Original Article

Self-medication in medical students in urban India: Exploring the extent of this dangerous practice

Amalesh Honnekeri, Nachiket Bhaveshaikh, Medha Shah, Usha Nayak

Department of Pharmacology, K.J. Somaiya Medical College, Somaiya Ayurvihar Complex, Sion (E), Mumbai, Maharashtra, India

Abstract

Objectives: To assess the prevalence of self-medication in urban Indian medical students and explore possible factors associated with this practice. **Methods:** After obtaining institutional ethics approval, 180 medical students from six medical colleges in Mumbai were recruited to participate via social media. They were administered a pre-validated questionnaire that assessed self-medication as a practice, along with the perceived stress scale (PSS-10) online. Anonymity and confidentiality were maintained. **Results:** The prevalence of self-medication in medical students was found to be 83.9%, with no significant difference between genders or between academic years of medical education. The most used source of information for self-medicating was older prescriptions, and for procuring drugs was pharmacist stores. Common cold was the most cited indication. Anti-pyretics and anti-inflammatory drugs were the most commonly self-medicated drugs. It was found that 73.3% of medical students had self-medicated with non-over-the-counter (OTC) drugs. It was observed that 6.1% of medical students had experienced adverse drug reactions, and alarmingly, 0.6% of medical students continued self-medicating despite experiencing adverse drug reactions. **Conclusions:** Most of the study participants admitted to having practised self-medication. It was alarming to find that an appreciable fraction of the study population had uncontrolled access to non-OTC drugs. Thus, there needs to be a greater emphasis on the education of medical students with respect to the problems encountered by self-medicating and a need to enforce stricter regulations, as well as to establish a more watertight monitoring system, to curb this hazardous practice.

Keywords: Drug safety, health policy, medication safety, prescribing, quality use of medicines

Introduction

Self-medication is defined as the use of medication without prior consultation with a doctor about appropriate dosage, duration of treatment, or indications for usage.[1] Urgency, convenience, time, and cost-effectiveness have been cited as the primary reasons for this practice.[2] This practice is unsupervised and lacks professionally licensed guidance.

A study in West Bengal found that 57.05% of medical students practised self-medication,[2] while a study in Mangalore found that 78.6% of medical students practised the same.[3] While studies conducted within India establish the existence of this potentially dangerous practice amongst medical students,[4] its detailed patterns are yet to be fully charted. Thus, the current scenario is one that points towards a potentially worrisome reality; however, the depths of this reality are yet to be ascertained and understood. This study is a critical step towards that.

Self-medication poses several dangers such as inaccuracies in self-diagnosis, delays in seeking professional aid, errors in regime and dosage, potentially dangerous adverse effects, interactions, and drug dependence.[5] Each of these hazards can cause great harm – both mentally and physically. It is due to these potentially

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harmful outcomes that the consumption of medications requires approval by an appropriately qualified professional. Understanding the factors that can cause adverse outcomes, as well as predicting and preventing or mitigating the aforementioned risks, requires a key understanding of physiology, biochemistry, pharmacology, and various other medical subjects – which is acquired through years of structured medical education. This competence cannot be attained without passing through the education system that creates a fully qualified medical professional.

Furthermore, research has shown that medical students, by virtue of their discipline, have easier access to drugs available in pharmacies.[6] This is an alarming fact as easy access implies potential unauthorised and unsupervised use, which further leads to an increased risk of adverse outcomes. Thus, the practice of self-medication in medical students is a matter of great concern and needs thorough exploration to design effective evidence-based interventions to address it and prevent harm.

While psychological stress is known to exist amongst medical students,[7-9] its association with self-medication is yet to be ascertained. Hence, this study also endeavours to both assess the level of stress in Indian medical students and examine its relation to their self-medication practices.

Given all the potentially dangerous hazards of self-medication, this study is timely and critical for the safety, health, and well-being of medical students and the population at large. A study in Jordan established that self-medication was a prevalent practice, reporting that 74.4% of medical students who had been surveyed indulged in it.[10] A South Indian study established the prevalence of self-medication in medical students at 92%,[6] in Nagpur, it was found to be 71.7%,[4] a study in New Delhi found a prevalence of 74.6% in 2007 and 69.4% in 2012,[11] in Karnataka, it was 88.18%,[12] while in another study in South India, it was found to be 84.4%.[13] A study conducted in a rural medical college in Sasaram found that males had a significantly higher tendency to practise self-medication.[14] In contrast, a study in coastal South India found that a proportionately large number of females were practising self-medication as compared to males.[3]

This study attempts to determine the various factors associated with self-medication behaviour in the cohort. Understanding these factors may help us better predict which medical students are at highest risk and design evidence-based interventions towards protecting our future generation of medical professionals from this dangerous practice.

