



Elective Module Preferences among Third-Year MBBS Students: Analysis of Preferences, Trends, Demand, and Allocation under the Competency-Based Medical Education Curriculum

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Abstract

Background: The Competency-Based Medical Education (CBME) curriculum mandates elective postings for MBBS students to foster early professional exposure, critical thinking, and self-directed learning. However, limited literature exists on how students choose among available electives and how preferences evolve across batches.

Objective: To assess the first-choice preferences of final year MBBS students for Block 1 elective modules across three consecutive batches, evaluate demand versus seat availability, and identify trends in changing preferences.

Methodology: An observational study was conducted using Google Form data collected from 429 MBBS students (Batch 1: n=134, Batch 2: n=152, Batch 3: n=143). Students ranked 16 elective modules based on their interest. Descriptive statistics (frequencies, percentages) were used to summarize first-choice preferences and demand. Seat allocation data were

analyzed to evaluate trends in student inclination and module saturation.

Results: Electives such as Adverse Drug Reaction Reporting and Rational Therapeutics, Body Donation and Procedure, and HIV/AIDS and Tuberculosis (Microbiology) showed consistently high demand across batches, with preferences exceeding available seats. Modules like Environmental Toxicology and Public Health electives showed minimal student interest. Over successive batches, preference for the ADR module increased substantially (from 6 in Batch 1 to 39 in Batch 3), while interest in research electives declined. A mismatch between demand and capacity was evident in several high-interest modules.

Conclusion: Student preferences for electives vary significantly across modules and over time, with a clear inclination toward clinically relevant and practical disciplines. Periodic evaluation of demand can help institutions realign elective offerings with student interests and optimize educational outcomes.

Keywords: Electives Modules, MBBS, Competency-Based Medical Education Curriculum (CBME), Student Preferences, Adverse Drug Reaction Reporting, Medical Education, Elective Trends

Introduction

Elective postings have become a cornerstone of the Competency-Based Medical Education (CBME) curriculum for MBBS students in India, following their formal integration by the National Medical Commission (NMC) under GMER 2019¹. These electives, spanning preclinical, paraclinical, and clinical domains, are designed to promote early exposure, foster self-directed inquiry, and help students make informed career choices, well-aligned with global educational objectives².

These postings span two four-week blocks, Block 1 in preclinical or paraclinical settings, and Block 2 in clinical disciplines or community environments with the purpose of fostering experiential learning, critical thinking, and informed career exploration³. Initial implementations of CBME electives have shown high student awareness and positive perceptions, with most trainees acknowledging their benefit in enhancing self-directed learning and professional development⁴. Studies from institutions in India reveal that students were generally knowledgeable and found the elective structure helpful, though some elective options, particularly nonclinical ones, were under chosen, indicating a need for improved orientation and support⁴. Despite these advances, there remains a gap in the literature regarding detailed quantitative evaluations of elective preference patterns, especially when comparing multiple student cohorts across varied specialties. Despite the significance of elective postings in shaping professional development, there is limited data in the Indian context on student preferences, patterns of selection, and the alignment of these preferences with departmental capacity. Understanding such trends is

critical for aligning curriculum offerings with evolving student interests and institutional capacity. Analyses of preference data can assist in planning capacity allocation and curriculum design more effectively by highlighting over- and under-subscribed modules. This study addresses this gap by analysing first-choice preferences for 16 elective modules in three consecutive final-year MBBS batches, examining demand relative to seat availability and identifying batch-wise changes in module popularity. The findings aim to inform curriculum development and elective planning within the CBME framework.

Methodology

Study Design

This was an observational study conducted among third-year MBBS students of 3 consecutive batches at Smt. Kashibai Navale Medical College and Hospital, Pune, India. Objective of the study was to analyse elective posting preferences for Block 1 under the competency-based medical education (CBME) curriculum. The elective program aimed to provide students with early exposure to various medical specialties and research opportunities, thereby supporting career exploration and self-directed learning. This study was conducted in accordance with the principles of the Declaration of Helsinki and adhered to Good Clinical Practice (GCP) Guidelines. Prior approval was obtained from the Institutional Ethics Committee. Confidentiality of student data was strictly maintained, and no identifiable personal information was used in the analysis or reporting of results. All data used for analysis were de-identified and used solely for academic and quality improvement purposes.

