

## ORIGINAL ARTICLE

# Electives in Medical Curriculum- An Insight of Medical Students

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### ARTICLE CYCLE

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### ABSTRACT

**Background:** Electives include courses that are interest based, where the students are free to choose the course content. NMC has introduced electives in medical curriculum and it has been implemented for the first time in various medical colleges. **Aims and Objectives:** The objective of this study is to assess the perception of MBBS students regarding Electives program. **Methodology:** This cross-sectional study was conducted among the first batch of MBBS students that completed the electives program after taking their consent and approval from ethical committee. Electives Experience scale (EES) and Electives Rating Scale (ERS) were developed, tested, and used for this study. Median, inter quartile range, Cronbach's alpha and Mann Whitney tests were used for analysis. **Results:** Most of the students learnt theory, practical, AETCOM (ethics & communication), clinical skills and research in both blocks of posting but research was more focussed in block 1 and practical knowledge and clinical skills in block 2. For the Likert scales (EES-1, EES-2, ERS-1, ERS-2 & ERS), Cronbach's alpha was found to be quite robust for all the scales. Median and inter quartile range were calculated for EES and ERS scores. Mann Whitney test showed significant gender difference for EES-2. If the student had got elective of his/her choice in block 1, the mean ranks of EES & ERS were significantly higher but if the student had got the elective of his/her choice in block 2, significantly higher scores were seen in overall ERS, ERS-2 and EES-2 only. **Conclusion:** Electives is a welcome addition to the medical curriculum. However, proactive approach from the student is a must to utilize this opportunity to the fullest.

### KEYWORDS

MBBS Students; Competency Based Medical Education; Electives; Medical Curriculum

### INTRODUCTION

Electives include courses that are interest based, where the students are free to choose the course content. Electives can be pursued in their own medical college or even at a different institute. The medical curriculum is a training program where every student must undergo a

set of mandatory trainings but electives is a subset where the students can elect a course from the available options based on their interest.(1)

Students who join MBBS come with many professional and personal aspirations. While meeting the needs of the profession and

nation, the MBBS program is also designed to create time and opportunity for students to explore future interests. Allowing students time to experience a speciality or project of their choice is thus key to helping student's interest to bloom.

Creating a diversity of choices within a specified framework that will allow students to be part of laboratory, participate in research, be part of super-speciality care team or interact with the patients in a community care setting is a mandate of the new regulations notified by the Government of India. Electives allow students to get taste of a future career; they also help them to pursue academic interests, do projects and work in diverse environments. These experiences outside the traditional boundaries of the core program allow students to reflect, plan and grow their careers. They also allow students to begin the process of professional networking early.

It has been seen that allowing the students to choose some of the topics enhances the level of interest of the students in the program and helps them build personal skills. (2) Students undergoing elective programs have often marked electives as being innovative and interesting. (3) Besides breaking the monotony of regular teaching in a fixed curriculum, electives provide multidimensional and varied learning experiences, making inter-professional education possible. Electives are preferred by students since they feel more responsible when they decide the topics themselves. (4)

Electives have been postulated to promulgate trans- formative learning. (5) Transformative learning is a two phase process involving instrumental and communicative learning. (6) Whereas primary focus of instrumental learning is on 'learning through task-oriented problem solving and determination of cause and effect relationships', communicative learning focuses on the 'understanding how others communicate their feelings, needs and desires with another person'. (5) Clinical skills are improved by instrumental learning and it inculcates critical thinking too. The promotion of transformative learning needs to be explored through electives.

### **Rationale of the study:**

As directed by NMC Institutions must give sufficient importance to the planning and execution of electives. Besides creating diverse opportunities, thought must be given to providing a safe and enabling environment for students to learn. Identifying and orienting preceptors for this purpose, developing portfolio and logbook events and continuous program evaluation are key to the success of the program. We should look beyond the traditional boundaries and create varied opportunities for medical students. Strategic collaborations with centres of excellence will increase value for students while building bridges of collaborative work among institutions.

Regulatory body for medical colleges across India (erstwhile Medical Council of India (MCI), now National Medical Commission (NMC)) introduced CBME curriculum for undergraduate medical training in the year 2019. (7) Under these regulations, electives have been introduced for the first time in medical undergraduate training in India. These 'mandatory' electives are conducted for two months, after the end of Final Professional Part I training with an objective to provide diversified learning opportunities to the students.

