



Original Article

A Comparative Study of an Updated Pharmacology and Therapeutics Curriculum for MBBS in Bangladesh with Previous Curriculum

Badar Uddin Umar¹, Sujit Kumar Sarker², Md. Mashud Rana³, Md. Zakirul Islam⁴, Abu Syed Md. Mosaddek⁵, Ashrafun Naher Dina⁶, Syed Didarul Haque⁷, Sushanta Das⁸, Sumaiya Binte Wahid⁹, Fatema Binte Kashem¹⁰, Miftaul Jannath Chowdhury¹¹, Fatema Johora¹², Zaida Rahman¹³, SM Md. Mahid-Al Hasan¹⁴, Sadia Binte Anwar Sonia¹⁵, Abu Tareq Md Rashel¹⁶, Tarafder Shahniyam Ahmed¹⁷, Samiha Mariam¹⁸

Abstract

Background: There have been several revisions of the medical curriculum of Bangladesh. Presently we are teaching students under two curriculums, 2012 and 2021 curriculum in Pharmacology classes. Several subject teachers highlighted issues and concerns with the newly introduced 2021 curriculum. As a fundamental preclinical discipline, Pharmacology lies at the core of medical education, providing the foundation for prescribing skills. It equips students with essential knowledge of drugs and the ability to select them rationally. Students are inadequately prepared to assimilate knowledge of drugs because, in Phase II, Pharmacology is paired with Forensic Medicine rather than being taught in parallel with Pathology and Microbiology. Pharmacology educators emphasize that this sequencing leaves students less prepared to understand drugs and their rational therapeutic applications. **Materials and Methods:** A questionnaire-based cross-sectional survey was done from January 1 to March 31, 2024, to deduct the perception of Phase II students and teachers regarding placement of Pharmacology with Forensic Medicine in Phase II of 2021 curriculum in Bangladesh. Students and educators were surveyed about their perceptions of the Pharmacology curriculum, including its various aspects, challenges encountered during the course, and suggestions for improvement. The questionnaire required approximately thirty minutes to be completed. **Results:** A total of 690 students and 57 teachers participated in the study. Among the student respondents, 54% were in the third year and approximately 45% were in the fourth year; 32% were enrolled under the 2012 curriculum, while 68% were following the 2021 curriculum. Nearly 90% of students reported that they found pharmacology classes enjoyable, and 99% considered the subject essential for clinical practice. Approximately 85% indicated that they were able to understand the topics satisfactorily as they were delivered. Less than half of the students expressed a preference for studying pharmacology alongside forensic medicine, whereas 68% favored learning pharmacology in conjunction with pathology and microbiology. Around 80% of students believed that integrating pharmacology with pathology and microbiology would improve their understanding of drug mechanisms of action and clinical indications, and 75% felt that this alignment would facilitate better comprehension of antimicrobial agents. Among teachers, the majority (87%) did not support placing pharmacology and forensic medicine within the same phase, and 85% expressed a preference for teaching pharmacology together with pathology and microbiology within the same academic year. **Conclusion:** The pharmacology component of Bangladesh's undergraduate medical curriculum has been revised on multiple occasions, with notable changes in the phase-wise organization of the subject. The results of the present study demonstrate a consistent preference among both students and faculty for integrating pharmacology with pathology and microbiology within the same phase of the MBBS program, rather than separating these closely related disciplines across different academic stages.

Keywords: Pharmacology and Therapeutics, MBBS program, Current curriculum, Previous curriculum.

Received: November 07, 2025; **Accepted:** December 22, 2025

doi <https://doi.org/10.3329/emcj.v11i1.90016>



Introduction

The vision statement of the 2021 MBBS curriculum strives on ensuring a learning environment for undergraduate students towards producing clinically, socially, and culturally competent physicians able to serve the community with compassion and dedication¹. Government of Bangladesh through the BMDC strictly controls the medical curriculum, thereby medical education of

Bangladesh, which is universal for all medical colleges in the country (Islam, et al., 2014)². Pharmacology & Therapeutics (PT) have been placed in phase II of the 2021 curriculum, by which time students would have completed anatomy, physiology and biochemistry in phase I. PT is going to be taught alongside Forensic Medicine in phase II. Among 195 hours of total teaching time, PT will

be taught one hundred hours in lecture classes, 30, 50 and 15 hours in tutorials, practical and clinical pharmacology, respectively. Besides, 17 hours are dedicated for integrated learning and 5 hours for medical humanities¹. Whereas in 2012 curriculum, PT was taught for total 200 hours, of which 100 hours in lecture, 30, 50 and 20 hours respectively in tutorials, practical and clinical case reports³.

The first curriculum for medical education in Bangladesh was developed in 1988 through a collaboration between UNDP, WHO and Centre for Medical Education (CME) which later have gone through a series of updates in 2002 and 2012 respectively^{4,5}. In the 2012 curriculum, which was identified as need-based, community oriented & competency-based curriculum, Pharmacology & Therapeutics was taught in the third phase of medical education alongside Pathology and Microbiology. Students before coming to the 3rd phase would have learned Anatomy, Physiology and Biochemistry in the 1st phase (for 1 ½ years) and Community Medicine and Forensic Medicine in the 2nd phase (for 1 year)¹. Basic change that took place in the latest curriculum is, moving Pharmacology and Therapeutics from third phase to second phase and separating it from Pathology and Microbiology and combining it with Forensic Medicine¹. Which might affect the quality of learning among the undergraduates. In a descriptive cross-sectional study published in 2019, Rahman and Talukder revealed that more than 90% of the students and teachers surveyed wanted a re-arrangement of the subjects in Phase II⁶. There are concerns among the teaching staffs of Pharmacology that the students now come less prepared to learn about drugs and their rational therapeutic application. Mosaddek et al⁷ in their correspondence to the editor expressed concern about the 2002 curriculum. In their survey majority of the respondents were satisfied with the course contents but not happy about having five subjects in the second professional examination. Ninety-five percent of the teachers taking part in the survey opted to split the second professional

examination and dividing the subjects into multiple phases⁷.

Johora and Rahman (2019) identified several gaps in the Pharmacology teaching, especially critical thinking skills, ethical perspectives of rational prescribing and aggressive pharmaceutical promotional activities on to be prescribers' behaviour⁴. Evidence from our neighboring countries suggest that medical curriculum of India, Pakistan and Sri Lanka puts all the para-clinical subjects- pathology, microbiology, pharmacology, forensic medicine, and community medicine together in the second or third phase of medical education alongside clinical subjects. Students get exposure to clinical subjects from the 3rd year MBBS and rotate through clinical subjects in the wards beside learning para-clinical subjects. This bridging is beneficial for learning more effectively⁶. In Nepal, medical curriculum is of four and half year in length and is divided into three phases. First phase is two years, second is one year and third is one and half year duration. This curriculum is an intensely integrated one. In first year of phase one students learn community medicine plus integrated basic medical sciences with early clinical exposure and lessons on communication skills. Second year comprises of integrated basic medical sciences, clinical rotations, and communication skills. The basic science subjects include- Anatomy, Physiology, Pharmacology, Pathology, Biochemistry, Microbiology⁸.