Elective Posting Framework

As per university norms, students were required to complete two elective blocks of four weeks each; Block 1

in a preclinical or paraclinical or basic science laboratory or under a researcher in an ongoing project, and Block 2 in a clinical department. This study focused exclusively on Block 1 elective preferences, which were offered across pre-selected 16 departments.

Study Population

The study included total 429 third-year MBBS students from three consecutive academic batches who had successfully completed the third MBBS Part I examination and were eligible for elective postings as per the Revised Graduate Medical Education Regulations, Part II, 2019 (GMER 2019)¹. As per the elective program, students were required to select preferences for 16 different elective modules spanning various preclinical, paraclinical, and research departments. All students were included in this study who had completely filled their preference forms.

Data Collection

A structured Google Form was developed to collect preference rankings from each student and distributed to all students of all consecutive 3 batches at the time of their elective posting schedule. The form listed 16 departmental elective modules and required students to rank each module from 1 (most preferred) to 16 (least preferred). Students were instructed to assign a unique ranking to each module as per their preference, ensuring complete and comparable data for analysis. The completed google forms were collated to analyse the data. Upon completion of data collection, responses were exported to Microsoft Excel for preliminary processing. Institutional records were also reviewed to obtain the maximum seat capacity (cut-off limits) for each elective module.

Elective Modules and Allotment Mechanism

Each department had predefined cut-off limits (i.e., maximum number of students) for their elective modules

based on departmental capacity and faculty availability. Based on students' preferences and seat availability, students were allotted to any of the 16 modules. In instances where first-choice demand exceeded available seats, allotment was done based on subsequent preferences.

Parameters Assessed

The following parameters were evaluated batch-wise and in total:

- Frequency and percentage of first-choice preferences per module
- Number of students selecting each elective as their first preference
- Number of students receiving or missing their first-choice due to cut-off limits
- Electives where first-choice demand exceeded available seats ("high demand")
- Electives where first-choice demand was equal to available seats
- Electives where first-choice demand was less than available seats ("low demand")
- Modules receiving zero first-choice preferences (batch-wise and overall)
- Changing trends in module preference across batches

Statistical Analysis

Descriptive statistics including frequencies and percentages were used to summarize student preferences for each module. A demand-versus-availability analysis was performed to assess alignment between student preferences and seat allotments. Results were organized batch-wise to identify evolving trends and module-specific variations across academic years.

Results

Data was analysed from three consecutive academic batches comprising a total of 429 third-year MBBS students (134 from batch 1, 152 from batch 2, and 143

from batch 3). Students provided ranked preferences for 16 elective modules offered as part of Block 1 elective postings.

First Choice Preferences

Among all electives, the most frequently selected first-choice modules were ADR Reporting and Rational Therapeutics (Pharmacology), chosen as the first preference by 74 students (17.25%), Body Donation and Procedure (Anatomy) by 51 students (11.89%) and Major Global Health Concerns: HIV/AIDS and Tuberculosis (Microbiology), selected by 40 students (9.32%) as their first choice (Figure 1). In contrast, electives from the Department of Community Medicine were among the least preferred as first choices; Community & Epidemiologic Surveys elective by 4 students (0.93%), Maternal & Child Health Outreach elective by 5 students (1.17%), School Health elective by 7 students (1.63%).

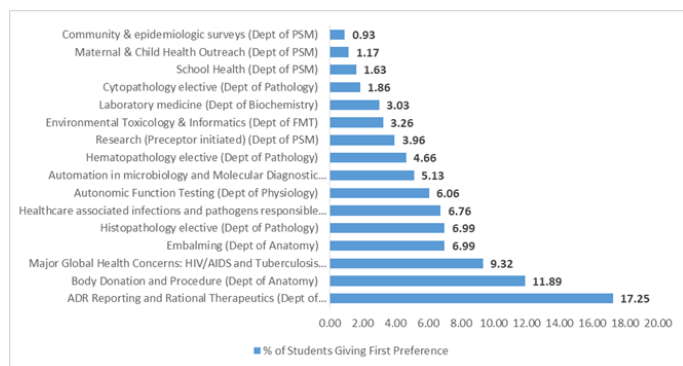


Figure 1: Distribution of First-Choice Preferences Across Elective Modules Among All Batches

Last Choice Preferences

Environmental Toxicology & Informatics (Forensic Medicine and Toxicology) had the highest number of

Table 1: High demand elective modules across batches (where first-choice preferences exceeded available seats)

Module	Total First-Choice Preferences	Total Available Seats	Overall Demand Status
ADR Reporting and Rational Therapeutics	74	60	High Demand
Body Donation and Procedure (Anatomy)	51	30	High Demand
Histopathology	30	22	High Demand

students ranking it as their last choice (72 students). Body Donation and Procedure (Anatomy) was the last choice for 13 students. ADR Reporting and Rational Therapeutics (Pharmacology) was the last choice for only 11 students. Major Global Health Concerns: HIV/AIDS and TB (Microbiology) was least ranked as last preference by just 5 students, indicating a relatively consistent high interest.