These electives will be supervised, self-directed, providing experiential and immersive learning experiences. Electives in two blocks for a duration of two hundred hours for four weeks each has been proposed. (8) Electives are not entirely a free-choice program, students have to pick-and-choose from the courses being offered by any particular institute. (5)

After the implementation of electives program for the first time, this study was conducted with the objective to assess the perception of MBBS students regarding Electives program.

### **MATERIAL & METHODS**

The present study was a cross sectional study conducted in a medical college of Delhi among MBBS students of 2019 batch (admission year 2019), the first batch that underwent the new addition in MBBS curriculum, i.e., the electives program. 10% of the total 100 students of this

batch, i.e., 10 students were randomly selected for the pilot study. From the remaining 90 students, one student did not give consent and two students did not complete the questionnaire, hence the final sample size was 87. After explaining the purpose of the study and taking verbal informed consent, a pretested, self-administered questionnaire with both open and closed ended questions was used for data collection.

The questionnaire consisted of five sections. The first section had questions related to the branch where the student was posted, the branch of choice and gender of the student. The second section had 10 questions related to the execution of block 1 and block 2 electives.

The third section was 21 items 5-point Likert scale questionnaire "Electives Experience Scale (EES)" designed by the authors based on 21 possible situations found in pilot testing regarding students' perception. The 5-point Likert scale was strongly disagree, disagree, neither agree nor disagree, agree and strongly agree. The 21 possible perceptions were hence graded on 5 points with minimum possible score of 21 and maximum 105. More points meant positive perception on this scale. The 21 items in short were awareness of objectives, clarity of possible learning, mental preparation, excitement & eagerness to join the course, feeling of being the first batch to undergo this, expectations before joining and how much those got fulfilled after the course completion, supervision, hands-on experience, active participation, confidence building, topic/skill grasping, time utilization, knowledge upgradation, professional development, choosing or excluding a specialty in post-graduation, future career options, program duration, perception regarding workload and interesting posting. EES was used to assess block 1 and block 2 electives separately, EES-1 (Electives Experience Scale for Block 1 Electives) and EES-2 (Electives Experience Scale for Block 2 Electives).

The fourth section was a rating scale developed by the authors "Electives Rating

Scale (ERS)" after extensive literature search and validation by pilot testing. The students were asked to rate the overall experience of electives on a scale of 1 to 5 (1: very poor, 2: poor, 3: neutral, 4: good, 5: very good) based on relevance, learning, supervision, work load, timing, resources available and benefit. The minimum and maximum possible scores on this rating scale were 7 and 35 respectively. The same scale was also used to rate block 1 and block 2 electives separately, names of the scales modified as ERS-1 (Electives Rating Scale for Block 1 Electives) and ERS-2 (Electives Rating Scale for Block 2 Electives). The fifth section comprised of open-ended questions based on positive experiences, negative experiences, any special experience, and suggestions for future batches.

Data analysis was done by Microsoft Excel 2019 and SPSS 23. Descriptive statistics were used to present data in tables, bar diagrams and pie charts. For the Likert scales (EES-1, EES-2, ERS-1, ERS-2 & ERS), the total scores were calculated, median was used as the measure of central tendency and inter quartile range as the measure of dispersion. Reliability analysis was done by calculating Cronbach's alpha. Mann Whitney test was used as the test of significance to test the null hypothesis and find out the possible correlates.

Approval from institutional ethics committee was taken before starting the study.

## RESULTS

The study group had 40 male students and 47 female students. Each student had to complete electives in pre/para clinical (block 1) as well as clinical specialties (block 2). The number and percentage of students posted in different specialties has been depicted in Table 1. The students were given a chance to choose from electives. The choices made by students have been expressed in the form of pie chart for block 1 and block 2 electives (Figure 1 & Figure 2 & Figure 3) depicts the learning experiences by students in block 1 & 2 electives in the areas of theory, practical, AETCOM (ethics & communication), clinical skills and research. Most of the students learnt all of these in their postings, theory and research was more

focused in block 1 and practical knowledge and clinical skills in block 2. The execution of block 1 & 2 electives according to students has been shown in Table 2. Almost all the students completed the criteria of attendance. Maximum students had preceptors allotted beforehand, topics were pre-decided, learning objectives were explained and learning

resources were shared. 72% of the students had completed log book by the time of study but only 50% had completed portfolio.

For the Likert scales (EES-1, EES-2, ERS-1, ERS-2 & ERS), Cronbach's alpha was calculated and was found to be quite robust for all the scales. Median and inter quartile range were calculated and have been depicted in Table 3.

