



ORIGINAL ARTICLE

Pharmaceutical Promotions and Medical Students: A Critical Appraisal of Knowledge and Attitude

Neha M Patel¹, A T Sathiya Vinotha^{2,*}, S Bhuvaneshwari³, M S Umamageswari²,
A Vijayamathy⁴, S Jeevithan⁵

¹CRMI, KMCH Institute of Health Sciences & Research, Coimbatore, Tamil Nadu, India

²Professor, Department of Pharmacology, KMCH Institute of Health Sciences & Research, Coimbatore, Tamil Nadu, India

³Professor & Head, Department of Pharmacology, KMCH Institute of Health Sciences & Research, Coimbatore, Tamil Nadu, India

⁴Associate Professor, Department of Pharmacology, Karuna Medical College, Palakkad, Kerala, India

⁵Professor & Head, Department of Community Medicine, KMCH Institute of Health Sciences & Research, Coimbatore, Tamil Nadu, India

ARTICLE INFO

Article history:

Received 08.02.2025

Accepted 12.09.2025

Published 19.10.2025

** Corresponding author.*

A T Sathiya Vinotha

drs.vinothaph@gmail.com

[https://doi.org/](https://doi.org/10.18579/jopcr/v24.i3.96)

10.18579/jopcr/v24.i3.96

ABSTRACT

Drug promotional literature (DPL) plays a significant role in influencing prescribing behaviors among medical professionals. However, concerns persist regarding its ethical implications and impact on rational prescribing. This study aims to assess the knowledge and attitudes of undergraduate medical students towards DPL. A cross-sectional study was conducted among undergraduate medical students at KMCH Institute of Health Sciences & Research, Coimbatore, using a structured questionnaire via Google Forms. The questionnaire comprised demographic details, five knowledge-based questions, and eleven attitude-based questions on DPL. Data from 353 respondents were analyzed using SPSS version 27, applying descriptive statistics. The mean age of participants was 20.74 ± 1.3 years, with 60.6% females and 39.4% males. While 84.4% of students correctly identified the essential information in DPL, only 57.5% were aware of factors influencing prescriptions. A major gap was noted in recognizing strategies to mitigate the impact of drug promotion, with only 23.5% demonstrating awareness. The attitude assessment revealed that 59.8% believed DPL aids rational prescribing, while 61.8% deemed incentives like gifts or sponsored events unethical. Additionally, 59.5% and 70% stressed the importance of cost comparisons and references in DPL, respectively. The study highlights knowledge gaps and diverse perceptions among medical students regarding DPL. While many acknowledge its role in updating drug knowledge, concerns about ethical practices persist. Structured educational interventions and stricter regulations are essential to enhance critical evaluation skills and ensure ethical prescribing practices among future healthcare professionals.

Keywords: Drug promotional literature (DPL); Medical students; Knowledge; Attitude; Prescribing behaviour; Pharmaceutical marketing

INTRODUCTION

WHO defines drug promotion literature (DPL) as “all informational and persuasive activities by manufacturers, the effect of which is to induce the prescription, supply, purchase, and/or use of medicinal drugs”¹. In underdeveloped nations, sales representatives are the primary source of drug information, with one sales representative for every five doctors². Doctors themselves use advertising as a source when reporting any information regarding new drugs. According to sales reps, doctors who have graduated a long time ago and frequently work in private practice

rely on promotions as their primary source of information. Their attitudes regarding promotions can also differ, as do their opinions³. When the newest medications are heavily promoted, they are prescribed and used widely before their safety profile is completely known. Newer, more expensive medications would replace the older ones if there was no proof of their therapeutic effects⁴. Drug advertising is not subject to review journal editors’ oversight, nor would any national legislation or guidelines satisfy DPL (printed advertisements) criteria. Numerous factors influence prescribing patterns, including the prescriber’s expertise, the

prescribing practices of elders and colleagues, numerous journal updates, clinical trials, continuing medical education (CME) events, conferences, and even DPL. According to a study by Dixit et al., prescriber expertise is the most significant factor influencing prescriptions, followed by drug promotion⁵. Since research clearly demonstrates that doctors who report depending more on promotion as a source of information tend to prescribe less appropriately, prescribe more frequently, and adopt new treatments more quickly, it is imperative that students receive training on the proper use of DPL. Nowadays, the most effective and accessible sources of information are the media, the internet, and advertisements. Additionally, the internet opens up a new market for illicit activities including the sale of unapproved new medications or goods with false health claims⁶. Large quantities of money are also spent by pharmaceutical companies on marketing, which includes sending out sales agents, providing samples, running ads in print and broadcast media, and sponsoring conferences and educational events⁷. Because referring them to the public may lead to incorrect conclusions about the drug, which could result in a number of health issues, such as the development of antibiotic resistance, regulatory authorities should take the necessary steps or establish some guidelines to check the availability of such DPL in the public domain. It has been observed that these DPL have influenced trainee physicians' attitudes and interfered with their prescribing practices⁸. Due to this hazard, we need to properly teach them how to evaluate promotions critically and alter their mindset in order to improve their prescription abilities. In light of all of this, undergraduate medical students are included in this study to assess their knowledge and attitudes on DPL as well as to critically evaluate any DPL. The aim of this study is to evaluate the understanding about the drug promotional literature among undergraduate medical students