Demand vs. Availability: Preference Trends Across Batches

To assess the alignment between student interest and seat availability, elective modules were compared batch-wise and overall for first-choice preferences against the cut-off/available seats.

1. High Demand Electives (Preferences > Available Seats)

Elective modules that received more first-choice selections than available seats indicate high demand (Table 1). These modules reflect strong student inclination and popularity.

Major Global Health Concerns: HIV/AIDS and Tuberculosis	40	32	High Demand
Research (Preceptor-initiated)	17	12	High Demand
Laboratory medicine (Dept of Biochemistry)	13	12	High Demand
Autonomic Function Testing (Dept of Physiology)	26	24	High Demand
Healthcare associated infections and pathogens responsible for it, Hospital infection control practices	29	32	Near High Demand (Balanced)

These modules had more applicants than seats in at least one or more batches, with Body Donation, ADR Reporting and Rational Therapeutics, and Histopathology consistently receiving a large number of first-choice selections across all batches.

2. Low Demand Electives (Preferences < Available Seats)

These electives had fewer students choosing them as their first choice compared to the number of seats available (Table 2). Notably, Environmental Toxicology (Dept of FMT) remained consistently unpopular across all batches with just 14 students choosing it (only 1 in Batch 3), despite having the highest number of total seats (60).

Table 2: Low demand elective modules across batches (where first-choice preferences were less than available seats)

Module	Total First-Choice Preferences	Total Available Seats	Overall Demand Status
Environmental Toxicology & Informatics	14	60	Low Demand
Community & Epidemiologic Surveys	4	12	Low Demand
Cytopathology	8	22	Low Demand
Maternal & Child Health (MCH) Outreach	5	12	Low Demand
School Health	7	12	Low Demand
Automation in microbiology and Molecular Diagnostic Laboratory	22	52	Low Demand

Batch-wise Changing Preference Patterns

A comparative view of changing preferences shows how interest evolved across batches (Table 3)

Table 3: Batch-wise Changing Preference Patterns for Elective Modules Based on First-Choice Selections

Module (First Choice)	Batch 1	Batch 2	Batch 3	Trend
ADR Reporting (Pharmacology)	6	29	39	↑ Rising interest
Body Donation (Anatomy)	10	12	29	↑ Sharp rise in popularity
Histopathology	11	12	7	— Slight decline
Research (Preceptor-initiated)	12	5	0	↓ Declining interest
Cytopathology	1	1	6	↑ Gradual increase
Environmental Toxicology (FMT)	13	0	1	↓ Poor and inconsistent

ADR Reporting and Rational Therapeutics emerged as the most favoured module in Batch 3, tripling its demand from Batch 1. Body Donation (Anatomy) gained consistent and sharp popularity. Research elective saw declining interest from Batch 1 to Batch 3. Environmental Toxicology remained one of the least preferred options throughout. Batch-wise preferences of students and seat availability based on their first-choice selections have been depicted in Table 4,5 and 6.

Zero First-choice preferences

In analysing the batch-wise data of elective module preferences, it was observed that certain modules received no first-choice preferences from students,

indicating minimal or no interest in those areas for the corresponding batch. Specifically, in Batch 2, the module Environmental Toxicology & Informatics (Forensic Medicine) did not receive a single first-choice selection despite offering 20 available seats, highlighting a complete lack of student inclination toward this topic in that cohort. Similarly, in Batch 3, both Research (Preceptor-Initiated) and School Health (both under Dept of Community Medicine) had zero students selecting them as their first preference, despite their relevance to public health and academia. Additionally, Environmental Toxicology again remained unpopular in Batch 3, receiving only one first-choice preference.

