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Perception of Early Clinical Exposure among Phase I MBBS Students in a Medical College of Rajasthan, India: A Qualitative Study

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TITLE PAGE

Perception of Early Clinical Exposure among Phase I MBBS Students in a Medical College of Rajasthan, India: A Qualitative Study

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Running Title

Perception of Early Clinical Exposure in Phase I MBBS Students

Abstract

Background:

Early Clinical Exposure (ECE), introduced under the Competency-Based Medical Education (CBME) curriculum by the National Medical Commission, aims to integrate basic sciences with clinical practice from the early phases of medical training. It is expected to improve conceptual understanding and promote professional development

Objectives:

This study explored and analyzed the perceptions, experiences, and acceptability of Early Clinical Exposure (ECE) as a teaching-learning method in physiology among undergraduate medical students and faculty through qualitative analysis.

Methods:

This qualitative educational interventional study was conducted among 100 Phase I MBBS students over four months (September–December 2023) in a Government Medical College in Rajasthan. The students were divided into two groups: the ECE group (n=50) and the control group (n=50). Data were collected using structured open-ended questionnaires and faculty feedback forms. Qualitative data were analyzed using thematic analysis.

Results:

More than 85% of the students rated the ECE as highly effective. Thematic analysis revealed improved understanding, better clinical integration, and enhanced professional development among participants.

Conclusion:

The ECE is an effective teaching–learning strategy in physiology that enhances academic performance and promotes early professional development.

Keywords: Early Clinical Exposure, CBME, Physiology, Medical Education, Undergraduate Students

Introduction

In 2019, medical school in India changed a lot with the introduction of Competency Based Medical Education (CBME) (1). Early Clinical Exposure (ECE) is a very important component of this new curriculum and is designed to show how the basics of science relate to actual medical situations right from the beginning of a student's training. (1,2)

First year medical students are expected to get from this early experience a grasp of how essential basic sciences are for diagnosing illnesses, looking after patients and treating them, and also to have a framework which will help them learn the basic sciences more easily. Importantly, they should be motivated to study by what patients are going through. They're also meant to understand that being professional, ethical and having the right approach matters in a doctor's relationship with the person they are treating, and to discover the social and cultural factors that influence sickness through the study of the humanities. (1)

The study looked at what medical students and faculty think about Early Clinical Exposure (ECE) as a way to teach and learn physiology, and how they experience it, using a qualitative approach. Physiology and similar subjects are usually taught separately from actual medical practice, and because of this, students often struggle to use what they've learned in theory when they're with patients (3). ECE solves this problem by linking what happens in the classroom to what happens in a real clinical environment (2, 3). It also helps students grasp the AETCOM module, which the NMC (National Medical Commission) requires. In fact, ECE connects classroom work and clinical practice (2, 3) and, in doing so, supports the development of professionalism, empathy, communication abilities, and a fuller

understanding of the NMC's AETCOM module. However, even though it's beneficial, setting up ECE isn't always easy. Getting different departments to work together, training instructors and handling practicalities are all difficulties (5, 9).Through qualitative analysis, this study investigated and examined undergraduate medical students' and faculty members' opinions, experiences, and acceptability of Early Clinical Exposure (ECE) as a physiology teaching-learning technique.

Objectives

1. To explore and analyze the students' perceptions regarding the understanding and clinical relevance of Early Clinical Exposure (ECE) as a teaching-learning method in physiology.

2. To assess faculty perceptions regarding the feasibility and challenges of Early Clinical Exposure (ECE).

Methodology

Study Design and Setting

This was a qualitative educational interventional study conducted at a Government Medical College in Rajasthan, India.

Participants

One hundred first-year MBBS students and eight faculty members from Departments of Physiology and allied clinical departments attended the study. Participants got informed about the objective of the study and gave written consents. Institutional ethics committee (IEC) provided ethical clearance for the project.

