International Journal of Community Medicine and Public Health
Kumar RBM et al. Int J Community Med Public Health. 2026 Mar;13(3):1433-1438
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20260704

Original Research Article

Knowledge, attitude and practice on over-the-counter drugs, P-drug and essential drugs by second- and third-year medical students in Mysuru

Rachitha Bale Muddu Kumar[1], Manu Gangadhar[1]*, Megha Gopal[2], Jesymol Joy[3]

[1]Department of Pharmacology, JSS Medical College, Mysore, Karnataka, India
[2] Department of Pharmacology, Sri Siddhartha Institute of Medical Sciences and Research Centre, Nelamangala, Bengaluru, Karnataka, India
[3]Department of Community Medicine, JSS Medical College, Mysore, Karnataka, India

Received: 06 January 2026
Revised: 18 February 2026
Accepted: 19 February 2026

***Correspondence:**
Dr. Manu Gangadhar,
E-mail: manug@jssuni.edu.in

ABSTRACT

Background: Over-the-counter (OTC) drugs, essential medicines, and personal drugs (P-drugs) form an integral part of rational prescribing. As future prescribers, medical students must develop a sound understanding of these concepts to ensure safe and effective drug use. The aim of this study is to assess the knowledge, attitude, and practice (KAP) regarding OTC drugs, essential medicines, and P-drugs among second- and third-year medical students.
Methods: A cross-sectional study was conducted among 320 second- and third-year medical students at JSS Medical College, Mysuru, using a structured, pre-tested questionnaire. Data on awareness, usage patterns, attitudes toward safety, and confidence in prescribing were collected and analysed using descriptive statistics.
Results: Of the 320 participants, 40.6% were male and 58.1% female. Awareness about OTC drugs, essential medicines, and P-drugs was high (91.9%). Self-medication was reported by 20.3% without medical supervision, with paracetamol and NSAIDs being the most commonly used drugs. While 52.9% perceived self-medication as safe, only 26.6% reported adverse drug reactions. A significant proportion (52.5%) expressed confidence in prescribing OTC and essential medicines. Comparative analysis with other studies indicated similar trends in high self-medication prevalence and analgesic use but variations in adverse drug reaction reporting and prescribing confidence.
Conclusion: Medical students exhibit commendable awareness of OTC drugs, essential medicines, and P-drugs, but substantial self-medication practices persist. Structured educational interventions, case-based training, and stricter institutional policies are needed to enhance rational prescribing practices and ensure safe drug use.

Keywords: Over-the-counter drugs, Self-medication, P-drug, Essential medicines, Rational prescribing

INTRODUCTION

The National Medical Commission (NMC) in India has set forth comprehensive guidelines on OTC drugs, p-drug and essential drugs for 2nd year MBBS students. The NMC defined OTC drugs as medicines for common ailments that are available over the counter and are safe and effective for use by the public without seeking treatment from a health professional. In its 'Regulations relating to Professional Conduct of Registered Medical Practitioners" issued on 2nd August, the NMC stated that OTC drugs are legally allowed to be sold without a doctor's prescription. The list of OTC therapeutic categories that have been mentioned by the NMC regulation include anti-haemorrhoids drugs, topical antibiotics, cough-suppressants, anti-acne drugs and non-steroidal anti-inflammatory medicines. It also includes antiseptics, analgesics, decongestants, aspirin,

vasodilators, antacids, expectorants, anti-fungal drugs, anti-histamines, anti-flatulence agents and smoking cessation drugs.[1] P drugs are the drugs you have chosen to prescribe regularly, and with whom you have become familiar. They are your drugs of choice for given indications. The p drug concept is more than just the name of a pharmacological substance, it also includes the dosage form, dosage schedule and duration of treatment. P drugs are your drugs of first choice for a common condition. It is selected for a disease and not for a particular patient. The activity of P drug selection can reduce the chances of irrational prescribing that is common problem. It can vary from doctor to doctor, country to country because of variation of cost, national formularies, essential drug list of the country, personal elucidation of information.[2]

Choice of P-drug (step criteria)

A p drug is selected depending upon the following criteria.

Safety

Possible adverse effects.

Tolerability

Suitability for a patient.

Efficacy

Drug profile.

Price

Always look at the total cost of treatment rather than the cost per unit.[2]

Essential medicines are those that effectively and safely treat the priority healthcare needs of the population. They are selected by taking into consideration public health relevance, evidence of benefits and harms, and with consideration of costs, affordability and other relevant factors. Essential medicines should always be available within functioning health systems, in sufficient quantities to meet patient needs.

