Original Article

Phase I Medical Students' Perceptions of Early Clinical Exposure In Classroom and Hospital Setting: A Qualitative and Quantitative Analysis

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Abstract

Introduction: Early Clinical Exposure (ECE) is a teaching learning methodology that exposes Phase I medical students to patients in classroom, hospital, or community settings. The aim of this study was to design and implement a structured module for ECE in Anatomy in dual settings, that is, in classroom and in hospital setting, and to determine its feasibility and acceptability based on students' perceptions.

Methods: In this mixed method educational interventional study conducted at Dayanand Medical College and Hospital two consecutive batches of Phase I MBBS students (n= 100/batch) were exposed to ECE designed by a core team of mentors, in two settings – classroom and hospital. A 'learning observation manual' was designed for use in hospital setting. The ECE1 was implemented for first batch of MBBS students. Based on their perceptions and feedback, implementational changes were made in ECE2 for the next batch. Mixed method analysis was done to evaluate the impact of ECE. Statistical analysis used: ECE 1 evaluation was done by qualitative data analysis of student reflections using thematic analysis. ECE 2 was evaluated by quantitative and qualitative analysis of student questionnaire.

Results: Emerging themes in student perceptions for classroom setting were: Context and relevance of Anatomy, Quest for knowledge, Teamwork skills, and Link to future aspirations; and for hospital setting were: Patient interaction skills and soft skills such as compassion, respect, and responsibility. Students expressed a statistically significant higher preference for working in teams for ECE in classroom setting versus working individually. Also, the students' felt that ECE in hospital setting prepared them better for their future years in medical school compared to ECE in classroom setting (p=0.028). The found the 'learning observation manual' useful during ECE sessions in hospital setting

Conclusions: Implementation of ECE for Phase I MBBS students in Anatomy in dual settings of classroom and hospital is feasible and acceptable in our medical college set-up. It serves as a platform to orient students toward the social context of clinical practice and provides an opportunity to strengthen students' affective and cognitive learning.

Keywords

Early Clinical Exposure, Medical Education, Anatomy, Medical Students, Competency Based Medical Education, Curriculum

Introduction

Early Clinical Exposure (ECE) is a teaching learning methodology, which promotes exposure of the medical students to patients as early as in the Phase I of medical college training.[1] In the traditional medical education system in India, the approach to Anatomy curriculum has mostly been directed towards information gathering rather than application and problem-solving.

There is evidence in literature that Anatomical pedagogy would be better understood, retained, and

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later practically applied, if its clinical significance is emphasized.[2] The ECE can be effectively used for vertical integration of basic and clinical sciences. Throughout the world, medical schools have incorporated it in their curricula, with a variety of objectives, teaching methods and assessment methods.[3,4]

The erstwhile Medical Council of India (MCI), in its Vision-2015 document recommended ECE as a step towards curricular reform for Competency Based Medical Education (CBME).[5] The Competency Based Undergraduate Curriculum (MCI) released in 2018 by National Medical Commission (NMC) and implemented from the 2019 batch of MBBS course, provides for incorporation of ECE in the curriculum and training program of Indian Medical Graduates (IMG).[6] Despite the mandate in the Graduate Medical Education Regulations 2019 (GMER 2019) by the regulatory body National Medical Commission, ECE has not been a routinely used method for teaching Anatomy. The ECE sessions designed and implemented in Anatomy would give students a deliberate practice of application of knowledge of Anatomy in clinical context. Introduction of case scenarios in classroom discussions for ECE is one of the simplest ways this can be done.

Implementation of ECE has been reported in classroom or hospital or community setting.[7] Published reports of ECE implementation from India are scarce, with limited sessions, or reporting results for a single cohort.[8] The ECE in classroom setting, utilizes interactive lectures, case-scenarios, case-based learning and clinical materials such as laboratory reports, photographs, radiographs and ECGs.[7-10] In Anatomy, ECE has mostly been implemented using multiple short interactive clinical Anatomy lectures, without real patient exposure.[11] Kar et al., (2017) conducted ECE session on neuroanatomy, to teach nerve palsies to Phase I students.[12]

The aim of this study was to design and implement a structured module for ECE in Anatomy in dual settings, that is, in classroom and in hospital, and to determine its feasibility and acceptability by collating the perceptions of students about it.

Hypothesis: ECE can be used as an educational tool to demonstrate context and relevance of Anatomy to clinical practice in Phase I MBBS students.

Materials and methods

Study design: This was a prospective mixed method educational interventional study.

Study participants: All students from two consecutive batches of Phase I MBBS students participated in the study. Informed consent was obtained from all the study participants.

Sampling: Convenience sampling (complete enumeration).

