

# Evaluation of the influence of elective postings in accordance with the competency-based undergraduate medical education pattern on the development of research abilities in students



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## ABSTRACT

**Background:** As per the revised competency-based medical education guidelines given by the National medical council of India, students are offered elective posting after the first part of 3<sup>rd</sup> phase of the medical professional course. This has been started from the year 2023. There will be various postings offered and at end of the posting they will be assessed on various domains. **Aims and Objectives:** Our study aims to assess the impact of elective posting on the research skills and students' perception toward it. It also aims to identify the best methods to implement elective postings. **Materials and Methods:** In the year 2023, using a complete enumeration technique 86 students from the third phase of MBBS at a medical college in Maharashtra, India, were registered for the 2 months of elective and would be questioned twice following consent using a pre-validated questionnaire. The first interview will take place following the completion of the first block of elective posting, and the second interview will take place following the conclusion of the second block of elective posting. **Results:** We observed a statistically significant difference when two blocks were compared on the domains of efforts. Students have reported higher efforts toward clinical and surgical postings. We also observed that students reported a statistically significant level of frustration in block two. In our study, we found that research work was taken more during the second block as students were sensitized in the first block regarding research. **Conclusion:** In our study, we have observed that research activities are taken up and processed for presentation using biostatistics in the second block of elective if resource material and support are provided in the block one. Students develop a better understanding of research with proper training.

**Key words:** Research; Elective posting; Satisfaction; Presentation; Biostatistics

## INTRODUCTION

Electives are introduced and implemented as per competency-based medical education (CBME) pattern from the year 2023 for the third phase of medical undergraduate students.<sup>1</sup> It has been considered as a valuable and high regarded experience during medical education. Students

are supposed to complete 2 months of elective posting in their third phase of medical education after the end of the first part and before the commencement of the second part of third phase MBBS. It is a voluntary posting divided into two blocks. Students were offered various topics from preclinical, paraclinical, and clinical departments of the institution to choose for elective. The decision of elective

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has to be conveyed to the affiliated University. The range of topics to be offered for elective will be according to guidelines of the national CBME pattern given by National Medical Council and University Grants Commission.<sup>2,3</sup> The elective course material along with the facilitator, moderator, faculty in charge, and resource material was conveyed to students beforehand. A time schedule was also conveyed to students, along with teaching and learning activities beforehand the existing work for elective posting is mostly from foreign countries. Most of the literature about electives is limited with respect to the Indian CBME medical curriculum.

A study done by Maki and Maki has concluded that satisfaction and high research skills are seen in different typologies of electives.<sup>4</sup> However, the information regarding consistent evaluation and its impact on research in Indian setting scarce. Hence, this study is planned to explore the impact of elective posting on research skills.

### Aims and objectives

#### Aims

The aim of this study was to assess the impact of elective posting on research skills.

#### Objectives

The objectives of the study are as follows:

1. To assess student's perceptions of the opportunities of electives in the medical curriculum
2. To obtain the best insights about best approach to implement electives with regard to its organization assessment methods, and elective typology as per blocks to meet student satisfaction
3. To assess research activities undertaken by students in their electives.

## MATERIALS AND METHODS

This study was carried out after the ethical approval by the Institutional Ethics Committee of ACPM Medical College Dhule, registered as 76 IEC/ACPMDC/Dhule under ECR/1448/INST/MH/2020.

An analytical study was conducted for the duration of 2 months. In this study, after the application of inclusion and exclusion criteria, students in the 3<sup>rd</sup> phase of MBBS in their 6<sup>th</sup> semester of education from a medical college of north Maharashtra, India, were enrolled using a complete enumeration technique. The minimum sample size is 86. Participants were interviewed using a pre-validated questionnaire following the conclusion of the first block and second block of elective posting. Participants will be enrolled after taking informed consent.