They should be available in appropriate dosage forms for the intended uses and patients, be of assured quality, and be affordable for both individuals and the health system. While essential medicines cover a wide range of global health needs, they represent only a small proportion of the total number of medicines available globally. The use of a limited number of carefully selected medicines can lead to improved supply, better prescribing practices and lower costs. Every 2 years since 1977, WHO has published the WHO Model List of Essential Medicines (also known as the Essential Medicines List or EML).[3]The purpose of the study is to evaluate knowledge on OTC drugs about its indication, risks and regulations, concept of p-drug and adherence to essential medicines list or EML. As future doctors, medical students must develop a rational approach to drug selection and usage. Understanding their level of awareness and prescribing tendencies will help in identifying gaps in their pharmacological education and the need for targeted interventions. By identifying the gaps in their knowledge and practice will help to design effective pharmacology learning and instil good prescribing practices among medical students.

METHODS

This is a cross-sectional study involves 400 samples which includes 2nd and 3rd year medical students in JSS Medical College, Mysore by purposive sampling. The study was conducted over a period of six months, from October 2024 to March 2025. Data collection was conducted using a self-administered, structured, and pre-tested questionnaire, designed to evaluate the knowledge, attitudes, and practices (KAP) of students concerning OTC drugs, p-drugs (prescribed drugs), and essential medicines.

The study was facilitated online through Google Forms, ensuring convenience in distribution and completion. Before participating, students were provided with a clear explanation of the study's objectives and instructions for completing the questionnaire. Informed consent was obtained from all participants, adhering to ethical research standards. The collected data were summarized using descriptive statistics, specifically focusing on counts and percentages, which enabled the analysis of trends and frequencies in the students' KAP regarding OTC drugs, p-drugs, and essential medicines.

RESULTS

Among the 320 medical students participated in the study, majority were 21 years old (38.1%), followed by 20 years (27.2%). The mean age of participants was 20.81±1.34 years. Predominant of the respondents were female (58.1%), and from 2nd year MBBS (64.1%).

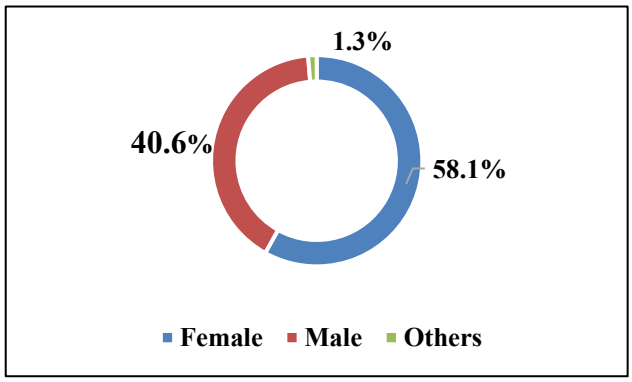

Figure 1: Gender distribution among the participants (n=320).

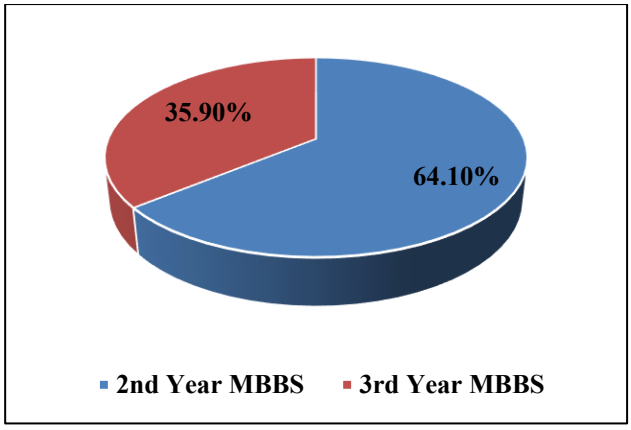

Figure 2: Year of study among the participants (n=320).

Knowledge on OTC, p drug and essential drugs

Almost all participants were aware of OTC drugs, with 91.9% responding "Yes". Knowledge of p-drugs and essential drugs was also high, with 95.3% familiar with the concepts. Most commonly used OTC drugs were paracetamol (29.1%), followed by other analgesics, antihistamines and antacids. A small proportion (4.1%) reported no OTC drugs used or prescribed.

Attitude towards over the counter and essential drugs

About 52.9% (44.1% agree and 8.8% strongly agree) believed OTC drugs were safe for self-medication, while 40.9% remained neutral. A large proportion (76.6%) agreed that essential drugs should be available for everyone at all times (47.5% agree and 29.1% strongly agree).

