



Original Article

## Knowledge, Attitudes, and Practices Regarding Over-the-Counter Pain Relievers Among MBBS Students: A Cross-Sectional Study

Dr M. Usha Rani<sup>1</sup>, Dr M. Sandhya Rani<sup>2</sup>, Dr Syed Mubishera Begum<sup>3</sup>

<sup>1</sup>Professor, Department of Pharmacology, Kurnool Medical College, Kurnool, Andhra Pradesh, India

<sup>2</sup>Professor, Department of Community Medicine, Government Medical College (GMC), Paderu, ASR District, Andhra Pradesh, India

<sup>3</sup>Assistant Professor, Department of Pharmacology, Guntur Medical College, Guntur, Andhra Pradesh, India

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### Corresponding Author:

**Dr. M. Sandhya Rani**

Professor, Department of  
Community Medicine, Government  
Medical College (GMC), Paderu,  
ASR District, Andhra Pradesh, India

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### ABSTRACT

**Background:** Over-the-counter (OTC) analgesics are frequently used for common symptoms, but unsafe self-medication may lead to dosing errors, adverse drug reactions, and drug–drug interactions.

**Objectives:** To assess knowledge, attitudes, and practices (KAP) regarding OTC pain relievers among MBBS students.

**Methods:** A questionnaire-based cross-sectional study was conducted among 200 MBBS students in a government medical college in Andhra Pradesh, India. The tool assessed demographics; item-wise knowledge (ingredients, maximum daily paracetamol dose, pregnancy choice, NSAID adverse effects, duration of continuous use, contraindications, and drug–drug interactions); attitudes; and self-reported practices. Data were summarized using frequencies and percentages.

**Results:** Of 200 participants, 83 (41.5%) were male, 113 (56.5%) female, and 4 (2.0%) preferred not to disclose gender. Knowledge was high for selecting paracetamol as the preferred OTC analgesic in pregnancy (173, 86.5%), recognizing serious NSAID adverse effects (170, 85.0%), and identifying drug–drug interactions (170, 85.0%). Correct knowledge of NSAID contraindications was 84.5% (169/200). Only 59.0% (118/200) correctly identified the maximum daily dose of paracetamol and 45.5% (91/200) identified the safe duration of continuous OTC use. Only 18 (9.0%) were very confident in choosing OTC analgesics, though most agreed that OTC pain relievers are overused (181, 90.5%) and that self-medication may delay care (174, 87.0%). OTC analgesic use in the past year was common (163, 81.5%); headache (61.5%) and fever (49.0%) were leading indications, and only 36.0% discussed OTC use with a healthcare professional.

**Conclusion:** Students showed good awareness of safety issues but had gaps in dose and duration knowledge, with low professional consultation, supporting targeted educational interventions.

**Keywords:** over-the-counter; analgesics; paracetamol; NSAIDs; self-medication; medical students; KAP study.

### INTRODUCTION

Over-the-counter (OTC) pain relievers most commonly paracetamol (acetaminophen) and nonsteroidal anti-inflammatory drugs (NSAIDs) are routinely used for headache, fever, musculoskeletal pain, and dysmenorrhea. Responsible OTC use can reduce symptom burden and avoid unnecessary clinic visits, particularly for minor, self-limiting conditions. However, easy availability may also encourage self-medication without adequate assessment of contraindications, drug interactions, dosing limits, and appropriate duration of use. Such risks are well recognized in the broader literature on self-medication, which highlights misdiagnosis, excessive dosing, prolonged use, and interaction-related harm as recurring concerns [1,2].

Medical students represent a special population in this context. They have partial pharmacological knowledge, ready access to medicines, and exposure to demanding academic schedules that can increase analgesic use. Studies from

multiple settings consistently demonstrate high prevalence of self-medication and OTC medicine use among medical and health science students, alongside variable levels of knowledge and risk perception [3–7]. In an Indian medical student cohort, self-medication prevalence has been reported to be very high, with analgesics/antipyretics among the most frequently used drug categories and common indications including fever and headache [8]. Because today's students are tomorrow's clinicians, their KAP patterns may influence not only their personal safety but also future prescribing habits and patient counseling practices.