Today's medical graduates should be competent enough to deal with the needs of the community and be able to prescribe safely. The medical curriculum focuses on this aspect of medical education emphasizing understanding of pharmacology and prescribing skills⁵. Pharmacology though considered a basic preclinical subject; it is at the core of medical education as the foundation of prescribing skills develop here. Students acquire knowledge of drugs and skills to choose drugs rationally⁹⁻¹¹. Foundation for medical practice stems

¹Instructor, Health-block, Oxford College of Arts, Business and Technology, Toronto, Canada.

²Associate Professor, Department of Pharmacology & Therapeutics, Tangail Medical College, Tangail, Bangladesh.

³Associate Professor, Department of Pharmacology & Therapeutics, Jashore Medical College, Jashore, Bangladesh.

⁴Professor, Department of Pharmacology & Therapeutics, Eastern Medical College, Cumilla, Bangladesh.

⁵Professor, Department of Pharmacology & Therapeutics, Uttara Adhunik Medical College, Dhaka, Bangladesh.

⁶Associate Professor, Department of Pharmacology & Therapeutics, Enam Medical College, Savar, Bangladesh.

⁷Associate Professor, Department of Pharmacology & Therapeutics, Gazi Medical College, Khulna, Bangladesh.

⁸Assistant Professor, Department of Pharmacology & Therapeutics, Nilphamari Medical College, Nilphamari, Bangladesh.

⁹Assistant Professor, Department of Pharmacology & Therapeutics, Gazi Medical College, Khulna, Bangladesh.

¹⁰Assistant Professor, Department of Pharmacology & Therapeutics, Sylhet MAG Osmani Medical College, Sylhet, Bangladesh.

¹¹Associate Professor, Department of Pharmacology & Therapeutics, Sylhet Women's Medical College, Sylhet, Bangladesh.

¹²Associate Professor, Department of Pharmacology & Therapeutics, Army Medical College, Bogura, Bangladesh.

¹³Professor, Department of Pharmacology & Therapeutics, Enam Medical College, Savar, Dhaka, Bangladesh.

¹⁴Professor, Department of Pharmacology & Therapeutics, International Medical College, Dhaka, Bangladesh.

¹⁵Assistant Professor, Department of Pharmacology & Therapeutics, Armed Forces Medical College, Dhaka, Bangladesh.

¹⁶Assistant Professor, Department of Pharmacology & Therapeutics, Sylhet Women's Medical College, Sylhet, Bangladesh.

¹⁷Professor, Department of Pharmacology & Therapeutics, Army Medical College, Bogura, Bangladesh.

¹⁸Faculty of Health Science, UoFT, Toronto, Canada.

Address of Correspondence: Dr. Badar Uddin Umar, Instructor, Health-block, Oxford College of Arts, Business and Technology, Toronto, Canada. Email: badarumar@gmail.com

from pharmacology, which teaches students to prescribe rationally, safely, and correctly^{2,12-14}. Students understanding of how drug molecules interact with biological systems to produce actions (pharmacodynamics) and how the body deals with drugs (pharmacokinetics) develop begins here. Prescribing is not a simple task of matching names of drugs with that of diseases. It involves knowledge of medicine, diseases, diagnosis, understanding risk of benefits and the uncertainty associated with it, communication skills and most of all critical thinking. This makes teaching pharmacology and prescribing drugs a very challenging task^{15,16}. Pharmacology also bridges the foundational sciences and clinical sciences¹². Inadequate exposure to pharmacology knowledge, ignoring the clinical context makes the students vulnerable to make errors in drug choices and lead to patient harm. Traditionally medical students have been taught pharmacology in more didactic ways, emphasizing on 'drugs', their mechanism of actions, indication and side effects. Pharmacology, when taught in clinical context enable tomorrow's doctors to evaluate potential risks and benefits of drugs while prescribing¹⁷. Students consider pharmacology as a hard-to-learn subject, being dry and information laden one¹³. In the light of rising incidences of drug related harm and medication errors at a global level strong knowledge base of pharmacology is very essential^{13,17}. There is ample evidence of inadequate prescribing skills among junior physicians, justifying gaps in undergraduate education in pharmacology¹⁸.

With the increasing amount of new information about drug targets, new molecules approved for prescribing, fast changing clinical guidelines and competencies becoming more broader and demanding, Pharmacology as a basic-clinical science is expanding rapidly in recent decades¹³. This underscores the need to rethink the Pharmacology curriculum in medical colleges across Bangladesh. Such rethinking must address critical areas to ensure the curriculum is modern, contextually relevant, and aligned with international standards of medical education. There is a need to include the important core competencies like- (a) rational prescribing, (b) clinical pharmacology, (c) pharmacovigilance, (d) evidence-based medicine. The core contents should be revisited by making sure that the students learn the essential medicines, know about antibiotic stewardship, develop practical skills for prescription writing, patient communication involving drug information ADRs etc. The changes in curriculum should embrace the evidence based on modern pedagogical methodologies emphasizing organ-system based curricula, enhanced longitudinal integration between pre-clinical and clinical subjects, student centered and directed curriculum, making the

educator a facilitator of learning. Problem based learning (PBL), Team-based learning (TBL) and Case-based learning (CBL) are a few innovative learning methods that can be incorporated into the new curriculum¹³. Students also prefer learning Pharmacology in a clinical context using modern audio-visual tools, case-based learning in small group settings¹⁹. To understand the needs and expectations of students, questionnaire-based surveys are very useful tools as evidenced by Parihar, Rani and Malhotra²⁰.

With changing needs and expectations of society and the professionals, the medical curriculum needs revisiting and reorganization of subjects in phases. This is evident from several previous studies^{6,21,22}. The dynamic process of curriculum change should go through proper planning, training and validation involving students and teachers as major stakeholders²³.

In light of the preceding discussion, we conducted a cross-sectional online survey to assess the perceptions and views of Phase II MBBS students and educators regarding the 2021 Pharmacology curriculum. Also, we compared the 2021 Pharmacology curriculum with the 2012 curriculum and explored the educators' views regarding 2021 curriculum and its effectiveness. This would help us to come to an effective consensus about the new curriculum and make recommendations.

