

# Skill Learning Through Early Clinical Exposure: An Experience of Indian Medical School

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## ABSTRACT

**Introduction:** Indian Medical curriculum being discipline based, there is a line of demarcation between preclinical and clinical subjects. The challenges in medical education include the methods that would enhance the clinical education quality; one such method been Early Clinical Exposure (ECE). ECE can help to instill the skill component of medical education in the first year students helping to minimize the line of demarcation.

Hence this study was undertaken to assess the skill learning of students through early clinical exposure and to collate the perception of them.

**Materials and Methods:** In the present study, students of 1<sup>st</sup> MBBS were exposed to ECE as an adjunct teaching method with

preset modules. They were evaluated by Objectively Structured Clinical Examination (OSCE). Feedback was obtained from 1<sup>st</sup> MBBS and also from the same students after passing the 1<sup>st</sup> MBBS in 4<sup>th</sup> semester.

**Results:** Significant differences in pre and post OSCE scores were noted ( $p < 0.0001$ ). Seventy six percent students rated ECE as an excellent tool. Second year students also perceived ECE held in 1<sup>st</sup> year was helpful to correlate topics and increasing confidence.

**Conclusion:** ECE had an effective influence on learning as manifested in skills gained by the students and their perceptions of ECE being helpful prospectively in their routine clinical posting.

**Keywords:** OSCE, Integrated learning, Feedback

## INTRODUCTION

Clinical exposure is an important part of health professions training. Hospital based educational system has covered a wide variety of learning environments like ward based teaching (including bedside teaching), the learning of technical skills, academic work in a clinical context and use of outpatients [1].

The challenge for health professions education is to look for ways to improve the quality of clinical education by comparing students' understanding and modifying practices of clinical education in new circumstances [1].

In India, the curriculum is mainly discipline based. Medical students for generations spend preclinical years in classrooms, dissection hall and laboratories. They find it hard to understand the importance of preclinical subjects and the purpose of their learning that takes place. They also are not able to relate the concepts of preclinical and clinical subjects, as they are not exposed to patients and their disease states. Teaching them remains in separate academic departments, without integration to interrelate the subjects. They look forward to dealing with patients and interact with them. Exposing medical students to the patients or community at the very first year is the need of current scenario. Early Clinical Exposure (ECE) is nothing but preparing the first year MBBS students to meet and learn from the patients. In MCI Vision 2015 document, there are proposed plans for undergraduate medical education in which ECE is one of the reforms to improve quality of medical education [2].

India is second largest country in population. It has a huge patient load presenting with varied complaints. There are, at present 398 medical schools in India having intake capacity of about 52000 every year [3]. Exposing the students to the varied patient load does not pose a problem in Indian setting. In fact, it can have an added advantage to the students for a firsthand experience and thus leading to deep learning.

So the aim of the intervention was to integrate the knowledge of basic sciences with clinical medicine providing the context for application of their learning in practice and the objectives were to assess the skills acquired through ECE as an adjunct to routine

clinical teaching, to collate the perception of students regarding utility of early clinical exposure and to integrate the knowledge of the basic science and clinical medicine through ECE.

## MATERIALS AND METHODS

The study design was longitudinal randomized interventional study. Approval of the study was obtained by Institutional Ethics Committee.

The study was conducted in the Department of Physiology, Jawaharlal Nehru Medical College and Acharya Vinoba Bhave Rural (AVBR) Hospital, Sawangi (M) Wardha; Maharashtra; India.

The study duration was two years. Study population included 150 students of 1<sup>st</sup> MBBS of which 75 students were selected as cases by simple random sampling and 75 as controls. Fifty students were randomly selected from 2<sup>nd</sup> MBBS. Written informed consent was obtained from participants.

## INTERVENTION

Students of 1<sup>st</sup> MBBS have traditional teaching schedule of Clinical Physiology as practical's in which they are taught clinical examination on normal subjects.

In our study, we exposed the study group students of 1<sup>st</sup> MBBS to ECE method as a supplement to above teaching schedule. The ECE was scheduled in the evening after their college timing (i.e. 5 pm) for about 2 hours. Heads of Department of Physiology, Medicine and Paediatrics mutually finalized the schedule of the ECE. Exposure of clinical settings was given to the students by regular hospital visits (Medicine and Paediatrics wards). Four modules were prepared namely on Cardiovascular Physiology, Respiratory Physiology, Gastrointestinal Physiology and Haematology with relevant inputs from clinicians imparting clinical teaching. They were requested to expose the students to the relevant patients mainly from the systems mentioned above and discuss important symptoms and elicit the related clinical examination/findings on the patients.

