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Developing a module for early clinical exposure: Experience of five years

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Abstract:

BACKGROUND: Preclinical students often fail to appreciate the clinical relevance of basic sciences during the first year of undergraduate medical training, leading them to lose interest in the subject, and preventing them from achieving the desired goals. In order to rectify this gap in the curriculum, Medical Council of India (MCI) in 2011 published a document announcing curricular strategies including Early Clinical Exposure (ECE) to effectively modify the Indian system of education. Lack of proper guidance prevented many institutions from implementing ECE. Since our institution had run a similar program of “Clinical Observership” as early as 2001, we were able to implement ECE in an efficient way.

MATERIALS AND METHODS: Early clinical exposure was implemented as a structured program, with the participation of 10 clinical departments since 2013. Feedback from the students, soon after ECE and also from the batch of CRRIs, who had undergone this program while they were preclinical students amply support the effectiveness of ECE in its contents and methods of implementation. Manual content analysis was performed on open comments. After reading the responses, they were broken down to meaning units, and these were then condensed. The condensed meaning units were labeled with codes. The codes were grouped into categories. Themes were derived from the categories.

RESULTS: Out of the 70 CRRIs, 52 responded to the questionnaire. All the CRRIs except one said that ECE was very helpful during their clinical postings and internship period. They suggested that the number of hours of posting should be increased and also reiterated the fact that a greater number of clinical departments could be included in the program. Though the beneficial effects were felt in all the domains of learning, the most remarkable impact was felt in the affective domain, wherein changes are not easy to come by.

DISCUSSION: Recently, National Medical Council has come out with plans of including ECE in the syllabus with strict time schedule. It is felt that the faculty will find our experience of running the program for the past five years helpful in implementing this program, for the fullest benefit of the preclinical students.

Keywords:

Empathy, motivation, professionalism

Introduction

In many countries, like in India, students take up the study of medicine soon after their secondary school education, and many of them are not primed towards this strenuous course of training to become a doctor. In India, since the last couple of years, entrance to study medicine is based on

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their performance in the National Eligibility cum Entrance Test (NEET), a competitive examination, conducted after completion of the secondary school education.^[1] They gain entry to study medicine, if they are academically “brilliant,” based on their performance in this entrance test, comprised of exclusively multiple-choice questions. To transition them from rote learning to clinically oriented and compassionate

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physicians, ECE plays a vital role. This also answers the lingering question in a students' mind the relevance of studying basic sciences in the curriculum and how it is related to clinical practice.^[2] To remedy this malady in the curriculum, the need for exposing students to clinical medicine early in their career has arisen. Such an exposure should aim to emphasize clinical relevance of basic sciences, which are learnt during the first year of their medical career, making learning holistic and meaningful. With the foregoing scenario in mind, Medical Council of India in the year 2011 decided to implement four curricular strategies to bring in effective modification of Indian system of education, to enhance quality of the Indian Medical Graduate (IMG). Introduction of a foundation course, early clinical exposure (ECE), integrated teaching and effective skills training at all levels were the envisaged programs. ECE aims at adding fervor of clinical significance to the teaching of basic sciences and brings in "understanding the relevance of basic and laboratory science in the clinical context."^[3] However, the MCI mandate communicated a few years ago (Vision 2015), unfortunately, seems to have not been taken in the correct spirit for implementation by many of the institutions. Methodology of ECE implementation was not spelt out, leaving it to the institutions to deliver the program as they deemed fit. Since our institution had conducted a similar program ("Clinical Observership for preclinical students") from the year 2003 onward, implementation of ECE in our institution became easy.^[4] There is paucity of strict guidelines regarding the conduct of this valuable and interesting program, and hence, it was thought worthwhile to report our experience of conducting ECE regularly for over six years. Impact of long-term effect of this program could be gauged from the feedback provided by the outgoing batch of interns. This is very crucial because feedback from the important stakeholders can be beneficial in improving the curriculum further if required.^[5]

Novelty

While the National Medical Commission has mandated the ECE in medical schools since 2019 only, we do not have any studies in the Indian context which reports the longitudinal impact. This is probably one of the first studies which report the longitudinal impact of ECE as we started it ahead of the NMC mandate. This study also explores the impact of the ECE at two different time points. One soon after the student entered the medical school and the second time point when he became an intern.

Materials and Methods

Study design and setting

A descriptive study was done to evaluate the impact of the early clinical exposure (ECE) program conducted

at the PSG Institute of Medical Sciences and Research. The ECE program aimed at making the students comprehend the basic sciences better, in order to appreciate the relevance to the study of clinical sciences which they will take up in the subsequent years of the MBBS program. The program also aimed at strengthening the attitudinal domain such as empathy, compassionate care, and the significance of communication skills. Details of the planning and conduct of program are as follows.