Materials and Methods

Study Design & Administration

A questionnaire-based cross-sectional observational study was conducted over a 12-week period from January 1, 2025, to March 31, 2025, involving 12 government and private medical colleges in Bangladesh, using a convenience sampling approach. Faculty members from the departments of pharmacology at medical colleges nationwide were contacted through the official social media page and WhatsApp group of the Bangladesh Pharmacological Society. Teachers from 12 medical colleges consented to participate in the study. Data was collected online using two separate Google Forms. A total of 57 teachers and 690 students from the 12 participating medical colleges provided valid responses. Prior to initiation of the study, ethical approval was obtained from the Ethical Review Committee of International Medical College, Dhaka, Bangladesh (Memo No. IMC 1202413058). Phase II and Phase III MBBS students in their 3rd and 4th academic years were invited to participate during scheduled pharmacology classes after obtaining informed consent. The respective teachers explained the purpose of the study and provided instructions for completing the questionnaire, after which the Google Form link was shared with the students. Participation was voluntary, the survey

was conducted anonymously, and all collected data were handled with strict confidentiality.

In the second component of the survey, pharmacology faculty members from medical colleges and universities across the country were included. They were invited to participate through a scheduled Zoom meeting, during which the study objectives were explained and informed consent was obtained prior to their inclusion in the survey.

Two distinct, pre-validated questionnaires were administered to students and teachers using Google Forms. Each questionnaire consisted of two sections: the first collected demographic details, and the second assessed attitudes and perceptions related to the pharmacology curriculum. The majority of perception items were structured as multiple-choice questions based on a five-point Likert scale, ranging from strongly agree to strongly disagree. The questionnaires were adapted from some previous studies with necessary modifications^{14,19,20,24}.

Following validation criteria were used

1. Time required to complete (30 minutes)
2. Appropriateness of question for collecting data
3. Repetition or inappropriate questions
4. Logical sequencing of questions
5. Unambiguousness
6. Clear instructions to follow

Study Population and Sampling

The study population comprised Phase II and Phase III MBBS students in the 3rd and 4th years. There were approximately 10,655 students enrolled for the said sessions in different medical colleges²⁵. Using the following formula, we determined the sample size: $n = [z^2pq/e^2]/1 + [z^2pq]/Ne^2$. Where n is the number of samples, N is the total population, e^2 is the error tolerance at 0.05, p is the probability of being chosen at 0.5, q is the probability of not being chosen at 0.5, and z is the standardized score at 1.96. A required sample size of 371 students was calculated. A total of 690 participants were ultimately recruited using a convenience sampling approach, based on accessibility and voluntary participation at the time of data collection. Eligibility criteria included enrollment in the 3rd or 4th year of the MBBS program.

Data Collection

Data collection was carried out using a self-administered questionnaire prepared in English. The instrument comprised two sections. The first section gathered participants' demographic details, while the second section contained items designed to capture respondents' perceptions of the pharmacology curriculum.

Data Analysis

Data were collected, compiled, and processed using Microsoft Excel spreadsheets and jamovi (Version 2.6.44.0). Descriptive statistical methods were applied, and results were expressed as percentages. The dataset underwent statistical analysis using relative frequency, mean values, and the chi-square test. Demographic characteristics of the respondents were summarized using frequencies and percentages. The chi-square test was employed to assess any significant association between respondents' demographic profiles and their perceptions of the curriculum. All analyses were independently reviewed by a statistician for validation. Findings are presented in tabular format.

Results

Students' Data

Out of 690 students who responded to the survey 405 (58.7%) were females and 285 (41.3%) males (Figure-1). Highest number of responses came from Armed Forces Medical College, Dhaka (AFMC) 192 (27.8%), followed by 142 (20.6%) and 131 (19.0%) from Ghazi Medical College, Khulna and Eastern Medical College, Cumilla (Figure-2). More than half (54.8%) of the respondents were in 3rd year MBBS course and rest (45.2%) in 4th year (Figure-3). Thirty-two percent of students were studying in 2012 curriculum and 68.0% in 2021 curriculum. (Figure-4). Almost 58% of the students were between the ages of 20-22 years, 41.7% were between the ages 23-25 years and only 0.29% above the age of 25 years (Figure-5).

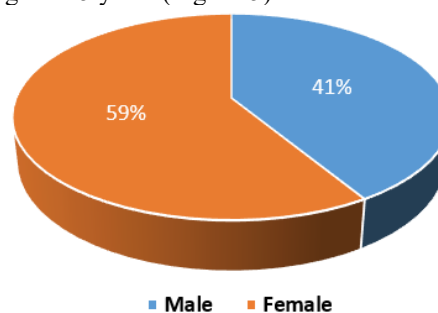


Figure-1: Gender distribution of the study participants (n=405)

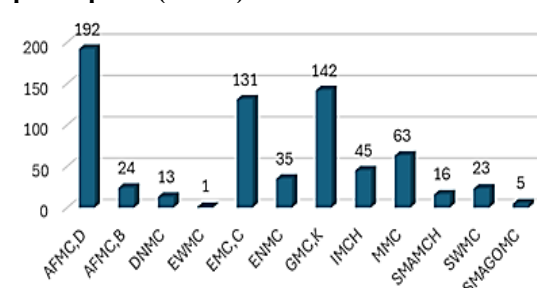


Figure-2: Distribution of Participants by Medical College and Response Rate

Armed Forces Medical College, Dhaka (AFMC); Gazi Medical College, Khulna (GMC); Eastern Medical College (EMC); Monno Medical College (MoMC); International Medical College and Hospital (IMCH); Enam Medical College (EMC);

Army Medical College, Bogura (AMCB); Sylhet Women's Medical College (SWMC); Shaheed Monsur Ali Medical College (SMAMC); Dhaka National Medical College (DNMC); Sylhet MAG Osmani Medical College (SOMC); East West Medical College (EWMC).

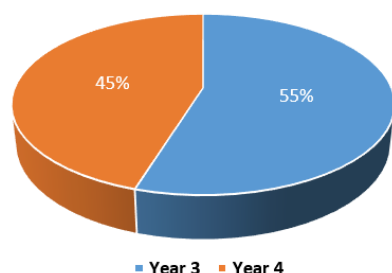


Figure-3: Year of the study participants

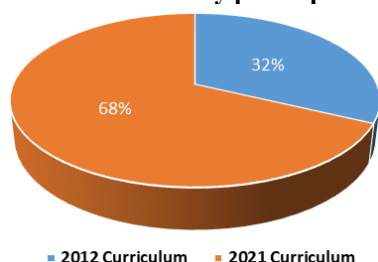


Figure-4: Curriculum year of the respondents.

