

DOI: <https://dx.doi.org/10.18203/2319-2003.ijbcp20243036>

Original Research Article

Assessment of knowledge, attitude and practice of over-the-counter drugs and dietary supplements among non-healthcare college students in Chitradurga

Annu Merin Varghese*, Srinivas V., Hema N., Yogananda R., Vaishnavi S.

Department of Pharmacy Practice, SJM College of Pharmacy, Chitradurga, Karnataka, India

Received: 31 August 2024

Revised: 08 October 2024

Accepted: 09 October 2024

*Correspondence:

Dr. Annu Merin Varghese,

Email: annumerinv@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The market for OTC drugs and dietary supplements is rapidly growing. However, there exists a lack of adequate awareness among the general public regarding the advantages and potential drawbacks associated with these products, particularly among the younger generation, who heavily rely on the internet for information. Therefore, this study sought to assess the knowledge, attitude and practice of college students regarding OTC drugs and dietary supplements, including prevalence and associated factors.

Methods: A prospective interventional study with 306 participants was conducted. Data were collected using a self-designed and pre-validated questionnaire and analysed using Statistical Package for the Social Sciences (SPSS) version 28. Descriptive and inferential (T-test) statistics were used.

Results: The prevalence of usage of OTC drugs and DSs was found to be 98.4% and 61.4% respectively. Easy accessibility (42.2%), safe and well tolerable (32.5%) were the main factors that influenced them to turn to SM with OTC drugs. The respondent's preference for DSs was primarily driven by their desire to maintain good health (33.6%). Internet (22.2%) and healthcare professionals (21.9%) were the two most reported sources that students relied on to obtain information about DSs. The result revealed poor knowledge and a positive attitude towards OTC drugs and DSs among all participants.

Conclusions: A high prevalence of self-medication with OTC drugs and dietary supplements use was highlighted. Notable issues and improper practices were recognized. The findings indicate a need for education to enhance knowledge about OTC drugs and DSs and to encourage safe practices.

Keywords: Dietary supplements, OTC drugs, Self-medication

INTRODUCTION

Non-prescriptive drugs, or over-the-counter drugs (OTCs), are the drugs that can be purchased without a prescription.¹ The trend of 'Over-the-Counter (OTC) Medicines' use has become increasingly popular over the past few years. This trend is brought on by a number of factors, including easy availability, affordability, and the ease of acquiring

information about the marketed products.² In India, there are currently no guidelines for licensing OTC medicines, unlike in many other countries where OTC medicines are recognized as a separate category of drugs with established regulations. India has not designated a specific category for OTC medicines, and drugs that are not classified under the prescription medicine schedule are generally sold as over-the-counter products.²

The rapid rise in the purchase of OTC drugs can be attributed to various advertising strategies employed by pharmaceutical companies. Nowadays, medicines are one of the most advertised products in the world. Intensive advertising of OTC products influences consumer choices and may result in overuse or addiction. As a result, the validity of the advertising message and applicable legal requirements are crucial factors.³

Much like OTC medications, dietary supplements are another product often subjected to exploitation under the guise of promoting health. The Dietary Supplement Health and Education Act of 1994 (DSHEA) defines Dietary supplements as “products, not drugs, that contain an ingredient intended to supplement the diet”. They are meant to enhance one’s dietary intake and provide essential nutrients that may be lacking.⁴

Recently, the market for dietary supplements has been undergoing rapid growth. However, there exists a lack of adequate awareness among the general public regarding the advantages and potential drawbacks associated with these products. Many individuals hold the belief that dietary supplements offer health benefits, including boosting overall health, strengthening the immune system, and warding off chronic illnesses. Despite being commonly cited reasons for their consumption, these assertions often lack solid scientific backing and certain supplements might pose health risks.⁵

In today's context, self-medicating with prescription drugs or/and OTC drugs has become notably significant among college students, particularly among the health-conscious younger generation who heavily rely on the internet for information.

They also exploit the knowledge they find online and the easy accessibility of drugs at their disposal for self-medication, often without realising the risks associated with incomplete and unreliable information.