Three groups were formed with 25 students in each group. Three facilitators from Department of Physiology and three clinicians from

the department of Medicine and Paediatrics were involved for each group which was then subdivided in 3 groups. The dropouts from each group were made into separate group and ECE was conducted for them also.

To assess whether the skills gained through ECE helped the students in the Physiology classes of clinical examination, OSCE (Objectively structured Clinical Examination) was arranged before and after the intervention and also for the control group. Ten OSCE stations were created with nine procedural stations incorporating psychomotor and affective skills and one station was response station for cognitive component.

**Control group:** The control group was given the routine teaching of clinical physiology and not exposed to ECE.

After the study was completed and OSCE and feedback were taken, control group was also exposed to ECE.

Students when they reached 2<sup>nd</sup> MBBS (4<sup>th</sup> Semester), perception of randomly selected 50 participants were taken for usefulness of ECE for their prospective learning.

Data was collected which then categorized into quantitative and qualitative.

## A. Quantitative Data

### 1. OSCE (Objectively Structured Clinical Examination) - Pre and post test:

Before starting the intervention, pretest was given by arranging OSCE (Objectively structured Clinical Examination). Ten OSCE stations were created. Same pre-test was organized for control group.

After the intervention, posttest was conducted on the same OSCE stations for study and control groups and scores of pre and post OSCE were analysed.

### 2. Perception (closed ended items):

- First perception of ECE was recorded by taking feedback on 13 closed ended items on 5 point Likert scale (n=75).
- After one year, the second perception was gathered from the same students (n=50) after their routine clinical posting (2<sup>nd</sup> phase MBBS students – 6 closed ended items)

## B. Qualitative Data:

- Perception (open ended items): First perception of ECE was recorded by taking feedback on two open ended items for first MBBS students.
- Perception (open ended item): Second perception of ECE was recorded by taking feedback on one open ended item of second MBBS students.

## STATISTICAL ANALYSIS

Microsoft office Excel 2007 and SPSS (version 16) were used for data analysis. Scores were reported as means+SD. Pre and post OSCE scores were analysed using students t-test. Statistical significance was assessed as p-value less than 0.001.

## RESULTS

**A. Quantitative Data:** The scores of pre and post OSCE were as follows:

[Table/Fig-1] showed significant difference in the pre and post OSCE scores in control and study group. The post-test scores of the control and study group were also statistically significant as shown in [Table/Fig-2].

### Perception

#### a. Close ended items on feedback from 1<sup>st</sup> year students.

The response rate was 100%. (Students who were absent during feedback session were given the feedback forms in consecutive sessions).

Group	Mean ± SD		p-value
	Pre OSCE	Post OSCE	
Control (n=75)	4.33 ± 0.79	5.08±0.82	< 0.0001
Study (n=75)	4.09±0.76	7.45±0.95	< 0.0001

[Table/Fig-1]: Pre and Post OSCE scores – (Control Group, Study group).

Control group - post OSCE scores (n=75)	Study group – post OSCE scores (n=75)	p-value
5.08±0.82	7.45±0.95	< 0.0001

[Table/Fig-2]: Post OSCE scores of Control and Study group.

The feedback of the students was taken by questionnaire on 13 items on 5 point likert scale after completion of hospital visits. These 5 points were: 1= Strongly Disagree; 2= Disagree; 3= Neutral; 4= Agree; 5= Strongly agree. The questionnaire was validated.

Majority of the students commented that ECE created interest in the subject of Physiology. Out of them, 86% strongly

S No.	Items	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	ECE created interest in the subject/topics.	0	0	2 (2)	12(9)	86 (64)
2	I had a better understanding of the topics by incorporation of ECE.	0	0	4 (3)	24 (18)	72 (54)
3	It encouraged me to participate more in such type of teaching methods.	0	0	7 (5)	12 (9)	81 (61)
4	I found the proper integration of the knowledge between basic and clinical sciences.	0	0	1 (1)	6 (5)	93 (69)
5	It was more useful in providing relevant subject material.	0	0	5 (4)	25 (18)	70 (53)
6	It ensured proper utilization of resources (i.e. Clinical material).	0	0	8 (6)	26 (20)	66 (49)
7	This method will cause better retention of topics than lecture classes.	0	0	2 (2)	10 (7)	88 (66)
8	This method will help me in better recalling of the topics.	0	0	5 (4)	12 (9)	83 (62)
9	ECE will help me in lifelong learning of the topics when integrated with applied aspects.	0	0	2 (2)	18 (13)	80 (60)
10	ECE motivated me to study more on that specific topic.	0	0	1 (1)	15 (11)	84 (63)
11	I am satisfied with the involvement and guidance of teacher in ECE.	0	0	12 (9)	16 (12)	72 (54)
12	I would like to learn other topics with this intervention i.e. ECE.	0	0	0	15 (11)	85 (64)
13	The overall rating of this instructional method			Good 7 (5)	Very Good 17 (13)	Excellent 76 (57)