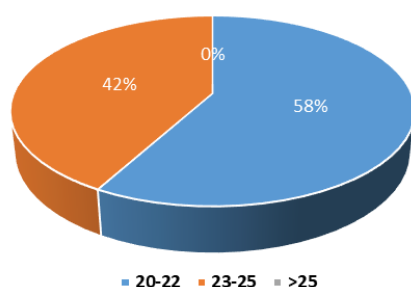


Figure-5: Age distribution by years in pie chart

Concerning the perception questions, 387 (56.15%) students agreed that they enjoy pharmacology and therapeutics lessons, followed by 235 (34.1%) students strongly agreeing and the responses were not significantly different between the curriculum years (2012 vs. 2021). Majority of the students (76.1%) strongly agreed that pharmacology and therapeutics are important for future clinical practice, followed by 22.8% agreeing to the statement, there was significant difference ($p = 0.031$) between respondents from 2012 vs. 2021 curriculum years. Almost 28% of respondents strongly agreed and about 57% agreed with the statement that they can understand the topics very easily as they are taught in the classroom. More than half (52.5%) of the students strongly agreed and 22.5% agreed that their curriculum prepared them enough in their previous phase to understand the subjects in the present phase (Table-I).

When it concerns the student's opinion regarding when to study pharmacology during the course, their opinion was divided. About 17% strongly agreed, 32.2% agreed, 23.6% were neutral, 19.0% disagreed and 8.0% strongly disagreed with studying pharmacology and therapeutics with forensic medicine with significant differences between 2012 and 2021 curriculum students ($p < 0.001$). About 68% of the respondents strongly agreed or agreed to study pharmacology and therapeutics with pathology and microbiology in the same phase to facilitate understanding, whereas about 16% of them either disagreed or strongly disagreed with this. Sixteen percent of the students were neutral and there was a significant difference between two curriculum students ($p < 0.001$).

Table-I: Student's perception about pharmacology and therapeutics and the curriculum

Question/Statement	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
I enjoy pharmacology and therapeutics lessons.	235 (34.1)	387 (56.1)	60 (8.7)	4 (0.6)	4 (0.6)
I believe this subject is important for my future profession/practice as a clinician.	525 (76.1)	157 (22.8)	8 (1.2)	0 (0)	0 (0)
I can understand pharmacology and therapeutic topics very easily as they are taught in the class.	191 (27.7)	391 (56.7)	93 (13.5)	13 (1.9)	2 (0.3)
My curriculum prepared me enough in my previous phases to understand the subjects in the present phase.	155 (22.5)	362 (52.5)	102 (14.8)	54 (7.8)	17 (2.5)
My previous phase subjects (anatomy, physiology and biochemistry) are sufficient to link my understanding of pharmacology and therapeutics	153 (22.2)	315 (45.7)	136 (19.7)	68 (9.9)	18 (2.6)
Studying pharmacology and therapeutics with forensic medicine is convenient for me.	119 (17.2)	222 (32.2)	163 (23.6)	131 (19)	55 (8.0)
It would be better for us to study pharmacology and therapeutics with pathology and microbiology in the same phase to facilitate understanding.	226 (32.8)	242 (35.1)	113 (16.4)	82 (11.9)	27 (3.9)
Studying pharmacology alongside microbiology and pathology will help us understand the mechanism of action and indications of drugs more easily.	267 (38.7)	284 (41.2)	104 (15.1)	24 (3.5)	11 (1.6)
Studying antimicrobial drugs without learning microbiology is very confusing and ineffective way of learning.	215 (31.2)	305 (44.2)	115 (16.7)	45 (6.5)	10 (1.4)

About 80% of the students strongly agreed or agreed that “studying pharmacology alongside microbiology and pathology is helpful to understand the mechanism of action and indication of drugs more easily”, whereas only about 5% either disagree or strongly disagreed to it. About 15% remained neutral to the statement this was also significantly different between 2012 and 2021 curriculum groups ($p < 0.001$). Almost 75% strongly agreed or agreed that learning about antimicrobial drugs without knowing about microbiology is very confusing and ineffective learning method, whereas only about 8% either disagreed or strongly disagreed to it and about 17% were neutral the opinion is significantly different between two curriculum groups ($p < 0.001$) (Table-I).

When asked, 35.5% of the respondents wanted to study pharmacology and therapeutics in year 3 with forensic medicine, whereas almost 49% wanted to study it in 4th year with microbiology and pathology. Eight percent responded that either of the options is good for them and 7.8% had no opinion (Figure-6).

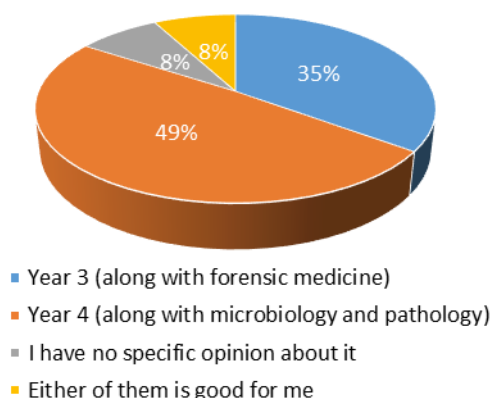


Figure-6: Preference of pharmacology and therapeutics study year

Majority of respondents (80.8%) stated that their performance in first term was either very satisfactory or satisfactory, 15.5% were not satisfied and 3.7% were poor (Figure-7). There was a significant difference between the students of 2012 and 2021 curriculum.

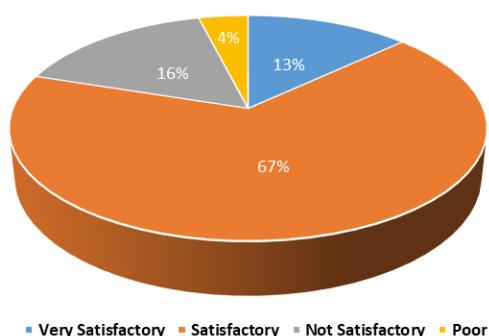


Figure-7: Pie chart showing First term results

Majority of the students believed that their teachers were knowledgeable (77.1%). Forty-four percent believed that the teachers were good communicators, were authoritarian (16.2%), student centered (20.6%), good at providing feedback (27.5%), encourages to become active learner (37.5%). Only a few said that teachers get angry when asked questions (3%) and emphasize factual learning (4.8%) (Figure-8). Majority of the respondents opined increasing the amount of problem-based learning (55.8%). Other recommendations were increasing the number of hours of case-based learning (44.2%), increasing the number of hours of lectures in pharmacology (28.7%), increasing the number of hours of tutorials (24.6%), and increasing the use of audiovisuals (21.4%) (Figure-9). According to the respondents difficult most topics in pharmacology are, general pharmacology (45.1%), drugs affecting the CNS (14.2%), drugs affecting the ANS (32.5%), drugs affecting the CVS (12.6%), drugs affecting the GIT (4.1%), drugs affecting the endocrine system (13%), Antimicrobials drugs (18.1%), cancer chemotherapeutics (30.3%) and others (5.2%) (Figure-10). Conversely, easiest to understand topics in pharmacology are, general pharmacology (27.8%), drugs affecting the CNS (45.9%), drugs affecting the ANS (27.2%), drugs affecting the CVS (35.8%), drugs affecting the GIT (46.1%), drugs affecting the endocrine system (26.8%), Antimicrobials drugs (34.9%), cancer chemotherapeutics (9%) and others (4.5%) (Figure-11).