Preparatory steps

- i. *Literature review:* ECE was planned based on the broad format provided by MCI's document "Vision 2015" published in 2011, aimed at bringing out the relevance of basic sciences to clinical medicine. However, this document did not specify methodology of delivering ECE, thereby giving autonomy to the institutions to design their own program, taking local logistics into consideration.
- ii. *Faculty training:* As an initial step to implement the program and to create awareness of the need for such a program among the faculty members of both preclinical and clinical departments, a two-day workshop, supported by MCI, was conducted in our institution, which reiterated the need for ECE, its design, and evaluation. Based on this, the first-year undergraduate students were sensitized about ECE, highlighting its significance and the proposed methodology. They were given an orientation to the various clinical departments, involved in the conduct of this program. The interactions emphasized the fact that this program does not involve teaching of the subject content of clinical disciplines. It is designed primarily to enlighten the students on the relevance of basic sciences to clinical medicine and to provide them an insight into a doctor's responsibilities. Experience gained from "Clinical Observership for preclinical students," which had very similar objectives and matched the format of ECE in many ways, was taken into consideration, while designing our ECE program in the year 2013.^[4] This included the program being designed as a hospital onsite visit, wherein students had the opportunity of observing the clinician interacting with the patients and/or performing procedures. This resulted in increased motivation, logical reasoning, and development of a self-directed approach toward learning.
- iii. *Forming a team:* Coordinators from each department decided on the learning outcomes. This is based on compliance with the MCI-mandated syllabus for undergraduate training and the opinion of the subject experts. They also decided the teaching learning activities for their departments.

Program

Selection of the clinical departments

Clinical departments were selected on the basis of the feedback from students on the earlier program of “Clinical Observership” as well as the willingness of the concerned clinical department to be part of the program. Over the five-year period from 2013 to 2017, following departments actively participated in this program: Departments of General Surgery, Respiratory medicine, Transfusion medicine, Medical imaging (Radiography and Ultrasonography), Medical imaging (CT Scans and MRI), Clinical simulation laboratory, Physical and Rehabilitation Medicine (PMR), Cardiology, Nephrology, Neurology, Hepatobiliary Surgery and organ transplantation, Medical Oncology, and Fetal medicine. From among this list, during a given year, five departments were chosen for rotation I and another five for rotation II.

Conduct of the program

Two cycles/rotations of ECE were held each year; the first one was conducted during the months of November and December, when the students had completed learning general anatomy and one of the regions of the body as well. Second rotation was held during the months of February and March, when they were learning thorax, physiology of respiration and cardiovascular system, and related biochemistry. Students visited the general clinical departments during their first rotation while the super speciality departments were reserved for the second rotation. Students were posted in Radiology and Clinical Simulation laboratory during both the rotations.

Since the model time table for the first MBBS class recommended by MCI did not provide the time slot for ECE, responsibility of finding the time, without interfering with the conventional teaching requirements, fell on the organizers of the program, taking the local logistics into consideration.

Afternoons of Mondays through Wednesdays were found to be suitable for this program. Students were divided into 15 groups of 10 each, in number. The groups elected a leader, who had the prime responsibility of liaison between the clinical departments and the students. Each cycle of rotation took 15 days, spread over five weeks, for all the 150 students to complete their postings in all the selected departments [Figure 1].

Teaching-learning activities in the department included observation of a clinical or diagnostic procedure. For example, in cardiology, they witnessed cardiac catheterization, whereby they had the opportunity to correlate anatomy of the coronary arteries with

the procedure of coronary angiography. Likewise, during nephrology posting, they could correlate renal physiology with the procedure of dialysis. Additionally, in all the departments they also witnessed interactions between patients and doctors and had the opportunity to observe interpretation of a few investigation reports of radiographs, ultrasonography, and ECG. Departments helped the students to observe what is being done in the clinical settings, which facilitated them to experience the hospital atmosphere.

Students were encouraged to interact with the clinicians and follow up the procedures they witnessed in the clinic, after the ECE session. Each of the department had drawn out a questionnaire, which served as the tool for the pre- and post-test, the score of which gauged their improvement in cognitive domain.

A valedictory session was held at the end of two rotations of ECE with the view of getting oral feedbacks from the students.

Study participants and sampling

Study participants included the outgoing batch of Compulsory Residential Rotatory Interns (CRRRI-2018) who had been exposed to ECE during their preclinical year of MBBS course in 2013. The survey questionnaire was shared with all the study participants who were in the campus at the time of study. The interns not willing to participate in the study were excluded.

Data collection tools and techniques

The program was evaluated at two levels—short term and long term.

