



## EARLY CLINICAL EXPOSURE ON ENDOCRINE PHYSIOLOGY FOR FIRST-YEAR MBBS STUDENTS

### Physiology

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### ABSTRACT

This comparative study was conducted on 79 first-MBBS students (31 females; 39.24% and 48 males; 60.76%) from a medical college in Western India to study the difference in scores after traditional didactic lectures and integrated teaching with early clinical exposure. After clarifying the purpose of the study and obtaining written informed consent, traditional didactic lectures were delivered as per syllabus for the first-year MBBS course. Following this, the students took a pre-test that comprised five questions (two marks per question; total 10 marks). After the pre-test, integrated teaching with early clinical exposure was conducted on the same topic. This was followed by a post-test that used a questionnaire that was identical to that of the pre-test. The differences between the pre- and post-test scores were highly significant for both females ( $p < 0.0001$ ) and males ( $p < 0.0001$ ). Significant gender differences in scores were observed both in the pre-test ( $p = 0.005$ ) and post-test ( $p = 0.045$ ).

### KEYWORDS

Diabetes mellitus, Early clinical exposure, Endocrine physiology, First year MBBS

### INTRODUCTION

Early Clinical Exposure (ECE) aims to provide authentic human contact in a social or clinical context that enhances learning and enables the pre-clinical students to – recognize the relevance and context of basic sciences in diagnosis, patient care and treatment, recognize attitude, ethics and professionalism as integral to the doctor-patient relationship and to understand the socio-cultural context of diseases. [1]

ECE refers to human contact in a social or clinical context during the pre-clinical medical years, [2] before the students are posted for official clerkship and internship training programs. [3] Besides providing relevance to teaching of basic medical sciences to first-year MBBS students, ECE can help them develop communication skills and the desired attitudes, and also provides opportunities to inculcate professional behaviour at an early stage. [4, 5]

By integrating basic science knowledge with clinical science, ECE can contribute to better understanding of the relevance of basic science and hence, better gratification among medical students. [6] Provision of opportunities to actively interact and learn from patients and the clinicians can enrich their learning experience. By introducing the students to basic clinical skills, professionalism and student-patient relation, it can facilitate smooth transition into clinical training. [7]

ECE has been successfully imparted by using the Internet, [8] computer assisted visual aids [9] and other web-based instructional materials [10] Computer-assisted learning packages were found to give the most benefit to the low achievers while high achievers were less affected by the method of instruction. [11]

ECE is viewed as the beginning of the process of professional socialization and the development of mentoring relationships, and is also seen as a way to provide contexts for basic science and its relevance to medical practice. [12] Many studies have revealed that ECE programs encourage medical students in several ways. [13] The ECE experience provides positive motivation toward medical education and in turn improves students' performance in examinations. [14]

ECE training can be conducted in primary care settings, outpatient clinics, hospital wards and in the community. [3] ECE programs should maintain students' learning cycle based on Kolb's experiential learning, emphasize the active role of students and provide timely supervision and feedback. [2] A Europe-based survey [3] reported that observation, small group teaching, clinical bedside teaching, supervision and feedback, reflective journal writing, self-learning, case-based learning, lectures, and shadowing were common teaching and learning activities in ECE programs.

Besides experiential learning, medical students also engage in situational learning during ECE, while keeping the community aspects

in perspective. [15] The learning process during ECE is therefore social and collaborative, so that outcomes of ECE experiences should be affected by the environment.

### MATERIALS AND METHODS

This comparative study was conducted at a medical college in Western India. The participants included all first-year MBBS students, aged 18 years and above, of either sex, who gave written informed consent. Those students who did not give written informed consent or those who were absent during the traditional didactic lectures (TDLs) or integrated teaching (IT) with early clinical exposure (ECE) or pre-test or post-test were excluded.

The purpose of the study was clarified to first-year MBBS students and written informed consent was obtained from those willing to participate in the study. TDLs were delivered on endocrine physiology and diabetes mellitus, as per syllabus for the first-year MBBS course, and a pre-test was conducted after TDLs. The pre-test comprised five questions (two marks per question; total 10 marks). After the pre-test, IT with ECE was conducted. Using a questionnaire that was identical to that of the pre-test, the post-test was conducted after IT plus ECE. The outcome studied was the difference in scores after TDLs (by a pre-test) and IT plus ECE (by a post-test).

