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Research Article

A CROSS-SECTIONAL STUDY TO ASSESS SELF-MEDICATION FOR VARIOUS CONDITIONS AMONG MEDICAL, PARAMEDICAL, AND NON-MEDICAL STUDENTS

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ABSTRACT

Objectives: The objectives of the study are to assess the knowledge about self-medication and factors influencing the use of self-medication among 2nd year medical, paramedical, and non-medical students.

Methods: A cross-sectional, multicenter study was conducted among 520 students of medical, physiotherapy, nursing, and engineering courses. Students were given a pre-structured questionnaire in e form/physical forms. The responses were collected and analyzed using descriptive statistics.

Results: It was found that 63% of students followed self-medication, among which 41% took medication from a chemist. Analgesic and antipyretic (31.8%) followed by cough and cold (23%) medication were the most common group for self-medication.

Conclusion: Self-medication is seen more commonly in medical students, especially the hosteller group. The most common reason for self-medication is the easy availability of drugs and the absence of strict regulations.

Keywords: Self-medication, Over-the-counter, Medical, Paramedical, Non-medical.

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INTRODUCTION

Self-medication is a common practice followed by most students worldwide. Self-medication has traditionally been defined as "the taking of drugs, herbs or home remedies on one's initiative, or on the advice of another person, without consulting a doctor" [1]. It has become a universal phenomenon deeply rooted in the modern world with its high levels of urbanization, especially among students [2]. This practice of student self-medication has raised alarm cutting across disciplines. Studies have shown a high prevalence of self-medication among undergraduate medical students in Uganda, with reasons such as cost-effectiveness and self-treatment of common illnesses such as diarrhea and vomiting [3]. Similar findings were observed in a study conducted among students in Kenya, revealing that self-medication was prevalent for minor illnesses such as coughs and colds, pains and headaches, stomach discomforts, and fever [4]. The World Health Organization's systematic review and meta-analysis underscore the magnitude of this issue, revealing an overall prevalence of 70.1% among university students globally [5]. Many students in developing countries as well as those undertaking medical, paramedical, or non-medical courses are in the habit of self-treatment. In India, it is found that approximately 53.3–68.1% engage in self-medication [6,7], reaching as high as 37% in urban areas [8] and 17% in rural areas [9]. It ranges between 12.7% and 95% in other developing countries, signaling a worrisome trend with potential repercussions for public health [10]. There are many drugs apart from over-the-counter (OTC) that can be purchased without a prescription such as antibiotics, analgesics, and anti-anxiety [11]. Factors contributing to self-medication encompass the perception of non-serious illnesses, the ease of accessing pharmacies, the desire to keep essential medications at home, the inconvenience of using health insurance, readily available health information on the Internet, time-saving motives, self-confidence, and even instances of laziness. Furthermore, a lack of confidence in the quality of health facility services adds to the multifaceted landscape of self-medication motivations. These insights underscore the need for a comprehensive understanding of the diverse factors influencing self-medication practices among students and the general [12-14].

Self-medication appears beneficial, but this comes with dangerous implications. First of all, one will look at the misdiagnosis aspect wherein students could fail to pinpoint symptoms or exaggerate the level of the sickness thereby making wrong prescriptions. Such delays could make the condition worse and mask serious illness which needs immediate treatment. Another danger that comes with self-medication is exposure to drugs with potentially adverse drug reactions and drug interactions. In addition, self-medication is part of the global problem of antibacterial resistance because when a student takes antibiotics on their own for minor infections, they might be at risk for serious illness which can lead to a great public health issue, which can sometimes lead to death [15-17].

The knowledge among the students about self-medication and OTC drugs is relatively less. Therefore, there is need of raising awareness among students about self-medication. Our study focused on medical, paramedical, and non-medical student categories. The study examines the trends and extent of self-medication, drug interactions, and awareness of its adverse effects among 2nd-year students of medical, paramedical, and non-medical courses.

Through this study, we expect that the associated risks of self-medication will be minimized and students promoted toward a health-conscious lifestyle.