Setting: The study was conducted in Dayanand Medical College and Hospital. The Institution follows a discipline-based curriculum. After obtaining due administrative and ethical committee approval (IEC No-2018293), a core group of four faculty members was formed (two from Anatomy, one from Medicine and one from Community medicine). Core team designed ECE in two settings – classroom and hospital. This structured module designed was designated ECE-1. Time was allotted in the timetable from Anatomy teaching hours, 2 hours/ week, total ten sessions were conducted (six classroom sessions and four hospital sessions). For classroom sessions, case scenarios were designed as a video of clinical findings in patients, followed by case details in form of paper-based case scenarios. For hospital sessions, four departments were selected (i.e., Medicine, Surgery, Obstetrics & Gynaecology and Orthopaedics). A 'learning observation manual' was designed to guide students in hospital sessions. For classroom sessions, students were divided into groups of five-six students and for the hospital sessions into groups of 25 students, according to their roll numbers. The venue for classroom sessions was the Dissection Hall, and for the hospital sessions was the Demonstration/ Seminar room of clinical departments and wards. The classroom sessions were conducted by faculty of Anatomy department, and hospital sessions were conducted by clinical facilitators.

Implementation of ECE-1: An orientation session of one hour was held to sensitize the students. Two classroom sessions were held before and four after the hospital sessions. The classroom sessions for ECE had video introductions of case scenarios (YouTube videos) followed by paper case with history/ examination/ investigations of patient. The paper case was given individually to students who were sitting in designated group of five or six students (total 18 groups). Students followed group dynamics to work in small groups. They were asked to designate a scribe, timekeeper, leader, and reporter among themselves.

The task given was to, search resources to correlate underlying anatomical basis of symptoms/signs in the case scenario, using their Anatomy textbook and smartphones. The reporter presented summary of discussions in large group. Single faculty from Anatomy facilitated these sessions. Teams could seek clarification from facilitator for their doubts and queries during the small group discussions. Answers to case scenarios were given as hand-outs in the subsequent session.

Hospital sessions were held in wards/ seminar room of clinical department by clinical facilitator(s). Twenty-five

students each were allotted to the four clinical departments. Clinical facilitators were requested to choose the patient cases for ECE keeping in view the novice status of Phase I medical student. One faculty from Anatomy joined the groups to oversee and facilitate smooth conduction of hospital session.

Data collection and Analysis for ECE-1: Student perception of ECE-1 was obtained using anonymous student reflections for implemented classroom and hospital sessions of ECE-1. The student narratives were coded and categorized using principles of thematic analysis for emerging themes. Thematic analysis was done, by two of the authors, using editing style to identify key themes and cluster data within them. The themes were compared to reflections by reading and re-reading by all the authors, to ensure a good fit. Students' suggestions and feedback for improvement of ECE-1 was discussed by core team and module modified as ECE-2 for implementation with the subsequent batch of MBBS students.

Questionnaire designing for ECE-2: Student questionnaire for ECE-2 was designed using themes generated from the students' reflections for ECE-1 as well as from literature research. Both closed-ended and open-ended questions were included. Questions were framed on a 5-point Likert scale. The designed questionnaire was externally validated by FAIMER fellows (for content validity), and feasible suggestions were incorporated. The questionnaire was pilot tested on 20 students of senior batch (for face validity and comprehensibility) and ambiguous questions were eliminated.

Designing of 'learning observation manual' for ECE-2: Based on student feedback for ECE-1, an observation booklet was modified and re-designed for the hospital sessions of ECE-2.

Implementation of ECE-2: Three classroom sessions were held before and three after the hospital sessions. The procedure for conducting the classroom session was like ECE-1, except that the facilitator highlighted key features at the end of each session and microphone was used by the facilitator during the sessions.

The hospital sessions were implemented using a framework designed for ECE-2. The four clinical departments chosen were same as in ECE-1. Students were divided into four batches A, B, C & D, of 25 students each, according to their roll numbers. Each batch assembled in seminar room/ demonstration room of respective departments. Three postgraduate residents from clinical department divided each batch into further small groups for bedside teaching in ward (showing a minimum of three patients).

The following framework was designed for uniformity of bedside teaching:

1. Brief outline of presenting complaint (preferably one or two chief complaints).
2. Brief outline of investigations without using too many technical terms (for example blood tests, urine tests, X-ray chest). The investigations in patient file were shown and correlated with basic sciences. Test results reports were referred to as raised from normal range, decreased or less than normal range as the students were novice learners from Phase-I MBBS.
3. Basis for treatment planned.
4. General treatment given.
5. Discussion and debriefing: Total bed-side session in ward was completed in 60 minutes followed by discussion in Seminar room with stress on correlation with basic sciences.