The data were entered in Microsoft Excel spreadsheet (Microsoft Corporation, Redmond, WA, USA) and analyzed using SPSS statistical software Windows Version 25.0 (IBM Corporation, Armonk, NY, USA). The data were presented as mean and standard deviation (SD) or as percentages, as applicable. 95% confidence interval (CI) was calculated using the formula:  $[\text{Mean} - (1.96 \times \text{Standard Error})] - [\text{Mean} + (1.96 \times \text{Standard Error})]$ . The statistical significance was determined at  $p < 0.05$ .

### RESULTS AND DISCUSSION

A total of 79 students (31 females; 39.24% and 48 males; 60.76%) participated in the study.

**Table-1: Difference In Pre- And Post-test Mean Scores (out Of 10)**

| Parameter        | Females (n=31) |             | Males (n=48) |             |
|------------------|----------------|-------------|--------------|-------------|
|                  | Pre-test       | Post-test   | Pre-test     | Post-test   |
| Mean             | 4.94           | 8.74        | 4.21         | 8.23        |
| SD               | 1.03           | 0.93        | 1.29         | 1.34        |
| 95% CI           | 4.57 - 5.30    | 8.41 - 9.07 | 3.84 - 4.57  | 7.85 - 8.61 |
| Paired 't' value | 15.246         |             | 14.973       |             |
| 'p' value        | <0.0001 *      |             | <0.0001 *    |             |

SD = Standard deviation; CI = Confidence interval; \* Highly significant

**Pre- And Post-test Scores:** Highly significant differences ( $p < 0.0001$ ) were observed between the scores in the pre- and post-tests in the

present study (Table-1). Another study [16] has reported statistically significant differences ( $p=0.011$ ) between the scores in the pre- and post-tests.

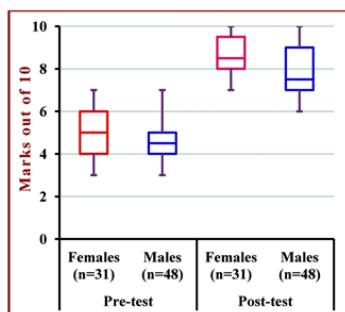
**Table-2: Gender Differences In Mean Scores (out Of 10)**

| Parameter | Pre-test       |              | Post-test      |              |
|-----------|----------------|--------------|----------------|--------------|
|           | Females (n=31) | Males (n=48) | Females (n=31) | Males (n=48) |
| Mean      | 4.94           | 4.21         | 8.74           | 8.23         |
| SD        | 1.03           | 1.29         | 0.93           | 1.34         |
| 95% CI    | 4.57 - 5.30    | 3.84 - 4.57  | 8.41 - 9.07    | 7.85 - 8.61  |
| Z value   | 2.781          |              | 1.995          |              |
| 'p' value | 0.005 *        |              | 0.045 *        |              |

SD = Standard deviation; CI = Confidence interval; Z = Standard error of difference between two means; \* Significant

Gender differences in mean scores: As depicted in Table-2, the gender difference in mean scores was significant in the pre-test ( $p=0.005$ ), as well as in the post-test ( $p=0.045$ ). Another study [17] reported that the study habits and study methods of medical students differ by gender and have significant impact on performance outcomes of learners. In contrast, another study [18] found no significant gender-based difference in scores of medical students.

In the pre-test, the minimum, first quartile were identical for students of both sexes but the median, third quartile and maximum scores (out of 10) were much higher for female students, compared with the scores of their male counterparts. In the post-test, the minimum, first quartile, median and third quartile scores were much higher for female students while the maximum scores were identical for students of either gender. (Fig-1)



**Fig-1: Box Plot Depicting Scores**

Feedback from students: During the feedback session, 72 (91.14%) felt that ECE would be useful experience to draw back on, when they are posted in clinical settings, 61 (77.22%) reported better clarity and communication, 76 (96.20%) found that the learning environment was comfortable. A Tehran-based study [19] reported that the majority of medical students believed that ECE was a valuable learning experience that could strengthen their learning in the pre-clinical phase, helped them appreciate the application of basic sciences knowledge in clinical problem-solving, to communicate the relevance of basic sciences to their future practice and to prepare them for the transition to clinical settings. Another study [20] from Nottingham, United Kingdom also showed that early experience had helped medical students to understand basic medical sciences. In a Vellore-based study, [21] many students stated that apart from increasing their interest in the subject and their comprehension, ECE increased their sensitivity toward patient problems and needs.

## CONCLUSION

Students' scores increased significantly after their exposure to integrated teaching with early clinical exposure. The gender difference in mean scores was significant in the pre-test as well as in the post-test.

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