Participants strongly supported education on OTC drug use, with 83.4% agreeing or strongly agreeing. Similarly, 79.7% believed knowledge on OTC, p drugs, and essential drugs affects their clinical practice (agree 40%, strongly agree 39.7%).

Practice related to over-the-counter drugs

Majority of the participants (79.7%) reported having used OTC drugs without a prescription. Regarding the frequency of OTC drug use, more than half of the students reported using them occasionally, with 51.9% indicating sometimes use.

Nearly one-fourth (24.4%) reported rare use, while 18.8% admitted to using OTC drugs often. Only a small proportion of participants (5.0%) reported that they had never used OTC medications without a prescription.

Confidence in prescribing

Almost half were confident/very confident (52.5%), while 39.4% were neutral and 8.1% not confident

Issues with availability

Most reported no problems in availability (73.4%), though 26.6% experienced difficulty.

Table 1: Age of the participants in years (n=320).

Age (in years)	Frequency (N)	%
18	4	1.3
19	37	11.6
20	87	27.2
21	122	38.1
22	48	15
23	16	5
24	3	0.9
25	1	0.3
30	2	0.6
Total	320	100

Table 2: Assessment of knowledge, attitude and practice among the participants (n=320).

Domain	Question	Response categories	Frequency (%)
Knowledge	Awareness of OTC drugs	Yes	294 (91.9)
		No	26 (8.1)
	Familiar with p-drug and essential drugs	Yes	305 (95.3)
		No	15 (4.7)
	Common OTC drugs used	Paracetamol (most common)	93 (29.1)
		None/don't know	13 (4.1)
Attitude	OTC drugs safe for self-medication	Strongly agree	28 (8.8)
		Agree	141 (44.1)

Continued.

Domain	Question	Response categories	Frequency (%)
		Neutral	131 (40.9)
		Disagree	20 (6.3)
	Essential drugs should be available to all	Strongly agree	93 (29.1)
		Agree	152 (47.5)
		Neutral	62 (19.4)
		Disagree	13 (4.1)
	Need more education on OTC use	Strongly agree	137 (42.8)
		Agree	130 (40.6)
		Neutral	47 (14.7)
		Disagree	6 (1.9)
	Knowledge affects clinical practice	Strongly agree	127 (39.7)
		Agree	128 (40.0)
		Neutral	55 (17.2)
		Disagree	10 (3.1)
Practice	Used OTC without prescription	Yes	255 (79.7)
		No	65 (20.3)
	Frequency of OTC use	Sometimes	166 (51.9)
		Rarely	78 (24.4)
		Often	60 (18.8)
		Never	16 (5.0)
	Confidence in prescribing p drugs	Very confident	32 (10.0)
		Confident	136 (42.5)
		Neutral	126 (39.4)
		Not confident	26 (8.1)
	Issues with availability	No	235 (73.4)
		Yes	85 (26.6)

DISCUSSION

The present study assessed the KAP regarding OTC drugs, the p drug concept, and essential medicines among undergraduate medical students and demonstrated a high level of awareness accompanied by a substantial prevalence of self-medication practices. A total of 320 students participated, with a mean age of 20.81±1.34 years; the majority were females (58.1%) and belonged to the second year of MBBS (64.1%) (Table 1, Figure 1, 2). Awareness regarding OTC drugs was high in the present study, with 91.9% of participants reporting familiarity (Table 2).

This finding is consistent with studies by Jagadeesh et al and Bekele et al which reported awareness levels ranging from 85% to over 95% among medical and pharmacy students.[4,5] Similar levels of awareness have also been reported from a study by Alkhatatbeh et al concluded that easily accessibility of OTC drugs and insufficient emphasis on essential medicines and rational drug use contributed to unsafe practices.[6] A study by Albusalih et al among medical and pharmacy students reported that nearly 70% of participants believing OTC drugs to be inherently safe.[7] The high awareness observed may be attributed to academic exposure during pharmacology teaching, easy accessibility of OTC drugs, and frequent use for minor ailments. Knowledge regarding the p drug concept and essential medicines was notably high in the current study (95.3%), which is higher than that reported in a study by Krishna et al that about 49.7% were aware of p drug.[8] A study by Rushabh et al revealed about 77% were aware of knowledge of p drug concept.[9] This improvement may reflect increased emphasis on rational prescribing, essential medicine lists, and competency-based medical education. The World Health Organization strongly advocates the use of essential medicines as a means to promote equitable, cost-effective, and rational healthcare delivery, making early familiarity among medical students particularly important.[3]

