

## Effectiveness of Early Clinical Exposure (ECE) as a teaching-learning method for first-year MBBS undergraduates in basic medical sciences

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Received: 03-09-2021 / Revised: 18-10-2021 / Accepted: 12-11-2021

### Abstract

**Introduction:** In Competency-Based Undergraduate Curriculum Module-2, 2019 for Indian Medical Graduate (IMG) stated that Early Clinical Exposure (ECE) provides a reference to basic science learning so that students can understand the applicative aspects of learning. This methodology orients students towards actual clinical scenarios & helps them to correlate their theoretical knowledge with real-life in the management of patients. **Methodology:** This was a prospective cross over study carried out at Al-Falah School of Medical Sciences & Research Centre, Dhauj, Faridabad. The Institutional Ethical committee has approved the study. A total number of 150 First year MBBS undergraduates participated in the study as the study group. ECE is a part of undergraduate Curriculum phase-1 in CBME. Students were sensitized to the method of ECE & the purpose of ECE was explained to them. Consent was taken from the participants. All first-year MBBS undergraduates were divided into two groups of 75 student (i.e., A & B) according to their class roll numbers. Preliminary lectures on Liver Function Tests, Renal Function Tests and Cardiac Profile Tests & Acid-Base disorders were conducted as per schedule. In Session-1, Clinical case study (ECE) of Acid-Base disorders were taught to Group A and Acid-Base disorders were taught by (Non ECE) Tutorial method to Group B. Likewise the Clinical case study (ECE) of Jaundice were taught to Group B & Jaundice was taught by (Non ECE) Tutorial method to Group A. Assessment of all the students was done by post-session MCQ test. In Session-2, Clinical case study (ECE) of Renal Function Tests were taught to Group A & Renal Function Tests were taught by (Non ECE) Tutorial method to Group B. Likewise the Clinical case study (ECE) of Myocardial Infarction were taught to Group B & Myocardial Infarction was taught by (Non ECE) Tutorial method to Group A. Assessment of all the students was done by post-session MCQ test. **Conclusion:** In Biochemistry ECE helps students to be aware of the clinical and diagnostic relevance of the subject. Successful implementation of ECE enhances performances of first-year undergraduate students in basic medical sciences.

**Keywords:** Early Clinical Exposure, Teaching-learning method, Competency-Based Undergraduate Curriculum.

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### Introduction

In Competency-Based Undergraduate Curriculum Module-2, 2019 for Indian Medical Graduate (IMG) stated that Early Clinical Exposure (ECE) provides a reference to basic science learning so that students can understand the applicative aspects of learning. This methodology orients students towards actual clinical scenarios & helps them to correlate their theoretical knowledge with real-life in the management of patients.

Biochemistry, Physiology and Anatomy subjects are the foundation of medicine. It is one form of vertical integration between basic sciences, clinical Subjects and also a method of modifying the curricula to meet tomorrow's needs. It enhances the learning of health illness or disease & the role of the health care professional [1]. ECE as a hegemonic educational model has been adopted by many medical colleges throughout the world to close the gap between basic and clinical sciences [2&3]. ECE plays an integral role in the initiation of students into medicine [4].

### Aims & Objectives

1. To compare the conventional teaching-learning method to the recently proposed teaching-learning method i.e., ECE in Competency-Based Medical Education.
2. To obtain a perception of Students about ECE.
3. To study the improvement in understanding of basic sciences by integrating with clinical cases.