Ethics Approval:

The study was conducted after obtaining approval from the Institutional Ethics Committee of the concerned [Name of Institution], medical college in Rajasthan, India. (Approval No.:)

Consent to Participate:

Written informed consent was obtained from all participating Phase I MBBS students prior to participation in the study. Participation was voluntary, confidentiality of responses was

maintained, and participants were assured that their academic evaluation would not be affected by their decision to participate or withdraw from the study at any stage.

Intervention

From September to December 2023, three modules for the ECE program were designed and implemented. Each session consisted of three hours of teaching, following the requirements in the NMC Competency-Based Undergraduate Curriculum. Each teaching session was made up of 30 min of introduction and instructions, 1 h 30 min of guided clinical experience (small group teaching in the ward/OPDs), 30 min of summary and conclusion, and 30 min of reflection (1).The students were divided into two groups of 50 each.

- **ECE Group (n = 50):** Exposed to early clinical exposure sessions.
- **Control Group (n = 50):** These students were taught the same topics through didactic lectures

Data Collection

Data were collected using the following methods:

- A pre-structured, self-administered electronic questionnaire containing open-ended questions for students was used.

  Process of validation of a questionnaire: Pre-validated questionnaire was used to take the opinion of students and faculty members about ECE.A pilot study were done using the same questionnaire on a different set of students and faculty (who were not a part of the study group). After conducting a pilot session the questionnaire was amended and the final version was based on unanimous decision by the expert group.

  In addition the test retest reliability was calculated using correlation of scores.

  The same set of MCQs was given to the study and the control group that were internally validated by peer review.

- Faculty feedback forms capturing their perceptions of the implementation of ECE as a teaching-learning method.

The questionnaires were shared electronically with the participants using ‘Google forms’

Data Analysis

Qualitative data were analyzed through thematic analysis. Responses were sorted, classified, and grouped into themes based on response patterns. Faculty feedback was analyzed through the same process to find common perceptions and issues.

Results

This qualitative study aimed to understand the perceptions of students and faculty about the implementation of the ECE modules in Physiology among 100 first-year MBBS students.

Student Perceptions

Over 85% of students rated ECE as a "Very Good" to "Excellent" method of teaching. Sixty-two percent expressed eagerness to learn more topics through ECE, and 52% rated the faculty guidance as excellent.

Feedback from the students about ECE

The feedback received form the students about ECE as a teaching learning method can be seen in **Table 1, Figure 1**.The mean score of the participants ranged from 3.12 to 4.44.More than 85% of the students rated the programme from Very Good – Excellent. More than 50 % of the students felt that ECE created more interest in the subject/ topic, causing better retention and recall of the study material in comparison to being taught by only didactic lectures. Most of them were eager to learn other topics through this intervention (62%) and found the involvement and guidance provided by the faculty members conducting the ECE to be excellent (52%).