**Table 1: Distribution of students in various specialties in Block 1 & 2 electives**

Specialty	Sub-specialty/Topic	Students posted No./%
<b>BLOCK 1 ELECTIVE</b>		
<b>Anatomy</b>	Cross sectional imaging anatomy	8/9.2
	Research methods in anatomy	9/10.3
<b>Biochemistry</b>	Endocrinology & Tumour markers in biochemistry	3/3.4
	Clinical Chemistry	6/6.9
<b>Community Medicine</b>	Research in Community Medicine	5/5.7
	Immunization clinic	4/4.6
<b>Forensic Medicine and Toxicology</b>	Legal and clinical aspects of Forensic Medicine	6/6.9
<b>Microbiology</b>	Molecular biology in microbiology	5/5.7
	Virology	3/3.4
	Interpretation of automated cell counter parameters to study and differentiate anaemias & non neoplastic leucocytic disorders	3/3.4
<b>Pathology</b>	Grossing and museum techniques in pathology	1/1.1
	Cytopathology	4/4.6
	Immunohistochemistry in pathology	5/5.7
<b>Pharmacology</b>	Drug utilization study in pharmacology	5/5.7
	Adverse drug reactions monitoring in pharmacology	5/5.7
<b>Physiology</b>	Teaching basic sciences in MBBS course	7/8.0
	Cardiac investigations	8/9.2
<b>BLOCK 2 ELECTIVE</b>		
<b>General Medicine</b>	Gastroenterology	5/5.7
	Respiratory medicine	4/4.6
	Cardiology	4/4.6
	Nephrology	3/3.4
<b>General Surgery</b>	Trauma surgery	9/10.3
	Neurosurgery	1/1.1
	General and minimal access surgery	7/8.0
<b>Obstetrics and Gynaecology</b>	Urology	3/3.4
	Materno-foetal medicine	5/5.7
<b>Ophthalmology</b>	Endoscopy in gynaecology	4/4.6
	Cornea in Ophthalmology	3/3.4
<b>Orthopaedics</b>	Trauma and orthopaedics	8/9.2
	Sports medicine: assessment of injuries around the knee	6/6.9
<b>Otorhinolaryngology</b>	Audiology	6/6.9
	Head & neck surgery-endocrinology & tumour marker	5/5.7
	Paediatric medical genetics	1/1.1
<b>Paediatrics</b>	Child psychology	7/8.0
	Neonatology	6/6.9

**Table 2: Items concerning the execution of block 1 & block 2 electives**

	Electives	Block 1 (N (%))	Block 2 (N (%))
<b>Attended with 75% attendance</b>	Yes	84 (96.6)	79 (90.8)
	No	3 (3.4)	8 (9.2)
<b>Preceptors/guides allotted</b>	Yes	77 (88.5)	71 (81.6)
	No	10 (11.5)	16 (18.4)
<b>Any prerequisites before the elective</b>	Yes	41 (47.1)	39 (44.8)
	No	46 (52.9)	48 (55.2)
<b>Pre-decided topics provided</b>	Yes	66 (75.9)	59 (67.8)
	No	21 (24.1)	28 (32.2)
<b>Learning objectives explained</b>	Yes	74 (85.1)	71 (81.6)
	No	13 (14.9)	16 (18.4)
<b>List of learning resources provided</b>	Yes	67 (77)	60 (69)
	No	20 (23)	27 (31)
<b>Log book completed</b>	Yes	72 (82.8)	61 (70.1)
	No	15 (17.2)	26 (29.9)
<b>Portfolio made</b>	Yes	50 (57.5)	47 (54)
	No	37 (42.5)	40 (46)
<b>Assessment done by preceptor/guide</b>	Yes	64 (73.6)	58 (66.7)
	No	23 (26.4)	29 (33.3)
<b>Frequency of assessment</b>	Daily	39 (44.8)	40 (46)
	End posting	20 (23)	21 (24.1)
	Both	12 (13.8)	10 (11.5)
	None	16 (18.4)	16 (18.4)

**Table 3: Measures of central tendency, dispersion and reliability analysis of Electives Experience and Electives Rating scales (EES & ERS)**

Scale	Median	Inter-quartile range	Min-Max values	Cronbach's alpha
<b>EES-1</b>	79	67-84	21-105	0.970
<b>EES-2</b>	81	70-86	21-105	0.974
<b>ERS-1</b>	27	23-28	7-35	0.950
<b>ERS-2</b>	28	23-34	7-35	0.984
<b>ERS</b>	28	22-32	7-35	0.984