METHODS

A comprehensive observational, prospective study was conducted at the Department of Pharmacology, M.G.M Medical College from July to August 2022. This multicentral study took place at various colleges in Indore, including Government Nursing College, MGM Allied Health Sciences Institute, IPS Engineering College, and M.G.M Medical College,

following approval from the Institutional Ethics Committee. We have included the students who were willing to give consent to participate in the study, objectives, and procedures of the study were explained before filling out the consent. A pre-structured e-form/physical form questionnaire was distributed among the participants after being validated by a pilot study. This questionnaire consisted of 17 questions categorized into demographic, knowledge, and attitude sections. A filled feedback questionnaire was collected from 540 respondents, of which 145 were from medical, 93 from physiotherapy, 112 from nursing, and 190 from non-medical students.

The study was conducted to compare the knowledge regarding self-medication among participants and to assess their awareness and factors influencing them to use self-medication among 2nd-year medical, physiotherapy, nursing, and non-medical students of different institutes.

Statistical analysis

All data collected in e-forms/physical form was analyzed in MS Excel and exported in SPSS statistics software version 26 for more depth analysis. Descriptive statistics were applied to uncover common trends and patterns of self-medication practices. To explore the relationship between categorical variables, Chi-square and Fisher exact tests were applied. Statistical significance was determined for differences with a $p<0.05$.

RESULTS

Demography of study population

Overall respondents involved in the study were 540 students. The demographic data reveal a diverse participant composition in our study. Of the students, 33.33% (180) were male, whereas 64.81% (350) were female. A small percentage, 1.85%, prefer not to disclose their gender. In terms of courses, there were 145 participants from MBBS, 93 from physiotherapy, 112 from nursing, and 190 from the non-medical category, as summarized in Table 1.

Evaluation of knowledge and awareness toward self-medication among medical, paramedical, and non-medical personnel: (n=540) as summarized in Table 2

It was observed that across various categories, distinct patterns emerged. Among MBBS students (145), 68.97% demonstrated knowledge about self-medication. Similarly, non-medical students (190) exhibited 63.79% knowledge in this regard. In contrast, paramedical students showed a different trend, with 54.44% of Bachelor of Physiotherapy (BPT) students (93 students) responding negatively followed by nursing students indicating a lower level of knowledge toward self-medication and this was statistically significant.

Out of 540 students, knowledge about self-medication was 63%, with MBBS students having a comparatively higher percentage at 37.9%, followed by non-medical students with 28.70%, and BPT and nursing with lower percentages, as shown in Fig. 1.

Concerning the purchase of medicines without a prescription, an overwhelming majority of MBBS students (86.21%) tended to refrain from this practice. Non-medical students, nursing, and physiotherapy students also exhibited varying lower percentages of adherence to this practice and a similar pattern was observed regarding checking the expiry date of medicines before purchase, with MBBS students (93.75%) leading in conscientiousness, followed by non-medical, physiotherapy, and nursing students. Their responses were statistically significant.

A considerable number of students across all categories acknowledged advising the same medication to others with similar complaints. Non-medical students stood out with 61.54% engaging in this practice.

Our study revealed concerns regarding leftover medication usage, with the majority of non-medical students (65.52%) agreeing to this practice, and the differences were found to be statistically significant. The data we collected showed no significant differences in the purchase of medication before traveling. However, when it came to using medication, especially during examination times, MBBS students (25.00%) displayed a relatively lower tendency compared to physiotherapy (42.86%), nursing (11.61%), and non-medical (46.15%) students.

Table 1: Demographic characteristics of participants

Demographic data	No of students	Percentage
Male	180	33.33
Female	350	64.81
Prefer not to say	10	1.85
Course		
MBBS	145	26.85
Physiotherapy (BPT)	93	17.22
Nursing	112	20.74
Non-medical	190	35.18