Table 4: Elective Module Preferences and Seat Availability for Batch 1 Based on First-Choice Selections

Sn.	Elective Module	Department	First Choice (n)	Available Seats	Demand Status
1	Tuberculosis	Microbiology	15	8	High Demand
2	Research	PSM	12	4	High Demand
3	Histopathology	Pathology	11	6	High Demand
4	Hematopathology	Pathology	9	6	High Demand
5	School Health	PSM	5	4	High Demand
6	Body Donation	Anatomy	10	10	Equal to Cutoff
7	Environmental Toxicology	FMT	13	20	Low Demand
8	Embalming	Anatomy	8	10	Low Demand
9	ADR Pharmacology	Pharmacology	6	20	Low Demand
10	Autonomic Function Testing	Physiology	6	8	Low Demand
11	HIV/AIDS	Microbiology	6	8	Low Demand
12	Automation Microbiology	Microbiology	2	28	Low Demand
13	HAI HIC	Microbiology	2	8	Low Demand
14	MCH	PSM	2	4	Low Demand
15	Cytopathology	Pathology	1	6	Low Demand
16	Lab Medicine	Biochemistry	1	4	Low Demand
17	Superbugs	Microbiology	1	8	Low Demand
18	Survey	PSM	1	4	Low Demand

Table 5: Elective Module Preferences and Seat Availability for Batch 2 Based on First-Choice Selections

Sn.	Elective Module	Department	First Choice (n)	Available Seats	Demand Status
1	ADR Pharmacology	Pharmacology	29	20	High Demand
2	Automation Microbiology	Microbiology	19	12	High Demand
3	Body Donation	Anatomy	12	10	High Demand
4	HAI HIC	Microbiology	19	12	High Demand
5	Histopathology	Pathology	12	8	High Demand
6	HIV/AIDS	Microbiology	26	12	High Demand
7	Research	PSM	5	4	High Demand
8	Autonomic Function Testing	Physiology	7	8	Low Demand
9	Embalming	Anatomy	8	10	Low Demand
10	Hematopathology	Pathology	6	8	Low Demand
11	Lab Medicine	Biochemistry	3	4	Low Demand
12	Survey	PSM	2	4	Low Demand
13	School Health	PSM	2	4	Low Demand
14	Cytopathology	Pathology	1	8	Low Demand
15	MCH	PSM	1	4	Low Demand
16	Environmental Toxicology	FMT	0	20	Low Demand

Table 6: Elective Module Preferences and Seat Availability for Batch 3 Based on First-Choice Selections

Sn.	Elective Module	Department	First Choice (n)	Available Seats	Demand Status
1	ADR Pharmacology	Pharmacology	39	20	High Demand
2	Body Donation	Anatomy	29	10	High Demand
3	Autonomic Function Testing	Physiology	13	8	High Demand
4	Embalming	Anatomy	14	10	High Demand
5	Lab Medicine	Biochemistry	9	4	High Demand
6	Cytopathology	Pathology	6	8	Low Demand
7	HAI HIC	Microbiology	8	12	Low Demand
8	HIV/AIDS	Microbiology	8	12	Low Demand
9	Histopathology	Pathology	7	8	Low Demand
10	Hematopathology	Pathology	5	8	Low Demand
11	MCH	PSM	2	4	Low Demand
12	Automation Microbiology	Microbiology	1	12	Low Demand
13	Environmental Toxicology	FMT	1	20	Low Demand
14	Survey	PSM	1	4	Low Demand
15	Research	PSM	0	4	Low Demand
16	School Health	PSM	0	4	Low Demand

Discussion

Elective postings are an essential curricular component under the CBME framework, aimed at fostering self-directed learning, early career exploration, and the development of research and professional skills among undergraduate medical students. Gaining exposure at an early stage in the profession by actively participating in clinical, laboratory, research, community-based, or team-oriented environments offers learners a meaningful and formative experience that can profoundly shape their future professional development and career trajectory¹.

This study sought to analyse student preferences for Block 1 electives across three consecutive MBBS batches and evaluate the alignment between their preferences and the available seat allotments across departments. The findings offer valuable insights into student inclinations, department popularity, and potential areas for curricular improvement.