This situation becomes perilous when they lack awareness of potential side effects and adverse reactions. Therefore, it is essential to prioritise raising awareness, especially among students pursuing non-healthcare disciplines. This concern extends to dietary supplements as well. Consequently, our study aims to evaluate college students' knowledge, attitudes and practices regarding over-the-counter drugs and dietary supplements, with the goal of enhancing their decision-making by addressing common misconceptions in their daily lives.

METHODS

A questionnaire-based prospective interventional study. Study was conducted at selected non-health care colleges under the SJM Institution in Chitradurga, Karnataka (SJM College of Technology, SJM College of Polytechnic, SJM Law College). The study was over a period of six months

(May 2023-Oct 2023). The study population consisted of 306 participants who met the inclusion criteria.

Study procedure

A six-month interventional study was carried out among students from Engineering, Polytechnic and Law College under the SJM Institution in Chitradurga. The study was commenced after obtaining approval from the Institutional Ethics Committee (IEC). All the students participating in the study were clearly explained about the purpose and nature of the study.

A self-designed and validated questionnaire was used to collect the information. For the purpose of the study, certain medical terms were explained to the study participants if they could not understand. A pre-test was conducted among students to assess their knowledge, attitude and practice regarding OTC drugs and Dietary supplements. Students were educated regarding OTC drugs and dietary supplements and their rational use. After one week, a post-test was conducted to assess their understanding of the subject. The data was entered in excel sheet and analysed with proper statistical method. The data collected was confidentially maintained.

Statistical analysis

Descriptive (mean, percentage, frequency and SD), and inferential (paired T-test) statistics were used. Statistical analysis was done using latest version of the Statistical Package for the Social Sciences (SPSS) 28 software.

Development of questionnaire

The development of our questionnaire followed a systemic approach, commencing with a thorough review of related literature. A structured questionnaire was prepared and validated by a subject expert. The questionnaire is composed of four sections: demographic details, knowledge section (11 questions), attitude section (10 questions) and practice section (12 questions) respectively. The initial section included inquiries about the demographic characteristics of participants, like name, age, gender and course. The following section assessed participant’s knowledge by using a set of true or false statements. The third section of questionnaire assessed the participant’s attitude towards OTC drugs and Dietary supplements with a set of Yes or No questions, while the last sections contained queries regarding practice of self-medication with OTC drugs and DSs products to assess the prevalence of usage and factors associated with it.

RESULTS

Demographic details of the participants.

In the present study, majority of participants were Engineering students (154, 50.3%) followed by Law (79, 25.8%) and the remaining were Polytechnic students (73,

23.9%). Out of 306 participants, 158 (51.6%) were males, followed by 148 (48.4%) females. The age range was from 15-46 years of age. The majority of were from 19-22 (53.5%) (Table 1).

Knowledge section

The study participants' knowledge about over-the-counter (OTC) medications and dietary supplements is shown in Table 2. It's worth highlighting that, in the post-test, there

was a noticeable improvement in the mean scores for each item. The statement "OTC stands for over-the-counter drugs" received the highest score, with a mean value of 0.83. It was followed by the statements "All medicines can be bought OTC" and "DSs are products, not drugs, that contain an ingredient intended to supplement the diet" with mean scores of 0.72 and 0.72, respectively. The least scored statement was "Fruit juice is a dietary supplement," with a mean score of 0.24 in the pre-test, which notably increased to 0.63 in the post-test (Table 2).

Table 1: Demographic details of participants.

Variables		Frequency	(%)
Course	Engineering	154	50.3
	LLB	79	25.8
	Polytechnic	73	23.9
Gender	Male	158	51.6
	Female	148	48.4
Age (years)	15-18	106	34.6
	19-22	164	53.5
	23-26	20	6.5
	27-30	6	1.9
	31-34	2	0.6
	35-38	5	1.6
	39-42	1	0.3
	43-46	2	0.6

Table 2: Knowledge of the study participants towards OTC medication and DSs.