BPT: Bachelor of Physiotherapy

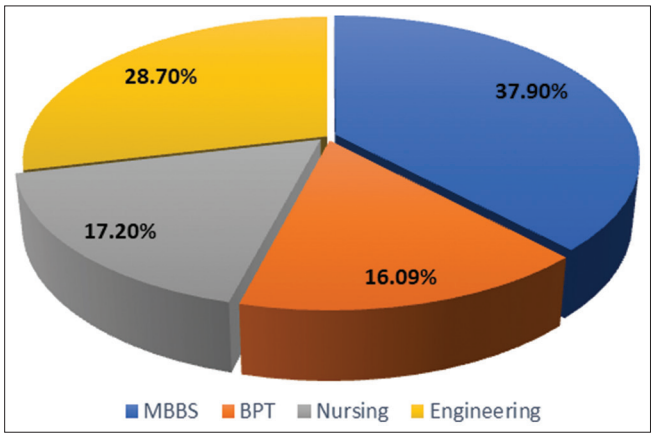

Fig. 1: Percentage of self-medication among different students

A critical finding was observed regarding awareness levels about the proper dose and duration of medication, with MBBS students (95.14%) demonstrating a higher understanding compared to non-medical (92.17%), nursing (91.83%), and physiotherapy (54.55%) students which was statistically significant. Knowledge about the potential risks of simultaneous use of more than one medicine leading to interactions was notably higher among MBBS students (86.21%), whereas physiotherapy (47.73%), nursing (65.38%), and non-medical (51.67%) students displayed varying levels of awareness.

Responses regarding encountering any side effects while taking self-medication varied, with 22 out of 123 MBBS students affirming that they experienced side effects, 55 in physiotherapy, and 83 in nursing category students denying it. Out of 190 non-medical students, 56 affirmed experiencing side effects due to the practice of self-medication, which also signifies statistical significance.

Regarding participant's interest in gaining more education about self-medication, 363 out of 540 students expressed a desire to learn more in the future, with 177 responding negatively. Almost more than half of the students expressed willingness to know about the consequences of continuing self-medication practices.

Evaluation of practices toward self-medication among medical, paramedical, and non-medical personnel: (n=540)

Observed data showed that overall, 63% of students followed self-medication, with a higher number of participants obtaining medication based on the advice of chemists, followed by self-treatment, friend's advice, and remaining through teleconsultation, as shown in Fig. 2.

The source of obtaining medications varied among different student categories, as mentioned in Table 3. Non-medical students predominantly relied on chemists, followed by MBBS, nursing, and BPT students. When it came to self-medication, there were no significant differences observed among students. Friends were a common source of medications, with outnumbering the paramedical and medical students. Similarly, teleconsultation was also utilized more by non-medical as compared to other groups.

As shown in Fig. 3, easy availability, being the main reason, accounted for 38.50% which was higher in non-medical students (84) followed by medical (54) and paramedicals with no significant differences observed statistically. The second reason for self-medication was taking the same medication for the complaints previously experienced, which constituted 29.80% out of 540 participants, among which non-medical students had a higher proportion compared to other groups, and this difference was statistically significant. Similarly, time-saving was another significant factor at 20.40%, with non-medical affirming more compared to medical and paramedical students. Similarly, the high cost of consultation stood at 11.3%, and non-medical students affirmed more. These were the reasons mentioned by the students for their self-medication depicted in Fig. 3 and the group-wise reasons for self-medication are detailed in Table 4.

The most common drug prompting self-medication included analgesics (31.90%) followed by antipyretics (23.80%), cold/cough (19.0%), antibiotics (14.50%), allergy (5.90%), and diarrhea (4.9%) shown in Fig. 4.