Short term

Scores of pretests and post-tests conducted formed the tools for the quantitative evaluation. Feedback on the program was taken using a structured questionnaire on five-point Likert scale with open comments, at the end of the program.^[4]

Long term

Anonymous feedback comments were taken from the study participants. A structured questionnaire was designed. The first question was whether the CRRIs found ECE program useful. This was followed by three open-ended questions which included the “reasons for perceived usefulness of the program,” “share one significant experience,” and “suggestions for future improvement.” Totally 52 of the 70 CRRIs available in the campus responded to the feedback questionnaire shared with them.

The entire process of ECE program has been pictorially represented in Figure 1.

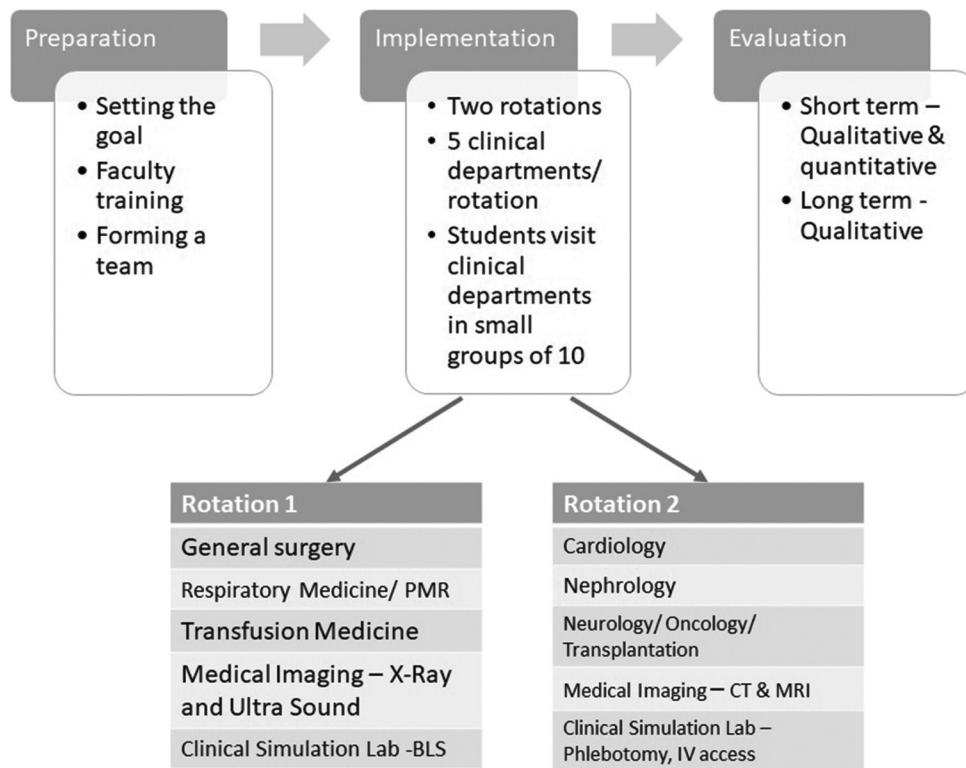


Figure 1: Process of developing ECE program

Data analysis

Manual content analysis was performed on open comments. After reading the responses, they were broken down to meaning units, and these were then condensed. The condensed meaning units were labeled with codes. The codes were grouped into categories. Themes were derived from the categories.

Ethical considerations

Informed consent was obtained from all respondents, and the study was approved by the Institutional Human Ethics Committee (Project No: 17/335).

Results

Short term—Quantitative evaluation

Results indicated widening of their cognitive domain, as evinced by their post-test scores, results of which have been published earlier.^[4]

Short term—Qualitative evaluation

In addition to the widening of their cognitive domain, as evinced by their post-test scores, (results of which has been published earlier) student feedbacks also identified the following themes in the affective domain, where they got benefitted^[4]:

- Application of basic sciences into clinical practice,
- Motivation to learn,
- Familiarity with various clinical specialties,

- Realization of the patient experiences/empathy and communication skills.

Long term—Qualitative evaluation

The content was analyzed to identify broad themes to categorize the responses which could be categorized as:

- Understanding of the subject,
- Functioning of the hospital,
- Changes in behavior.

The main responses under these broad topics are summarized in Box 1.

The CRRIs also specifically mentioned the postings during ECE which helped them in patient care [Box 2].

All the CRRIs (n = 52) except one said that ECE was very helpful during their clinical postings and internship period. They suggested that the number of hours of posting should be increased and also reiterated the fact that a greater number of clinical departments could be included in the program.