MATERIALS & METHODS

A cross-sectional study was conducted after human ethical committee approval (23/IHEC/2022) with Google Forms as the data collecting instrument. The study's questions were divided into the following sections: Demographic information such as age, gender, and qualifications were included in Section A. Sections B and C had five knowledge questions and eleven attitude questions regarding over-the-counter medications, respectively. The questionnaire underwent content validation by a panel of three senior faculty members from the Department of Pharmacology. Their expert feedback ensured the relevance, clarity, and appropriateness of the items. After obtaining Google informed consent, 353 responses were gathered from KMCH Institute of Health Sciences & Research undergraduate students in Coimbatore. The questionnaire (Google form) began with a description of the study's purpose and

participants' willingness to participate. Details about the participants were kept private. The study did not include students who did not provide informed consent.

Statistical analysis

SPSS software version 27 was used for data analysis. The data collected was analyzed using simple mean and proportions. The maximum and minimum response for each question was analyzed separately.

RESULTS

The study population was 20.74 ± 1.3 years old on average. There were 60.6% females and 39.4% males in the population [Table 1]. Participants' comprehension of drug promotional literature (DPL) varies, according to the knowledge content data. Only 57.5% of respondents were aware of the factors influencing prescription, even though the majority (84.4%) correctly identified the complete information that should be contained in DPL and 68% recognized the safety information it should contain. There is a notable lack of expertise in areas like recognizing strategies to lessen the impact of drug promotion on prescribing (23.5%) and identifying the name of the drug mentioned in DPL (only 14.7% of respondents properly replied). These results underline the necessity of increased educational initiatives to raise prescribers' awareness of DPL and its consequences [Table 2].

Table 1: Demographic characteristics of the study population

Variable	Value
Mean age (in years)	20.74±1.34
Gender	
Male	39.4%
Female	60.6%

Table 2: Knowledge Content on Drug Promotional Literature

S. No	Parameters	Correct (%)	Wrong (%)
1	What are all the factors which affect prescribing?	57.5	42.5
2	Which name of the drug is mentioned in the drug promotional literature (DPL)?	14.7	85.3
3	What complete information regarding the drug should be mentioned in DPL?	84.4	15.6
4	What are all the safety information does DPL contain?	68	32
5	What measures to be taken to reduce the influence of drug promotion on prescribing?	23.5	76.5

Participants' opinion on drug promotional literature (DPL) and associated ethical practices varied, as shown in



Table 3. Most respondents concur that DPL helps with rational prescribing (59.8%) and refreshes prescribers medication knowledge (54.7%). Though there are differing views on ethical issues, a sizable portion (61.8%) consider practices like tours/dinner parties or offering profit shares/gifts to be unethical, while 41.6% think manufacturers encourage off-label drug use for profit and 41.6% think prescribers may feel obligated after receiving benefits. The majority (59.5% and 70%, respectively) stress the importance of cost comparisons and citations to scientific literature in the DPL content. These results underline the necessity of more stringent moral standards and increased openness in DPL and related marketing strategies.

Table 3: Attitude of students towards Drug Promotional Literature

S. No	Parameters	Yes	No	May be	Can't say
1	Do you think DPL updates prescriber's knowledge about drugs?	54.7	9.9	32.3	3.1
2	Do you think DPL helps in rational prescribing?	59.8	7.6	29.2	3.4
3	Do you think prescriber becomes obliged after receiving the benefits from the manufacturers?	41.6	13.3	38.2	6.8
4	Do you think manufacturers promote off label use of some medicines to make profit?	41.6	10.2	38.2	9.9
5	Is it ethical to distribute free samples of the drug to the physician by the manufacturer for promotion?	30.3	38.2	26.1	5.4
6	Do you think conducting CMEs for the promotion of their products by the manufacturer is ethical?	32.3	28.0	30.3	9.3
7	Do you think arranging tours/dinner parties to the prescriber by the manufacturer is ethical?	15.9	61.8	17.8	4.5
8	Do you think giving a percentage in profit/gifts to the prescriber by the manufacturer is ethical?	13.3	61.8	21.2	3.7
9	Do you think cost and comparison with other drugs is needed in DPL?	59.5	11	24.4	5.1
10	Do you think references to scientific literature are necessary in DPL?	70	6.2	19.5	4.2

The knowledge score distribution reveals that most participants scored in the mid-range, with 38.2% achieving a score of 3 and 33.1% a score of 2, indicating moderate knowledge levels. Only a small percentage demonstrated excellent knowledge, with just 0.8% scoring the maximum of 5. Conversely, a minority exhibited very low knowledge, with 2.3% scoring 0 and 13% scoring 1. These results suggest a significant need for targeted educational interventions to improve knowledge levels and bridge the gap among participants.

