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Original article

Assessment of Undergraduate Medical Students' Feedback on Pharmacology Teaching Patterns in Baghdad, Iraq

Maha Alnajar

Department of Pharmacology and Toxicology, Faculty of Pharmacy, Al-Rafidain University College, 10052 Baghdad, Iraq

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A B S T R A C T

Pharmacology is both a foundational and applied science, essential for the development of rational therapeutic strategies. Effective pharmacology education requires continual updates to teaching and assessment methods, with student feedback playing a critical role in guiding these improvements. This study aimed to evaluate students' perspectives on current teaching and evaluation practices in pharmacology. Conducted in January 2025, this cross-sectional study surveyed 634 students from the medicine, dentistry, and pharmacy disciplines using a validated questionnaire based on the Likert Scale. Data analysis included median scores and percentage distributions across various questionnaire items. Key findings reveal that participant age was 20, with 53.8% representing this modal age group, and females making up 71.8% of the sample. More than half of the students (54%) reported preferring multiple methods for studying pharmacology. A significant portion (57.7%) supported introducing pharmacology instruction in the third year of study. Students favored more problem-solving activities (47%) over traditional lectures and highlighted the importance of receiving handouts in advance (62.1%) to better prepare for classes. A majority (58.2%) endorsed the use of problem-based learning and prescription writing to improve clinical relevance. Regarding assessment methods, 29.4% preferred a mix of MCQs, written, and oral evaluations 50% of respondents acknowledged the value of correlating drug knowledge with disease conditions, especially when taught alongside clinical subjects. Finally, 61% recommended introducing key pharmacology topics in the pre-final or final academic years. Overall, the findings provide valuable insights into how students perceive pharmacology education and suggest areas for curricular enhancement to improve learning outcomes.

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INTRODUCTION

Pharmacology constitutes the basis of rational therapy and clinical practice. It has traditionally prioritized factual knowledge while neglecting therapeutic and practical elements. The foundational elements of conventional pharmacology practical exercises have consistently included dispensing pharmacy experiments and experimental pharmacology [1,2]. In Pharmacology, students learn about drug classification, mechanisms of action, drug interactions, side effects, and treatments utilized for various diseases [3].

Pharmacology is advancing rapidly, like other fields of medicine. Therefore, reforms in undergraduate education are essential currently. Regular review of the teaching program and modifications in methodologies for imparting fundamental knowledge about drugs and drug therapies are essential. Numerous colleges overseas have undertaken efforts to enhance the engagement and relevance of pharmacology education. Teaching expertise is cultivated over years of experience through the application of diverse instructional methods [4,5].

Additionally, it is essential to periodically review the teaching program and adjust the methodologies of knowledge delivery. To evaluate the effectiveness of our pharmacology curriculum and the student learning experience, it is essential to collect student feedback via a questionnaire. This will facilitate the implementation of necessary reforms to enhance the teaching and learning of the subject [6].

Feedback aims to enhance performance through the systematic evaluation of strengths, weaknesses, and areas for improvement. Timely feedback accompanied by a positive attitude towards improvisation is beneficial [7]. The adoption of student suggestions and comments appears to be an effective method for enhancing teaching practices and improving student performance.[8]

The structure and organization of medical education require assessment and modification of teaching and evaluation methods informed by student feedback. The curriculum must undergo regular evaluation to identify shortcomings that require attention for the enhancement of medical education [9]. Similar questionnaire-based studies have been published in 2018 by Balabalajee *et al.*,[9] in 2017

*Corresponding E-mail addresses: mahaalialnajar@gmail.com

by Vare *et al.* [10] in 2016 by Satish *et al.,*[11] and in 2010 by Badyal *et al.* [12].

Previous studies exclusively evaluated teaching methodologies and assessment methods among medical students or those enrolled in the Bachelor of Medicine and Bachelor of Surgery (MBBS) program. In contrast, the current study examines feedback from all undergraduate students studying pharmacology, encompassing pharmacy, Bachelor of Dental Surgery (BDS), and MBBS programs. This study aimed to obtain, analyze, and evaluate feedback from medical, dental, and pharmacy students regarding various teaching and evaluation methods in pharmacology. Periodic assessment of the curriculum is essential, as it identifies strengths and weaknesses necessary for enhancing medical education, ultimately contributing to the development of future healthcare providers. This study aimed to evaluate students' perspectives on current teaching and evaluation practices in pharmacology

METHODS

This cross-sectional study involved third-year pharmacy, dentistry, and medicine students and was conducted at Iraqi universities in the Baghdad city area from January 2025 to March 2025. All enrolled students were eligible to participate in the study and were surveyed using a pre-validated questionnaire. The questionnaire was modified from an earlier study that evaluated student feedback regarding teaching-learning methodologies and assessment methods in pharmacology [13].

