowledge was cited as most popular source of information regarding supplements, it would be better to review the undergraduate medical education for encouraging better and safer prescribing of supplements in future.

Reference

1 U.S. Food and Drug Administration. FDA 101: Dietary Supplements. Available online: https://www.fda.gov/consumers/consumer-updates/fda-101-dietary-supplements (accessed on 12 April 2022).

2 Rautiainen S, Manson JE, Lichtenstein AH, Sesso HD. Dietary supplements and disease prevention - a global overview. Nat Rev Endocrinol. 2016 Jul;12(7):407-20.

3 Wirth JP, Petry N, Tanumihardjo SA, Rogers LM, McLean E, Greig A, Garrett GS, Klemm RD, Rohner F. Vitamin A Supplementation Programs and Country-Level Evidence of Vitamin A Deficiency. Nutrients. 2017 Feb 24; 9(3):190.

4 World Health Organization (WHO). Weekly iron and folic acid supplementation programmes for women of reproductive age: an analysis of best programme practices (short version). WHO, Geneva, Switzerland, 2011.

5 Li K, Wang XF, Li DY, et al. The good, the bad, and the ugly of calcium supplementation: a review of calcium intake on human health. Clin Interv Aging. 2018; 13:2443-2452.

6 Zhang FF, Barr SI, McNulty H, Li D, Blumberg JB. Health effects of vitamin and mineral supplements. BMJ. 2020;369:m2511.

7 Bjelakovic G, Nikolova D, Gluud LL, Simonetti RG, Gluud C. Antioxidant supplements for prevention of mortality in healthy participants and patients with various diseases. Cochrane Database Syst. Rev. 2012; 3: CD007176.

8 Zhao JG, Zeng XT, Wang J, Liu L. Association Between Calcium or Vitamin D Supplementation and Fracture Incidence in Community-Dwelling Older Adults: A Systematic Review and Meta-analysis. JAMA. 2017; 318(24):2466–2482.

9 Straub DA. Calcium supplementation in clinical practice: a review of forms,

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

doses, and indications. Nutr Clin Pract. 2007; 22(3):286–296.
10 Radford LT, Bolland MJ, Mason B, et al. The Auckland calcium study: 5-year post-trial follow-up. Osteoporos Int. 2014; 25(1):297–304.
11 Gahche J, Bailey R, Burt V, et al. Dietary supplement use among U.S. adults has increased since NHANES III (1988–1994) NCHS Data Brief. 2011; 61:1–8.
12 Arora I, White S, Mathews R. Global Dietary and Herbal Supplement Use during COVID-19-A Scoping Review. Nutrients. 2023; 15(3):771.
13. Johora F, Abbasy AA, Jeenia FT, Bhowmik MC, Aktar M, Choudhury NA, Moitra P, Ferdoush J. COVID-19 Pandemic and Prevalence of Self-Care Practices among the Future Physicians: A Bangladesh Study. Chatt Maa Shi Hosp Med Coll J. 2021;20(2):22-27
14 Kantor ED, Rehm CD, Du M, White E, Giovannucci EL. Trends in Dietary Supplement Use Among US Adults From 1999-2012. JAMA. 2016; 16(14):1464-1474.
15 Ahmed F, Prendiville N, Narayan A. Micronutrient deficiencies among children and women in Bangladesh: progress and challenges. J Nutr Sci. 2017; 5:e46.
16 Karim K, Tasnim T. Nutritional status, dietary food and nutrient consumption patterns in monga affected area of the northern part of Bangladesh. Asian. J. Clin. Nutr 2015;7: 55-63
17 Jahan I, Uddin ABMN, Reza ASMA, et al. Tendencies and attitudes towards dietary supplements use among undergraduate female students in Bangladesh. PLoS ONE 2021; 16(4): e0249897.
18 Das AK, Rahman MS. Prescribing vitamins at primary health care level: Exploration of facts, factors and solution. Bangladesh J Pharmacol. 2010; 5: 92-97.
19 Tasfia SZ, Kabir MA, Islam MR, Elias-Al-Mamun M Study on Nutritional Supplements for Females in Dhaka City, Bangladesh Bangladesh Pharmaceutical Journal 2020; 23(1): 39-43.
20 Ferdoush J, Biswas RS, Jeenia FT, Chowdhury T, Parveen K, Ata M. Information and Communication Technology (ICT) in Medical Education: A Survey among Medical Students' of Bangladesh.j sci soc; 2021; 48(3):165-170. DOI: 10.4103/jss.jss_93_20
21 Islam M, Hasan MDT, Al-Fuad MDS et al. Dietary supplements use and associated determinants among adult population in Southern Bangladesh. Am J Food Sci Nutr 2018; 5, 64–70.
23. Ferdoush J, Chowdhury A, Parveen K, Ata M, Alam SS, Reza FH. A Survey of Factors Influencing Drug Choice and the Prascribing Attitudes Among Junior Doctors of Two Major Tertiary Care Hospitals in Chittagong City. ChattogramMaa-O-ShishuHosp Med Coll J 2018; 17(1): 17-21.
24 Johora F, Abbasy AA, Mahboob S, Jeenia FT, Ferdoush J. Trend and weightage of problem based questions in undergraduate pharmacology written question papers of Bangladesh. BGC Trust Med Col J; 2021: 6(2).
25. Ferdoush J. Adverse Drug Reactions and Its Importance in Clinical Practice. ChattMaa Shi Hosp Med Coll J. 2018; 19(2):1-2.
26. Jahangir SM, Ferdoush J, Parveen K, Ata M, Alam SS, Chowdhury R, Rahman MS. Evaluation of the Knowledge and Attitude of the Future Prescribers about Pharmacovigilance: Experience of Four Medical Colleges of Chittagong. JCMCTA 2016; 27(1): 4 - 10.
27 Naqvi AA, Ahmad R, Zehra F, et al. 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.
28. Ferdoush J, Johora F, Khan IU, Hossain SMT, Sadia H, Jeenia FT,

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

Chowdhury SS, Sultana N, Sharmeen S. Attitude and Perceived Barriers towards Research among Undergraduate Medical students of Bangladesh. BGC trust Medical College Journal. 2022; 7(1),3-7.