Knowledge related questions	Mean value		T-value	P value
	Pre score	Post-score		
OTC stands for over the counter drugs.	0.83	0.93	4.57	0.00
OTC drugs can be given only with prescription of a registered medical practitioner.	0.58	0.77	6.60	0.00
OTC drugs are used usually for treating chronic illness	0.56	0.74	6.173	0.00
There is no legal recognition of OTC in India.	0.60	0.80	6.413	0.00
All OTC drugs taken along with prescription medicines are safe.	0.34	0.54	6.336	0.00
All medicines can be bought OTC.	0.72	0.82	3.523	0.00
DSs are products, not drugs, that contain an ingredient intended to supplement the diet.	0.72	0.82	3.889	0.00
DSs can completely replace a healthy diet.	0.44	0.64	6.005	0.00
DSs can prevent chronic diseases.	0.44	0.53	2.662	0.008
DSs can be taken according to our need.	0.26	0.47	6.268	0.00
Fruit juice is a dietary supplement.	0.24	0.63	6.268	0.00

Table 3: Attitude of the study participants towards OTC medication and DSs.

Attitude related questions		Frequency	%
Do you think OTC drugs encourage self-medication among patients?	Yes	189	61.8
	No	117	38.2
Do you think antibiotics should be available as OTC?	Yes	209	68.3
	No	97	31.7
Do you think easy availability of OTC drugs is leading to its misuse?	Yes	228	74.5
	No	78	25.5
Is it okay to share an OTC drug that worked for you with your friend that has	Yes	174	56.9

Continued.

Attitude related questions		Frequency	%
similar symptoms?	No	132	43.1
Do you think it is necessary to periodically update information regarding OTC?	Yes	238	77.8
	No	68	22.2
Do you seek a pharmacist before considering an OTC drug?	Yes	202	66.0
	No	104	34.0
Do you think it's better to ask for professional opinion while taking dietary supplement?	Yes	255	83.3
	No	51	16.7
Do you think dietary supplement is apt for all age groups?	Yes	89	29.1
	No	217	70.9
Do you trust in the safety of dietary supplements?	Yes	150	49.1
	No	156	50.9
Do you think that marketing and advertising of DSs can sometime be misleading?	Yes	205	67.0
	No	101	33.0

Table 4: Characteristics of study participants related to practice with OTC medication and DSs.

Practice related questions		Frequency	%
When did you consume OTC drugs?	When I cannot visit a doctor	91	30.2
	When symptoms are minor	120	39.8
	Whenever I feel sick	90	30.0
Do you buy OTC drugs to keep at home in case there is a use for it later in the future?	Yes	186	61.7
	No	115	38.3
If an OTC drug does not work for your symptoms	Consult a pharmacist or physician	154	51.2
	Increase the dose	48	16
	Switch to another OTC drug	85	28.2
	Wait for the symptoms to subside	14	4.6
What factors influence you to use OTC drugs in your daily lives?	Easy accessibility	127	42.2
	Low cost	39	13
	Safe and well tolerable	98	32.5
	Time saving	37	12.3
For which illness you usually go for OTC drug?	Fever	136	45.1
	Cough and Cold	121	40.1
	Headache	117	38.8
	Pain	105	34.8
	Diarrhea	36	11.9
	Vomiting	48	15.9
	Constipation	10	3.3
How often do you read the instructions on drugs or DSs label before use?	Always	140	46.5
	Never	60	20.0
	Occasionally	101	32.5
Which of the following sources you rely on to get information on DSs?	No response	55	17.9
	Friends	35	11.4
	Gym trainer	29	9.4
	Health care professionals	67	21.9
	Internet	68	22.2
	TV Advertisements	22	7.1
	Magazines	30	9.8
What is your reason for consuming DS?	No response	55	17.9
	Maintaining good health	103	33.6
	Body building	37	12.2
	Treat minor illness	48	15.6
	Meet increased energy demand of the body	34	11.2
	Prophylaxis to prevent disease	29	9.5

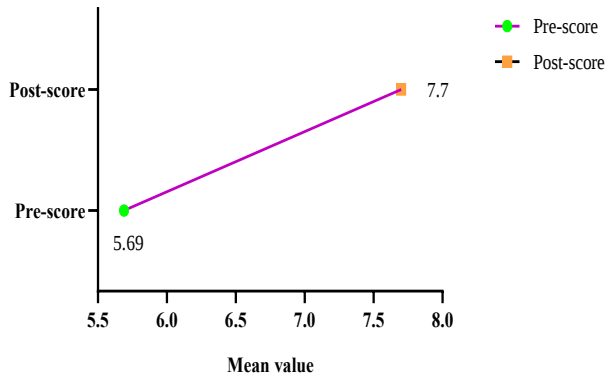


Figure 1: Paired sample statistics.

