Impact of a Comprehensive Early Clinical Exposure Program for Preclinical Year Medical Students

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Impact of a Comprehensive Early Clinical Exposure Program for Preclinical Year Medical Students

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Abstract

Purpose: To study the impact of an early clinical exposure program designed to provide a wide variety (cognitive, affective and psychomotor) of learning experiences for the preclinical year students.

Method: One hundred and fifty preclinical students were posted in small groups to selected departments – Transfusion medicine, Catheterization lab, Simulation lab, Radiology, Neurology, Nephrology, Respiratory medicine and General surgery. Each student had at least ten hours of clinical exposure under this program. The program was evaluated through a series of pre and post-test questionnaires, which were designed based on the learning objectives of each session. Students who wished to participate in the program evaluation gave informed consent, took up the pre / post test and were also asked to give their written open comments about the program.

Results: There was a significant increase in the post-test scores (ranging from 9.14 ± 2.67 to 36.65 ± 6.62) when compared to the pre-test scores (ranging from 7.94 ± 2.31 to 28.69 ± 6.11) for all the sessions (p value < 0.001, n = 144). Analysis of the open feedback showed that the program had significant impact on the cognitive, psychomotor and affective domains. “Application of basic sciences in clinical practice”, “motivation to learn”, “got familiar with various specialties”, “insight about what the patient undergoes” were the themes identified from the open comments.

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Conclusion: The innovative use of early clinical exposure program to teach/learn clinical skills like phlebotomy and Basic Life Support had been well appreciated by the students. The present design involving a variety of learning experiences has been successful in introducing the various dimensions of medical profession like scientific, ethical, interpersonal, professional and social to the new entrants in addition to enhancing their motivation to learn.

Keywords: Attitude; Learning; Simulation lab; Medical education; Curriculum

1. Introduction

In India, students enter medical schools at an early age with little priming towards the profession. Entry of students in most of the medical colleges is entirely based on their academic performance with no weighting for humanistic attitude and communication skills.1,2 Due to lack of adequate exposure, most students do not realize what to expect in the medical profession. A few enter the medical college purely due to parental pressure.3 Large classes, intense competition, exploding vocabulary and voluminous content delivered over a short time are some of the challenges faced by the first year MBBS students.3,4 Insufficient level of guidance and problems pertaining to transition from school to college life can also be included to this list of problems faced by the students during this period. Some students find the abrupt shift of medium of instruction from vernacular language to English difficult to cope. All these, along with the traditional curriculum, where the students are engaged in long hours of classroom and laboratory teaching with no exposure to the clinical setup, plays a major role in dousing the enthusiasm of the upcoming doctor. Under these circumstances, students often find their preclinical year to be tough, dreary and most importantly, they fail to understand the relevance of basic sciences in the clinical setting.

There has been an urgent call for curricular reforms with emphasis towards vertical and horizontal integration and competency based training.5 Many parts of the world have responded to these needs by shifting away from discipline-based curriculum. In line with these changes, Medical Council of India (MCI) developed the ‘Vision 2015’ document. MCI vision 2015 aims to produce a new generation of medical graduates of global standards through curricular reforms. “The roles of this new age doctor are recognized as clinician, communicator, life-long learner, team leader and professional”.6 Required curricular changes begin early in the form of a foundation course; early clinical exposure; properly designed integrated teaching and programs to develop the correct attitude and communication skills (ATCOM module).6

Early clinical exposure (ECE) needs to be a coordinated effort by the preclinical, paraclinical and clinical faculty. If implemented effectively, it has the potential to improve motivation for learning and promote deep learning, better understanding and longer retention of the knowledge. It can facilitate the students to understand the application of basic sciences in clinical practice and aid in effective learning of clinical skills. It could also serve as a platform for students to improve their communication skills and get initiated into inculcating professionalism at a very early and impressive stage of their medical education.7 Above all, it provides an opportunity for them to see the illness from the patient’s perspective. All this can foster the development of a holistic doctor who will be competent, communicative, humanistic and empathetic towards the patients.

To offer this experience, ‘Clinical observership’ program was started in PSG Institute of Medical Sciences and Research (PSGIMSR) in the year 2000. In this program, the first year MBBS students had the opportunity to spend half a day in the following selected specialties in small groups: Cardiology, Gastroenterology, Radiology, Nephrology and Transfusion medicine. This initiative was highly appreciated by the students.8 This program has now been modified and expanded to include more departments and implemented readily to suit the mandates from MCI as early clinical exposure. The aim of this study was to evaluate the impact of an organized program of early clinical exposure for the preclinical students in enhancing their motivation to learn basic science in relevance to clinical medicine.