One of the key findings from our analysis was the marked variability in student preferences across batches, indicating evolving interests possibly influenced by peer feedback, personal exposure, or contemporary relevance of topics. Modules such as ADR Reporting and Rational Therapeutics (Pharmacology), Body Donation and Procedure (Anatomy), Histopathology (Pathology), and HIV/AIDS (Microbiology) were consistently among the most preferred electives. The increasing demand for the ADR module, especially from Batch 1 (6 first-choice preferences) to Batch 3 (39 preferences), suggests a growing recognition of pharmacovigilance, rational therapeutics, and medication safety as crucial domains in clinical practice. A cross-sectional study by Kaleem S et al. among MBBS students who undertook electives reported that 57% of respondents agreed that electives helped them in clarifying their career choice, emphasizing the value of practical exposure in shaping

professional interests⁵. This resonates with our finding that electives like ADR reporting and others strongly influence student preference and career insight.

Conversely, certain modules such as Environmental Toxicology & Informatics (Forensic Medicine) and Community & Epidemiologic Surveys (Community Medicine) remained largely unpopular across all batches, with minimal or no students listing them as their first choice. These findings point toward either a lack of awareness regarding the relevance of these subjects or a perception that these modules are less clinically engaging or beneficial for future specialization. In an Indian study by Chauhan et al, no students opted for community medicine electives in Block 1 postings, and Pathology electives were the most preferred, with Anatomy and Physiology being the least chosen among pre-/para-clinical subjects⁶. This parallels our data where Body Donation, Histopathology, and ADR-related modules attracted most first-choice selections, while PSM and FMT modules remained unpopular.

The demand vs. availability analysis revealed significant mismatches in several high-demand modules, where the number of first-choice applicants exceeded the seat capacity. For example, the Research module (Preceptor-Initiated) was selected as the first preference by 12 students in Batch 1 despite only 4 seats being available. Similarly, electives on ADR Reporting and Rational Therapeutics, Body donation, Major Global Health Concerns: HIV/AIDS and Tuberculosis, Histopathology, etc. repeatedly saw oversubscription. These modules may represent areas of perceived relevance and applicability to real-world clinical challenges, particularly in light of the COVID-19 pandemic and antimicrobial resistance crisis.

Importantly, some modules that were in high demand in Batch 1 (e.g., Research in community medicine) lost

traction in later batches. This shift may reflect changes in student experiences, perceived workload, or word-of-mouth feedback. This dynamic evolution of preferences supports the need for regular feedback-based evaluation and revision of offered electives.

Our findings also underscore a disparity between student aspirations and module capacity, suggesting the need for greater flexibility in seat allocation and possibly offering duplicate sessions for highly preferred modules. Moreover, modules with consistently low preference should be revisited and redesigned, possibly with greater integration of practical exposure, interactive teaching methods, and clinical correlations.

Though elective experiences have been widely studied in terms of satisfaction and educational value, there is a paucity of published longitudinal data tracking first-choice preference trends across multiple student cohorts within a structured curriculum. Most studies focus on satisfaction metrics or cross-sectional choice patterns rather than detailed demand-versus-capacity analysis over time. This highlights the novelty and significance of your study, which captures evolving preferences for 16 fixed elective modules across three consecutive batches.

Educational Implications

- Curriculum planners should use this data to forecast demand and plan elective offerings accordingly.
- Departments with low preference modules can enhance student engagement by restructuring content, showcasing career relevance, or increasing visibility during foundation and clinical postings.
- Orientation sessions explaining the value and scope of all electives could help reduce bias and broaden student perspectives.

Study Limitations: Our study has few limitations. Firstly, this study was conducted in a single medical college, and the findings may not be generalizable to

other institutions with different elective offerings or student demographics. Secondly, the study primarily used quantitative preference data without capturing the reasons behind student choices or dissatisfaction, which could have provided deeper insights. Also, preferences may have been influenced by prior batch feedback or informal guidance, which was not accounted for in the analysis. Factors such as faculty popularity, perceived workload, or prior exposure to subjects may have influenced choices but were not evaluated.

Conclusion

This study highlights critical insights into the elective preferences of final-year MBBS students under the CBME framework. It identifies high-demand areas such as pharmacovigilance, infectious diseases, pathology, and anatomy-related skills, while simultaneously revealing modules with low student engagement. The observed mismatch between student interest and seat availability calls for dynamic and responsive curriculum planning, including possible module restructuring, expansion of popular electives, and better sensitization toward lesser-known subjects. Understanding these patterns not only helps optimize student satisfaction and engagement but also aligns the curriculum more closely with the evolving healthcare landscape and student aspirations. Regular review and refinement of elective offerings based on longitudinal data, feedback, and changing trends are essential for maximizing the educational value of the elective posting period.

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