*EES-1: Electives Experience Scale for block 1 electives; EES-2: Electives Experience Scale for block 2 electives*

*ERS-1: Electives Rating Scale for block 1 electives; ERS-2: Electives Rating Scale for block 2 electives*

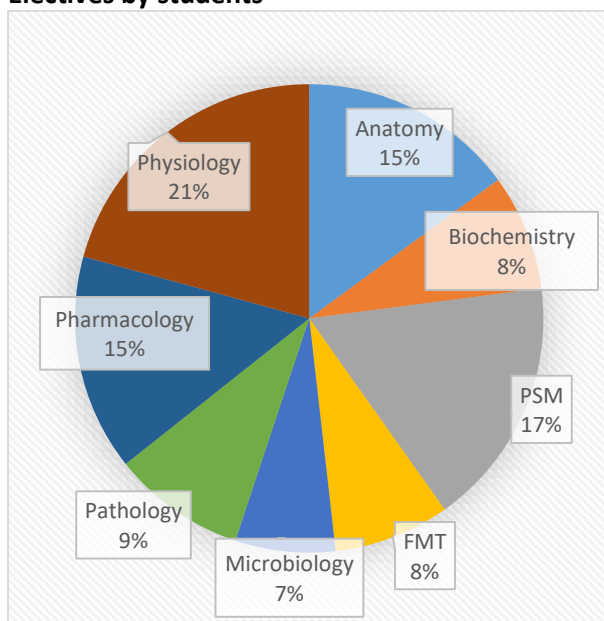
*ERS: Electives Rating Scale*

**Table 4: Correlates of Electives Experience and Electives Rating scales (EES & ERS)**

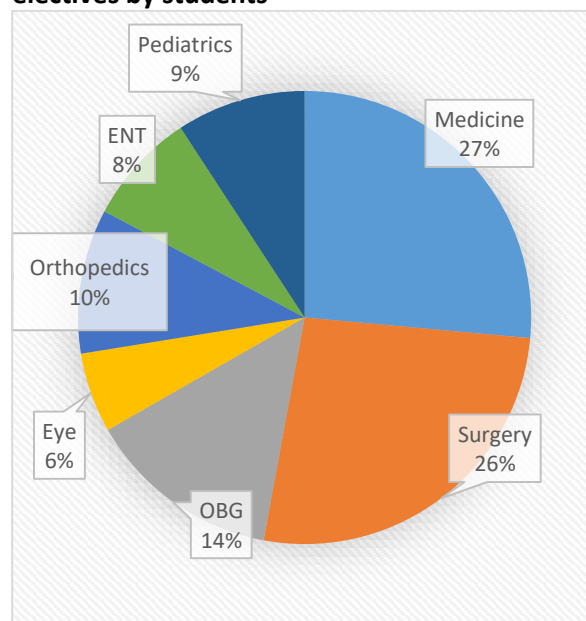
	Did you get elective of your choice (block 1)		Did you get elective of your choice (block 2)		Gender				
	N/Mean rank	p value*	N/Mean rank	p value*	N/Mean rank	p value*			
<b>ERS score</b>	Yes	65/49.05	0.001	Yes	70/46.85	0.029	M#	40/39.36	0.106
	No	22/29.07		No	17/32.26		F	47/47.95	
<b>ERS-1 score</b>	Yes	65/48.01	0.010	Yes	70/46.07	0.118	M	40/44.44	0.881
	No	22/32.16		No	17/35.47		F	47/43.63	
<b>ERS-2 score</b>	Yes	65/48.67	0.003	Yes	70/46.39	0.048	M	40/39.10	0.089
	No	22/30.20		No	17/34.15		F	47/48.17	
<b>EES-1 score</b>	Yes	65/48.04	0.010	Yes	70/46.01	0.132	M	40/39.23	0.103
	No	22/32.07		No	17/35.74		F	47/48.06	
<b>EES-2 score</b>	Yes	65/48.85	0.002	Yes	70/46.63	0.049	M	40/37.04	0.018
	No	22/29.68		No	17/33.18		F	47/49.93	