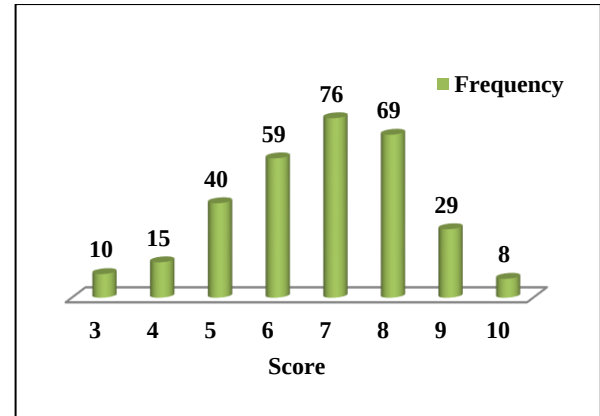


Figure 4: Normal frequency distribution of attitude score.

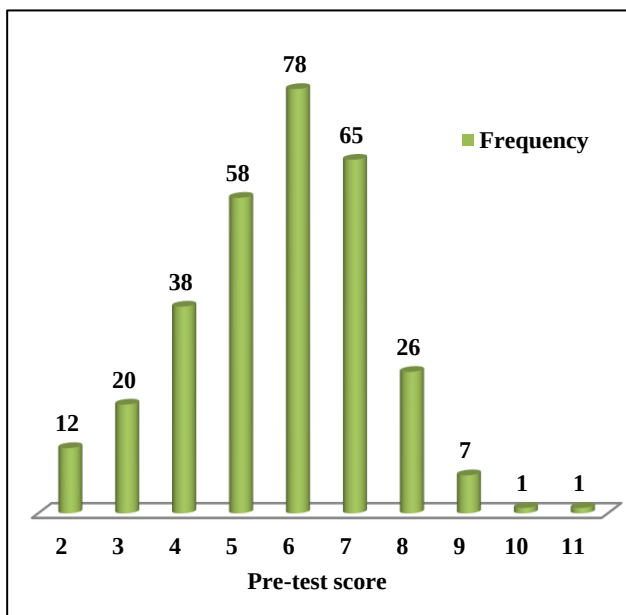


Figure 2: Normal frequency distribution of pre-test scores.

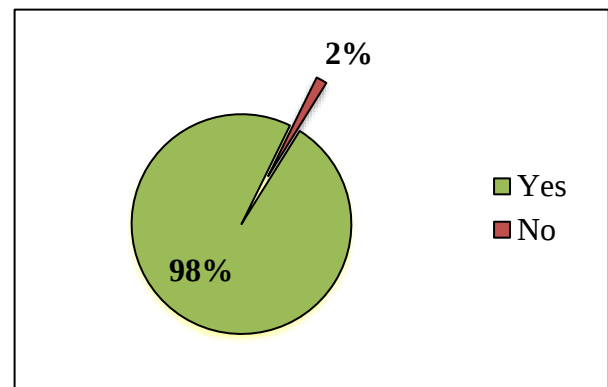


Figure 5: Prevalence OTC drugs.

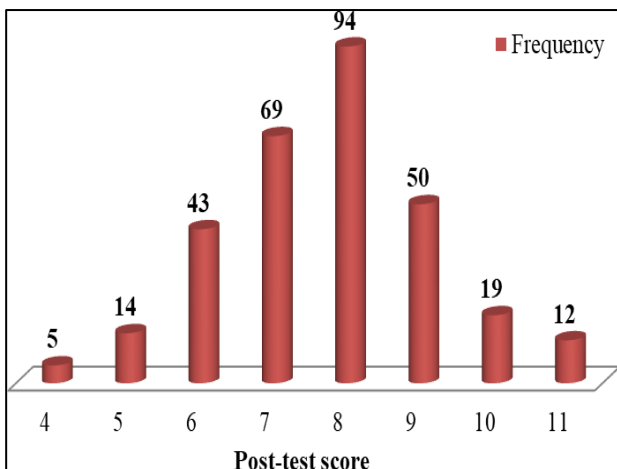


Figure 3: Normal frequency distribution of post-test scores.