The clinical stakes are tangible. Paracetamol is widely perceived as safe, yet confusion around maximum daily dose recommendations and combination products can contribute to inadvertent overdose, with hepatotoxicity as the principal concern [9]. NSAIDs are associated with gastrointestinal bleeding and cardiovascular effects, including blood pressure elevation; comparative studies have demonstrated differential blood pressure responses across NSAID classes, and population data show variability in upper gastrointestinal bleeding risk among individual NSAIDs [10,11]. Additionally, clinically meaningful interactions can occur with OTC analgesics for example, ibuprofen may interfere with aspirin's antiplatelet effect depending on timing, and paracetamol can potentiate warfarin anticoagulation [12,13]. In pregnancy, paracetamol is generally regarded as the preferred first-line analgesic, whereas many NSAIDs carry trimester-specific concerns, making correct selection essential for safe counseling [14].

OTC combination products and brand-driven purchasing can further obscure ingredient content and cumulative dosing, even for well-informed users. Given the widespread availability of OTC analgesics in India and the central role of pharmacies in access, identifying knowledge gaps and risky practices in medical students is a practical starting point for curriculum improvement. Therefore, the present study assessed knowledge, attitudes, and practices regarding OTC pain relievers among MBBS students, focusing on ingredients, dosing limits, contraindications, interactions, and duration of use.

## **MATERIALS AND METHODS**

### **Study design and setting:**

A questionnaire-based cross-sectional study was conducted among undergraduate MBBS students at a Guntur Medical College, Guntur in Andhra Pradesh, India.

### **Study population and eligibility:**

Students enrolled in the MBBS program and present during data collection were approached. Those who were willing to participate and provided informed consent were included. Students who declined participation or returned incomplete questionnaires were excluded.

### **Sample size and sampling:**

A total of 200 complete responses were included in the final analysis. Participants were recruited using a classroom-based approach and convenience sampling.

### **Study instrument and operational definitions:**

A structured questionnaire was prepared after reviewing published literature on OTC use and self-medication among student populations [3–8]. Content was reviewed for clarity and relevance by faculty members from pharmacology and community medicine, and minor edits were made to improve readability. The tool consisted of four sections: (i) demographic variables; (ii) knowledge items related to common OTC analgesic ingredients, maximum daily paracetamol dose, preferred analgesic choice in pregnancy, serious adverse effects of NSAIDs, safe duration of continuous OTC use, drug–drug interactions, differences between paracetamol and ibuprofen, and contraindications for NSAID use; (iii) attitudes toward OTC pain relievers (confidence in choosing OTC analgesics, perceived overuse, concern about long-term risks, perceived importance of patient education, and perceived delay in care due to self-medication); and (iv) practices (frequency of OTC use in the prior year, indications multiple responses permitted, discussion with a healthcare professional, and source of medicines). For knowledge items, the “correct/most appropriate” responses were defined a priori using standard pharmacology teaching points and widely accepted safety guidance [9–14].

**Data collection procedure:** Data were collected anonymously to encourage candid responses and reduce social desirability bias. Participants completed the questionnaire without consulting external resources. Completed forms were checked for completeness before data entry. Data entry was cross-verified for consistency.

**Statistical analysis:** Data were entered into a spreadsheet and analyzed using standard statistical software. Categorical variables were summarized as frequencies and percentages. The analysis was descriptive in line with the study objectives.

**Ethical considerations:** Institutional ethics committee approval was obtained prior to the study. Participation was voluntary, informed consent was taken, and confidentiality was maintained throughout.

## RESULTS

Among 200 participants, 83 (41.5%) were male, 113 (56.5%) were female, and 4 (2.0%) preferred not to disclose gender (Table 1).

**Table 1. Demographic Characteristics of the Study Participants (n = 200)**

Variable	Category	n (%)
Gender	Male	83 (41.5)
	Female	113 (56.5)
	Prefer not to say	4 (2.0)

Knowledge responses are summarized in Table 2. Correct identification of common OTC analgesic ingredients was observed in 123 (61.5%) students, and 118 (59.0%) correctly identified the maximum daily dose of paracetamol. High proportions selected paracetamol as the preferred OTC analgesic in pregnancy (173, 86.5%) and recognized serious NSAID adverse effects such as gastrointestinal bleeding and possible blood pressure effects (170, 85.0%). Knowledge of drug–drug interactions with OTC analgesics was correctly identified by 170 (85.0%), while 169 (84.5%) correctly recognized contraindications to NSAID use. Correct knowledge of the safe duration for continuous OTC analgesic use was lower at 91 (45.5%).