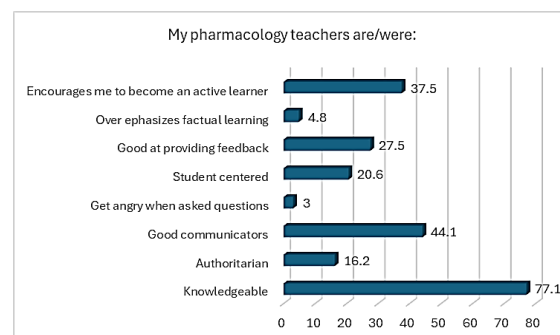


Figure-8: Student's opinion about pharmacology teachers

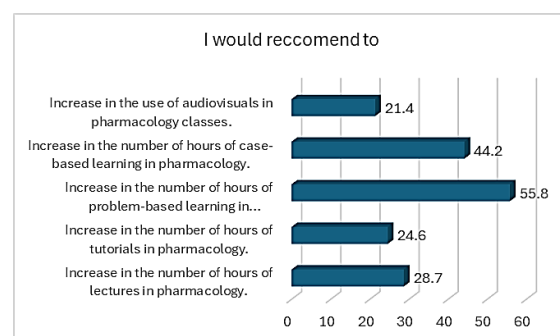


Figure-9: Student's recommendation about pharmacology course

When the students were asked, “what I knew about pharmacology before I came to phase-2” the responses were as following: very useful, practical, important and interesting subject (64.2%), boring and useless subject (1.7%), interesting but useless subject (1.2%), useful but boring, dry subject (20.9%) and 18.8% had no idea about the subject (Figure-12). After being in phase-2 and reading pharmacology, this opinion changed to ‘very useful, practical, important and interesting subject’ (84.6%), boring and useless subject (0.6%), interesting but useless subject (0.9%), useful but boring, dry subject (8.6%) and 8.8% of the respondents were neutral and said it is neither bad nor good subject (Figure-13).

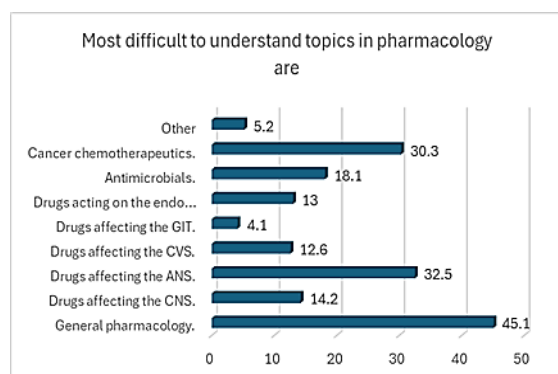


Figure-10: Most difficult to understand topics in pharmacology

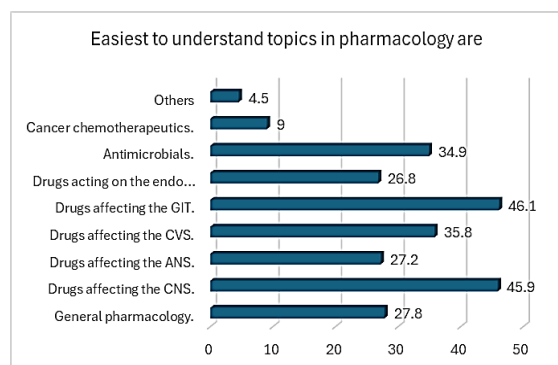


Figure-11: Easiest to understand topics in pharmacology

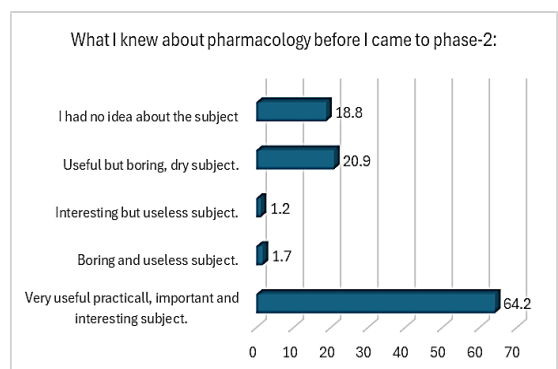


Figure-12: What I knew about pharmacology before coming to phase-II

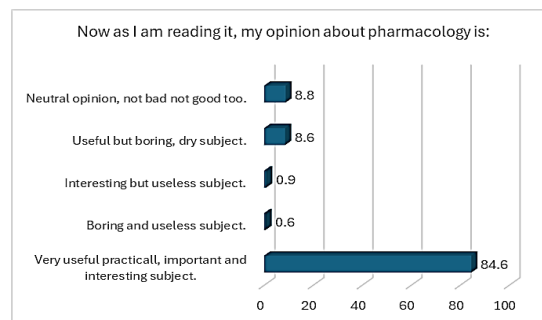


Figure-13: What I think about pharmacology, as I am studying the subject

Teachers' Data

Total 57 teachers responded to the questionnaire, which was sent to 73 pharmacology teachers in different medical colleges via email, as well a link of the Google form was shared via the Bangladesh Pharmacological Society's official WhatsApp group and through emails. Response rate being almost 78%. Among the respondent's majority 72% were females and rest 28% were males (Figure-14). Almost 30% respondents were assistant professors, followed by associate professors (24.6%), lecturers (24.6%) professors (19.3%) and others (1.75%) (Figure-15).

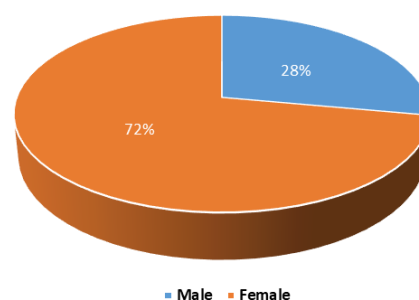


Figure-14: Gender of pharmacology teachers

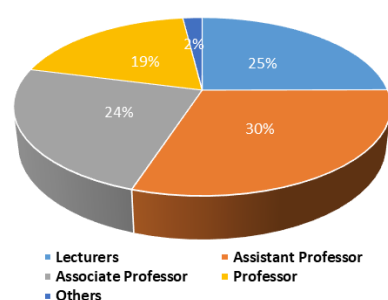


Figure-15: Teachers' designation in pie chart

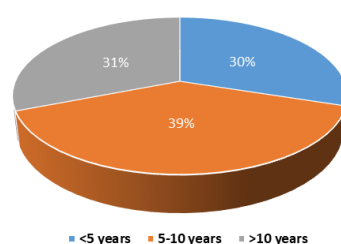


Figure-16: Distribution of Teaching Experience in Pharmacology & Therapeutics

Majority of the teachers (38.6%) have been teaching for 5-10 years, followed by 31.6% more than 10 years and 29.8% less than 5 years (Figure-16).

