

## Evaluation of the effectiveness of early clinical exposure in learning clinical examination skills among preclinical students

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### Abstract

**Introduction:** The Vision 2015 of Medical Council of India states that the Indian medical graduate (IMG) should have the necessary competencies (Knowledge, Skills and Attitude) to assume his or her role as a health care provider to the people of India and the World. Early Clinical Exposure (ECE) is one of the measures taken by MCI to enact its vision.

**Objectives:** This study was aimed to evaluate the effectiveness of ECE in learning clinical examination skills among preclinical students and to explore the perspectives of ECE among the students and faculty.

**Materials and Methods:** Present study was conducted in the department of Physiology, Govt. Thiruvapur Medical College, Thiruvapur on 99 medical students. After obtaining informed, written consent pretest questionnaire was given to the study participants. After obtaining informed, written consent pre-test questionnaire was given to the study participants. After that students were allocated into Group 1 (n=49) and Group 2 (n=50) by simple random technique by lottery method. Group 1 students were trained on clinical examination of anemia in medicine ward (Early Clinical Exposure) and Group 2 students were trained on clinical examination of anemia in clinical physiology laboratory (Control). At the end of the session both groups were assessed by Post-test questionnaire and Objective Structured Clinical Examination (OSCE). Crossing over of the batches was done in the next session for training of clinical examination of jaundice. Feedback was obtained from the students (n=99) and faculty members involved in this (n=7).

**Results:** There was a statistically significant difference present between the post test scores of Group 1 and Group 2 in anemia and jaundice (p<0.01, p<0.001) respectively. Also there was a statistically significant difference present between Group 1 and Group 2 on OSCE scores in anemia and jaundice (p<0.01 & p<0.01 respectively).

**Conclusion:** Results of the present study justify the need of Early Clinical Exposure to teach clinical examination skills to first year medical students when compared to the traditional teaching method.

**Keywords:** Early clinical exposure, First year medical students, Clinical examination skills.

### Introduction

The Vision 2015 of Medical Council of India states that the Indian medical graduate (IMG) should have the necessary competencies (Knowledge, Skills and Attitude) to assume his or her role as a health care provider to the people of India and the world.<sup>1</sup> Also the goals of medical education should be learner-centered in which the student develops knowledge, skills and attitude respectively with cognitive, psychomotor and affective domains.<sup>2</sup> Early Clinical Exposure (ECE) is one of the measures taken by MCI to enact its vision.

In the traditional teaching methods, students are engaged in the class rooms and laboratory settings during the first year of their education and clinical subjects are introduced only in the second year.<sup>3</sup> MCI in its Vision 2015 has insisted the need of clinical teaching exposure from first year onwards in all medical colleges of India through which the imaginary wall that always existed between the basic sciences and clinical sciences would have been broken and the application of basic knowledge in clinical correlation of patients would have been achieved easily. ECE also ensures the communication skills and attitude development along with clinical skills among the students. By the way of using a wide variety of teaching and learning methods, ECE

integrates basics and clinical science teaching without jeopardizing the existing methods of teaching the basics.<sup>4</sup>

In ECE the clinical training is started from the first year, whereby sufficient clinical exposure is given at the primary care level that would be integrated with the learning of basic medical sciences. Introduction of case scenarios for classroom discussion/ case-based learning also can be emphasized as a coordinated effort by the pre, para-clinical and clinical staff members.<sup>5-7</sup>

Education system all over the world now emphasizes ECE towards vertical and horizontal integration. Hence the present study was planned to evaluate the effectiveness of ECE compared to conventional teaching method in learning clinical examination for anemia and jaundice and to explore the perspectives of ECE among the students and faculty.