## RESULTS

During this study, we collected data on domains of workload, class typology, efforts, satisfaction, research intention assessment, and attendance from a total of 86 students. The same set of questionnaire was utilized to collect the data after the completion of block one and Block 2 of elective posting. Response rate was 100%. A total of 172 responses were obtained. (All the 86 students interviewed twice.) The workload pattern was found to be non-significant as shown in Table 1.

About 53.6% of students were satisfied 10.7% were highly satisfied and 28.6% were neutral on the satisfaction rating after the elective block (Table 2).

Students reported that in block one the strength of the program was practical training whereas time management was a challenging experience for them. Assisting clinical procedures and conducting scientific laboratory analysis was opportunity of this block one program.

Overlapping study pattern and clashing of elective and routine classes were identified as threat of block one program (Tables 3-6).

## DISCUSSION

In this study, we found out that a wide range elective posting in different specialties of the institution was offered to student. It was observed that in the first block of the elective posting, students have a preference preclinical and paraclinical subjects such as the anatomy of various system, applied anatomy, enzyme-linked immunosorbent assay, epidemiology, and pharmacovigilance program. In the second block, students opted for emergency medicine, sports medicine, health-care quality, and antenatal care.

The course was developed by the work of students and faculties. It is similar to the study done by Anand and Sankaran in the year 2019.<sup>5</sup> They concluded that students prefer surgical and medical applied subjects over preclinical and paraclinical subjects. At the end of elective posting student has to write the log book and submit the project report. Students of block one worked through pair and presented their work as a seminar. More than 50 seminars were conducted in every block. It was observed that the activity helped them to refine their statistical methods and formative assessment was carried out. This result is similar to the reports published by the Kandi.<sup>6</sup> A study by Banerjee reported that for international health it is important to give early exposure to undergraduate students about the possibilities of electives in the area of interest.<sup>7</sup>

**Table 1: Distribution of students as per the workload domain**

Workload Domain	Block one of the elective posting (n=86) (%)	Block two of the elective posting (n=86) (%)	Significance
Workload was high	23.2 (20)	25.5 (22)	Non-significant
Programmatic content had too many topics	21.4 (18)	31.9 (27)	Non-significant
Had enough time to study the topic allotted in the elective posting	68 (58)	74.5 (64)	Non-significant
Had a high burden to perform	23.25 (20)	31.9 (27)	Non-significant
The work of elective was not bothering them in the understanding of topic	71.5 (61)	74.5 (64)	Non-significant
Have attended more than 75% of classes for elective	56 (48)	44.7 (38)	Non-significant
Have studied for elective more than twice in a week	28.6 (25)	48.9 (42)	P=0.012, 6.259

**Table 2: Distribution of students as per the satisfaction toward two blocks of elective**

Satisfaction in students toward elective domain	Block one of the elective posting (% of students who had given score of 5 and more on 0-10 scale) (n=86) (%)	Block two of the elective posting (% of students who had given score of 5 and more on 0-10 scale) (n=86) (%)	Significance
Satisfied with content	66.1 (57)	56.1 (48)	Non-significant
Satisfied with faculty	75 (65)	74.5 (64)	Non-significant
Satisfied with workload	70 (60)	62.3 (54)	Non-significant
Satisfied with the assessment method	74 (64)	76 (65)	Non-significant
Satisfied with research activities	66 (57)	84 (75)	P=0.002, 9.414
Satisfied with duration of elective	68 (58)	59 (51)	Non-significant

**Table 3: Distribution of students as per the class typology preferences**

Class typology preference	Block one of the elective posting (n=86) (%)	Block two of the elective posting (n=86)	Significance
Theory	41 (35)	23 (20)	P=0.02, 5.238
practical	40 (34)	42 (36)	Non-significant
Seminar	65 (56)	62 (53)	Non-significant
Theory-practical combination	52 (45)	52 (45)	Non-significant
Visit	54 (46)	41 (35)	Non-significant
Survey	51 (44)	53 (46)	Non-significant
Theory practical seminar combination	68 (58)	72 (62)	Non-significant