The findings of this study will be useful to primary care physicians, who play a pivotal role as the first point of contact when an individual seeks medical care, in identifying factors that deter medical students from obtaining necessary healthcare from qualified professionals. Primary care physicians can also liaise with pharmacy stores and pharmacists to help curb this unregulated practice.

Materials and Methods

Type of study and study design
This was a cross-sectional study conducted across six medical colleges in Mumbai.

Study population
The cohort included current medical students.

Sample size and selection criteria
The sample size was calculated using the formula[15] $(1.96 \times 1.96 \times p \times q)/l^2$

Where p = proportion of students practising self-medication = 71.7%[14]

q = 100 - p = 28.3,

l = 7%

Therefore, sample size = 159.02 = 159 (approx.)

For a 10% non-response rate, the sample size was adjusted to 159 + 16 = 175.

Thus, we enrolled 180 subjects for the present study.

The study sample was stratified into subject groups based on the year of study. Each group consisted of 30 students from each year of MBBS – 1st MBBS, 2nd MBBS, 3rd MBBS: Part 1, 3rd MBBS: Part 2, and two working batches of Internship.

Inclusion criteria
The study population included medical students of either sex, at least 18 years of age, who were willing to participate in the study, and had a working knowledge of English.

Exclusion criteria
Medical students who were not willing to participate in the study, or who were under 18 years of age, or who did not have a working knowledge of English were excluded.

Data collection procedures and instruments used
The student-researcher directly recruited participants fulfilling the foretasted eligibility criteria for the study through social media platforms Facebook, Instagram, and WhatsApp Messenger.

The following study materials were distributed to the participants: a participant information document, informed consent forms, a structured and validated questionnaire assessing the prevalence and practice of self-medication in medical students, and the validated Perceived Stress Scale (PSS-10).

The study materials were self-administered online.

Statistical analysis

Data were analysed using Statistical Package for Social Sciences, Version 15.0 (SPSS v15.0). Data have been presented as mean and standard deviation for continuous normal data and as numbers and percentages for categorical data. Comparison of the means of two groups was carried out by Student's unpaired *t*-test for numerical normal data. Mann-Whitney U test was applied to compare non-normal data. Fisher's exact probability test was applied to compare percentages for categorical data between two groups. All statistical tests were two-tailed. Alpha (α) level of significance was taken as $P < 0.05$.

Confidentiality and ethical considerations

The proposal was presented to the institutional ethics committee (IEC), and requisite approval was obtained. The consenting participants were explained the purpose and procedure of the study with the help of a participant information sheet. Following this, written valid informed consent was obtained from all participants. All data have been kept anonymous and confidential. The ethical guidelines laid out by the ICMR and the WHO were strictly adhered to throughout the study.

Results

It was found that 83.9% of medical students reported having practised self-medication within the previous year [Table 1].

Amongst the cohort, 24 students (80.0%) from 1st-year MBBS, 20 students (66.7%) from 2nd-year MBBS, 27 students (90.0%) each from 3rd-year MBBS (Part 1) and 3rd-year MBBS (Part 2), and 53 interns (88.3%) reported having self-medicated within the previous year. On statistical analysis via the Chi-square test, there was no significant difference found in the prevalence of self-medication practices amongst the different years of medical education.

In the study group, 76 respondents were male, and 104 respondents were female. Of these individuals, 64 male respondents (84.2%) and 87 female respondents (83.7%) reported having practised self-medication. On applying Fisher's exact probability test, there was no significant difference or association found in the gender-wise prevalence of self-medication amongst the subjects.

The study respondents cited using multiple sources of information while self-medicating [Table 2]. Of these, the three most common sources were older prescriptions (42.8%), textbooks (39.4%), and word of mouth/advice from friends (33.3%). The internet (24.4%), classroom teaching (23.3%), and advertisements (2.8%) were also referred to for information.