[Table/Fig-3]: Students' perception with 5 point Likert scale in percent. (figures in parenthesis are number of students).

agreed and 12% agreed for it. ECE contributed for their better understanding of the topics, 72% strongly agreed and 24% agreed for this perception. Eighty one percent students felt that ECE encouraged them to participate more in such type of teaching learning activity. When asked about usefulness in providing relevant subject material and proper utilization of resources (clinical material), 70% and 66% of students strongly

agreed for these items respectively. Majority of students (80%) were of the opinion that ECE will help them for lifelong learning. Also, they (85%) would like to learn more topics with this method. The majority (76%) of the students rated this method as excellent [Table/Fig-3].

**b. Close ended item of feedback of 2<sup>nd</sup> MBBS students:**

Majority of the Second year MBBS students (92%) perceived ECE was helpful to correlate the topics and reinforce the concept (88%) learned during the first MBBS. 98% attributed ECE to better understanding of clinical topics and which also helped them to score good marks in clinical examinations. Students also strongly agreed that it increased confidence and enhanced self motivation [Table/Fig-4].

**B. Qualitative data:** It was for open-ended questions as their perceptions.

S No.	Items	Strongly Disagree	Disagree	Neither agree Nor disagree	Agree	Strongly Agree
1	ECE helped me to correlate the topics learned during 1st MBBS	0	0	8 (4)	29 (15)	63 (31)
2	It helped me to reinforce the concept learned during 1st MBBS	0	0	12 (6)	24 (12)	64 (32)
3	I have better understanding of clinical topics	0	0	2 (1)	16 (8)	82 (41)
4	It helped to score good marks in the clinical examination.	0	0	5 (3)	09 (4)	86 (43)
5	It increased confidence to deal with patients	0	0	2 (1)	09 (4)	89 (45)
6	It enhanced self motivation to attend the clinics.	0	0	3 (2)	11 (5)	86 (43)

[Table/Fig-4]: Second MBBS Students' perception with 5 point Likert scale in percent. (figures in parenthesis are number of students).

**1. Perception (open ended items)-1<sup>st</sup> year MBBS students:**

Students were asked for open-ended questions as;

- Attributes that you like the most [Table/Fig-5].
- Suggestions that could be added (or deleted) for ECE to make learning more effective [Table/Fig-6].
- Experiences shared by students [Table/Fig-7].

**3. Perception (open ended items)-2<sup>nd</sup> year MBBS students:**

Second year MBBS students were asked to share their experiences [Table/Fig-8].

## DISCUSSION

Medical Council of India desires an increase in integration in order to provide students with a holistic rather than fragmented learning

S.N.	Category	Comments
1.	Retention of Knowledge	"We are able to learn in better way."
		"Provided examples to help learning and remembering topics".
		"It is easy to understand with ECE than studying from books".
		"Signs and symptoms of disease are easy to remember".
2.	Interest development	"It created an interest in me to read and understand the various pathophysiological conditions noticed in the patients".
		"Created deep interest in this profession".
3.	Being a professional	"It feels exactly what we will be exposed to, once we become doctor".
		"It gave me a chance to develop a view on a real life cases and management".
		"We were shown the responsibilities of a doctor that will help us in being more serious about our profession".

[Table/Fig-5]: Attributes that you like the most (in verbatim).

1	"Batches should be small. All 25 students at one time created a bit of menace in the hospital. Maximum five students in batch so that everyone can hear teacher well".
2	"More patients with different topic related problems".
3	"We should be made to do projects or seminars on ECE".
4	"We should have ECE more often like every month".
5	"We should be told about the patients before visits, to let us know what all to revise".

[Table/Fig-6]: Suggestions that could be added (or deleted) for ECE to make learning more effective.

1	"We felt very happy to be a part of clinical exposure especially in Paediatric ward where by watching all the ward and patients could boost up the moral status of us. We could learn how to behave with the patients and to create healthy relations with the doctors present over there. And we can learn more well by just watching practically than learning theoretically."
2	"One of my friends who is in other Medical College said that this type of activity is not taken in their college and this is a very good activity undertaken by your university".