Paracetamol was the most commonly used OTC drug (29.1%) among participants, followed by other analgesics, antihistamines, proton pump inhibitors, antibiotics, and antiemetics (Table 2). This pattern aligns with findings from studies conducted Bekele et al on medical and pharmacy students, most commonly used OTC drugs are antipyretics and pain killers.[5] Similarly, a study by Alkhatatbeh et al also reported that analgesics and cold preparations were most commonly used OTC drugs.[6] Hassan et al, Araia et al and Abdi et al reported analgesics (79%) and antibiotics (61%) were most commonly used OTC medications.10–12 The popularity of paracetamol likely reflects its perceived safety, affordability, and effectiveness for common ailments such as fever and pain. However, several authors have

cautioned that inappropriate dosing and prolonged use may lead to adverse outcomes, highlighting the need for continued education on safe use and toxicity. With regard to attitude, more than half of the participants (52.9%) believed that OTC drugs are safe for self-medication, while a substantial proportion remained neutral. Similar mixed attitudes have been reported by Alkhatatbeh et al and Hassan et al where students acknowledged the convenience of OTC drugs but expressed uncertainty regarding their safety.[6,10] This ambivalence may reflect partial awareness of risks such as ADRs, incorrect dosing, and masking of serious illnesses. Encouragingly, a large majority of students strongly supported the concept that essential medicines should be universally available, a finding consistent with previous studies and aligned with global public health principles.[3,5]

Despite high awareness, the prevalence of self-medication without prescription was considerable, with 79.7% of students reporting OTC use without medical supervision (Table 2). Jagadeesh et al reported self-medication in 78–85% of second-year MBBS students. Bekele et al similarly reported that 79.7% of students used OTC medications for self-treatment, citing reasons such as saving time and obtaining quick relief.[5] Alkhatatbeh et al documented a prevalence of 87.6%, with nearly 40% unaware of adverse drug reactions.[6] Hassan et al reported an exceptionally high prevalence of 92.3%, including >55% antibiotic use without prescription.[10] Abdi et al found self-medication in 76.4% of health-science students, while Albusalih et al reported 63.8%, with 70% perceiving OTC drugs as safe.[7,12] Faheem et al further showed OTC use in >88% of Saudi medical students despite knowledge levels exceeding 80%.[13] The persistence of self-medication despite good knowledge underscores a significant gap between awareness and practice, commonly attributed to convenience, perceived minor illness, time constraints, and confidence in pharmacological knowledge.

Confidence in prescribing p drugs was moderate in the present study, with 52.5% of students reporting confidence or high confidence. Similar findings have been reported by Bekele et al and Faheem et al suggesting that although theoretical knowledge is imparted, students may lack sufficient hands-on experience in drug selection and prescription writing.[5,13] This highlights the need for experiential learning approaches such as case-based discussions, supervised prescribing exercises, and early clinical exposure to strengthen rational prescribing skills. The occurrence of adverse drug reactions during self-medication was reported by 26.6% of participants, which is lower than that reported in several other studies. Bekele et al reported ADRs in 86.8% of users, Hassan et al reported 30.2% and Faheem et al reported 70.5%

ADRs among self-medicating students.[5,10,13] The lower ADR rate observed in the present study may be related to predominant use of relatively safer drugs such as paracetamol and antihistamines; however, underreporting cannot be excluded. Most students did not report major issues with drug availability; however, more than one-quarter experienced difficulty accessing certain drugs. This may reflect regional variations in supply chains and regulatory controls. Recent policy changes and discussions by the National Medical Commission regarding drugs that can be sold without prescription may further influence availability and self-medication patterns in India.[1] Continuous monitoring of the impact of such regulatory changes on prescribing behaviour is therefore essential.

Overall, the findings of the present study are largely consistent with previously published literature and reveal a recurring pattern of high knowledge and positive attitudes coexisting with frequent self-medication practices. Importantly, nearly 80% of students believed that knowledge of OTC drugs, essential medicines, and p drugs would positively influence their future clinical practice, reflecting a favourable attitude toward rational prescribing and a strong desire for further education. Strengthening undergraduate pharmacology training with greater emphasis on rational drug use, safe self-medication practices, and practical application of p drug and essential medicine concepts is crucial, as today's medical students are tomorrow's prescribers whose practices will significantly impact patient safety and healthcare costs.

The present study has certain limitations that should be considered while interpreting the findings. Being a cross-sectional study, it reflects participants' knowledge, attitudes and practices at a single point in time and does not permit causal inference or assessment of temporal changes. The use of a self-administered questionnaire may have introduced recall and social desirability bias, potentially leading to overreporting of appropriate behaviours or underreporting of unsafe self-medication practices. As the study was conducted in a single institution using purposive sampling, the generalizability of the findings is limited. Despite these limitations, the study provides valuable insights into students KAP regarding OTC drugs, P-drugs, and essential medicines and identifies areas for focused educational interventions.