The main sources for procuring drugs while self-medicating were found to be pharmacists/chemist stores (65%), followed by medicines readily available in the subjects' homes (28.3%), medicines that were available with doctors in the family (23.9%), college pharmacies (20.6%), unused/leftover medicines (10.6%), free physician samples (8.3%), older prescriptions (6.7%),

Table 1: Prevalence of self-medication amongst study subjects

	Number	Percentage
Self-medication practiced in the past year	151	83.9
Self-medication not practiced in the past year	29	16.1
Total	180	100.0

Table 2: Source of information used to practice self-medication

Source	Frequency	Percentage
Textbooks	71	39.4
The Internet	44	24.4
Classroom teaching	42	23.3
Older prescriptions	77	42.8
Advertisements	5	2.8
Word of mouth/advice from friends	60	33.3
Did not self-medicate	29	16.1

Table 3: Source used to procure medicines for self-medication

Source	Frequency	Percentage
Pharmacist/Chemist store	117	65.0
College pharmacy	37	20.6
Home	51	28.3
Doctors in the family	43	23.9
Unused/leftover medicines at home	19	10.6
Older prescriptions	12	6.7
Prescriptions issued to others	3	1.7
Seniors or classmates	5	2.8
Medications in the OPD/Wards/Nursing trolleys or cabinets	8	4.4
Free physician samples	15	8.3
Did not self-medicate	29	16.1

medications in the outpatient departments or clinics/wards/nursing trolleys/cabinets (4.4%), seniors/classmates (2.8%), and prescriptions issued to others (1.7%) [Table 3].

The most common indication for self-medication in our cohort was found to be common cold (61.7%), followed by fever (47.2%), sore throat (42.8%), cough (41.7%), and gastrointestinal complaints (28.3%). Other indications included menstrual pain (26.7%), anxiety and stress (4.4%), and contraceptive measures (2.2%) [Table 4].

The study subjects also reported the medicines that they self-medicate with [Table 5]. The most used medicines were anti-pyretics and anti-inflammatory agents (68.3%). In addition, 132 (73.3%) study subjects revealed that they had obtained non-over-the-counter (OTC) drugs while self-medicating.

The reasons for self-medicating were also assessed in this study [Table 6]. Convenience was cited as the most common reason (52.8%).

Table 4: Indications for self-medicating

Indication	Frequency	Percentage
Fever	85	47.2
Common cold	111	61.7
Sore throat	77	42.8
Cough	75	41.7
Diarrhoea	51	28.3
Muscle or joint pain	43	23.9
Contraceptive measures	4	2.2
Menstrual pain	48	26.7
Stomach ache	39	21.7
Nausea and vomiting	43	23.9
Peptic ulcer	5	2.8
Mouth ulcer	21	11.7
Allergic conditions	32	17.8
Stress or anxiety	8	4.4
Acne	12	6.7
Headache	26	14.4
Acidity	1	0.6

Table 5: Medications used while self-medicating

Medication used	Frequency	Percentage
Analgesics	114	63.3
Anti-pyretics, Anti-inflammatory agents	123	68.3
Antibiotics	63	35.0
Anti-histamines	69	38.3
Oral Contraceptive Pills	5	2.8
Multivitamins	66	36.7
Decongestants	47	26.1
Antacids and/or other anti-acidity medications	68	37.8
Anti-acne medication	11	6.1
Anxiolytics	4	2.2
Homeopathic medication	6	3.3
Herbal medication	8	4.4
Memory enhancers	0	0.0
Agents that increase alertness	5	2.8
Anti-diarrheal	27	15.0

This study also revealed that 132 (73.3%) respondents had accessed non-OTC drugs while self-medicating.

Furthermore, it was also found that 11 (6.1%) study subjects had personally experienced adverse effects while self-medicating. On further review, it was found that 0.6% of subjects continued self-medicating despite experiencing an adverse effect, 1.1% decreased the dosage of the drug they were using, and 7.2% switched to another medicine for the same indication [Table 7].

The subjects also responded to situations during which they self-medicate. We found that 56.4% did so during examinations, 21.7% during mild illness, 7.2% during serious illness, and 15% did not exhibit a fixed pattern while self-medicating.

We also assessed the students' perception about various factors that play a role in the practice of self-medication, asking them to rate each factor as 'unimportant', 'mildly important', 'moderately important', and 'highly important' [Table 8].