Perceptions of the pharmacology teachers are reflected in table-2. More than 96% teachers strongly believed that pharmacology and therapeutics is important for a physician to make informed clinical choices during profession/practice and about 4% agreed to the statement, whereas none disagreed (0%). Almost all of the teachers enjoyed teaching the subject (>90%). Many of them strongly agreed (12.28%) and agreed

(42.11%) that the way the subject is taught is easy for the students to comprehend. More than half of the respondents also believed that phase 1 subjects are important for helping understand PT. Majority of them did not want PT to be taught in phase 2 with forensic medicine (35.09% and 52.63%). Over 85% of the teachers believed that it would be better to teach PT in the same phase with pathology and microbiology to impart better understanding. More than 90% believed that students can understand the mechanism of action and indications of drugs more easily if taught alongside microbiology and pharmacology (Table-II).

Table-II: Teachers' perception about pharmacology & therapeutics and the curriculum

Question/ Statement	Strongly agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly disagree n (%)
I believe this subject is important for a physician to make informed clinical choices during profession/practice.	55 (96.5)	2 (3.5)	0 (0)	0 (0)	0 (0)
I enjoy teaching pharmacology and therapeutics.	53 (91.2)	4 (8.8)	0 (0)	0 (0)	0 (0)
Students can understand pharmacology and therapeutic topics very easily as they are taught now.	7 (12.28)	24 (42.11)	17 (29.82)	6 (10.53)	3 (5.26)
Phase-I subjects (anatomy, physiology and biochemistry) are important to help understanding pharmacology and therapeutics concepts.	33 (57.89)	18 (31.6)	3 (5.26)	2 (3.5)	1 (1.75)
Studying pharmacology and therapeutics with forensic medicine in Phase-II is helpful for the students.	1 (1.75)	3 (5.26)	3 (5.26)	20 (35.09)	30 (52.63)
It would be better for the students to study pharmacology and therapeutics with pathology and microbiology in the same phase to facilitate clear understanding.	47 (82.46)	4 (7.02)	3 (5.26)	2 (3.51)	1 (1.75)
Studying pharmacology alongside microbiology and pathology will help students understand the mechanism of action and indications of drugs more easily.	49 (85.96)	6 (10.54)	1 (1.75)	0 (0)	1 (1.75)
Studying about antimicrobial drugs without learning microbiology is very confusing and ineffective way of learning.	49 (85.96)	8 (14.06)	0 (0)	0 (0)	0 (0)

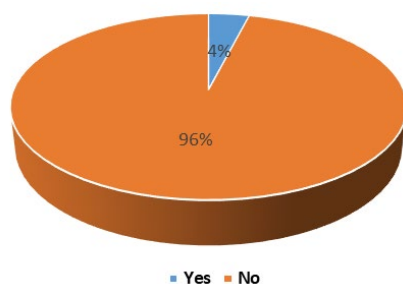


Figure-17: I prefer teaching PT in year 3 with forensic medicine

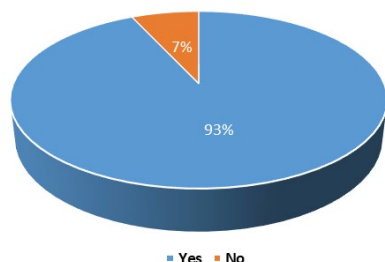


Figure-18: I prefer teaching PT in year-4 with microbiology and pathology

Majority of the pharmacology teachers did not want pharmacology to be taught in year 3 with forensic medicine (96.5%), whereas 93% preferred to teach pharmacology in year 4 along with microbiology and pathology (Figure-17 and 18).

Some common themes emerged from both the students' and teachers' surveys. Respondents were asked to leave a comment. Many suggested to include PT with pathology and microbiology in phase 3. Some of the comments by the responding teachers are as follows:

"Teaching pharmacology and therapeutics should start along with Microbiology and Pathology and should be continued with the subject in 4th phase also."

"Teaching Pharmacology & Therapeutics should be along with Microbiology & Pathology in phase 3. Phase 3 Should be at least one and half year."

One teacher suggested to have a two-year curriculum of five subjects, like "Teaching

pharmacology along with microbiology and pathology is a better option. But I personally prefer the two-year curriculum of five subjects (pharmacology, pathology, microbiology, community medicine and forensic medicine) in second phase so that students get more time for understanding clearly all the subjects and their results will be better, including integrated teaching. Contents of Integrated teaching for pharmacology should also be changed accordingly”.

One of reviewer wanted that curriculum review should be done systemically through a specific body- Before implementing any curriculum of any subject should be discussed with all the faculties and phase coordinator/ academic coordinators. A curriculum should be easier to understand and easy to implement for both the teachers and students rather than a burden. An authorized body should be responsible for a curriculum which would train the respective faculty members and for answering any questions that will arise in the future. To me this curriculum is like an orphan which is going door to door and begging for fix its errors”.

Discussion

The present study was conducted to explore the perception and opinion of 3rd and 4th year MBBS students as well as those of PT teachers’ regarding 2012 and 2021 pharmacology curriculum in various Bangladeshi public and private medical colleges. A comprehensive understanding of the current situation is essential for effectively planning future curriculum reviews that address students’ needs. There is a scarcity of research papers examining perception of students and teachers regarding PT curriculum in Bangladesh.

In the present study, 32% responding students were studying in 2012 curriculum and 68.0% in 2021 curriculum. Almost 90% of the students enjoyed PT lessons, and almost 99% believed that PT is important for future clinical practice. Eighty-five percent of students could understand PT topics very easily as they were taught in the classroom. Almost three-fourths of the students believed that phase-I subjects prepared them enough to comprehend phase-2 subjects, and almost half of the participants wanted to study PT with Forensic Medicine while 23.6% remained neutral. Such preferences are likely influenced by the comparatively lower course load. Besides, more than one-fourth of the students did not want to study it with Forensic Medicine. In an Indian study, more than half of students rated PT as very useful, practically important and interesting subject, whereas almost 24% rated as useful and interesting²⁰. In another Bangladeshi study, 71% of 4th year students rated PT as important as other subjects, while over a quarter put PT over all other subjects²⁶. Most Phase I, II and II medical students

in UK also regarded pharmacology as an essential subject²⁷. Students consider pharmacology as a hard-to-learn subject, being dry and information laden one¹³.