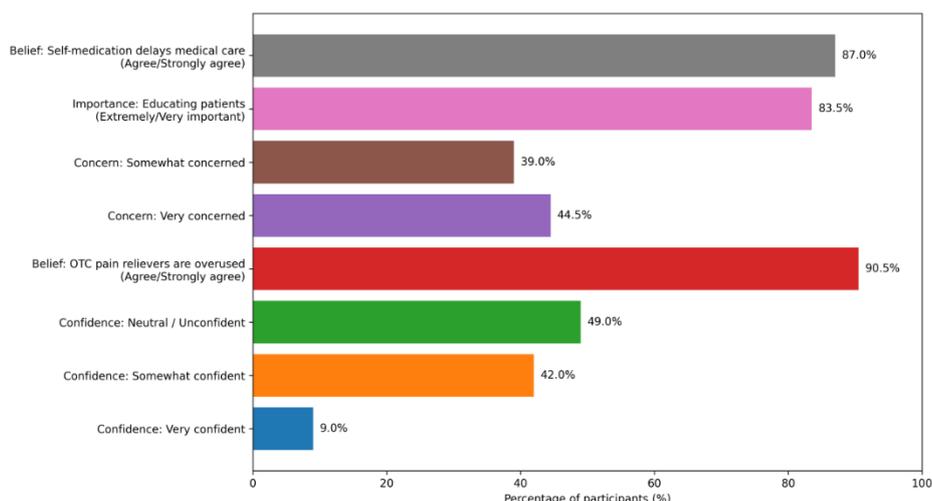
**Table 2. Knowledge Regarding Over-the-Counter (OTC) Pain Relievers**

Question domain	Correct / most appropriate response	n (%)
Common OTC analgesic ingredients	Correct combination identified	123 (61.5)
Maximum daily dose of paracetamol	Correct dose	118 (59.0)
OTC analgesic safe in pregnancy	Paracetamol	173 (86.5)
Serious adverse effects of NSAIDs	GI bleeding ± hypertension	170 (85.0)
Safe duration of continuous OTC use	Correct duration	91 (45.5)
Drug–drug interactions with OTC analgesics	Correctly identified	170 (85.0)
Difference between paracetamol and ibuprofen	Correct mechanism	123 (61.5)
Contraindications for NSAID use	All conditions identified	169 (84.5)

Attitudes toward OTC pain relievers are presented in Table 3. Only 18 (9.0%) students reported being very confident in selecting OTC analgesics, whereas 98 (49.0%) were neutral or unconfident. Most agreed that OTC pain relievers are overused (181, 90.5%) and that self-medication can delay medical care (174, 87.0%). A majority rated educating patients about OTC analgesic use as extremely or very important (167, 83.5%).

**Table 3. Attitudes Toward OTC Pain Relievers Among MBBS Students**

Attitude statement	Response category	n (%)
Confidence in choosing OTC analgesics	Very confident	18 (9.0)
	Somewhat confident	84 (42.0)
	Neutral / Unconfident	98 (49.0)
Belief that OTC pain relievers are overused	Agree / Strongly agree	181 (90.5)
Concern about long-term risks of OTC use	Very concerned	89 (44.5)
	Somewhat concerned	78 (39.0)
Importance of educating patients on OTC use	Extremely / Very important	167 (83.5)
Belief that self-medication delays medical care	Agree / Strongly agree	174 (87.0)



**Figure 1. Attitudes Toward OTC Pain Relievers Among MBBS Students**

Practice patterns are shown in Table 4. Occasional or frequent OTC analgesic use in the past year was reported by 163 (81.5%). Headache was the most common indication (123, 61.5%), followed by fever (98, 49.0%), muscle pain (84, 42.0), and menstrual pain (78, 39.0) (multiple responses permitted). Only 72 (36.0%) students reported discussing OTC analgesic use with a healthcare professional. Pharmacies were the predominant source of OTC medicines (170, 85.0%).