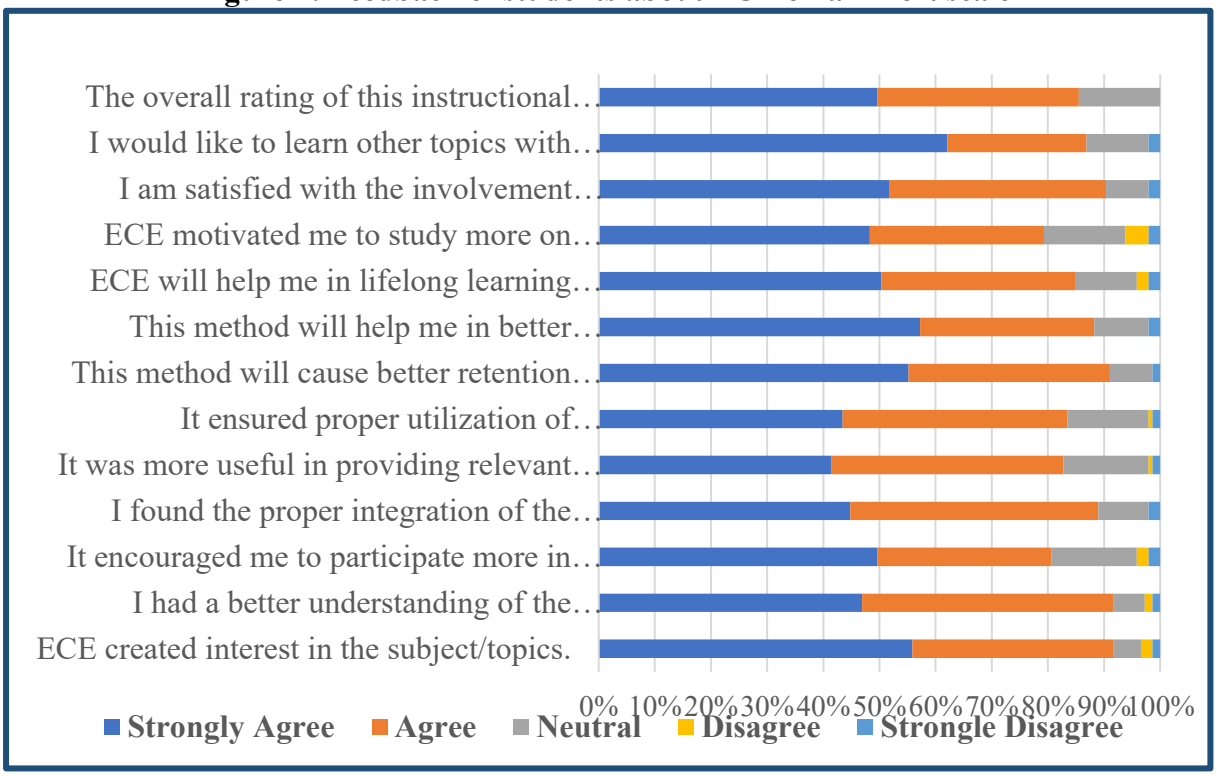
Table 1: Feedback of students about ECE on Likert Scale (N=145)
(Values are presented as number of students with percentage given in brackets)

Q. No	Description	Mean Score	5	4	3	2	1

1	ECE created interest in the subject/topics.	4.42	81 (56)	52 (36)	7 (5)	3 (2)	2 (1)
2	I had a better understanding of the topics by incorporation of ECE	4.34	68 (47)	65 (45)	8 (5.5)	2 (1.5)	2 (1)
3	It encouraged me to participate more in such type of teaching methods	3.12	72 (50)	45 (31)	22 (15)	3 (2)	3 (2)
4	I found the proper integration of the knowledge between basic and clinical sciences	4.29	65 (45)	64 (44)	13 (9)	0	3(2)
5	It was more useful in providing relevant subject material	4.20	60 (42)	60 (42)	22 (15)	1 (0.7)	2(1.3)
6	It ensured proper utilization of resources (i.e. Clinical material).	4.23	63 (43.5)	58 (40)	21 (14.5)	1(0.7)	2(1.3)
7	This method will cause better retention of topics than lecture classes.	4.43	80 (55)	52 (36)	11 (8)	0	2(1)
8	This method will help me in better recalling of the topics.	4.41	83 (57)	45 (31)	14 (10)	0	3(2)
9	ECE will help me in lifelong learning of the	4.28	73 (50.5)	50 (34.5)	16 (11)	3 (2)	3 (2)

	topics when integrated with applied aspects						
10	ECE motivated me to study more on that specific topic	4.19	70 (48.5)	45 (31)	21(14.5)	6 (4)	3 (2)
11	I am satisfied with the involvement and guidance of teacher in ECE.	4.37	75 (52)	56 (38)	11 (8)	0	3 (2)
12	I would like to learn other topics with this intervention i.e. ECE.	4.44	90 (62)	36 (25)	16 (11)	0	3 (2)
13	The overall rating of this instructional method	4.35	Excellent 72 (49)	Very Good 52 (36)	Good 21 (15)	Poor 0	Very Poor 0