2. Methods

2.1. Participants

One hundred and fifty first year MBBS students participated in early clinical exposure program conducted in the year 2015–16. Students were divided into
three batches (A, B, C) based on their roll numbers. Each batch was further divided into five small teams comprising of ten students. Each team spent an hour (from 4 pm to 5 pm) in the clinical departments every day of the week in turns, ensuring that there were no more than ten students in an ECE session. Last hour of the working day was selected for this program without interfering the conventional teaching sessions. Keeping the program at the end of the day also gave an opportunity to extend the session beyond the allotted hour when required.

Though attendance for the ECE program was compulsory as per MCI and University guidelines, participating in the program evaluation and giving feedback was strictly on voluntary basis. Informed consent was obtained from the participants. The study was approved by the Institutional Human Ethics committee.

2.2. Materials

The program was implemented in two cycles of three weeks duration. Five clinical departments were covered in each cycle. The first cycle of ECE sessions were conducted in the months of Nov-Dec 2015 and included rotations in Clinical simulation laboratory (for phlebotomy training), blood bank, and departments of neurology, radiology and surgery. During the second rotation of the program, which was conducted in March 2016, the students were posted once again in the Clinical simulation laboratory (for Basic Life Support training) and Radiology in addition to the Departments of Nephrology, Respiratory medicine and Cardiology (Catheterization laboratory).

Selection of departments was done with an intention to expose the students to a variety of learning experiences involving all the three domains of learning- cognitive, psychomotor and affective. The program also included super specialty departments like Cardiology, Nephrology and Neurology for which the students would not have the opportunity to be exposed in their regular curriculum. The departments to which the students were posted in each rotation were selected based on the subject matter covered in basic sciences until the time of the program. For example, the first rotation concurred with the completion of lower limb in Anatomy, hence visiting the Surgery department to see a case of varicose veins/ peripheral vascular disease was more pertinent than visiting Catheterization lab. Catheterization lab was reserved for the second rotation, which was scheduled when the students were learning or just finished learning thorax and abdomen in Anatomy.

2.3. Process

An orientation session for the students was conducted by the program coordinator prior to starting the rotations, wherein the objectives of the program, clear directives regarding the conduct of the sessions and the expected goals of this innovative venture were highlighted. Clinical

Table 2
Summary of open written comments.

| General | 'Knew about various departments/ specialties in the hospital, their functioning & infrastructure' |
| Knowledge | 'Made us familiar with various fields' |
| Psychomotor domain | 'CPR - empowered us' |
| Affective domain | 'Observed live procedures, saw instruments, drugs' |
| Motivating | 'Interesting motivating inspiring useful worthy awesome' |
| Suggestions | 'Program timing can be increased' |

Table 1
Comparison of pretest and posttest scores of ECE sessions.

<table>
<thead>
<tr>
<th>ECE Session (Maximum score)</th>
<th>Pretest score (n=144)</th>
<th>Post test score (n=144)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiology (50)</td>
<td>28.69 ± 6.11</td>
<td>36.65 ± 6.62</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Neurology (50)</td>
<td>21.44 ± 5.77</td>
<td>30.14 ± 7.55</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Surgery (50)</td>
<td>22.57 ± 5.93</td>
<td>34.31 ± 7.76</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Simulation Lab (Phlebotomy) (30)</td>
<td>15.54 ± 4.75</td>
<td>24.06 ± 4.60</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Blood Bank (15)</td>
<td>7.94 ± 2.31</td>
<td>9.14 ± 2.67</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Nephrology (40)</td>
<td>16.33 ± 2.84</td>
<td>28.51 ± 5.11</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Respiratory Medicine (35)</td>
<td>15.3 ± 12.59</td>
<td>23.27 ± 4.74</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Simulation lab (Basic Life Support) (40)</td>
<td>16.11 ± 5.87</td>
<td>29.19 ± 5.93</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Cardiology (40)</td>
<td>18.08 ± 5.44</td>
<td>29 ± 5.33</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>
department postings were coordinated by a faculty in each department. The designate faculty drew out the learning objectives for this session based on the student's prior knowledge and availability of clinical materials. This arrangement was kept uniform for the entire class.

The learning objectives for each session were chosen carefully in view of student's prior knowledge, the availability of clinical material and relevance. In departments like Nephrology, Radiology, Simulation lab, Blood bank the content was fixed and all students were uniformly exposed. For example in nephrology, the students witnessed a patient undergoing dialysis. The principle of dialysis, biochemical alterations in the blood before and after dialysis was discussed. In other departments like Respiratory medicine, Surgery, Neurology the experience was more impromptu, based on the availability of cases. In Cardiology, the objective was to give the students an experience of observing coronary angiogram followed by a discussion on the relevant anatomical aspects. If there were no patients scheduled for angiogram at the time of ECE session they were allowed to view the recorded procedure.