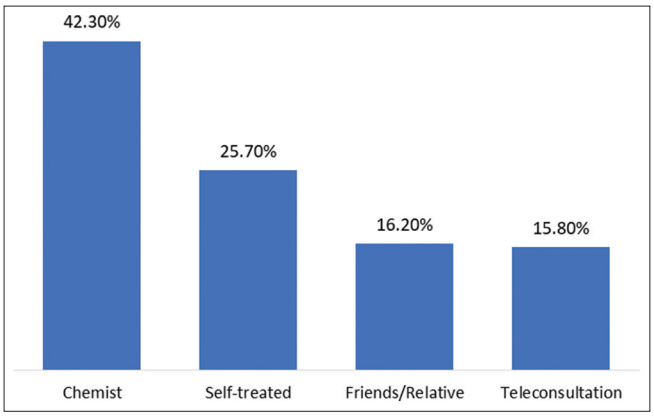

Fig. 2: Consultation sources for self-medication among students

A comprehensive overview of drug practices among students, revealing distinct patterns in usage has been shown in Table 5. Analgesics were found to be more prevalent in non-medical students, followed by nursing, MBBS, and BPT students. In the usage of antipyretic drugs, non-medical were reported higher usage compared to medical students followed by para-medicals. The proportion of students using drugs for cough/cold was higher in MBBS students, and statistically, the difference was insignificant. Antibiotics were predominantly used by non-medical followed by physiotherapy students. Similar trends were observed in the use of drugs for allergy and diarrhea.

DISCUSSION

OTC drugs are designed to be easily accessible, providing a convenient way for people to address common health issues without needing a prescription, and offering a convenient and efficient means of self-treatment for minor illnesses. However, the practice of self-medication involves individuals taking charge of their health without professional guidance, often relying on OTC medications. While this approach is influenced by the desire for convenience and affordability, it can lead to misdiagnoses and incorrect medication use and pose risks of irrational use and drug misuse [18,19].

The trend of self-medication for various common illnesses has raised concerns within the public health sector [20]. Several research studies have revealed a worrying trend among students, for various health conditions. Instead of seeking advice from health-care professionals, individuals diagnose and treat their own with the help of OTC drugs. The ease of access and affordability of these medications may contribute to this trend. However, this seemingly convenient approach can pose potential risks, such as misdiagnosis, inappropriate drug use, and adverse effects [21-24].

In college life, students often resort to this method due to time constraints and financial limitations, which makes it difficult for them to seek professional medical assistance for minor health issues.

Thus, through this study, we present a nuanced view of self-medication practices among students from medical, paramedical, and non-medical backgrounds. The results shed light on the varying degrees of knowledge and awareness about self-medication practices, their sources, and reasons for various health conditions among medical,

Table 2: Knowledge and awareness toward self-medication

S. No.	Questions	MBBS (n=145) Yes/No	BPT (n=93) Yes/No	Nursing (n=112) Yes/No	Non-Medical (190) Yes/No	p-value
1	Knowledge about self-medication	100/45	42/51	46/66	74/116	<0.0001
2	Students who purchased medicines without a prescription	126/19	37/56	83/29	98/92	<0.0001
3	Students who checked the expiry date of medicines while purchasing	136/09	48/45	100/13	106/84	<0.0001
4	Students who advised the same medication to other people with similar complains	79/66	43/50	83/29	122/68	<0.0001
5	Leftover medication used by students	100/45	46/47	92/20	94/96	<0.0001
6	Purchasing any kind of medication before traveling	61/84	41/52	41/71	91/89	0.12NS
7	Use of any medication, especially during examination times	29/116	39/54	13/99	60/130	<0.0001
8	Awareness that every medicine should be taken at the proper dose and duration	138/07	51/42	103/09	108/82	<0.0001
9	Knowledge about the simultaneous use of more than 1 medicine can lead to interaction	126/19	49/44	74/38	98/92	<0.0001
10	Encountering any side effects while taking self-medication	22/123	38/55	29/83	56/134	0.0002
11	After this survey are you keen to know more information regarding self-medication/OTC and details of the medicine you have taken	118/27	40/53	98/14	107/83	<0.0001