The survey comprised twelve questions. The initial eight questions were formulated using the internationally recognized Likert Scale (SAD – Strongly Disagree, DA – Disagree, NS – Not Sure, A – Agree, SD – Strongly Agree). The final four questions required selecting the most suitable option(s) by marking with a tick (√). Candidates were permitted to select multiple options for certain questions. The demographic section of the survey comprised inquiries regarding age and gender. Participation in the study was conducted voluntarily. Participants were requested to provide recommendations for enhancing pharmacology instruction.

The statistical analysis utilized the median score and percentage distribution of the parameters outlined in the questionnaire. The local ethical committee of the Faculty of Pharmacy, Al-Rafidain University College, approved the study protocol in accordance with internationally recognized guidelines and ethics of medical research.

RESULTS

A total of 634 students participated in the study, with 28.2% identifying as male and 71.8% as female. All participants completed the questionnaire.

Table 1 presents the median scores and percentage distribution of individual statements (Questions 1-8). The analysis focused on the median score and the percentage distribution of the various parameters utilized in the questionnaire. A majority of participants (56.3%) agreed with the assertion that pharmacology is among their preferred subjects. 57.7% of respondents concurred that studying pharmacology in the third year of college would facilitate informed drug selection in their future practice. Interviewees exhibited a strong preference for the horizontal integration of pharmacology with other paraclinical subjects, accounting for 53.8% of responses. Participants indicated a preference for increased focus on problem-solving exercises over didactic lectures (47%), with over half (62.1%) strongly endorsing the significance of distributing handouts in advance, highlighting their essential role in offering guidance for subsequent lectures. A majority of students (58.2%) concurred that learning-based problems and prescriptions would be highly beneficial in clinical settings.

The response was very good (50.0%) in correlating drugs with specific diseases when pharmacology is studied concurrently with clinical conditions. Sixty-one percent of participants indicated that it would be appropriate to include certain pharmacology-related topics in the curriculum during the pre-final or final year.

Table 2 presents the response rate and the percentage distribution of different parameters. Over half of the interviewees (55.5%) favored multiple choice questions (MCQs), while 4.7% preferred written questions, 10.4% opted for oral examinations, and 29.4% chose a combination of methods as evaluation techniques for examination purposes.

Students indicated a preference for various study tools for pharmacology, with 54% favoring a combination of methods and 18.9% selecting lecturing as their primary approach. 11.8% of participants expressed a preference for textbooks. In this survey study, 40% of students indicated a preference for combination methods in learning pharmacology. The responses regarding the desire to pursue pharmacology were diverse. 7.6% indicated uncertainty, 41.8% responded with 'maybe,' 4.9% answered 'no,' and 45.7% affirmed 'yes.'

DISCUSSION

This study aimed to evaluate the effectiveness of teaching patterns in pharmacy and toxicology while gathering recommendations from students. Data for the study were collected using questions based on the Likert scale, as outlined in the methods section. The results indicate that, regarding the first question, 11.7% of students are uncertain about whether Pharmacology and Toxicology are their preferred subjects among the basic sciences, 14% do not agree, while 56.3% expressed a preference for these subjects. This explains why only 45.7% of students aspire to become pharmacists, while approximately 41.8% consider a career in pharmacy as a viable option.

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Table 1. Percentage-wise distribution and median score of various parameters

No.	Percentage wise distribution(n=634)					Median score (SDA-1,DA-2, NS-3,A-4,SA-5)
	SDA	DA	NS	SA	A	
1	44(6.9%)	14(2.2%)	74(11.7%)	145(22.9%)	357(56.5%)	4
2	57(9%)	25(3.9%)	67(10.6%)	119(18.8%)	366(57.7%)	4
3	77(12.1%)	17(2.7%)	50(7.9%)	341(53.8%)	149(23.5%)	5
4	49(7.7%)	37(5.8%)	159(25.1%)	91(14.4%)	298(47%)	4
5	35(5.5%)	25(3.9%)	105(16.6%)	75(11.8%)	394(62.1%)	4
6	63(9.9%)	24(3.8%)	79(12.5%)	99(15.6%)	369(58.2%)	4
7	68(10.7%)	11(1.7%)	68(10.7%)	317(50%)	170(26.8%)	5
8	479(7.4%)	22(3.5%)	90(14.2%)	88(13.9%)	387(61%)	4

Note: SDA Strongly Disagree, DA Disagree, NS not sure, A Agree, SA Strongly Agree

Table 2. Percentage-wise distribution and median score of various parameters

Q no.	Responses %			
9	MCQs only	Written only	Oral only	Combination
	352(55.5%)	30(4.7%)	66(10.4%)	186(29.4%)
10	Textbook Only	Teaching Class	Self-Prepared	Combination
	75(11.8%)	120(18.9%)	97(15.2%)	342(54%)
11	Cramming	Understanding	Grasping	Combination
	58(9.1%)	179(28.2%)	144(22.7%)	253(40%)
12	Don't know	May be	No	Yes
	48(7.6%)	265(41.8%)	31(4.9%)	290(45.7%)

9 = Rating evaluation methods for examinations: Choose only one option using tick (√).10 = Study material to learn pharmacology: Can choose more than one option using tick (√).11 = Pharmacology learning methods: Can choose more than one option using tick (√).12 = Wish to be a pharmacologist: Choose more than one option using tick (√).