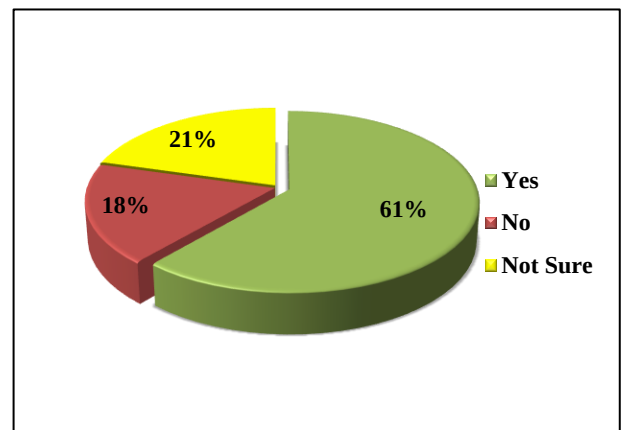


Figure 6: Prevalence of usage of DS.

In current study, the mean pre-test value was 5.69, and the mean post-test value was 7.70. This shows an average increase of 2.01 units from pre-test to post test. The observed increase in the mean value of the post-test implied that the intervention had a positive impact on the students (Figure 1). The paired sample correlation coefficient between pre-test and post-test scores for the 306 participants was found to be 0.516, indicating a moderate positive relationship between the two sets of scores. The significance value of $p < 0.001$ suggested that

this correlation was statistically significant, indicating that the observed value is unlikely to have occurred by chance. The t-value was found to be 22.845, indicates a significant difference between the means of the two groups.

Among the 306 respondents, the majority (78, 25.5%) obtained a score of 6, with the subsequent largest group (65, 21.2%) achieving a score of 7. Only a total of 35 respondents managed to score 8 or higher, where 8 was the baseline score. In the post-test, the majority obtained a score of 8. In total, 174 respondents scored 8 or higher, indicating a substantial improvement in their knowledge following the intervention (Figure 2, 3).

Attitude section

From the total study participants, about 61.8% agreed that OTC drugs encourage self-medication and only 97 (31.7%) held the view that antibiotics should not be available as OTC. The majority (228, 74.5%) of the participants agreed with the statement that the easy availability of OTC drugs is leading to their misuse. It's concerning that a substantial number (56.9%) responded positively to the idea of sharing OTC drugs with friends.

Furthermore, the majority of the respondents agreed to the necessity of periodically updating information regarding OTC drugs and seeking the advice of a pharmacist before considering an OTC drug, with a frequency of 238 (77.8%) and 202 (66%), respectively.

In relation to dietary supplements, the majority (255, 83.3%) agreed that it is always better to seek professional opinion while taking DSs. About 217 (70.9%) of the respondents opposed the statement dietary supplements are appropriate for all age groups.

Around half of the respondents (156, 50.9%) lacked trust in the safety of DSs. The statement that marketing and advertising of DSs can sometimes be misleading or deceptive was agreed upon by a majority of (205, 67%) participants (Table 3).

In the pre-test, with a baseline score of 7, the most frequently obtained score was 7, achieved by 76 participants (24.4%). A total of 124 students obtained a score below 7 (6-59, 5-40, 4-15, 3-10), while a total of 182 students scored 7 or higher (7-76, 8-69, 9-29, 10-8), indicating that the majority of the participants had a positive attitude towards OTC drugs and DSs (Figure 4).

Practice section

Out of 306 respondents, the majority 301 (98.4%) reported that they have at least once practiced self-medication with OTC drugs and among those 301 study participants, 127 (42.2%) were practicing SM with OTC drugs due to their easy availability and about 37 (12.5%) of them considered it as a time saving alternative. 120 (39.8%) study participants reported that they consume OTC medications

when the symptoms are minor. More than half of them (186, 61.7%) reported that they buy OTC drugs to keep at home in case there is a need for it later in the future.