[Table/Fig-7]: Few experiences shared by students.

1	"Early clinical exposure in 1st MBBS was valuable because it provided us an opportunity to learn basic clinical skills that have improved over the later two years i.e. bedside skills, examination and basic history taking".
2	"ECE is essential to increase our interest and enhance our learning in clinical subjects. It gave us basic orientation in applied concepts of clinical subjects".
3	"ECE during first year of medical education was beneficial since we somehow learned to link basic subjects with clinical practice. It also helped in understanding applied concepts into clinical subjects".

[Table/Fig-8]: Experiences of 2nd MBBS students.

perspective [2]. At the beginning of the medical profession, it is seen that students are not exposed to interrelatedness of scientific, social, professional and interpersonal elements of the field of medical education [4]. Thus, gradually it became clear that the clinical context, which the preclinical phase would ultimately serve, should be introduced earlier.

In the present study, early clinical exposure was used as an adjunct modality to traditional teaching method and it showed significant gain in the skills ( $p < 0.0001$ ) as evident by the scores of OSCE. Similar results were also shown in the study conducted by Tayde MC et al in which there was statistically significant difference in gain in the skills of students of the ECE and non-ECE group [5].

The future doctors perceived ECE in a very positive manner. The conduction of ECE created interest and better understanding was strongly agreed by 86% and 72% of the students respectively giving a good feedback regarding ECE. Motivation is an important component in any teaching and learning method, which was also the highlight of our study in which the students were themselves motivated to study a topic. Majority of the students rated this method as Excellent as they found a platform to boost their moral status and to feel exactly the same, once they themselves became doctors. These findings are in accordance with the study conducted by Chari S et al., in which the students were positive about ECE and were full of enthusiasm [6]. Increased motivation of the students with ECE was also seen in the study conducted by Baheti S N et al., [7].

The study also involved the feedback taken from the same students in 2<sup>nd</sup> year after their routine clinical postings, where they realized the importance of ECE in correlating and reinforcing the concepts learned during their course of 1<sup>st</sup> MBBS.

The findings of our study was in accordance with Sathish kumar S et al., and Vyas R et al., where in their feedback on a 5 point likert scale, 96.4% students gave an overall positive rating for the ECE. They also mentioned that after ECE sessions, the interest for their subjects increased. They felt motivated and enhanced the understanding of endocrine physiology as there was integration of knowledge [8-10].

The perception of the present study also matched with the study done by Duque G et al., in which students found their posting more effective as a learning experience and expressed greater satisfaction in interactions with physicians. The grades that the students obtained in the exams showed a better and more effective acquisition of knowledge [11].

In another study by McLean M, the highlight of their academic year was ECE, which reinforced their original desire to study medicine and allowed them to experience the real world of Medicine. Sixty-nine percent of students appreciated that the health care visits, particularly the labor ward postings and an ambulance duty with many hands-on experience, were their most rewarding experiences [1].

Systematic reviews by Dornan T et al., and Littlewood S et al., concluded that early experience not only helped medical students learn, develop proper attitude towards their studies but also made their learning more relevant and influenced career options [12,13].

ECE conducted in some special situations like exposure of students to patients who are dying, explored the emotional component of the profession and taught them to care more effectively for the patients [14].

A study where Branstetter BF et al., exposed the students to the subject of radiology revealed that Radiology had greater importance to the overall practice of Medicine and they stated that the exposure encouraged them select Radiology as a career option. They also performed better on the test of basic radiologic knowledge, which was statistically significant [15]. Nimkuntod P et al., in their study stated that the experience of the students with ECE was valuable to them as a physician in clinical practice [16].

In an Indian setting, as ours, patients (learning resource element) are not a limiting factor for learning. Early clinical exposure had been proved for integration of basic with clinical discipline. For skill learning, which is an integral part of clinical teaching learning in medical education, we had an encouraging experience. The perception gathered from students reinforced the affirmative nature of ECE, which provided holistic learning to them.

## CONCLUSION

The ECE program was introduced for first year medical students as an approach to augment the traditional teaching sessions in clinical Physiology. Medical students had positively received this approach. Students were able to identify the basic science learning issues with an integrated clinical case oriented approach. The effectiveness of the study manifested in the skills gained by the students through ECE being helpful prospectively in their routine clinical postings.

## Some Challenges Faced:

1. Busy Clinical faculty.
2. More resource intensive.

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