Table 6: Reasons for self-medicating

Reason	Frequency	Percentage
Convenience	95	52.8
Saving time	68	37.8
Cost-effectiveness	27	15.0
Easy availability	61	33.9
Previous experience/recurrent ailment	68	37.8
Embarrassment to discuss symptoms with the physician	1	0.6
Urgency/quick relief	73	40.6
Illness of a mild nature	82	45.6
Confidence in self-diagnosis	48	26.7
Confidence in knowledge about drugs	64	35.6

Table 7: Action taken on experiencing adverse effects while self-medicating

Action taken on experiencing medication adverse effect	Frequency	Percentage
Did not experience adverse effects or did not self-medicate	161	89.4
Stopped taking the drug	10	5.6
Consulted a doctor	2	1.1
Continued self-medicating	1	0.6
Decreased the dosage	2	1.1
Switched to another medication for similar use	13	7.2
Total	180	100.0

The subjects were also administered the Perceived Stress Scale (PSS-10); 16.1% of participants reported having high perceived stress, 61.1% reported having moderate perceived stress, and 22.8% reported having low perceived stress. On performing the Chi-square test, it was, however, established that there was no significant association between self-medication and psychological stress in the study group.

In addition, the circumstances under which subjects self-medicated were assessed. Examinations (71.1%) were the predominant factor, followed by academic burden (55.6%), thoughts about the future and career prospects (53.9%), interpersonal issues (35.6%), academic competition (31.7%), lack of recreational time (26.1%), and family issues (23.9%).

It was found that 6.1% of the respondents had made an attempt to obtain an anxiolytic unprescribed.

Lastly, 18.9% of the cohort revealed that they would recommend the practice of self-medication to other medical students.

Discussion

This study established the prevalence of self-medication in medical students in urban India to be 83.9%, data that is in congruence with the prevalence found in other studies conducted in India.[3,4,11,13] The fact that most of the subjects reported having self-medicated within the past year is an alarming indication of the easy availability of drugs and their own perceived confidence in self-prescription.

Table 8: Subjects' rating of factors pertaining to the practice of self-medication				
Factor	Unimportant	Mildly Important	Moderately Important	Highly Important	Total
Consulting a doctor before taking any medication	4 (2.2%)	36 (20.0%)	71 (39.4%)	69 (38.3%)	180 (100.0%)
Completing a course of medication once started	4 (2.2%)	5 (2.8%)	34 (18.9%)	137 (76.1%)	180 (100.0%)
Compliance with the recommended dosage schedule	3 (1.7%)	13 (7.2%)	32 (17.8%)	132 (73.3%)	180 (100.0%)
Awareness regarding adverse effects of drugs	3 (1.7%)	11 (6.1%)	51 (28.3%)	115 (63.9%)	180 (100.0%)
Awareness about drug interactions	7 (3.9%)	14 (7.8%)	49 (27.2%)	110 (61.1%)	180 (100.0%)
Awareness about recurrence of symptoms	7 (3.9%)	11 (6.1%)	54 (30.0%)	108 (60.0%)	180 (100.0%)
Not using drug beyond expiry date	3 (1.7%)	8 (4.4%)	36 (20.0%)	133 (73.9%)	180 (100.0%)
Reading and adhering to package inserts	6 (3.3%)	20 (11.1%)	62 (34.4%)	92 (51.1%)	180 (100.0%)
Recommending self-medication to peers	69 (38.3%)	60 (33.3%)	25 (13.9%)	26 (14.4%)	180 (100.0%)
Non-dispensing of medications by pharmacies without prescription	18 (10.0%)	34 (18.9%)	57 (31.7%)	71 (39.4%)	180 (100.0%)
Enforcing strict rules regarding misleading pharmaceutical advertising	5 (28.0%)	9 (5.0%)	47 (26.1%)	119 (66.1%)	180 (100.0%)

On stratifying the cohort by their current academic year, it was found that there was no significant difference in the prevalence of self-medication practices in different years of medical education. This finding corroborates with the study conducted in Jordan.[10] Conversely, the study conducted in Nagpur found that self-medication practices increased with an increase in the year of education,[4] while the study conducted in Karnataka found that they decreased with an increase in seniority.[12] Thus, it can be surmised that in urban India, due to the availability of resources, there is indiscriminate broad-spectrum self-medication amongst medical students, irrespective of one's knowledge base or year of study – a trend that needs further evaluation as well as intervention through counselling and stricter enforcement of prescription frameworks.