When asked about what they will do if an OTC drug does not work for their symptoms, 154 (51.4%) answered that they will consult a pharmacist or physician, 85 (28.2%) will change the drug to another OTC medication, 48 (16%) will increase the dose and only 14 (4.6%) of them responded that they will wait for the symptoms to subside. Furthermore, 140 (46.5%) reported that they always read the instructions on the drug or DSs label before use. Fever was the most frequently reported indication for the use of OTC drugs, with a frequency of 136 (45.1%). Cough and cold were the second most common indications (121, 40.1%), followed by headache as the third most common (117, 38.8%) (Figure 5).

In the present study, 61.4% of the study participants declared that they had used any one of the DS in the past years (Figure 7). Among the DSs users, 68 (22.2%) of them relied on the internet to get information on DS, following health care professionals, friends and magazines with a frequency 67 (21.9), 35 (11.4%), 30 (9.8%) (Figure 8). The majority (103, 33.6%) of DSs users were consuming DSs for maintaining good health. The least reported reason for taking DSs was to prevent disease, which is reported by 29 (9.5%) respondents (Figure 6) (Table 4).

DISCUSSION

In the current study, the prevalence of OTC drugs was found to be 98.4% and that of DSs was about 61.4%. It was evident that self-medication with OTC drugs and DSs was quite prevalent among the study population. These findings were in line with previous studies conducted by Basavanna et al, 2019 and Elshahoryi et al, 2023, where the prevalence rates of OTC drugs and DSs were reported as 95% and 60.9%, respectively.^{4,6} The pre-test unveiled a concerning gap in the participant's understanding of OTC drugs and DSs. The pre-test gave an overall mean score of 5.69, which was below the considered baseline score of 8. This initial assessment highlighted the urgent need for educational intervention to rectify these knowledge deficiencies. Following the intervention, the post-test results exhibited a remarkable transformation. There was a significant and noteworthy increase in the students' knowledge levels. Statistical analysis confirmed this improvement, showcasing a significant difference in the post-test score (mean value of 7.70, T-value of 22.845). The data unequivocally supported the effectiveness of the intervention. The previous studies by Raut et al, 2022 and Chiba et al, 2020 had similar results.^{7,8}

The attitude level of respondents regarding OTC drugs and DSs was classified into positive (7-10 scores) and negative (0-6 scores), here 7 was considered as the baseline score. The findings revealed that students had limited knowledge but tended to hold a positive attitude towards these

products. These findings were a bit contradictory to similar studies conducted in this domain by Abdullah et al, 2022 and Ghazzawi et al, 2022. These studies showed individuals with a positive attitude to possess good knowledge, whereas those with a negative attitude often demonstrate poor knowledge.^{9,10}

While assessing the practices of self-medication with OTC drugs, the factors influencing self-medication with OTC drugs were easy accessibility (42.2%), safe & well tolerable (32.5), low cost (13%) and time saving (12.3%). A previous study by Subramanian et al, 2018 found low cost (45.6%) to be the main factor that motivated the study population to turn to self-medication with OTC drugs.¹¹

In the present study, the main reasons for consuming DSs were to maintain good health (33.6), treat minor illnesses (15.6%), body building (12.2%), meet increased energy demand of the body (11.2%) and for prophylaxis to prevent disease (9.5%). These findings were in agreement with similar studies conducted by Alowais et al, 2019, Alhomoud, 2016 and Ibrahim, 2018.¹²⁻¹⁴

Our study reveals that the widespread self-medication among the participants was primarily driven by the perceived benefits of OTC drugs. Despite the participants displaying responsible behaviour when using OTC or DSs, the alarming prevalence of self-medication raises concerns, particularly as the trend was pronounced among non-healthcare college students lacking awareness of associated risks. It is quite evident in their responses where some opted internet as a reliable source of information. These observations emphasize the urgent need for education and heightened awareness regarding OTC and DSs and also the need for their proper regulation.

This study faced several limitations that may have influenced the results. The study was conducted within a short duration, which limited the time available to thoroughly carry out the research. Additionally, the accuracy of the results may have been affected by respondent bias, as participants might not have provided completely honest responses. Furthermore, some of the respondents were under the age of 18, which may have influenced the way they answered the questions, potentially impacting the overall findings.