Figure 1: Feedback of students about ECE on a Likert scale



Feedback from the faculty members

Total 8 faculty members from various departments of the institute were involved in implementing the 3 modules of ECE as a part of this study. The feedback received from them on a Likert scale can be seen in **Table 2, Figure 2**.All the statements except one had a mean score of more than 4.More than 75% of them found this medium of instructions to be Excellent overall. They felt that ECE resulted in better understanding of the subject by the students, significantly improving the teacher-student interaction in the process. A very high percentage of faculty members (87.5%) found the response of the students to ECE to be enthusiastic. .However around 50% felt that some sort of training needs to be provided to the faculty members for conducting the ECE and expressed concern about co-ordination with the clinical departments for effective implementation of ECE. Some of the faculty members (3/8) also felt that ECE was a time consuming method of teaching-learning and cannot be considered feasible for all the topics.

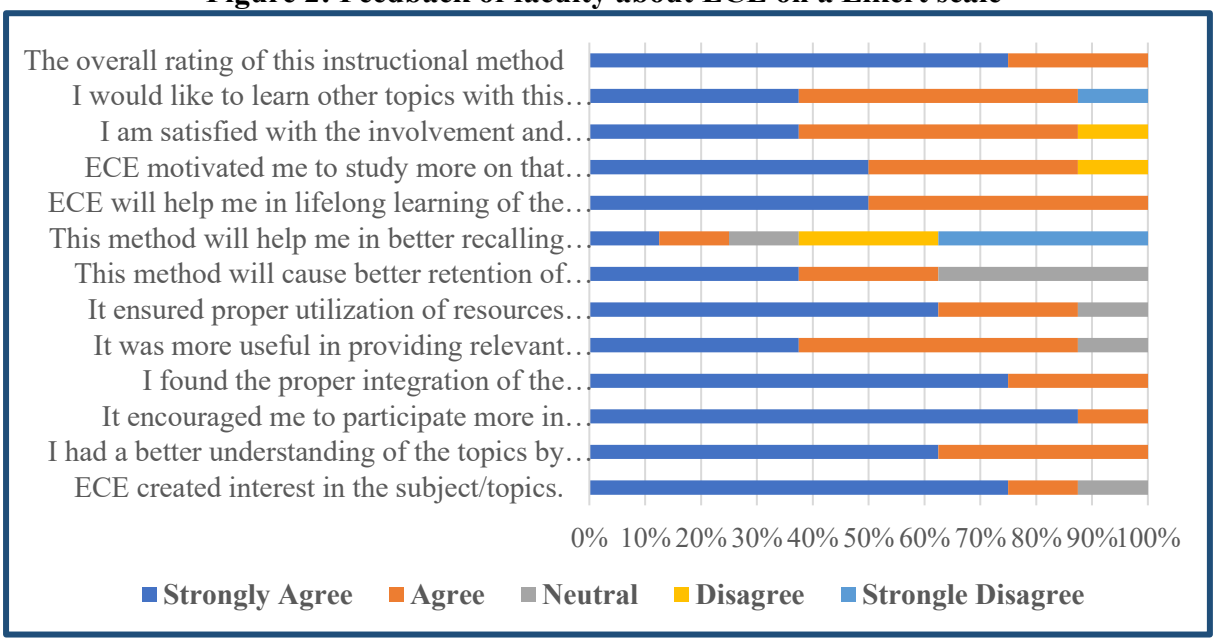
Table 2: Feedback of faculty about ECE on Likert Scale (N=8)

(Values are expressed as absolute numbers with percentage in brackets)

Q. No	Description	Mean score	5 Strongly Agree	4 Agree	3 Neutral	2 Disagree	1 Strongly Disagree
1	ECE has resulted in better understanding of subject in students	4.37	6 (75)	1 (12.5)	1(12.5)	0	0
2	ECE encouraged active participation of students in learning the subject of anatomy	4.62	5 (62.5)	3(37.5)	0	0	0
3	The response of the students to the ECE was enthusiastic	4.87	7(87.5)	1(12.5)	0	0	0
4	ECE Improved student teacher interaction	4.75	6 (75)	2 (25)	0	0	0
5	ECE satisfies the current disciplinary, interdisciplinary and expectations of MCI	4.25	3(37.5)	4 (50)	1(12.5)	0	0