Based on the learning objectives, questionnaires were formulated for all the sessions and used as pretest and post-test for the students. Students who wished to participate in the program evaluation gave informed consent, took part in the pre-test and post-test and were also encouraged to give their written open comments anonymously.

2.4. Data collection and analysis

The questionnaires were designed in a five point Likert scale with 6–10 items to assess the effectiveness of ECE sessions. The scores used were 1 = not aware, 2 = not sure, 3 = know vaguely, 4 = know with reasonable clarity and 5 = know confidently. The questionnaire was meant to assess the impact of the program on the students. This was achieved by comparing the scores obtained by the students in pre- and post-tests. The scores were expressed as mean ± standard deviation and were compared by paired ‘t’ test using IBM SPSS software version 19.

The open comments regarding the program were analyzed through inductive approach. Specific themes were identified and the comments were assigned to the appropriate theme.

3. Results

Among the one hundred and fifty participants, one hundred and forty four participants submitted their filled in pre and post test questionnaires. There was a significant increase in the post-test scores when compared to the pretest scores for all ECE sessions (Table 1).

One hundred and eight students had given their written open comments anonymously. The review of the open comments has been tabulated in Table 2.

4. Discussion

Regulatory bodies of the medical education have spelled out clearly that the medical education needs to be geared to train professionals capable of providing holistic care to patients with compassion. Early clinical exposure, if implemented effectively could very well initiate the changes in the medical education system in the right direction to achieve the stipulated goal. There have been no clear directives to implement this program in terms of content, duration and mode of delivery. This has left the challenging responsibility of designing ECE entirely to the individual institutions, and the resultant programs would certainly depend upon the resources and initiatives available. Reports on the details of the conduct of ECE are scanty.

Interactive lectures, case scenarios, case based learning and occasional hospital visits have been implemented by a few of the institutions, as part of ECE. In PSG Institute of Medical Sciences and Research, this program has been implemented as postings to selected departments of not less than an hour's duration per session. Each student gets an exposure of at least ten hours of this experience. The posting involves a variety of experiences like observing an interventional or investigative procedure, seeing a patient in ward or observing the doctor-patient interaction in the outpatient clinics, observing the demonstration of clinical signs, learning and practicing skills like phlebotomy or Basic Life Support (BLS) on manikins in the Clinical simulation laboratory.

Most students appreciated the ECE experience as ‘inspiring’, ‘motivating’, ‘interesting’, ‘awesome’, ‘useful’, ‘good way of learning’, ‘evoked self interest’. They felt it helped them see the relevance of basic science in clinical practice. Interested students also contacted the clinicians in the specialty of their choice later and pursued their interest in the subject. For students who entered the medical profession without prior exposure, this program provided a bird’s eye view of the opportunities that lay ahead of them as evidenced from their comments like ‘Knew about various departments/specialties in the hospital, their functioning & infrastructure’, ‘Made us familiar with various fields’.
In the Clinical simulation laboratory students had instructions in Phlebotomy in the first rotation and hands-on training in BLS in the second rotation. BLS enables a person to recognize and support people in life threatening emergencies until full medical care can be provided. Any trained person can perform this if the need arises. Introducing BLS training as early as possible is considered essential and may help to increase their eagerness to learn and passion for the profession.\textsuperscript{10,14} ECE could be the ideal platform to introduce BLS training to the medical students. Students in their feedback expressed that learning BLS empowered them and made them feel more confident.

The program seemed to have helped students to develop a humanistic attitude towards the patients as evidenced by their comments like ‘‘developed an insight about what the patient undergoes’, ‘learnt how to behave kindly with patients’, ‘learnt the importance of human life’. They also commented that they gained an insight about the various roles/duties of a doctor. Students were of the opinion that more departments need to be incorporated in the program and the duration of the program should be increased. Authors fully endorse these views and feel that time factor could probably be a major restriction for expanding this program as per the students’ wishes.

5. Conclusion

ECE can serve as a platform for providing the preclinical year students a cosmic variety of experiences involving all the three domains of learning. It can also be adapted as the teaching strategy to introduce the various dimensions of medical profession like scientific, ethical, interpersonal, professional and social. This program if implemented effectively has the potential to be the ideal first step in the making of a holistic doctor.

Disclosure

The ethical clearance has been granted from the Institutional Human Ethics Committee. (Ref number 15/343, dated 6th November 2015).

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Other disclosures

None.

Conflict of Interest

None.

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