DISCUSSION

Studies consistently demonstrate that medical students are frequently exposed to pharmaceutical promotions throughout their education, shaping their perceptions and interactions with the pharmaceutical industry. For instance, a study conducted at the University of Zaragoza found that a significant majority 78.6% of clinical stage students reported receiving non-educational gifts, such as stationery, meals, or other incentives, from pharmaceutical representatives. This study further revealed a concerning trend: as students progressed through their academic years, the likelihood of accepting such gifts increased, indicating a gradual normalization of these promotional practices within medical training^{9,10}.

Similarly, a study examining German medical students uncovered a comparable pattern of industry influence. The research found that nearly half (44%) of medical students had direct interactions with pharmaceutical sales representatives. This exposure intensified as students advanced in their studies, with the percentage rising to 77% among final-year students, demonstrating a substantial increase in direct pharmaceutical engagement over time. Furthermore, the study highlighted the widespread acceptance of industry-sponsored incentives, with 80% of students admitting to having accepted gifts from pharmaceutical companies. This widespread participation underscores the pervasive nature of pharmaceutical promotions within medical education, raising concerns about the potential impact on students' prescribing behaviors and professional ethics as future healthcare providers^{11,12}.

Medical students' perceptions of Drug Promotion and Literature (DPL) vary widely, reflecting a mix of skepticism and acceptance. A study conducted at Goa Medical College revealed that 36% of second-year medical students believed that information provided by medical representatives was biased and excessively commercialized. This indicates a concern among students regarding the credibility and objectivity of promotional material distributed by pharmaceutical companies. Additionally, 40.7% of the students expressed the opinion that stringent policies and guidelines implemented by healthcare authorities were necessary to reduce the influence of drug promotion on prescribing behaviors. This highlights a recognition among students that

regulatory interventions are crucial in maintaining ethical and evidence-based prescribing practices^{13,14}.

A similar trend was observed in a German study, which showed that 92% of medical students found it acceptable to accept small promotional gifts from pharmaceutical companies. Despite this, an equally high percentage (92%) acknowledged that information provided by the pharmaceutical industry often presents an imbalanced view, emphasizing the benefits of a drug while downplaying its potential risks. This finding suggests that while medical students may engage with pharmaceutical promotions, they are also aware of the inherent biases in such marketing strategies. The study underscores the complexity of students' attitudes toward DPL, where they simultaneously recognize promotional biases yet may still participate in industry-led activities^{15,16}. The potential impact of Direct-to-Physician Marketing (DPL) on future prescribing habits is an important concern, as it may lead to biased medical decisions influenced by pharmaceutical companies. A study conducted in Germany highlighted this issue by surveying medical students about their perceptions of promotional gifts from pharmaceutical companies. The findings revealed a notable discrepancy: while 42% of the students acknowledged that such promotional incentives could influence the prescribing behaviors of doctors in general, only 14% believed that their own prescribing decisions would be affected. This gap suggests that many future physicians may underestimate their own vulnerability to marketing strategies, which could lead to unintended biases in their prescribing patterns. Recognizing and addressing this potential influence is crucial to ensure that clinical decisions remain evidence-based and free from undue external pressures^{17,18}.

There is a significant need for structured educational interventions to address the impact of drug promotional literature (DPL) on medical students and healthcare professionals. A study conducted in Germany highlighted the concerning gap in formal education regarding interactions with the pharmaceutical industry. According to the findings, an overwhelming 90% of students reported that they had not received any formal training or guidance on how to engage with pharmaceutical representatives or navigate industry influence. Additionally, 65% of students admitted that they did not feel adequately prepared to handle such interactions, which could have important implications for their future clinical practice and decision-making. This lack of preparedness underscores the necessity of integrating relevant educational modules into medical curricula. Encouragingly, 60% of the surveyed students expressed a keen interest in educational initiatives that would equip them with the necessary knowledge and critical thinking skills to engage ethically and effectively with the pharmaceutical industry. These findings highlight the pressing need for universities and medical institutions to develop comprehensive training programs that address the ethical, financial, and professional dimensions of pharmaceutical industry interactions¹⁹. A

previous study investigating the knowledge, attitude, and practices (KAP) of medical students regarding drug promotional literature (DPL) highlighted the importance of equipping future healthcare professionals with the necessary skills to critically assess such materials. The study emphasized that pharmaceutical companies often use promotional literature to influence prescribing behaviors, which can sometimes lead to irrational drug use. Therefore, training medical students to critically evaluate the accuracy, credibility, and potential biases in DPL is essential to fostering rational prescribing practices. By incorporating structured educational interventions and evidence-based guidelines in medical curricula, students can develop a more analytical approach to assessing drug-related information, ultimately contributing to more ethical and informed clinical decision-making²⁰.

CONCLUSION

The study identifies substantial gaps in knowledge and mixed perceptions regarding DPL among participants. While a considerable number acknowledge the role of DPL in updating drug knowledge, concerns about ethical practices persist. Addressing these gaps through targeted educational initiatives and stricter regulatory measures could enhance prescribers' ability to critically evaluate DPL, thereby promoting rational prescribing and minimizing undue influence from pharmaceutical promotions. Future research should explore the effectiveness of specific educational strategies in improving knowledge and ethical decision-making regarding DPL.

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