A notable finding indicates that 12.9 percent of students did not believe that studying pharmacology and toxicology in their third and fourth years of college would assist them in selecting the most appropriate drugs for their future practice. More than half of the respondents indicated that pharmacology should be integrated horizontally with other paraclinical subjects. This is significant as it elucidates why 77.3% of students indicated that correlating treatment with the disease would be challenging unless pharmacology and toxicology are concurrently studied alongside clinical conditions addressed in other approaches, such as Therapeutics. This study's findings offer significant insights into undergraduate students' perceptions and preferences concerning pharmacology teaching methods. The data gathered from 634 participants across multiple health disciplines reveal several significant themes that can guide future curriculum development and instructional strategies. A substantial majority of students (54%) indicated a preference for employing various study methods in pharmacology. This reflects an acknowledgment of the subject's complexity and the necessity for diverse instructional strategies to accommodate various learning styles. The preference for a combination of methods indicates that students appreciate a holistic approach to learning, potentially improving their understanding and retention of pharmacological concepts. Prior research indicates that varied instructional approaches enhance student engagement and learning results in medical education [9,10]. The research indicated that 47% of participants preferred problem-solving exercises to traditional didactic lectures. This preference is consistent with modern educational theories that support active learning strategies, which have demonstrated enhancements in critical thinking and application skills [11]. Integrating problem-based learning into the curriculum enhances understanding of pharmacology and its clinical applications. A significant 62.1% of students expressed strong agreement regarding the importance of distributing handouts before lectures. This finding highlights the importance of offering students organized resources to facilitate their learning and readiness for future content. Handouts function as effective instruments for reinforcing essential concepts and promoting active engagement during lectures [12]. The data revealed that 58.2% of students considered clinical problem-based learning to be highly beneficial. This underscores the necessity for pharmacology education to be thoroughly integrated with clinical practice. Contextualizing pharmacological knowledge within real-world scenarios enhances students' appreciation of the relevance of their studies and fosters the development of skills essential for effective patient care [14]. A notable percentage of students (61%)

*Corresponding E-mail addresses: mahaalialnajar@gmail.com

indicated that pharmacology topics ought to be introduced in the pre-final or final year. This feedback indicates a possible misalignment between the timing of pharmacology instruction and students' clinical experiences. Aligning pharmacology education with clinical rotations and practical experiences enhances the applicability of pharmacological knowledge in clinical settings [15]. The research indicated that 55.5% of students preferred multiple-choice questions (MCQs) as an evaluation method, whereas 29.4% supported a combination of assessment techniques. This preference indicates that students value the efficiency and clarity of multiple-choice questions while also acknowledging the importance of varied assessment formats that can measure different competencies. The integration of diverse assessment methods enhances the evaluation of student learning and performance [16]. Pharmacology is a critical and dynamic subject within the medical curriculum. The perceptions and attitudes of students towards various teaching, learning, and evaluation methods are crucial for the future development and restructuring of medical education [17]. This study highlights the necessity of routinely assessing and modifying pharmacology curricula in response to student feedback. Involving students in the evaluation of teaching methods enables educators to identify curriculum strengths and weaknesses, facilitating necessary reforms. The iterative process of feedback and improvement is crucial for maintaining the relevance, engagement, and effectiveness of pharmacology education in preparing future healthcare providers [18]. This study reveals several insightful observations, with students proposing various methods to enhance traditional pharmacology education, making the subject more engaging and comprehensible.

Study limitations

The study was conducted with a limited sample size and possible bias in student feedback. Future study could be enhanced by a bigger and more diverse participant pool to ensure that findings are more representative. Furthermore, executing follow-up interviews or surveys to obtain comprehensive feedback on suggested educational improvements may yield significant insights for the effective implementation of changes in pharmacology education. This work acts as a foundation for subsequent investigation and enhancement in this domain.

Conclusion

The feedback from undergraduate students on pharmacology teaching methods indicates a significant preference for diverse, integrated, and clinically relevant educational experiences. Incorporating student feedback and addressing preferences in curriculum design can improve the quality of pharmacology education and better equip students for future roles in healthcare systems. Ongoing evaluation and modification of instructional strategies are essential for creating an engaging and effective educational setting for the students

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