Data collection and Analysis for ECE-2: Students' perceptions were collected by administering pre-validated paper-based student questionnaire consisting of both type of questions: open ended (7 items) and closed ended (17 items). Students were instructed to return it as anonymous. No demographic data was collected. The feedback was tabulated and analysed. Qualitative data from seven open ended questions, was coded and categorised for emerging themes using Thematic analysis. The quantitative data was analysed in SPSS 20 (IBM SPSS, Chicago, Illinois). Item-wise statistical comparison was done using non- parametric test for ordinal scales, the Mann-Whitney-U test, p value <0.05 was considered significant.

Results

Limited demographic data on participants was made available from student data records in the office of the Dean. The ECE-1 participants were 100 students of MBBS Course Phase I, with an average age of 17.5±0.25 years, and of which 51 were female students. The ECE-2 also had 100 students of subsequent batch of MBBS Phase I with average age 17.6±0.14 years, and of which 49 were female students. All students had joined the MBBS course after completion of higher secondary education.

Out of 100 students who participated in ECE-1, 95 students (95%) submitted their reflections. Majority (83%) of students expressed a positive perception about ECE-1. The themes for the case scenario discussions in classroom setting were context and relevance of Anatomy to clinical practice, application of knowledge of Anatomy, and teamwork skills. For real patient contact in hospital setting, the emerging theme was motivation and inspiration. The emerging themes from student reflections along with representative student comments are tabulated in Table 1.

Qualitative analysis of student reflections also yielded some negative comments regarding ECE-1 and suggestions for improvement. The problems reported for classroom setting were that a few case scenarios given as home assignments were difficult to solve alone, and the solutions were not discussed in class but given as typed answers on paper sheets. The problems stated for ECE in hospital setting were that there wasn't adequate exposure to real patients in some sessions, and also the complex medical terminology used by some clinical facilitators. The Table 2 depicts the students' suggestions for improvement of ECE session in both classroom and hospital settings.

Out of 100 students who participated in ECE-2, 93 students submitted the questionnaire and the filled-in 'learning observation manual'. The qualitative analysis of open-ended responses yielded similar themes for ECE-2, such as application of knowledge of Anatomy, context and relevance, teamwork, motivation, and inspiration. Students unanimously reported satisfaction with ECE-2 and felt that no improvements were needed (as assessed from rtesponse to the open-ended question in questionnaire: "Identify the aspects of classroom and hospital setting that might be improved").

Analysis of student perception of skills gained in ECE-2 led to emerging themes of skills of dealing with patients and soft skills. Students commented that they learnt the importance of making patient comfortable, communicating with patient in vernacular language, and how to explain to patient appropriately. They also reported feelings of compassion, respect for patient and emotions of responsibility.

Quantitative analysis of closed-ended items in student questionnaire showed that majority (97.84%) students felt that they understood the correlation of concepts learnt in separate subjects better with ECE compared to the traditional teaching methods. Majority of the students (98.9%) reported that participation in classroom setting helped them to understand anatomical basis of case scenarios. Students rated the solutions to case scenarios provided during classroom setting (88.17%) more helpful for learning than the case scenarios given for home assignments (75.26%). Majority (87.09%) also reported that 'learning

Table 1: Themes in student reflections for ECE-1

S.No.	Themes	Representative student comments
1.	Context and relevance	- "It showed me the real purpose of what I am studying for". - "Case scenario helped to know how to read Anatomy and correlate it." - "Before it (ECE) I found it totally useless, memorizing blood supply and nerve supply of muscles."
2.	Application of knowledge	- "It compelled me to think beyond books, to combine different concepts and apply to solve the given case". - "I came to know Anatomy is not to be read as bookworm, but to join whole aspects of a topic." - "From case I realized how vast and thorough knowledge I need".
3.	Teamwork skills	- "Discussion in groups in Dissection-hall was good way to solve case as different ideas from different people make it very interesting". - "Group of six students in a Case enables everyone to discuss about case".
4.	Motivation and inspiration	- "Inspires us to become ethical and responsible doctors". - "Talking to real patients was very inspiring." - "It gives us an idea how I should approach patients in real life". - "It reminds me why I am doing MBBS and how important it is".

Table 2: Student comments with suggestions for improvement of ECE-1

Comments with suggestions for ECE in Classroom setting	Comments with suggestions for ECE in Hospital setting
"Microphone should be used in Dissection-hall."	"During our four visits to hospital, we were exposed to a few patients only, some teachers just delivered lectures."
"Teacher should discuss all the answers to cases, for some cases only typed answers were given."	"One teacher just made us write how to examine a patient without the presence of one."
"Discuss the answer of case studies on same day".	"Teachers used complicated terms which we were not able to understand."
"Case studies should be solved in Dissection hall time only, and not given as assignments".	"Smaller groups should be made."