About 68% of the students in our study wanted to study PT alongside Pathology and Microbiology, while about 16% did not like it, another 16% remained neutral. About 80% believed that studying PT beside Pathology and Microbiology is helpful to impart better understanding of the mechanism of action and indications of drugs, with significant differences between 2021 and 2012 curriculum (51% vs. 28.17%, $p < 0.001$). Almost three-fourths of the respondents believed that learning about antimicrobials without knowing microbiology is very ineffective learning strategy, 47% vs. 28% in 2021 and 2012 curriculum students respectively ($p < 0.001$). More (49%) students wanted to study PT in year 4 with Pathology-Microbiology, and 35.5% wanted to study PT in year 3 with Forensic Medicine. In a previous study by Rahman and Talukder 90% of the respondents wanted rearrangement of phase II subjects, while about 88% teachers and 90% students opined for adding pathology to phase II⁶. This paper also cited that in three neighboring countries- India, Pakistan and Sri Lanka Pathology-Microbiology, Community Medicine and Pharmacology are taught at the beginning of the clinical phase⁶. An earlier study exploring the views of MBBS teachers and intern doctors regarding 2002 curriculum revealed that only a minor number of the respondents were satisfied with the curriculum and about 70% teachers and 94% interns wanted a curriculum change²¹.

Majority of the students were positive about their PT teachers, except a few (16%) felt that the teachers were authoritarian. Students preferred more problem-based learning (PBL) (55.8%), about 44% wanted more hours for case-based learning, about 29% wanted increased lecture hours. Almost 25% wanted increased tutorial hours. In a Malaysian study the students showed overall positive opinion about their PT teachers²⁸.

Most difficult PT topics considered by the students were- general pharmacology (GP) (45.1%), ANS drugs (32.5%), cancer-chemotherapy (30.3%), CNS drugs (14.2%), endocrine drugs (13%), CVS drugs (12.6%). Easiest topics identified were- GIT drugs (46.1%), CNS drugs (45.9%), CVS drugs (35.8%), Antimicrobial drugs (34.9%), GP (27.8%), ANS drugs (27.2%), endocrine drugs (26.8%). In an Indian study students rated most difficult to understand topic as CVS (67%), CNS (65%) followed by ANS (59%)¹⁹. In a study by Patel, et al students identified CNS (43%) as difficult most topic followed by CVS (41%), General

pharmacology (26%), antimicrobials (24%) and endocrine system drugs (12%)²⁹.

Teachers' perceptions varied by experience: 38.6% had between 5 and 10 years of teaching, whereas 31.6% had more than a decade of subject-specific experience. All the teachers believed PT is important for a physician to make informed clinical decisions, and over 90% enjoyed teaching the subject. Most teachers agreed with the statement that the way the subject was taught was easy for the students to comprehend (55%). They also believed that phase-I subjects were important for helping understand PT (>50%). Majority of the teachers did not want PT to be combined with Forensic Medicine in the same phase (88%), and >85% wanted the subject to be taught alongside Pathology-Microbiology to impart better understanding. This would help the students to better comprehend mechanism of action and indications of drugs more easily (>90%). There was agreement between students and teachers on this point. When it came to preference of subject placement, >96% teachers did not want PT to be taught alongside Forensic Medicine in year 3, whereas 93% of them preferred PT to be taught in year 4 with Pathology-Microbiology.

There is a limitation to our study, despite getting responses from multiple medical colleges across the country, we did not get responses from major government medical colleges in Dhaka, Chittagong, Rajshahi etc.

Conclusion

A well-designed curriculum is essential for creating an effective learning environment for students. The pharmacology curriculum within Bangladesh's medical education system has undergone multiple revisions aimed at modernization, many of which have focused on altering the phase-wise or year-wise placement of the subject within the MBBS program. Greater emphasis is now required on a substantial shift toward integrating pharmacology with the clinical phase of training. Curriculum development should prioritize the acquisition of practical skills and core competencies, enabling undergraduates to prescribe safely and select medications rationally through sound clinical reasoning. The present study highlights the perspectives of both pharmacology students and teachers, who favor positioning pharmacology alongside pathology and microbiology within the same phase. Further nationwide, in-depth investigations are warranted to explore current views on pharmacology education and to inform the development of an optimized curriculum.

Conflict of interest

The authors declared that they have no conflicts of interest.

Acknowledgments

This study was conducted under the initiative of the Research Group of Bangladesh Pharmacology and Therapeutics (RGBPT) teachers. The authors sincerely acknowledge all participants for their active engagement and valuable contributions during the Zoom-based discussion sessions. We are also grateful to the expert pharmacology teachers whose insights and professional experience enriched the study.

In particular, we extend our appreciation to Prof. Mir Misbahuddin; Prof. Md. Kamal Uddin; Prof. Dr. Mahmuda Begum (Enam Medical College); Anjum Ferdoush, Farjana Akter, and Fatema Akter Shanta (International Medical College); Hashina Munni and Khaleda Siddika (Sylhet MAG Osmani Medical College); Mosfika Mahjabin (Enam Medical College); Sadia Akter (International Medical College); Sarmin Sultana (Gazi Medical College); Shahrin Sultana (Eastern Medical College); and Syeda Habiba Humayra (International Medical College) for their time, expertise, and constructive contributions.

References

1. Bangladesh Medical and Dental Council (BMDC). MBBS Curriculum Update - 2021 [Internet]. Dhaka: BMDC; 2021. Available at: <https://www.bmdc.org.bd/curriculum-2020> [Accessed on March 24, 2024]
2. Islam MZ, Rahman MF, Mossaddek AS, Rozario RJ, Iftikhar AM, Akhter S, et al. Assessment of Bangladeshi interns' knowledge of pharmacology and therapeutics for prescribing. *J Appl Pharm Sci*. 2014; 4 (4): 43-51. doi: 10.7324/JAPS.2014.40408.
3. Bangladesh Medical and Dental Council (BMDC). MBBS Curriculum Update- 2012 [Internet]. Dhaka: BMDC. Available at: <https://www.bmdc.org.bd/curriculum-2012> [Accessed on March 24, 2024]
4. Johora F, Rahman MS. Pharmacology education in the perspective of pharmaceutical promotion: Bangladesh experience. *Bangabandhu Sheikh Mujib Med Univ J*. 2019; 12: 128-32. doi: 10.3329/bsmmuj.v12i3.42702.
5. Johora F, Abbasy AA, Mahboob S, Jeenia FT, Ferdoush J, Rahman MS. Pharmacology written questions of one decade: evaluation of curricular objectives and content coverage. *Bangladesh J Med Educ*. 2023; 14 (1): 43-9. doi: 10.3329/bjme.v14i1.63681.
6. Rahman MM, Talukder MH. Views of teachers' and students' regarding the distribution of subjects in phase II and phase III of MBBS course. *Bangladesh J Med Educ*. 2019; 10 (2): 19-22. doi: 10.3329/bjme.v10i2.44638.
7. Mosaddek AS, Islam MZ, Rahman MF, Chaudhury HS, Parvin R, Khanom M. Present status of implementation of undergraduate curriculum of Bangladesh in selected private medical colleges: teacher's perspectives. *J Uttara Adhunik Med Coll*. 2012; 2 (2): 97-9.