### Materials and Methods

Present analytical study was conducted on 99 first year medical students, (Out of 100 first year students, 99 students gave consent to participate in the study) in the Department of Physiology, Govt. Thiruvapur Medical College, Thiruvapur, after obtaining ethical clearance (SEC 2017/5) from the Institute Ethics committee for Human studies. A separate orientation program was conducted for the students

(n=99) and faculty members of physiology department (n=7) separately about the purpose of the study and procedure. The permission was obtained from the department head of general medicine to train students in the medicine ward. After obtaining informed, written consent pretest questionnaire was given to the study participants. After that students were allocated into Group 1 (n=49) and Group 2 (n=50) by simple random technique by lottery method.

Group 1 students were trained on clinical examination of anemia in medicine ward (Early Clinical Exposure) by physiology faculty member using a anemia patient and Group 2 students were trained on clinical examination of anemia in clinical physiology laboratory (Control) by another physiology faculty using a subject. The topics included were definition, pathophysiology, sites to look for anaemia, approach to the patient, management protocols and advice regarding diet. Each session lasting for 40 to 45 minutes. At the end of the session, knowledge domain was tested by post-test questionnaire (formulated by our department and peer reviewing was done among the faculty members), skill domain was assessed by Objective Structured Clinical Examination (OSCE) and attitude domain was tested by unstructured feedback in both the groups.

In the next session, crossing over was done i.e. Group 2 students were taken to Medicine ward and were taught clinical examination of jaundice by physiology faculty using a patient and Group 1 students were taken to clinical physiology laboratory and taught clinical examination of jaundice by another physiology faculty using a subject. The topics included were definition, pathophysiology, and sites

to look for jaundice, approach to the patient, management protocols and advice regarding diet. Both groups were assessed by post-test questionnaire and OSCE at the end of the session. Attitude of the students and perception of the physiology faculty members towards ECE were assessed by a feedback questionnaire and analyzed qualitatively.

### Statistical Analysis

Data were plotted in Microsoft Excel sheet and GraphPad InStat version 3.10 was used for statistical calculation. Students paired t-test was used to compare the pre-test and post-test values and Students unpaired t-test was used to compare post-test scores between Group 1 and Group 2.  $P < 0.05$  at  $\alpha = 5\%$  for was considered as statistical significance.

### Results

Baseline comparison of pre-test scores on anemia and jaundice between Group 1 and Group 2 scores shows that the groups were comparable ( $P = 0.29$ ,  $P = 0.57$  respectively) (Table 1). There was a statistically significant difference present between the post-test scores of Group 1 and Group 2 in anemia and jaundice ( $p < 0.01$ ,  $p < 0.001$ ) respectively (Table 1). Also, there was a statistically significant difference present between Group 1 and Group 2 on OSCE scores in anemia and jaundice ( $p < 0.01$  &  $p < 0.01$  respectively) (Table 2). Qualitative data on student feedback suggests that many students and faculty members felt that ECE is a useful, interesting tool for learning clinical examination skills. (Table 3).

**Table 1:** Comparison of Pre-test and Post-test scores between Group 1 (n=50) and Group 2 (n=49):

Parameters	Group 1 (n=50)		Group 2 (n=49)	
	Pre-test	Post-test	Pre-test	Post-test
Anemia - 10 MCQ	4.31 ± 1.62	6.59 ± 1.65 <sup>++</sup>	4.64 ± 2.69	5.34 ± 1.35
Jaundice - 10 MCQ	6.16 ± 1.45	6.62 ± 1.26	6.29 ± 1.77	7.35 ± 1.36 <sup>+++</sup>

Values are expressed as Mean ± SD. Analysis for comparing pre-test and post-test scores in each group was done by Student's paired t-test. (+) Comparison of post-test scores between Group 1 and Group 2 was done by Student's unpaired t-test (\*). <sup>+</sup> $P < 0.05$ , <sup>++</sup> $P < 0.01$ , <sup>+++</sup> $P < 0.001$ . \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ . SD: Standard Deviation