**Table 4: Distribution of students as per the level of efforts put in the elective posting blocks**

The level of effort in six dimensions of the elective	Block one of the elective posting (n=86) (% of students who had given score of 5 and more on 0-10 scale) (%)	Block two of the elective posting (n=86) (% of students who had given score of 5 and more on 0-10 scale)	Significance
Mental effort was required	96.45 (83)	100 (86)	Non-significant
Physical effort	87.5 (75)	96 (83)	Fischer exact 0.04, 3.84
Temporal effort	80.3 (69)	98 (84)	Fischer exact 0.0003, 11.59
Accomplishment of aims of elective in terms of success	82.1 (71)	78 (67)	Non-significant
Had put more than usual efforts to accomplish results	82.1 (71)	92 (79)	Non-significant
They were frustrated or stressed at some point while doing elective posting	41.1 (35)	64 (55)	0.003, 8.4136

In block two of elective posting, it was observed that students were more engaged in survey and interview methods of data collection. A total of 10 project surveys were carried out after taking the permission from head and Board of research studies of the institute during Block 2 of elective posting. The sensitization and statistical hands on training can be the reason for uptaking more surveys during the second block.

In our study, it was observed that there was no statistically significant difference between the workload between the two blocks; however, we observed that the amount of time dedicated for study by students was more during block two of elective. The increased duration of the study can be due to overall efforts required in the block two elective involving patients. This is similar to the study done by Khilnani and

**Table 5: Distribution of students as per the research activities carried out**

Research activities	Block one of the elective posting (n=86) (%)	Block two of the elective posting (n=86) (%)	Significance
Presented in an internal meeting	66.1 (57)	63.8 (55)	Non-significant
Registered for an academic conference	71.5 (61)	53.2 (46)	0.0276, 4.8472
Not publishing their work anywhere	76.8 (66)	78.8 (68)	Non-significant
Registered their projects with the board of research studies of the institution	71.4 (61)	76.6 (66)	Non-significant
Conducted statistical analysis on their project work	41.1 (35)	55.3 (48)	Non-significant
Planning to present their work in external academic conference	32.1 (28)	53.2 (46)	0.0088, 6.8544
Applied for grant for their projects	1 student	1 student	Non-significant

**Table 6: Distribution of participants as per the perception regarding the quality of elective**

Perceptions regarding quality of elective domain	Block one of the elective posting (n=86) (%)	Block two of the elective posting (n=86) (%)	Significance
Students were having elective posting as expected	40 (36)	35 (30)	Non-significant
Students were provided enough of study material and bibliography material for elective	66.1 (57)	65.9 (57)	Non-significant
Elective was a pleasant and useful learning experience for them	76.8 (66)	80.8 (69)	Non-significant
Faculty was successful to encourage them to work independently about the theme of elective	75 (65)	74.5 (64)	Non-significant
Assessment method of elective was appropriate	75 (65)	76.6 (66)	Non-significant
Would recommend the block of elective to their colleagues	69.6 (60)	76.5 (66)	Non-significant
Will choose again the elective for coming professional session	58.9 (51)	75 (65)	0.003, 4.4748

Thaddanee in the year 2022.<sup>8</sup> They found that designing and implementation patterns between the electives of preclinical and clinical subjects showed significant statistical difference. Students report more efforts during the electives of clinical subjects.

We observed that there is a similar level of quality of electives as perceived by students. We noted that there is a statistically significant difference when a student has been given a choice to repeat the elective again in the next phase of undergraduate training between the two blocks. Most of the students wanted to repeat the block two elective consisting of clinical and surgical subjects. This is similar to a study done by Kusurkar and Croiset in the year 2014, which reported that students prefer clinical subjects over paraclinical subjects in their elective postings.<sup>9</sup>