BPT: Bachelor of physiotherapy, *NS: Non-significant

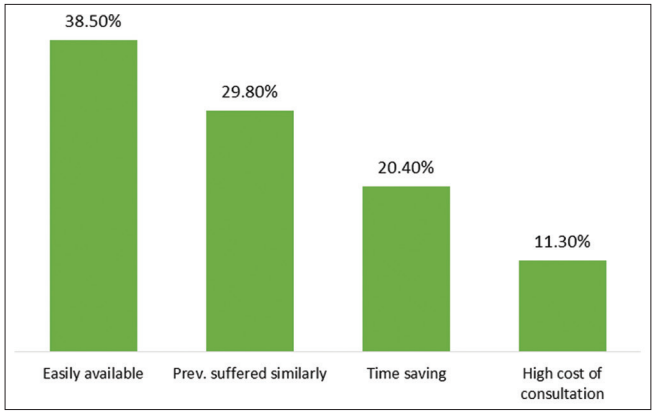

Fig. 3: Graphical representation of reason for self-medication

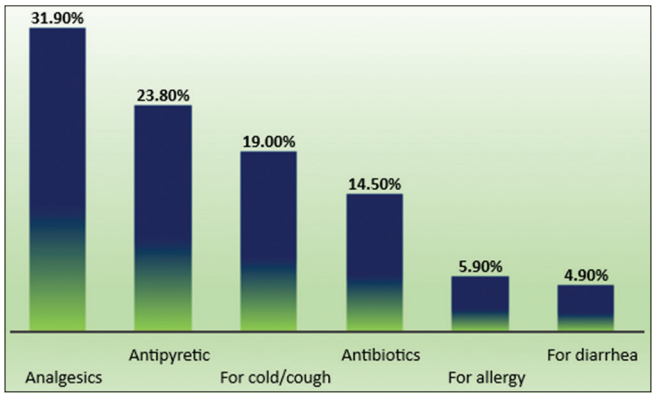

Fig. 4: Common drugs used by students

Table 3: Consultation regarding self-medication among medical, paramedical, and non-medical students, (n=540)

Source of consultation	MBBS	Nursing	BPT	Non-medical	p-value (χ^2 test)
Chemist	75	49	21	84	<0.0001
Self-medicated	36	34	25	42	0.444 (NS)
Friends	18	13	24	34	0.020
Teleconsultation	16	17	23	30	0.046

*NS: Non-significant, BPT: Bachelor of Physiotherapy

Table 4: Reasons regarding self-medication among medical, paramedical, and non-medical students, (n=540)

Reason for self-medication	MBBS	Nursing	BPT	Non-medical	p-value (χ^2 test)
Easily available	54	37	32	84	0.188NS
Previous suffered	53	49	27	31	<0.0001
Time-saving	28	15	16	51	0.036
High cost of consultation	10	11	18	23	0.028

*NS: Non-significant, BPT: Bachelor of Physiotherapy

paramedical, and non-medical students, encompassing a sample size of 540 participants.

In our study, the demographic data showed that 33.33% were male, 64.81% were female, similar to the previous study by Kumar *et al*., 2013 [25], and 1.85% chose not to disclose their gender. This gender distribution a higher representation of female students in the study population. This could be due to various factors such as the gender ratio in the health-care field or the enrolment pattern of students in different courses similar to

Table 5: Commonly used drugs in self-medication practices among medical, paramedical, and non-medical students (n=540)

Drugs used	MBBS	Nursing	BPT	Non-medical	p-value (χ^2 test)
Pain killers	39	55	23	61	0.0003
Antipyretic	43	29	12	45	0.028
Cold/cough	37	17	18	30	0.095 (NS)
Antibiotics	19	9	24	26	0.003
Allergy	9	1	4	16	0.046
Diarrhea	2	1	12	12	0.0001

*NS: Non-significant, BPT: Bachelor of Physiotherapy

the study by Janatolmakan *et al*., 2022 [26]. The diverse representation of different courses suggests that the study population includes students from various health-care and non-health-care backgrounds, providing a comprehensive perspective on self-medication behaviors same as the study by Vincent and James, 2020 [27].

The second part of the study focused on evaluating the knowledge and awareness of self-medication among medical, paramedical, and non-medical personnel where MBBS students demonstrated higher knowledge percentages compared to paramedical students. This finding suggests that students in MBBS may have a better understanding of the risks and limitations of self-medication compared to students in other health-care fields in contrast to the previous study by Rahimisadegh *et al*., 2022 where pharmacy students engaged the least in self-medication compared to their counterparts in nursing and medicine [28].

Concerns regarding leftover medication usage were significant among non-medical students, emphasizing the necessity for specific interventions. Usage patterns of medication before traveling remained consistent across categories. However, during examination periods, MBBS students showed a comparatively lower inclination. In a recent study by Rajab MH *et al*., 2023 [29], it was found that medical students commonly use OTC painkillers during academic examinations.