**Table 2:** Comparison of OSCE scores between Group 1 (n=50) and Group 2 (n=49):

Parameters	Group 1 (n=50)	Group 2 (n=49)
Anemia - OSCE score	6.59 ± 1.70 <sup>**</sup>	4.62 ± 2.14
Jaundice - OSCE score	5.1 ± 1.49	6.88 ± 1.56 <sup>**</sup>

Values are expressed as Mean ± SD. Analysis for comparison of OSCE scores between Group 1 and Group 2 was done by Student's unpaired t-test. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ . SD: Standard Deviation

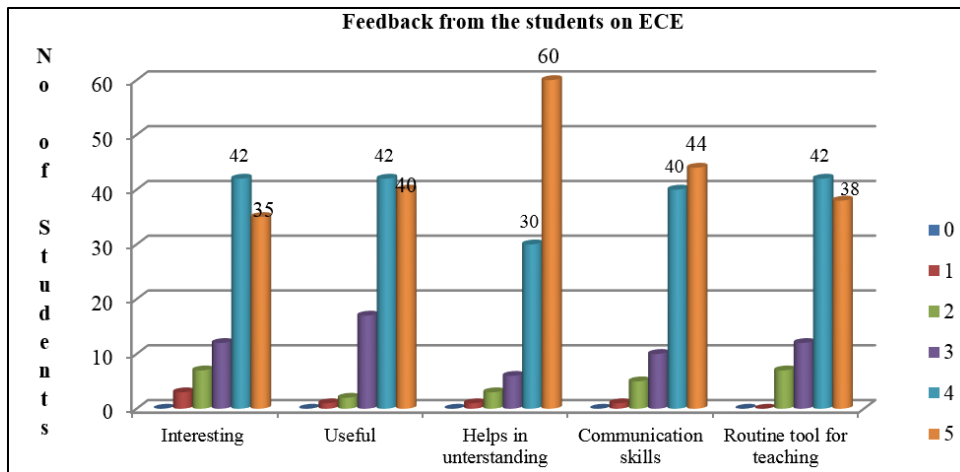


Fig. 1: Shows the feedback obtained from the students (n=99)

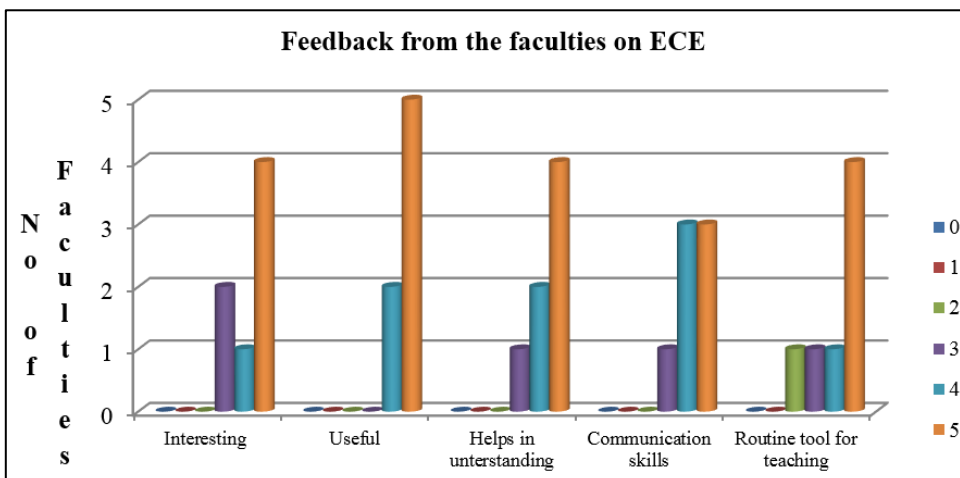


Fig. 2: Shows the feedback obtained from the faculty (n=7)