**Table 4. Practices Related to OTC Pain Reliever Use**

Practice variable	Category	n (%)
Frequency of OTC use in past year	Occasional / Frequent	163 (81.5)
Common indications*	Headache	123 (61.5)
	Fever	98 (49.0)
	Muscle pain	84 (42.0)
	Menstrual pain	78 (39.0)
Discussion of OTC use with healthcare professional	Yes	72 (36.0)
	No	128 (64.0)
Source of OTC medicines	Pharmacy	170 (85.0)
	Supermarket / Others	30 (15.0)

\*Multiple responses permitted.

## DISCUSSION

This study provides an item-wise snapshot of knowledge, attitudes, and practices (KAP) regarding over-the-counter (OTC) pain relievers among MBBS students. Overall, safety awareness appeared relatively strong in several clinically important domains, including correct analgesic choice in pregnancy, recognition of major NSAID harms, identification of contraindications, and awareness of potential drug interactions. However, practical gaps persisted in key areas that directly influence safe self-use, particularly knowledge of maximum daily paracetamol dose limits and the appropriate duration for continuous OTC analgesic use.

The high prevalence of OTC analgesic use reported in the preceding year is consistent with earlier literature showing common self-medication among medical students across different settings, including India, where headache and fever are frequently reported indications and analgesics/antipyretics remain among the most commonly used medicines [3,8]. The finding that pharmacies were the predominant source of OTC medicines also aligns with prior reports highlighting convenience and easy access as major drivers of OTC use and self-medication behaviors [1,4,6].

The knowledge profile observed in this cohort has encouraging elements. A large proportion of students recognized serious NSAID adverse effects, which is important because clinically meaningful harm can occur even with commonly used agents. Evidence from ambulatory blood pressure monitoring indicates that ibuprofen can increase systolic blood pressure and may contribute to incident hypertension in susceptible individuals [10]. In addition, population-based studies demonstrate that the risk of upper gastrointestinal bleeding varies among individual NSAIDs, supporting the need for drug-specific risk assessment and careful counseling [11]. The relatively high proportion correctly identifying contraindications suggests awareness of screening for comorbidities and high-risk clinical states.

In contrast, weaker performance in identifying the maximum daily dose of paracetamol and the safe duration of continuous OTC use is clinically significant. Paracetamol is often perceived as inherently safe, yet dosing-related confusion and variability in labeling can contribute to inadvertent overdose and preventable toxicity [9]. Moreover, the low proportion reporting high confidence in choosing OTC analgesics, despite strong concern regarding overuse and delayed care-seeking, suggests a gap between factual knowledge and real-world decision-making. Similar discordance between knowledge, attitudes, and practices has been reported in KAP studies involving medical and pharmacy students [4–7].

Although 85% reported correct knowledge of interactions, consultation with healthcare professionals was low (36%). Strengthening practical counseling skills may therefore be as important as improving factual knowledge. Teaching should emphasize interaction screening (e.g., ibuprofen–aspirin timing and paracetamol–warfarin potentiation) [12,13], dose calculation across combination products, and clear “when to seek care” rules. Pharmacist-led counseling and short skills sessions can reinforce safe OTC decision-making and patient communication. Because this was a single-institution, self-reported study, generalizability may be limited; nevertheless, the identified gaps are teachable and actionable within undergraduate training.

## CONCLUSION

OTC pain reliever use was common among MBBS students, with pharmacies as the dominant source. Students demonstrated good awareness of key safety domains, including appropriate analgesic choice in pregnancy, major NSAID adverse effects, contraindications, and potential interactions. Nonetheless, important knowledge gaps were identified for

maximum daily paracetamol dose and safe duration of continuous OTC use. Confidence in selecting OTC analgesics was low, and professional consultation about OTC use was infrequent. Integrating brief, case-based teaching on dosing limits, duration, interaction screening, and red-flag symptoms—along with structured counseling practice and reinforcement of responsible self-care—may improve safe OTC analgesic use and strengthen future patient education. Periodic workshops and assessments are recommended at scale.