### Methodology

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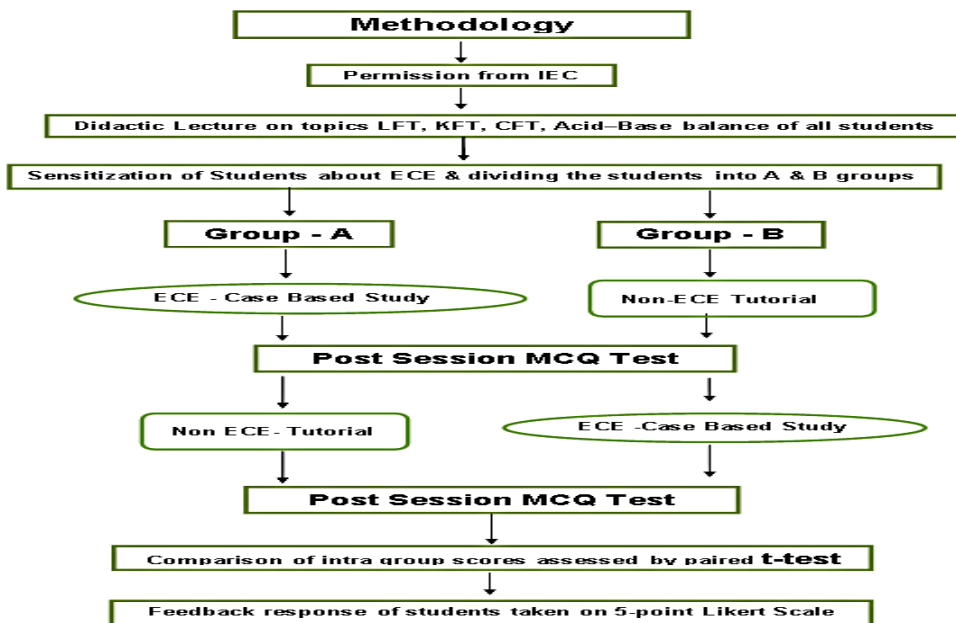
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Infarction was taught by(Non ECE) Tutorial method to Group A. Assessment of all the students was done by post-session MCQ test. Feedback on ECE was collected from students; the performance of the same student with ECE was compared to that without ECE by paired

t-test. Then p-value was analysed to know the significance of the ECE method. Then the attitude of students was tested by perception about ECE by feedback questionnaire with Five Point Likert scale. The data was analysed in percentage.

**Results**

A total number of 150 First year MBBS undergraduate students & four faculty members from the Department of Biochemistry have participated in the study. The list of variables, the measurement scale & methods used have been shown in Table-1.



**Table 1: List of variables, the measurement scale & methods used**

No	Variable	Measurement method	Measurement Scale
01	Knowledge	MCQs	Scores
02	Attitude	Questionnaire	Percentage

The Descriptive Analysis of Mean with Standard Deviation of individual groups is presented in Table-2 & 3. Marks obtained by each group were statistically significant when compared by paired t-test. The p-values for group A 0.6052 (Session-1), 0.2072 (Session-2) and for group B 0.030 (Session-1), 0.0341 (Session-2) were calculated. The p-value for group B is significant and insignificant for group-A.

**Table 2: Statistical analysis- Group A**

MCQs	Group A ECE Group Mean+/-SD	Group A Tutorial group Mean+/-SD	Value of 't' test	p-value
Session 1	5.55±0.87	5.40±2.35	0.51 df=148	0.6052
Session 2	5.04±2.05	4.63±1.91	1.26 df=148	0.2072

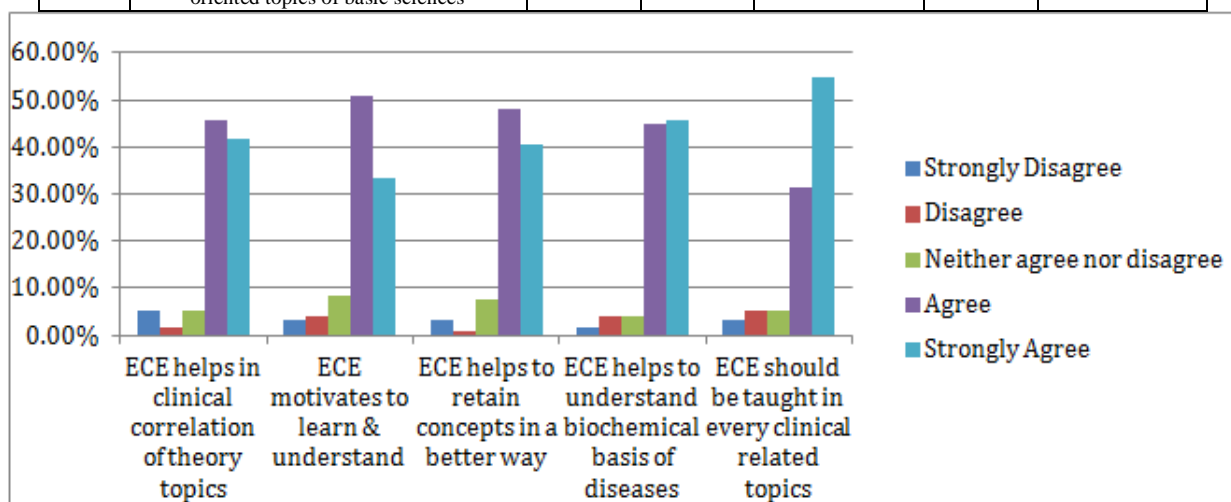
**Table 3: Statistical analysis- Group B**