6	ECE can be incorporated in routine teaching	4.5	5(62.5)	2(25)	1(12.5)	0	0
7	ECE needs more manpower	4	3(37.5)	2(25)	3(37.5)	0	0
8	ECE is burden to the faculty.	2.37	1(12.5)	1(12.5)	1(12.5)	2(25)	3(37.5)
9	For ECE there may be concern over coordination with clinical departments	4.5	4(50)	4(50)	0	0	0
10	Some level of training is required to the faculty for conduct of ECE	4.25	4(50)	3 (37.5)	0	1(12.5)	0
11	ECE is time consuming.	4.12	3(37.5)	4(50)	0	1(12.5)	0
12	ECE is not feasible for all topics.	4	3(37.5)	4(50)	0	0	1(12.5)
13	The overall rating of this instructional method	4.75	Excellent 6(75)	Very Good 2(25)	Good 0	Poor 0	Very Poor 0

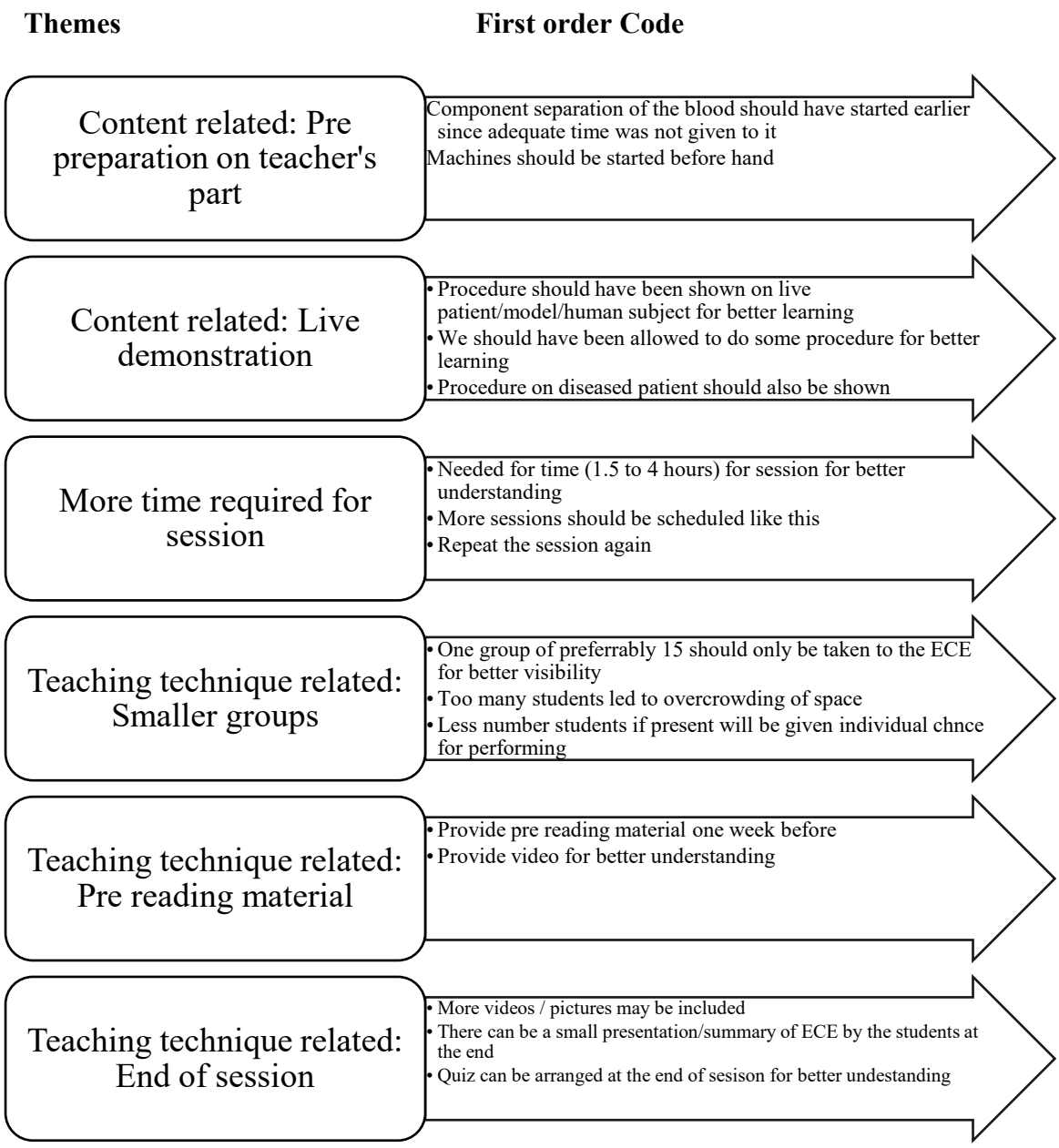
Figure 2: Feedback of faculty about ECE on a Likert scale