29. Ferdoush J, Johora F, Hoque A, Sadia H, Islam M,Jahangir B, Sultana N, Hossain SMT, Sharmeen S, Abbasy AA.Challenges and Attitude towards Research among Physicians of Bangladesh: A Cross Sectional Questionnaire Survey. Bangladesh Journal of Medical Education. 2022;13(1):10-19. DOI: 10.3329/bjme.v13i1.57501
30. Gardiner P, Woods C, Kemper KJ. Dietary supplement use among health care professionals enrolled in an online curriculum on herbs and dietary supplements. BMC Complement. Altern. Med. 2006, 6, 21.
31. Spencer EH, Bendich A, Frank E. Vitamin and mineral supplement use among US medical students: A longitudinal study. J Am Diet Assoc. 2006; 106(12):1975-83.

32 Brożyna K, Gąsławska-Kupisz A, Marzęda A, Tkaczyk J, Rutkowska A. Prevalence, attitudes and motivations concerning dietary supplements in sport intake among medical students. Central European Journal of Sport Sciences and Medicine. 2019; 28 (4): 67–74

33 Al-Johani WM, Al-Dawood KM, Abdel Wahab MM, Yousef HA. Consumption of vitamin and mineral supplements and its correlates among medical students in Eastern Province, Saudi Arabia. J Fam Community Med 2018; 25:169-74.

34 Aina BA, Ojedokun OA. Knowledge and use of dietary supplements by students of College of Medicine, University of Lagos, Idi-Araba, Lagos, Nigeria. J Basic Clin Pharm. 2014; 5(2):34-9.

35 Tareq MA, Emi UH, Banna MHA, Rezyona H, Seidu A-A, Abid MT, et al. Prevalence and factors associated with dietary supplement use among Bangladeshi public university students: A cross-sectional study. PLoS One. 2022; 17(10):e0276343.

36 Žeželj SP, Tomljanović A, Jovanović KG, Peloza OC, Prokurica IP. Prevalence, Knowledge and Attitudes Concerning Dietary Supplements among a Student Population in Croatia. Int. J. Environ. Res. Public Health. 2018; 15, 1058.

37 Axon DR, Vanova J, Edel C, Slack M. Dietary Supplement Use, Knowledge, and Perceptions Among Student Pharmacists. Am J Pharm Educ. 201781(5):92.

38 Rizwan AAM, Banik SK, Anny NA, Ferdush J, Nokshi SS, Hossain AM4, et al. Comparative analysis of dietary diversity and food consumption patterns among public and private University Students in Bangladesh. International Journal of Biological and Pharmaceutical Sciences Archive, 2023; 06(02), 191–198.

39 Pouchieu C, Andreeva VA, Péneau S, Kesse-Guyot E, Lassale C, Hercberg S, et al. Sociodemographic, lifestyle and dietary correlates of dietary supplement use in a large sample of French adults: results from the NutriNet-Santé cohort study. The British journal of nutrition, 2013; 110 (8*)*:1480-91.

40 Hegazy N, Sayed HA, Hasan AA, Salem MR. Popularity of the Consumption of Dietary Supplements and its Associated Factors among Students in an Egyptian University: A Cross-sectional Study. Open Access Maced J Med Sci. 2020; 8(E):566-573.

41 Kostka-Rokosz MD, Camiel LD, Tataronis G, Steinberg M, McCloskey. Use of vitamins, minerals, herbs, and supplements among pharmacy and nursing students: Why educators should consider factors influencing students' choices? Currents in Pharmacy Teaching and Learning. 2015; 7:427–433

42 Mamtani R, Cheema S, MacRae B, Alrouh H, Lopez T, ElHajj M, et al.

ISSN: 2306-0654(Print), 2313-4224 (Online)
DOI:

Herbal and nutritional supplement use among college students in Qatar. . East Mediterr Health J. 2015;21(1):39-44.

43 Carr AC, Cook J. Intravenous vitamin C for cancer therapy—Identifying the current gaps in our knowledge. Front. Physiol. 2018; 9:1182.

44 Johora F, Abbasy AA, Jeenia FT, Sojib FA, Sabiha K, Khan MM, et al. Viewpoint regarding COVID-19 vaccine and pursuing self-medication amidst medical students. International Journal of Pharma Sciences and Research. 2020; 11 (12): 275-81.

45. Johora F, Abbasy AA, Mahboob S, Jeenia FT, Ferdoush J, Rahman MS. Undergraduate Pharmacology Written Question Papers of Different Universities of Bangladesh: Analysis of One Decade. Chatt Maa Shi Hosp Med Coll J. 2022:21(2):3-8.

46 Al-Naggar RA, Chen R. Prevalence of vitamin-mineral supplements use and associated factors among young Malaysians. Asian Pac J Cancer Prev. 2011, 12, 1023–1029.

47 Sharma A, Adiga SMA. Knowledge, attitude and practices related to dietary supplements and micronutrients in health sciences students. J Clin Diagn Res. 2014; 8(8):HC10-3.