In this study, self-medication was found to be prevalent in 83.7% of female respondents, while in males, the prevalence was 84.2%. On applying statistical tests, it was concluded that there was no significant difference in the prevalence of self-medication practices between the two genders. This is in keeping with the data found in the pan-India study conducted in New Delhi.[11] However, studies in Mangalore[6] and Sasaram[14] concluded that there was a preponderance of male medical students practising self-medication over female medical students, while in coastal South India, females were found to be practising self-medication at a significantly larger scale than males.[3] It can be concluded here that the practice of self-medication in medical students does not follow an established trend when it comes to gender and that it is a uniformly widespread practice.

The main source of information that was obtained to self-medicate was older prescriptions (42.8%). This was followed by textbooks (39.4%), word of mouth/advice from friends (33.3%), the internet (24.4%), classroom teaching (23.3%), and advertisements (2.8%). This data is congruent with data from other studies. This establishes the fact that rather than considering the actual individual clinical case in real time, any available literature – be it from patient prescriptions or educational resources – is being used to self-medicate, along with consultation with peers and local pharmacists, who are not appropriate resources for prescribing medicines. This points towards a worrisome reality and a possible gap in systems that have been set up for curbing the indiscriminate and unlawful sale of medicines.

The main source for procuring drugs while self-medicating were found to be pharmacists/chemist stores (65%), followed by medicines readily available in the subjects' homes (28.3%), medicines that were available with doctors in the family (23.9%), college pharmacies (20.6%), unused/leftover medicines (10.6%), free physician samples (8.3%), older prescriptions (6.7%), medications in outpatient clinics/wards/nursing trolleys/cabinets (4.4%), seniors/classmates (2.8%), and prescriptions issued to others (1.7%). This tells us that the regulatory practices in pharmacists and chemist stores need to be made more robust as most students obtain medications from them while self-medicating. Furthermore, there seem to be lacunae in the regulation of medicines that are consumed at home, which points towards the need to counsel family members and have their cooperation. There also needs to be a stricter check on medicines that are kept in the hospital premises as they too are being consumed by medical students without consultation with a qualified professional. The fact that older prescriptions and prescriptions issued to others are also being used to self-medicate points towards the need for greater pharmacovigilance amongst those disbursing the medications.

As has been established in other studies, the most common indication for self-medication in our cohort was found to be common cold (61.7%). The next most common indication was fever (47.2%), followed by sore throat (42.8%), cough (41.7%), and gastrointestinal complaints (28.3%). Some indications that were not reported in previous studies but have been established as indications for self-medication in this study include menstrual pain (26.7%), anxiety and stress (4.4%), and contraceptive measures (2.2%).

The most commonly self-prescribed class of drugs was anti-pyretics and anti-inflammatory drugs (68.3%), followed by analgesics (63.3%), anti-histamines (38.3%), antacids (37.8%), multivitamins (36.7%), and antibiotics (35%), amongst others.

This data, too, is in accordance with data from various other studies that have been conducted in India. It is imperative to curb this practice as all the drug classes are accompanied by the risk of serious adverse drug reactions.[16] Furthermore, self-medicating on antibiotics is also hazardous due to the emerging trends of antibiotic resistance.[17,18]

The reasons for self-medicating were also analysed in this study. The main reason for doing so was revealed to be convenience (52.8%), followed by perceived mildness of one's illness (45.6%), urgency/quick relief (40.6%), time (37.8%), previous experience with similar symptoms or ailments that are recurrent (37.8%), confidence in knowledge about drugs (35.6%), easy availability of medications (33.9%), confidence in self-diagnosis (26.7%), cost-effectiveness (15%), and embarrassment in discussing symptoms with a physician (0.6%). The primary reasons for self-medicating, that is, convenience, mildness of symptoms, and urgency, are all congruent with reasons that were ascertained in other studies.[2,19]

This study further established several other reasons such as previous experiences with self-medication, the easy availability of medicines, confidence in one's knowledge while self-prescribing, and embarrassment in discussing one's symptoms with an expert. This all points towards the need to lay a greater emphasis on the importance of consulting a doctor when in need of treatment, no matter how minor one may perceive one's illness to be, as well as the need to confide in medical professionals without fear of embarrassment or judgement. The fact that medical students reported having easy access to medicines is worrisome and once again calls for stricter regulation on medicine disbursement, storage, and accessibility.

A factor that has yet to be studied in depth is self-medicating with non-OTC drugs. In our study, 73.3% of medical students reported having self-medicated with non-OTC drugs. This is an alarming fact as it indicates that there are breaches in the strict regulation of the sale of non-OTC drugs, which further indicates that legal and procedural checks and balances in the drug dispensing framework need to undergo examination and revision.