The questionnaire that was filled by the students and faculty after the ECE session also asked for suggestions (minimum 2) for improvement of the ECE sessions.

Qualitative analysis of suggestions taken from students for the session

Figure : Summary of codebook refinement and final theme determination



Thematic Analysis of Student Responses

The qualitative analysis identified four primary themes.

1. Understanding of the Subject Students expressed that the previously complex ideas were clearer and easier. It helps with a deeper understanding of the subject. ECE makes it easier to understand the subject.
2. Integration of Clinical Education As a bridging theory and practice, a lot of students see ECE. It helps with bridging the gap between clinical practice and theory. ECE connects the clinical and preclinical domains.

3. Professionalism and Attitude
Students admitted that their professional identities were greatly influenced by their early exposure to patient care. It offers an intimate look at the reality of patient care. It aids in the development of professionalism and attitude.
4. Improvement Opportunities

<u>Suggestions for improvement of the session by students:</u>

1. a) The blood's component separation should have begun sooner because there wasn't enough time for it; b) The actual blood donation procedure should have been carried out rather than just explained theoretically; c) Each group should have fewer students to avoid crowding; no group should have more than five or six students at once; d) The lesson should be repeated to increase comprehension; e) Historical information about blood donation should be included to make it more engaging; and f) More ECE sessions should be scheduled to cover more subjects.
2. Rather than merely providing theoretical explanations, the real blood donation procedure need to have been carried out.
3. To avoid overcrowding, each group should have had fewer students—no more than five or six at a time.
4. To increase comprehension, the session ought to be repeated.
5. To make it more engaging, historical information about blood donation should be provided.
6. To cover more subjects, more ECE sessions must be scheduled.

- Instead of just a presentation, students' understanding may be assessed following the session through a quiz, multiple-choice question, or group discussion.
- Students should get the module, readings, and PowerPoint at least one week prior to the scheduled class.
- There might be more images or movies.
- At the conclusion, the students may give a brief presentation or overview of ECE.

Suggestions for improvement of the session by faculty

1. More time is required to conduct the session
2. ECE should occur at least once every month.

Discussion

According to the current study, Early Clinical Exposure (ECE) significantly improves first-year MBBS students' cognitive and affective learning domains. This suggests that early integration of clinical context improves comprehension and retention of physiological concepts, which is consistent with the tenets of Competency-Based Medical Education (1).This study found that ECE's capacity to encourage contextual and experiential learning is one of its main advantages. The clinical application of traditional lecture-based techniques is limited because they frequently convey physiological principles in isolation (3). On the other hand, ECE makes it possible for students to apply theoretical information to actual clinical scenarios, which enhances their understanding and applicability, consistent with experiential learning theory proposed by Kolb (6). In addition to improving cognitive outcomes, the ECE significantly contributes to professional development. Early exposure to patients and clinical environments helps students develop empathy, communication skills, and a sense of responsibility towards patient care, which is consistent with the literature on professional identity formation (4,12). The findings further show that the ECE facilitates integration between preclinical and clinical disciplines. Students reported an improved ability to correlate theoretical concepts with clinical applications, reflecting the benefits of integrated teaching approaches (7).