Discussion

Preclinical students need to get exposed to vignettes of clinical medicine in the hospital atmosphere, which will greatly help them to appreciate the relevance of basic sciences to their chosen career. Significance of ECE

Box 1: Categorised responses of CRRIs on major themes, wherein learning has occurred

Understanding of the subject

- Understood the relevance of basic sciences
- Importance of anatomy
- Correlation to clinical subjects
- Idea of clinical practice
- Approach to cases
- Hands on experience helped in knowing what to expect being a medical student
- Better knowledge of curriculum

Functioning of the Hospital

- Understood the facilities available
- Knew the functioning of different departments like blood bank
- How health care is practiced

Changes in Self

- Became fearless while entering clinical postings
- Increased confidence during internship
- Better equipped to do Cardio Pulmonary Resuscitation (CPR) due to training in Basic Life Support (BLS).
- Improvement in Communication skills
- Better in building rapport with others
- Understood doctor- patient relationship Reduced anxiety and fear during internship

Few Verbatim responses

- "Gave confidence while code blue announcements in internship"
- "During internship my first code blue was revived. Thanks to ECE."
- "Able to apply what I learnt in anatomy in cath lab and dialysis unit"

Box 2: Listing of areas/departments wherein the effect of ECE was felt by the CRRIs

Clinical simulation lab

Basic life support-Code Blue responses

Dialysis unit

Cardiac catheterization lab

Blood bank

Phlebotomy

and the need for its implementation have already been brought out. Some of these reports are by earlier batches of students from our own institution.^[4,6-8] As noted in earlier communications, motivation of the students to participate in the program is an essential prerequisite for the success of the program.^[4,6-8]

Since the clinical departments involved were the ones who volunteered to be part of this program, we were assured of their much-needed cooperation for the implementation. Lessons learnt from the Clinical Observership program helped us in formulating the logistics of running this program.^[4]

Challenges in conducting ECE included finding time from basic sciences teaching, involvement of the clinical personnel, and the clinical resources available when the students arrived for the program. Finding time for the program was a challenge in the initial

period of the program, as MCI had not allotted specific timeslot for this activity. This was resolved when the individual departments came forward to forgo their tutorial hours to accommodate this activity. With the implementation of Competency-Based Medical Education (CBME) in 2019, specific hours have been scheduled for this program. Whenever the clinical material was not readily available for the students, departments used recorded procedures and met the objectives of the session.

A session of valediction was held each year at the end of the ECE rotations, wherein the students were encouraged to reflect upon their experience in this unique program. This, in turn, helped them to share their experience with their peers and the faculty. This was important since all of them would certainly have not gone through similar case vignettes during their postings in individual departments.

The results of the program evaluation amply support the fact that ECE as conducted in our institution has achieved its goals. It is significant to note that, in addition to the feedback from the first-year undergraduate students, feedback taken from the CRRIs as well reiterates this observation. This batch of CRRIs belongs to the preclinical students who underwent the ECE program in the year 2013, were on the verge of completing their internship program, and ready to become qualified doctors, thereby possessing qualities of ideal Indian Medical Graduate. Their feedback becomes very significant in assessing the credibility of our ECE program, since their observations reflect the long-term impact of the program, which they had while they were preclinical students.

This study prompts us to believe that ECE has contributed tremendously in reiterating the relevance of basic sciences in the study of clinical medicine. They could also witness professionalism, empathy, love, and care, as exhibited by the physicians. This experience in turn helped them to emulate the above-mentioned qualities. Incidentally, these are the qualities advocated as highly desirable attributes in a physician and grouped as "non-traditional discipline-independent skills" (NTDIS).^[9] This, in our opinion, is the benchmark of a successful ECE program.

Along with the introduction of CBME in 2019, National Medical Council (NMC) has provided detailed guidelines for the implementation of ECE as well. Our experience of conducting ECE prompts us to lay stress on the fact that the objectives of this program are distinctly different from parallel programs like integrated teaching. ECE aims at bringing in appreciable changes in the attitude of the students, apart from the skills and knowledge. This program is unique since it had the most impact on the

attitude of the students, the domain of learning which is very difficult to bring changes in.

Limitations and recommendation

This study was based on the experience from one institution only. Hence may not be generalizable to other institutions. The effectiveness of such a program depends on various other factors including infrastructure, availability of trained faculty, and clinical material which may vary between different Institutions.

It is hoped that the authors' experience, as reflected in this article, would be of use in implementing ECE, with the correct perspective to derive the fullest benefit of the program.

Conclusions

There are very few reports in the literature on the successful implementation of the ECE program mandated by the MCI for preclinical students as early as 2013. After conducting this program successfully for the past five years, the authors are convinced about the desirability of ECE and its uniqueness, as supported by the student feedback. NMC has come out with a detailed instruction for structuring this program in 2019, stipulating the number of hours and topics to be covered. However, it has to be borne in mind that the issue addressed by ECE is very different from the conventional integrated teaching and other similar programs. ECE has been able to particularly address the affective domain of the learning process and also to promote awareness of the diverse roles and responsibilities of a doctor. It is tempting to suggest at this stage that the faculty will find our experiences of help in implementing this program, for the fullest benefit of the preclinical students. This will help in achieving the goals as evinced by the NMC.

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Conflicts of interest

There are no conflicts of interest.

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