The awareness levels about the proper dose and duration of medication were significantly higher among MBBS students, emphasizing the impact of educational backgrounds. MBBS students also exhibited heightened awareness of the risks associated with the simultaneous use of multiple medicines. This surpasses a study by Kumar *et al*., where they have observed improvement in many aspects of self-medication after sensitization [30].

The occurrence of side effects during self-medication varied among different categories of students, with significant responses from non-medical students. Encouragingly, a majority of participants expressed interest in gaining more education about self-medication, indicating a receptiveness to future awareness programs.

In the third part evaluating self-medication practices, approximately 63% of students engaged in self-medication, seeking advice from chemists, friends, and through teleconsultation. Interestingly, non-medical students predominantly relied on chemists, reflecting distinctive consultation preferences. Similarly, a study by Muiru, also found that pharmacists were the primary source of information for self-medication [4].

Reasons for self-medication included easy availability, prior experience, time-saving, and the high cost of consultation which aligns with findings from several other studies by Susanto *et al*., 2023, Sigcho *et al*., 2023, Srivastava *et al*., 2023 [31-33]. These reasons varied across groups, emphasizing the importance of personalized educational approaches.

The most commonly self-medicated drugs included analgesics, antipyretics, cold/cough medications, and antibiotics with notable

variations among different student backgrounds. In one study, the most frequently used drugs for self-medication among medical and pharmacy students were analgesics, antibiotics, and vitamin supplements [34]. Another study found that the most commonly used drugs for self-medication among undergraduate medical students were antipyretics, antihistamines, and analgesics [35]. The increased use of antibiotics through self-medication practices can lead to a rise in antibiotic resistance as per the World Health Organization (WHO), potentially resulting in diseases, and some of them can be fatal if antibiotic resistance is not promptly addressed. In Europe, approximately 25,000 individuals die because of bacterial infections with multiple medication resistance [36]. The rapid promotion of antibiotic resistance can also be exacerbated by the use of falsified or substandard antibiotic products [37]. Understanding these patterns provides valuable insights for designing targeted interventions to enhance responsible self-medication practices among diverse student populations.

To encourage safe self-medication practices and responsible use of OTC drugs, educational campaigns and initiatives should be developed to reach students and the broader community across all educational backgrounds. These efforts should aim to raise awareness about the potential risks and consequences of self-medicating without professional guidance, while also emphasizing the importance of seeking health-care advice when necessary. Furthermore, it is crucial to highlight the immunological impact of improper self-medication practices, such as antibiotic resistance. Providing easy access to reliable information sources and encouraging individuals to consult health-care professionals before self-medicating can help translate this awareness into tangible actions that promote both individual and public health.

CONCLUSION

This study explores the complex issue of self-medication among students with various educational backgrounds. The results show that factors such as easy access to medications, past experiences, and financial constraints contribute to the prevalence of self-medication. Despite its convenience, self-medication poses significant risks, including misdiagnosis and adverse effects. We found that MBBS students are more aware of the risks associated with self-medication, whereas non-medical students tend to use leftover medications. Participants expressed interest in learning more about responsible self-medication practices, indicating a potential for future educational programs. Patients who rely solely on themselves or local pharmacists to treat symptoms may inadvertently allow underlying diseases to progress into severe or life-threatening conditions. Raising awareness about the dangers of self-medication is a crucial step in addressing this issue. It should be an integral part of a health-care professional's responsibilities. Hence, there should be increased awareness about appropriate drug usage and regulations should be put in place to limit the inappropriate use of drugs without medical supervision.

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AUTHORS CONTRIBUTION

Conceptualization-Dr. Pooja S Mishra and Dr. Narlapati Vignan; methodology; Dr. Pooja S Mishra, Dr. Sapna More, Dr. Kamayani Gupta, Dr. Deepti Rastogi, and Dr. Narlapati Vignan; formal analysis; data collection, writing – original draft preparation-Dr. Narlapati Vignan; final review-Dr. Pooja S Mishra, Dr. Sapna More, Dr. Kamayani Gupta, and Dr. Deepti Rastogi.

CONFLICT OF INTEREST

The author declares no conflict of interest.

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