This study also observed that 6.1% of the respondents experienced adverse effects on self-medicating. Furthermore, 6.1% of medical students also reported that they continue to self-medicate despite being aware of the risk of adverse reactions. Further analysis revealed that 5.6% of students reported stopping a drug on experiencing adverse reactions, while 7.2% switched to another drug for similar use, 1.1% consulted a doctor, 1.1% decreased the drug dosage, and 0.6% continued self-medicating.

On assessing situations under which the subjects showed a tendency to self-medicate, it was revealed that 56.4% did so during examinations, 21.7% during mild illness, 7.2% during serious illness, and 15% did not show a fixed pattern to self-medicating. This data can help identify periods within a medical student's life wherein they are more prone to self-medicating, and greater vigilance and targeted timely counselling during those periods can help curb this practice.

We also assessed the students' perception about various factors that play a role in the practice of self-medication, asking them to rate each factor as 'unimportant', 'mildly important', 'moderately important', and 'highly important'. Key takeaways from this exercise revealed that consulting a doctor was majorly perceived to be mildly important rather than highly important, while most students agreed that completing a course of medication once started, and complying with recommended dosage schedules were both highly important. The majority of the students were also of the opinion that awareness regarding the adverse effects of drugs, drug interactions, and recurrence of symptoms were all highly important. Most of them also agreed that it was highly important to enforce strict rules regarding misleading pharmaceutical advertising. Thus, from this data, we can infer what different medical students feel about various factors that are linked to self-medication, and accordingly, measures can be taken to incorporate further awareness within their curriculum itself, and thereby curb this practice.

Through this study, an attempt was made to evaluate any relationship between psychological stress and the practice of self-medication. It was found that 6.1% of the subjects tried to obtain anxiolytic drugs, while 14.4% considered using the same. Furthermore, 48.9% of the subjects reportedly neglected their health and wellness due to psychological stress. An assessment of the main cause behind psychological stress in the study group revealed examinations (71.1%) to be the predominant factor, followed by academic burden (55.6%), thoughts about the future and career prospects (53.9%), interpersonal issues (35.6%), academic competition (31.7%), lack of recreational time (26.1%), and family issues (23.9%).

The Perceived Stress Scale (PSS) that was administered to the study participants revealed that 16.1% of participants reported having high perceived stress, 61.1% reported having moderate perceived stress, and 22.8% reported having low perceived stress. On performing the Chi-square test, it was, however, established that there was no significant association between self-medication and psychological stress in the study group.

Thus, psychological stress needs to be further evaluated in medical students, and the fact that 6.1% of the subject group had tried to obtain anxiolytics needs to be further studied as it indicates the need to not only tackle mental health issues faced by medical students but also the potential of them self-medicating more during periods of stress.

Lastly, this study also observed that 18.9% of medical students would recommend the practice of self-medication to others. This indicates a greater need for targeted educational interventions and systematic counselling, emphasising the importance of consulting a qualified professional while seeking treatment for any ailment. If this practice is left unchecked and allowed to permeate further and become endemic in student attitudes and behaviours, it could lead to a large-scale crisis in the future.

Conclusions

This timely study extends the literature by adding key dimensions to the existing body of knowledge on this dangerous and potentially lethal practice. It is critical for both individual well-being and safety, as well as that of the nation, for self-medication practices to be explored, understood, and then mitigated through robust, targeted evidence-based interventions. Education and counselling, awareness interventions, studying existing systems and frameworks for gaps and loopholes, stricter enforcement of laws and regulations, and revising existing checks and balances to prevent self-medication are critical. It is important to conduct interventions not just for medical students but also for other hospital staff, pharmacists, chemist stores, families of medical students, as well as the population as a whole. This study is also helpful to primary care physicians in understanding the barriers that prevent medical students from seeking appropriate medical aid. Healthcare providers may devise strategies to work around these barriers to ensure that medical students have their healthcare needs met in a timely and efficient manner.

Limitations and future directions

This study did not assess the impact of the COVID-19 pandemic on self-medication habits or medication-seeking behaviours. This could also be a future direction for further studies that wish to expand on the data obtained from this study.

Availability of data and materials

The data and materials that support the findings of this study are available from the corresponding author upon reasonable request.

Acknowledgments

Ethical considerations

Institutional Ethics Committee approval was obtained prior to the commencement of this study. Participant details were kept anonymous and confidential throughout.

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Conflicts of interest

There are no conflicts of interest.

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