In our study, it was noted a statistically significant difference between the satisfaction toward the research activities in blocks one and two. Around three-fourth of the students reported satisfaction toward research activities in block two and only 57% reported satisfaction in block one. Sensitization toward research and statistics in the first block of elective and statistical help was provided to them in both blocks. This can be the reason for the satisfaction and intent to present their work in various seminars. We also observed that a statistically significant difference was present in block one and two of the elective for the domain presenting the work to external academic meetings. This was a similar

study of Ramalho et al., in the year 2020 stating that satisfaction increases during the research implementation part of elective.<sup>10</sup> Another study done by Mahajan and Singh reported similar results stating that students find the opportunity to carry out research more enriching if they have proper training with foundation statistics.<sup>11</sup>

We observed that there was a significant statistical difference present for class typology. In block two of elective posting, very few students reported preference toward theory-based learning method whereas the combination method was highly preferred in both selectives. This was similar to the systematic review done by Agarwal et al., in the year 2015.<sup>12</sup> A study done by Maki and Maki in the year 2003 reported higher satisfaction among students if learning methods are diverse and flexible nature than didactic or classroom teaching and learning method.<sup>4</sup>

We found that during block two of elective posting more than half of students were feeling frustrated at some point of time when compared with block one. This was statistically significant. We also observed that students reported a high level of physical and temporal effort during the block two of elective posting. This was statistically significant. This can be the reason for frustration. The reason are different from the results obtained by Mahajan in the year 2020 and Kumar and Zayapragassarazan in the year 2013.<sup>13,14</sup>



In our study during the SWOT analysis (Strength, weakness, opportunity, and threat analysis) of block one and two we found out various domains. The strength of block one was under the domain of skill enhancement and field and practical skills of survey and data. This was similar to reports by Mathur et al., in the year 2022.<sup>15</sup>

The weakness of block one was the overlapping of regular and elective classes as regular clinical posting was underway. The threat to block one was topics turning theoretical. The challenge identified by the student in block one was time management.

Students in the elective program's second block identified the application of research and statistical skills in practice as strength. The opportunity that the students identified fell under the category of assistance and demonstration. Lack of leadership capabilities and overlap between research and clinical exposure were the challenges noted in block two. Students' direct observation assessment patterns for block two's threat were identified. In a study done by Salam and Zainol in the year 2022 reported that continuous assessment using direct observations is a better way to carry out assessment in electives.<sup>16</sup> In another study done by Salam et al., in the year 2022, it was concluded that reflective writing will be a better method to carry out assessment in the electives.<sup>17</sup>

A report by Shrivastava and Shrivastava in the year 2021 reported that continuous assessment in the manner of formative assessment should be the method of assessment in the electives.<sup>18</sup> An article by Lumb and Murdoch-Eaton reported that elective posting in the undergraduate medical education is an opportunity for students to gain practical insights about workload and managerial skills.<sup>19</sup> In our study, it was observed that elective posting helps students to expose themselves to various non-curricular challenges like managerial and leadership skills.

### Limitation of the study

This study being cross-sectional in nature carry the limitation of time. A longitudinal study will be helpful to assess overall impact on the academic performance of elective posting.

## CONCLUSION

This study reported that students participated in research activities and registered for various academic presentations after the end of elective posting. The second block of elective posting was utilized to carry out survey as constant statistical support and hands on was provided in the first block of elective posting.

In the second block of posting, students reported higher levels of frustration and workload than the first block of posting. Students reported preference toward mixed typology of classes for elective posting.

## KEY MESSAGE

The inclusion of elective posting in medical education will lead to an attitude of evidence-based practice due to medical research activities from the early part of academics.

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#### Authors' Contributions:

**BSP**- Definition of intellectual content, literature survey, prepared the first draft of manuscript, implementation of the study protocol, data collection, data analysis, manuscript preparation and submission of article; **SP**- Concept, design, clinical protocol, manuscript preparation, editing, and manuscript revision; **AJP**- Design of study, statistical analysis, and interpretation; **SRD**- Review manuscript; **ARP**- Review manuscript; literature survey and preparation of figures; **MUS**- Coordination and manuscript revision.

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