## REFERENCES

1. Hughes CM, McElnay JC, Fleming GF. Benefits and risks of self medication. *Drug Saf.* 2001;24(14):1027-37. doi:10.2165/00002018-200124140-00002. PMID:11735659.
2. Bennadi D. Self-medication: A current challenge. *J Basic Clin Pharm.* 2013;5(1):19-23. doi:10.4103/0976-0105.128253. PMID:24808684.
3. Hashemzaei M, Afshari M, Koohkan Z, Bazi A, Rezaee R, Tabrizian K. Knowledge, attitude, and practice of pharmacy and medical students regarding self-medication: a study in Zabol University of Medical Sciences, Iran. *BMC Med Educ.* 2021;21(1):49. doi:10.1186/s12909-020-02374-0. PMID:33446190.
4. Bekele KM, Abay AM, Mengistu KA, Atsbeha BW, Demeke CA, Belay WS, Yimenu DK. 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;9:135-146. doi:10.2147/IPRP.S266786. PMID:32983946.
5. Abdullah IS, Chaw LL, Koh D, Hussain Z, Goh KW, Abdul Hamid AA, Ming LC. 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. doi:10.3390/ijerph19052658. PMID:35270352.
6. Rajab MH, Ewis SK, Almatar K, Abdelmajed LY, Ba Sowid MS, Bajaber MO, Aljejakli R, Bin Saeedu S, Abbad T, Alsultan ZS, Shabi SM. Utilization of over-the-counter painkillers among medical students during academic examinations. *Cureus.* 2023;15(8):e43706. doi:10.7759/cureus.43706. PMID:37724194.
7. Sinuraya RK, Wulandari C, Amalia R, Puspitasari IM. Public knowledge, attitudes, and practices regarding the use of over-the-counter (OTC) analgesics in Indonesia: a cross-sectional study. *Patient Prefer Adherence.* 2023;17:2569-2578. doi:10.2147/PPA.S426290. PMID:37869729.
8. Badiger S, Kundapur R, Jain A, Kumar A, Pattanshetty S, Thakolkaran N, Bhat N, Ullal N. Self-medication patterns among medical students in South India. *Australas Med J.* 2012;5(4):217-20. doi:10.4066/AMJ.2012.1007. PMID:22848313.
9. Krenzelo EP, Royal MA. Confusion: acetaminophen dosing changes based on NO evidence in adults. *Drugs R D.* 2012;12(2):45-48. doi:10.2165/11599660-000000000-00000. PMID:22530736.
10. Ruschitzka F, Borer JS, Krum H, Flammer AJ, Yeomans ND, Libby P, et al. Differential blood pressure effects of ibuprofen, naproxen, and celecoxib in patients with arthritis: the PRECISION-ABPM (Prospective Randomized Evaluation of Celecoxib Integrated Safety Versus Ibuprofen or Naproxen Ambulatory Blood Pressure Measurement) Trial. *Eur Heart J.* 2017 Nov 21;38(44):3282-3292. doi: 10.1093/eurheartj/ehx508. PMID: 29020251; PMCID: PMC8139400.
11. Massó González EL, Patrignani P, Tacconelli S, García Rodríguez LA. Variability among nonsteroidal antiinflammatory drugs in risk of upper gastrointestinal bleeding. *Arthritis Rheum.* 2010;62(6):1592-1601. doi:10.1002/art.27412. PMID:20178131.
12. Awa K, Satoh H, Hori S, Sawada Y. Prediction of time-dependent interaction of aspirin with ibuprofen using a pharmacokinetic/pharmacodynamic model. *J Clin Pharm Ther.* 2012;37(4):469-474. doi:10.1111/j.1365-2710.2011.01313.x. PMID:22122406.
13. Zhang Q, Bal-dit-Sollier C, Drouet L, et al. Interaction between acetaminophen and warfarin in adults receiving long-term oral anticoagulants: a randomized controlled trial. *Eur J Clin Pharmacol.* 2011;67(3):309-314. doi:10.1007/s00228-010-0975-2. PMID:21191575.
14. Toda K. Is acetaminophen safe in pregnancy? *Scand J Pain.* 2017;17:445-446. doi:10.1016/j.sjpain.2017.09.007. PMID:28986045.