The results also show that the ECE makes it easier for preclinical and clinical fields to integrate. The advantages of integrated teaching methods were demonstrated by the students' increased capacity to link theoretical ideas with practical applications (7). The development of clinical reasoning abilities and the preparation of students for patient-centered care depend on this early

integration.

The ECE makes a significant contribution to professional development in addition to enhancing cognitive outcomes. According to research on professional identity formation, early exposure to patients and clinical settings fosters students' development of empathy, communication skills, and a sense of responsibility for patient care (4,12).

The high degree of student satisfaction found in this study further supports the efficacy of the ECE. The majority of students preferred interactive and clinically oriented learning over traditional lectures, which is consistent with evidence that active learning strategies significantly improve student performance and retention (10). The demand for more frequent sessions, smaller group teaching, and hands-on participation reflects the learners' evolving expectations. However, the implementation of ECE is associated with a number of practical challenges. Faculty members reported increased workload, time constraints, and the need for improved departmental coordination, findings that are consistent with previous reports (5,9). The majority of students favoured interactive, clinically focused instruction over standard lectures, which is consistent with research showing that active learning techniques greatly improve student performance and retention (10). The students' changing expectations are reflected in the demand for more frequent sessions, smaller group instruction, and hands-on involvement.

However, there are a number of real-world difficulties with ECE implementation. In line with previous assessments, faculty members cited increased workload, time restrictions, and the need for improved departmental cooperation (5,9). These difficulties emphasize the value of faculty development initiatives and institutional assistance.

Notwithstanding its strengths, this study has limitations, such as its single-center design, convenience sampling, and focus on short-term outcomes. Future research should include multicentric studies and long-term evaluation of clinical competence achieved through implementation of ECE. Overall, Early Clinical Exposure emerges as a transformative teaching–learning strategy that enhances understanding, promotes the integration of knowledge, and fosters professional development, closely aligning with the goals of CBME. Participants suggested improving session quality through smaller groups, increased frequency, live demonstrations, and the use of audio-visual aids Learning results could be further improved by using formative assessment techniques (10).

This study has drawbacks despite its positives, such as its convenience sampling, single-

center design, and emphasis on short-term results. Multicentric studies and long-term assessments of clinical competency attained through ECE adoption should be included in future research.

All things considered, Early Clinical Exposure shows itself to be a revolutionary teaching-learning approach that strengthens comprehension, encourages information integration, and cultivates professional growth, all of which are strongly related to the objectives of CBME.

Conclusion

Early Clinical Exposure is an effective teaching–learning strategy in physiology that enhances understanding, clinical application, and professional development. With appropriate planning and institutional support, it can be successfully integrated into undergraduate medical education (1,10).

Declarations

Ethics approval and consent to participate

The study was conducted after obtaining approval from the Institutional Ethics Committee (IEC) of ESIC Medical College & Hospital, Faridabad, India. The study involving human participants was conducted in accordance with the ethical principles of the Indian Council of Medical Research (ICMR) National Ethical Guidelines for Biomedical and Health Research Involving Human Participants (2017) and the Declaration of Helsinki. Written informed consent was obtained from all participating Phase I MBBS students prior to enrolment in the study.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

SK conceptualized and supervised the study. SZA contributed to study design, data interpretation, and manuscript review. US collected data, performed thematic analysis, and drafted the manuscript. All authors read and approved the final manuscript.

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Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryQuestionnaireECE.pdf