CONCLUSION

The study highlights a high-level awareness (91.9%) among medical students regarding OTC drugs, essential drugs, and p-drugs, reflecting the effectiveness of pharmacological education during the early years of medical training. However, the prevalence of self-medication (79.9%) remains substantial' with paracetamol and NSAIDs being the most frequently used drugs, underscoring the need for better guidance on rational drug use. While over half of the students perceive self-medication as safe and feel confident in prescribing, this confidence may not always be supported by adequate clinical reasoning, indicating a gap between theoretical knowledge and safe practical application.

Comparative analysis with similar studies conducted shows consistent patterns of high self-medication practices and dominant use of analgesics, but also reveals variations in confidence levels, adverse drug reaction reporting and attitude towards drug safety. These findings reinforce the need for structured training modules on p drug selection, adverse drug reaction identification and ethical aspects of self-medication.

In conclusion, while medical students demonstrate commendable awareness, targeted educational interventions–such as case-based learning, workshops on rational prescribing and stricter institutional policies on OTC access–are essential to transform this knowledge into safe and responsible drug practice. Future studies should also explore long-term behavioural changes post-intervention and evaluate the impact of enhanced pharmacology curricula on prescribing practices.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Rowe G. Essential skills: medicines management and administration. The Handbook for Nursing Associates and Assistant Practitioners. 2022 :299.
2. Singh DV. Concepts of P drug selection. Nepal J Epidemiol. 2013;3(1):226-9.
3. Petro E, Siebers AC, Mantel-Teeuwisse AK, Suleman F, van den Ham HA. Availability and affordability of essential medicines from the who global core list in Albania: a cross-sectional survey using the who/HAI Methodology. medRxiv. 20252025-08.
4. Jagadeesh K, Chidananda KN, Revankar SP, Prasad NS. Study on self-medication among 2nd year medical students. International J Basic Clin Pharmacol. 2015;4(1):164–7.
5. Bekele KM, Abay AM, Mengistu KA, Atsbeha BW, Demeke CA, Belay WS, et al. Knowledge, attitude, and practice on over-the-counter drugs among pharmacy and medical students: a facility-based cross-sectional study. Integr Pharm Res Pract. 2020;9:135–46.
6. Alkhatatbeh MJ, Alefan Q, Alqudah MAY. High prevalence of self-medication practices among medical and pharmacy students: a study from Jordan. Int J Clin Pharmacol Ther. 2016;54(5):390–8.
7. Albusalih FA, Naqvi AA, Ahmad R, Ahmad N. Prevalence of Self-Medication among Students of Pharmacy and Medicine Colleges of a Public Sector University in Dammam City, Saudi Arabia. Pharmacy. 2017;5(3):51.
8. Parsode RB, Chandaliya KC, Deshmukh JB. Knowledge, attitude, and practice of 'P-drug concept' among postgraduate residents and interns in a tertiary care teaching hospital in Maharashtra. Int J Basic Clin Pharmacol. 2023;13(1):147–51.
9. Parise DRS, Yuwnate DAH, Thomas DAV. Study of Knowledge, Attitude and Practices of "P-Drug" Concept Among Postgraduate Students and Interns at A Tertiary Care Hospital. International J Med Pharma Res. 2025;6:1549–54.
10. Hassan NM, Koabar SMM. Self-medication pattern among medical students in Middle Delta, Egypt. BMC Medical Education. 2025;25(1):99.
11. Araia ZZ, Gebregziabher NK, Mesfun AB. Self medication practice and associated factors among students of Asmara College of Health Sciences, Eritrea: a cross sectional study. J of Pharm Policy and Pract. 2019;12(1):1–9.
12. Abdi A, Faraji A, Dehghan F, Khatony A. Prevalence of self-medication practice among health sciences students in Kermanshah, Iran. BMC Pharmacology and Toxicology. 2018 Jul 3;19(1):36.
13. Faheem AM, Bamatraf MS, Mohammed SM, Al Ghamdi NA, Rayani RN, Alharbi MM. Knowledge, attitude, and practice of over-the-counter drug use among medical students in fakeeh college: a cross-sectional study. Cureus. 2020;17(5):83878.

Cite this article as: Kumar RBM, Gangadhar M, Gopal M, Joy J. Knowledge, attitude and practice on over-the-counter drugs, P-drug and essential drugs by second- and third-year medical students in Mysuru. Int J Community Med Public Health 2026;13:1433-8.