CONCLUSION

The findings indicated a high prevalence of OTC drugs and dietary supplements (DSs) use among college students. Their positive attitude towards these products, despite limited knowledge, suggests a tendency to make informed and prudent choices. This favourable inclination could lead to safer and more effective use as they acquire the necessary knowledge. However, the discovery of significant issues and malpractices is indeed worrisome. It highlights the importance of improving education and awareness about the proper use of these products among college students, especially non-health care college

students, due to their limited exposure to healthcare-related topics. Promoting pharmacist consultation, improving product labelling, and developing reliable online resources or apps specifically designed for college students to access accurate information about OTC drugs and dietary supplements, while emphasising the importance of verifying information sources, can empower students with the knowledge and tools to make safe and informed decisions regarding OTC drugs and dietary supplements, ultimately enhancing their well-being.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Akande-Sholabi W, Akinyemi OO. Self-medication with over-the-counter drugs among consumers: a cross-sectional survey in a Southwestern State in Nigeria. *BMJ Open*. 2023;13(5):72059.
2. Marathe PA, Kamat SK, Tripathi R, Raut SB, Khatri. Over-the-counter medicines: Global perspective and Indian scenario. *J Postgrad Med*. 2020;66(1):28-34.
3. Chelani T, Patel M, Patel A, Patel K, Patel U, Emmanue FJ. Use of self-medication with otc drugs and its associated factors among nursing students. *Mat Journals*. 2021;3(2):2582–5720.
4. Elshahry NA, Odeh MM, Jadayil SA, McGrattan AM, Hammad FJ, Al-Maseimi OD, et al. Prevalence of dietary supplement use and knowledge, attitudes, practice (KAP) and associated factors in student population: A cross-sectional study. *Heliyon*. 2023;9(4):14736.
5. Kulkarni P, Rawool S, Saini M, Salvi S, Samjiskar H, Sawant S. Knowledge, attitude and practice related to the use of dietary supplements in indian population. *Int J Innov Res Technol*. 2023;9(11):2349–6002.
6. Basavanna PL, Krishnadas A, Saji AM, Arab A, Lalitlanthangi F, Devi M. A study to assess the knowledge, attitude and practice on over the counter drugs among college students. *Eur J Biomed Pharm Sci*. 2019;6(10):231–6.
7. Raut A, Varghese BE, Singh DR, Reji SM. Knowledge, attitude, and practice of ‘over-the-counter’ medications among medical and non-medical professionals during COVID-19 pandemic. *MGM J Med Sci*. 2022;9(2):154–9.
8. Chiba T, Kobayashi E, Okura T, Sekimoto M, Mizuno H, Saito M, et al. An educational intervention improved knowledge of dietary supplements in college students. *BMC Public Health*. 2020;20(1):633.
9. Abdullah IS, Chaw LL, Koh D, Hussain Z, Goh KW, Abdul Hamid AA, et al. Over-the-counter medicine attitudes and knowledge among university and college students in Brunei Darussalam: Findings from the first national survey. *Int J Environ Res Public Health*. 2022;19(5):2658.

10. Ghazzawi HA, Hazem Es A, Amawi AT. Evaluation of knowledge, attitudes, and practices related to dietary supplements intake among college students: a cross-sectional study. *J Clin Diagn Res.* 2022;16(6):11-7.
11. Subramanian S, Satyanarayana V, Bhandare B. A study on knowledge and practices of over-the-counter medications among 1st year medical students. *Int J Basic Clin Pharmacol.* 2018;7(12):2452–5.
12. Alowais MA, Selim MAE-H. Knowledge, attitude, and practices regarding dietary supplements in Saudi Arabia. *J Family Med Prim Care.* 2019;8(2):365–72.
13. Alhomoud FK, Basil M, Bondarev A. Knowledge, attitudes and practices (KAP) relating to dietary supplements among health sciences and non-health sciences students in one of the universities of united arab emirates (UAE). *J Clin Diagn Res.* 2016;10(9):5–9.
14. Ibrahim OM. Nutritional Epidemiology Study, Prevalence of vitamin and mineral supplement use and correlated factors among university students in Jordan. *Pakistan J Nutr.* 2018;17(12):654–60.

Cite this article as: Varghese AM, Srinivas V, Hema N, Yogananda R, Vaishnavi S. Assessment of knowledge, attitude and practice of over-the-counter drugs and dietary supplements among non-healthcare college students in Chitradurga. *Int J Basic Clin Pharmacol* 2024;13:864-71.