Table 3: Comparison of students' attitudes towards working as teams versus individual working in classroom setting in ECE-2

Group as per Students' attitude	Frequency	Mean rank	p-value (Mann-Whitney-U Test)
Working in teams helped learning.	93	106.48	0.001
Working individually helped learning	93	80.52	W=7488.000 Z= -3.517

Table 4: Comparison of student perception towards usefulness of sessions in classroom versus hospital setting in ECE-2

Group as per Students' perception	Frequency	Mean rank	p-value (Mann Whitney-U Test)
Participation in classroom setting helps to prepare for future years in Medical school.	93	86.48	0.028 W=8043.000 Z = - 2.195
Participation in hospital setting helps to prepare for future years in medical school.	93	100.52	

Data analysed using non-parametric Mann-Whitney U test showed statistically significant (p= 0.001) values for students' attitude towards working in teams as compared to working individually to solve case scenarios in classroom setting as depicted in Table 3.

There was also a statistically significant (p=0.028) difference in student attitude towards ECE sessions in hospital setting versus classroom setting for skills. Students preferred hospital setting over classroom setting in as they felt better equipped for future years in medical school, as shown in Table 4.

Discussion

In the present study, students gave positive feedback for the ECE sessions held in classroom and hospital settings. Sathishkumar et al., 2007 conducted ECE sessions in Physiology and reported positive perception of students towards ECE.[9] Similar results were reported by Vyas and Sathishkumar (2012).[10] Our student reflection themes of application of knowledge of Anatomy, context and relevance of Anatomy and skills in patient dealing are similar to themes in published literature.[4,8] A review of ECE in medical curricula across Europe, concludes that ECE facilitated integration of basic and clinical sciences, improved students' attitude towards basic sciences, and provided students insight into the psychosocial aspects of medical care.[3] Students in our study also reported similar perceptions about context and relevance of Anatomy as well as gain in soft skills such as compassion and respect for patients.

Literature advocates that in hospital setting of ECE, students need to know who to observe, what to observe and what to report back.[3] The 'learning observation manual' for active observation during ECE was designed to fulfil this objective and was well received by the students. It sensitized the students to standardized best practices for patient interview through the essential elements of communication skills in medical encounters (Makoul, 2001)[13] which was included in it. Students noted down the patients seen, questions clinical facilitator asked to patient and any examination findings that were shown during hospital setting. They also wrote their reflections in it, for each session in the hospital. It was important source of information to core team about the learning events in the hospital setting. We could not find any study reporting on the designing of 'learning observation manual' for ECE and/or its acceptance by Phase I MBBS students. Reporting on implementation of ECE in dual setting also could not be found in literature.

The ECE promotes "authentic human contact in a social or clinical context to enhance the learning of health, illness and/or disease, and the role of health professional" in the preclinical years of medical curriculum.[14] Student perceptions in our study emphasize the additional gain in soft skills during exposure to real patients in hospital setting. ECE gave them a glimpse of hospital environment, professional attributes, and future role in the healthcare team. It has been reported in literature, that direct contact with patients plays a crucial role in development of communication skills, professional attitudes, and empathy, in undergraduate medical students.[15] Rawekar et al.,2016 reported a significant gain (p < 0.0001) in the skills of Phase I MBBS students from ECE sessions based on

the scores in Objective Structured Clinical Examination.[8]

Acquisition of clinical reasoning skills by a novice learner like Phase I MBBS student, can be achieved by exposure to a wide variety of clinical conditions.[16] In the present study, wide variety of real patients observed by students in hospital setting, and multiple case-scenarios solved during classroom setting, was a step towards developing clinical reasoning skills.

The student perceptions in this study reaffirm that ECE provides holistic learning opportunity to the medical students. This finding is similar to that reported by a study, which allowed them to experience real world of medicine and reinforced their desire to study medicine.[17]

Structured programs for real patient exposure in Phase I MBBS students require interested and motivated clinical facilitators who are ready to come to the level of novice learners for meaningful sessions in hospital setting of ECE. Faculty development plays a major role in capacity building for designing appropriate case-scenarios as well as facilitating small and large group sessions for meaningful learning.

Conclusions

We found that the implementation of ECE for Phase I MBBS students in Anatomy in dual settings of classroom and hospital is feasible and acceptable in our medical college set-up. Students felt that it helped them to build their knowledge in the context of its future applications. Structured ECE module enabled the students to integrate and establish cause-effect relationships between knowledge of Anatomy and patient signs/ symptoms. It serves as a platform to orient students toward the social context of clinical practice and provides an opportunity to strengthen students' affective and cognitive learning.

Acknowledgement

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