8. Khanal S. Curriculum outline [Internet]. Digital Medicine; 2011. Available at: <https://digitalmedicine.com.np/curriculum-outline-felf5cf27cd2#.ndwkwqlw> [Accessed on March 24, 2024]
9. Umar BU, Haque M. Changing perspectives: should we integrate pharmacology in the clinical phase? *Bangladesh J Med Sci.* 2022; 21 (2): 249-61. doi: 10.3329/bjms.v21i2.58056.
10. Bullock S, Leversha A. Medical student perceptions of their knowledge and skills in pharmacology in their first and final clinical years. *Med Ed Publish.* 2019; 8: 42. doi: 10.15694/mep.2019.000042.1.
11. Pandit R, Poleij MC, Gerrits MA. Student perception of knowledge and skills in pharmacology and pharmacotherapy in a bachelor's medical curriculum. *Int Med Educ.* 2023; 2 (3): 206-18. doi: 10.3390/ime2030020.
12. Jefferies WB, McMahon KK, Rosenfeld GC, Strandhoy JW, Szarek J, Wilson-Delfosse A. Pharmacology-in the face of revisiting Flexner's view of medical education. *Med Sci Educ.* 2010; 20 (3): 288-92.
13. Fasinu PS, Wilborn TW. Pharmacology education in the medical curriculum: challenges and opportunities for improvement. *Pharmacol Res Perspect.* 2024; 12 (1): e1178. doi: 10.1002/prp2.1178.
14. Bhosale UA, Yegnanarayan R, Yadav GE. Attitude, perception and feedback of second year medical students on teaching-learning methodology and evaluation methods in pharmacology. *Niger Med J.* 2013; 54 (1): 33-9. doi: 10.4103/0300-1652.108891.
15. Maxwell SRJ. An agenda for UK clinical pharmacology: how should teaching undergraduates in clinical pharmacology and therapeutics be delivered and assessed? *Br J Clin Pharmacol.* 2012; 73 (6): 893-9. doi: 10.1111/j.1365-2125.2012.04232.x.
16. Umar BU, Haque M. Prescribing skill and medication error: role of pharmacology teaching. *Int J Pharm Res.* 2015; 7 (2): 10-6.
17. Haque M. Potential of clinical pharmacology in developing rational prescribing. *Acta Med Int.* 2017; 4 (2): 2-3. doi: 10.4103/ami.ami_41_17.
18. Dornan T, Ashcroft D, Heathfield H, Lewis P, Miles J, Taylor D, et al. An in depth investigation into causes of prescribing errors by foundation trainees in relation to their medical education (EQUIP study). Manchester (UK): GMC. Available at: https://www.gmc-uk.org/-media/documents/FINAL_Report_prevalence_and_causes_of_prescribing_errors.pdf [Accessed on March 24, 2024]
19. Yadav SP, Anusha KN. A questionnaire-based study to evaluate perception, attitude and opinion of undergraduate medical students on teaching-learning methodology in pharmacology. *Int J Basic Clin Pharmacol.* 2020; 9 (4): 599-604. doi: 10.18203/2319-2003.ijbcp20201184.
20. Parihar A, Rani S, Malhotra P. A questionnaire based assessment questionnaire-basedition and feedback of medical undergraduates on teaching learning methodology and evaluation methods in pharmacology. *J Evid Based Med Healthc.* 2019; 6 (51): 3160-5. doi: 10.18410/jebmh/2019/663.
21. Mosaddek AS, Nargis W, Ahamed BU, Islam MZ, Chaudhury HS, Begum MF, et al. Views of medical educators and intern doctors on the existing MBBS curriculum. *Bangladesh J Med Educ.* 2012; 3 (1): 8-11. doi: 10.3329/bjme.v3i1.18589.
22. Sarker SK, Bhas G, Moitra P, Paul R, Yusuf MA, Marakala V, et al. Appraisal of the current pharmacology curriculum, teaching methodology and effectiveness in undergraduate medical education. *J Curr Adv Med Res.* 2021; 8 (1): 30-3. doi: 10.3329/jcamr.v8i1.52479.
23. Janjua RS, Riaz J, Omer W. Special pathology in the course content of third year MBBS: views of students and teachers. *Pak J Med Sci.* 2020; 36 (5): 987-92. doi: 10.12669/pjms.36.5.2397.
24. Patil AA, Chaudhari VL. Students' perception of the educational environment in medical college: a study based on DREEM questionnaire. *Korean J Med Educ.* 2016; 28 (3): 281-8. doi: 10.3946/kjme.2016.32.
25. Directorate General of Medical Education (DGME). Medical education bulletin [Internet]. Dhaka: DGME; 2022. Available at: <https://dgme.gov.bd/site/page/ebe34f64-d41f-485d-a9c6-89155deabfd5/-> [Accessed on March 24, 2024]
26. Alima F, Rozario RJ, Hasnat F, Lovely UT, Ahsan MF, Noor SB. Fourth year MBBS students feedback on teaching and evaluation methods in pharmacology. *Eastern Med Coll J.* 2020; 5 (2): 50-5.
27. Smith ER, Paley M, Lalli RK, Malekigorji M, Broad J. Interrogating the perceptions of undergraduate pharmacology teaching on an MBBS programme at a UK medical school. *Pharmacol Res Perspect.* 2025; 13 (4): e70136. doi: 10.1002/prp2.70136.
28. Abdulghani MA. Medical students' feedback about teaching fundamental pharmacology in an integrated curriculum. *Br J Educ Soc Behav Sci.* 2016; 15 (3): 1-7. doi: 10.9734/BJESBS/2016/25258.
29. Patel KM, Ch VN. A study on pharmacology curriculum in undergraduate students. *IOSR J Dent Med Sci.* 2019; 18 (5): 77-82. doi: 10.9790/0853-1805117782.

Citation of this article

Umar BU, Sarker SK, Rana MM, Islam MZ, Mosaddek ASM, Dina AN, Haque SD, Das S, Wahid SB, Kashem FB, Chowdhury MJ, Johora F, Rahman Z, Mahid-Al Hasan SM, Sonia SBA, Rashel ATM, Ahmed TS, Mariam S. A Comparative Study of an Updated Pharmacology and Therapeutics Curriculum for MBBS in Bangladesh with Previous Curriculum. *Eastern Med Coll J.* 2026; 11 (1): 71-81.

doi: <https://doi.org/10.3329/emcj.v11i1.90016>