MCQs	Group B ECE Group Mean+/-SD	Group B Tutorial group Mean+/-SD	Value of 't' test	p-value
Session 1	6.16±1.97	6.9±2.18	2.17 df=148	0.030
Session 2	5.25±1.8	4.63±1.75	2.13 df=148	0.034

The perception of first-year MBBS undergraduate students about ECE was assessed by questionnaires. Most of the students find the ECE helpful in learning a particular topic. In the student’s feedback questionnaire, 87 % of students agreed that ECE helps in the clinical correlation of theoretical topics while 84% of students agreed that the ECE method motivates them to learn and understand the topic. 88% of students agreed that the ECE method helped them to retain the concepts in a better way while 90% of students felt that ECE helps them to understand the significance of the biochemical basis of different diseases. 85% of students believed that ECE should be taught in every clinically oriented topic of basic medical sciences. Students’ Feedback on ECE (5 point Likert scale) has been shown in Table 4 & Fig 2.

**Table 4: Students’ Feedback on ECE (5 point Likert scale)**

S. No.	Questions	Strongly Disagree n (%)	Disagree n (%)	Neither agree nor disagree n (%)	Agree n (%)	Strongly Agree n (%)
01	Early clinical exposure helps in clinically correlation of theoretical topics	7 (5.4)	2 (1.6)	7(5.4)	60(45.7)	55 (41.9)
02	This method motivates me to learn & understand the topic better	4 (3.1)	5 (3.9)	11(8.5)	67(51.0)	44 (33.5)
03	ECE helped me to retain the concepts in a better way	4 (3.1)	1 (0.8)	10 (7.7)	63(48.0)	53 (40.4)
04	ECE helps me to understand biochemical basis of clinical features of different diseases	2 (1.6)	5 (3.9)	5 (3.9)	59(44.9)	60 (45.7)
05	ECE should be taught in every clinically oriented topics of basic sciences	4 (3.1)	7 (5.4)	7 (5.4)	41(31.3)	72 (54.8)



**Fig 2: Students’ Feedback response on ECE**

**Discussion**

In the present study paired t-test showed that the performance of students has been significantly improved after ECE among the students in the group B. This shows that ECE helps to understand the topic in a better way. In group A students found that ECE helps to motivate them to study the topic but no significant difference was found in their performance.

The findings of our study were also match with the findings of Dorman T et al and Littlewood S et al which state that early exposure helps medical students to learn and develop a proper attitude towards their studies and develop learning more relevant and influence future options [5&6]. Chari S et al had found that the response of students towards ECE was positive and were full of enthusiasm [7]. Our findings are also in accordance with the study of Rawekar A et al in which they stated that ECE being helpful prospectively in routine clinical postings of MBBS students [8]. In the present study students also agree with the fact that ECE helps in correlating applied aspects of biochemistry. This method should be taught along with regular lectures in biochemistry and other subjects of basic medical sciences in the first year MBBS curriculum as stated in the study done by Kumar S S et al [9].

Tayade et al in their study showed a significant difference between ECE and Non-ECE groups [10]. Grover R et al also proves ECE as an effective integrating tool and enhances the performance of fresh

medical entrants. Increased motivation of the students with ECE was also seen in the study conducted by Baheti S N et al [11&12].

Indian studies on subjects such as Physiology [10, 13, 14 & 15], Anatomy [15, 16, & 17], Transfusion Medicine, Radiology, Neurology, Nephrology, Respiratory Medicine and General Surgery [4 & 10] have been successfully administered to measure & perceive the effects of ECE in early clinical years.

Kapil Gupta et al also found that ECE helped them in the improvement of knowledge and understand the relevance of Biochemistry in the clinical setup [18].

Miglani A K et al also state that ECE should be adopted as a teaching strategy to introduce various dimensions of medical professions like scientific, ethical, interpersonal, professional and social [19]. The rapid change in the priorities in the health care system is giving rise to corresponding rapid changes in the content and process of medical education. Thus ECE allows higher order of thinking, covering higher levels of the cognitive domain [7]. Importance of ECE can be understood in one line by Benjamin Franklin’s words - “Tell me and I forget, teach me and I may remember, involve me and I learn [20].

**Conclusion**

In Biochemistry ECE helps students to be aware of the clinical and diagnostic relevance of the subject. Successful implementation of

ECE enhances performances of first-year undergraduate students in basic medical sciences.

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**Conflict of Interest: Nil Source of support: Nil**