\*Mann Whitney test p value; #M: Male, F: Female

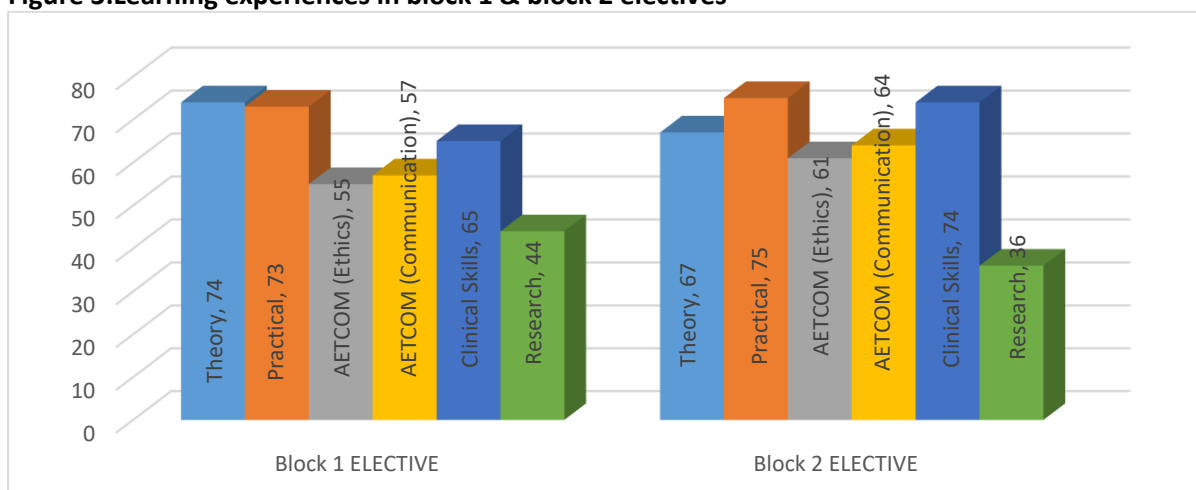
**Figure 1: Distribution of 1st choice of Block 1 Electives by students**



**Figure 2: Distribution of 1st choice of block 2 electives by students**



**Figure 3: Learning experiences in block 1 & block 2 electives**



On applying Mann Whitney test as test of association, the difference of mean ranks in gender was found to be significant in EES-2 only. If the student had got elective of his/her choice in block 1, the mean ranks of EES & ERS were significantly higher but if the student had got the elective of his/her choice in block 2, significantly higher scores were seen in overall ERS, ERS-2 and EES-2 only.

After summarizing the open-ended responses, the following results were obtained:

#### Positives of block-1

The response of students in Block 1 have been mostly positive and very beneficial. Nearly

every student was satisfied with the preceptors and their method of teaching as well as approach to explaining the absolute basics, including the significance of even basic medical sciences and legal aspects of medicine. The students were ecstatic about the services provided to them by the faculties. Most of the students mentioned about ECG, FNAC and haematology and how this Programme helped them clear many of their existing doubts and confusions with the subject matter. Students made a note about how enlightening their experience was, being able to interact with the patients and participate in research.

### **Positives of block-2**

The response of students in Block 2 were mostly positive. The guidance provided to the students by the faculty was said to be adequate by the students. Students enjoyed their experience of interacting with real patients and work ethics in a clinical settings like counselling and preliminary examination of patients. Students expressed gratitude towards preceptors. Students were pleased to expand their knowledge in fields of neonatology, nephrology, endoscopy, colonoscopy and audiology, etc. Students were also grateful to be taught proper surgical procedures and pre-surgery preparations and exposure to ICU. Patient interaction was also very prominent feedback mentioned by a lot of students.

### **Negatives of block-1**

Few feedbacks suggest that some students did not find electives relevant or helpful. Some of the students expressed dissatisfaction with regards to their time being improperly utilised and unnecessary workload being offloaded onto their shoulders in the programme, their feedback displaying discontent towards the long programme duration especially in their stressful final year. A handful of students remarked that they found it incredibly difficult to grasp such advanced subjects within this short duration. Few students stated that the elective programme was far more theory based rather than practical or clinically oriented.

### **Negatives of block-2**

Some students found it extremely exhausting and found the lack of structural guidance with regards to their fields very disappointing. Few students shared concerns regarding lack of electives they were interested in and inadequate amount of time provided with practicals. Some students found it difficult to work during intensive clinical hours. Their workload was intense. Some students wished to spend more time with their respective fields and OPDs. Some of the students found it difficult for the clinicians to respond to their doubts during busy clinical hours.

### **Special experiences by students during elective postings**

Students were happy to get their first exposure of endoscopy, colonoscopy, bronchoscopy and cardiology department. They were pleased to be able to learn new facts, interact with patients, visit the cath lab, learn about clinic etiquettes, observe and perform surgeries themselves like removal of pigtail catheter, ingrown toe nail removal, incision and drainage of a finger abscess.