**Discussion**

Early clinical exposure (ECE) involves an active, experiential learning from patients with practicing clinicians and it has been designed to be the 'beginning of a life-time of learning'.<sup>8,10</sup> Nowadays ECE program is recommended as a component of undergraduate medical education curriculum.<sup>3</sup> Medical Council of India underlined the need of practice of ethics and early clinical exposure in view of current clinical practices in our society. The main objective behind this is to familiarize the medical students with patients earlier so that the students can develop professional skills and ethical approaches. In Indian scenario it is an urge to produce healthcare professionals with predefined view and expertise to work in the rural set up.<sup>11,12</sup>

In our study we found that there was significant difference in the scores obtained by ECE and control groups. The students trained by ECE were benefitted more when compared to the control group as it is evident from the scores of ECE group on the learning modules of anaemia and jaundice. These results are in congruent with the previous study reports by Motilal Et al (2014) in which the students exposed to ECE in the form of case based discussion on breast cancer topic scored good marks

compared to traditional teaching.<sup>4</sup> A study by Solomon et al (2007) which studied the attitude of medical students towards ECE in learning endocrine physiology on 56 medical students reported that the feedback of the participants was favourable towards ECE. The students felt that ECE increases the interest for the subject and motivate them to read more. They also felt that ECE enhanced their understanding of endocrine physiology, enabled them to remember the subject better, contributed to their knowledge of the subject and also helped them to integrate their knowledge. Also many students said that ECE increased their sensitivity toward patient problems and needs. The majority of the students (96.4%) in their feedback gave an overall rating of the program as good to excellent on a 5 point Likert scale.<sup>8,9</sup>

Another study by Spencer J et al (2000) found that direct contact of medical students with patients play a crucial role in the development of clinical reasoning, communication skills, professional attitudes and empathy.<sup>13</sup> Bokken et al (2009) also reported the similar results stating the importance of patient involvement in medical education.<sup>14</sup> However in a study by Johnson AK et al (1998) put forth that the students' attitudes toward medical

education were generally favorable, regardless of their clinical exposures.<sup>15</sup>

BEME systemic review (2006) which included 76% of results from descriptive studies and 24% from comparative studies reported that early experience with patients motivated and satisfied students of the health professions and helped them to acclimatize to the clinical environments. Also it helped them to develop professionally, interact with patients with more confidence and less stress, develop self-reflection and appraisal skill which ultimately develop a professional identity to a medical student.<sup>16</sup> In ECE the students actively participate in learning process. This experience strengthened their learning and made it more real and relevant to clinical practice. Medical students also learnt about the structure and function of the healthcare system, the preventive care and the role of health professionals. Also, educational research studies reported that the students who are actively involved in the learning activity will learn more than the students who are passive recipients.<sup>17,18</sup>

### Student's Perception

Most of the students felt that ECE helped them in understanding the topic and they were able to relate the topic to the clinical set up. Also in comparison to the other systems 90% of the students felt that ECE helped them to understand the concepts better. Also majority of the students (78%) opined that ECE was interesting and motivating to learn clinical examination skills. About 82% of the students felt that ECE will be helpful in developing communication skills and 77% felt that ECE should be incorporated in the routine schedule. Few students felt that the number of clinical cases was low, time was not adequate and they have to wait for their turn to examine. They also felt that in selected topics ECE can be conducted rather than all the topics.

### Faculty's Perception

Most of the faculty members involved in the present study opined that ECE is useful (100%), interesting (71%). Also they agreed that ECE will be helpful in understanding the topic (85%) and to improve the communication skills (85%). However few faculties pointed out that ECE necessitates adequate manpower, resources and coordination from concerned clinical departments for conducting ECE programs.

### Conclusion

Results of the present study justify the need of Early Clinical Exposure to teach clinical examination skills to first year medical students in the current scenario. Few faculties pointed out that ECE necessitates adequate manpower, resources and coordination from concerned clinical departments for conducting ECE programs.

### Limitations of the study

The study was conducted with two clinical scenarios with single batch of students only. A multi centric study with more number of participants is needed for the definite conclusion.

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**Conflict of Interest:** None.

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