### **Suggestions by students for the elective postings**

Students have provided insightful suggestions for this program. Some have suggested to spread the programme throughout the final year. Students expressed concerns towards inadequate knowledge garnered, suggesting requirement of a proactive approach. Students put forward the idea of making the programme an inter-college event. With more colleges involved, the experience will become more interactive for the students. One student has put forward the opinion to cancel the event all-together. Some students even suggest to not have the event take place during the final year. A request in limited attendees per session has been a common suggestion by students to avoid overcrowding and promote better student-teacher interaction. Students requested for more time to be able to attend electives they missed out on. Another student suggested for the programme to be more patient oriented.

### **Suggestions by students for junior batches**

Some students suggested that junior batches should utilise their electives to the utmost and choose their topic and department wisely as well as be proactive in the event. Junior batches should not miss out on this experience and attend as many major elective classes as they can to aid in the development of their medical skills. They should obey instructions and complete objectives they have been given to them by the department as it makes the learning experience more engaging and interesting. Junior batches should not be afraid or cynical of the workload during clinical/practical and surgery sessions. Elective

and clinical postings should be taken seriously and attended with interest as this will widen their horizon and aid in their decision of field selection as well as provide great hands-on hospital experience and increase their practical knowledge. Junior batches were advised to read the topics of their respective electives before attending as it will assist them to grasp the topic or attain skills more effectively.

#### **Comments on recommendation of electives for future batches**

Many students agreed on recommending elective postings for future batches as it will give them clinical exposure and exposure to various departments as well as dust off their unrevised knowledge regarding the elective of their choice. It will help future batches familiarize themselves to the clinical setting early. It will also aid in increasing their interest in the subject. The elective posting will create an incredible and enthusiastic environment for final year. Continuing to hold elective posting for future batches will aid them in choosing their field and what to expect beforehand. A student described the hesitation to recommend elective posting to future batches as the final year is a very sensitive and important period for a student - however the student was less reluctant if the elective posting takes place during the second or third year. These elective postings will educate the future batches with useful information that will help them get better at diagnosis and interacting with patients. It will also teach them a lot about medical practices and medical jurisprudence. Elective posting provides a much-needed break from traditional teaching. Students described these elective postings as one-of-a-kind experience and a must-have for future batches. Elective posting is a good transition between third year and final year so the future batches should attend it seriously. This course will also provide them with opportunities to correlate with what they have studied and how it takes place in a real-life scenario.

#### **DISCUSSION**

Students' perspective towards electives was studied in this study, through both open and

close ended questions. A study performed on elective courses at Oman by Ajmi et al, (9) had concluded that female students were having more positive perception than male students but our study did not prove it conclusively. Significant difference in mean ranks between males and female students was found only in EES-2, in other scales the difference was non-significant. Our study showed that maximum students were satisfied by the learnings but the students of Oman were only moderately satisfied.(9) This difference could be because of different pattern of electives. As rightly pointed out in different review articles on electives (10, 11, 12), this inclusion is perceived to be beneficial by most of the students of this study. The students enjoy the postings and learn more if they get elective of their choice as it is reflected in EES and ERS scores of this study. Based on the responses of the students to open ended questions, most of the students found it extremely interesting and useful in enhancing their medical knowledge and learning the basics of various clinical and research skills at an early stage. Some students showed concern over the timing of electives being conducted during the stressful final year. Many students found it innovative and took it as a good break from the usual curriculum. For some students, it helped to decide their branch of post-graduation too. Students also recommended electives to be continued for future batches like recommended by other authors. (1, 5) They suggested their juniors to take the postings as an opportunity to learn something new and keep a proactive approach. Similar programs have been conducted in medical curriculum of various countries since long,(13) hence India should also give it a try in a form like the current one which is relevant in the Indian context.

#### **CONCLUSION**

Electives is a welcome addition to the medical curriculum according to the first batch of MBBS students who underwent elective postings. However, proactive approach from the student is a must to utilize this opportunity to the fullest.



### Limitation

This study was performed at one medical college, so the sample size was small and it highlights students' perspective from one medical college only.

### Recommendation

Electives should be continued for future batches too with varied options for the students to select in block 1 and block 2 electives. Similar studies are recommended for future batches to understand students' perspective and do necessary modifications time to time.

### AUTHORS CONTRIBUTION

All authors have contributed equally.

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Nil

### CONFLICT OF INTEREST

There are no conflicts of interest.

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