

Evaluation of Effectiveness of Early Clinical Exposure in Learning Anatomy to 1st MBBS StudentsVarsha R. Bhivate^{1*}, Manoj. R. Bhivate², Mithula Raj³, Bhakti Sarang⁴¹Associate Professor, Department of Anatomy, Terna Medical College, Nerul, Navi Mumbai, Maharashtra.401705²Associate Professor, Department Ophthalmology, Vedantaa Institute of Medical Sciences, Dahanu, Palghar, Maharashtra.401606³Assistant Professor, Department of Anatomy, Terna Medical College, Nerul, Navi Mumbai, Maharashtra.401705⁴Professor, Department of Surgery, Terna Medical College, Nerul, Navi Mumbai, Maharashtra.401705

Received: 25-11-2023 / Revised: 23-12-2023 / Accepted: 26-01-2024

Corresponding Author: Dr. Varsha Bhivate

Conflict of interest: Nil

Abstract:**Context:** The National Medical Council of India recently announced a number of reforms and upgrades to medical education, including the inclusion of "early clinical exposure" (ECE) in the newly proposed competency-based medical education.**Aim & Objectives:** To assess the knowledge, skill, the improvement in scores and perceptions of 1st MBBS students after early clinical exposure. To study feasibility of ECE as a T-L method for phase 1 curriculum.**Materials & Methods:** A prospective interventional study was done on the evaluation of the effectiveness of early clinical exposure in learning anatomy to 100 students of the 1st MBBS (21–22 batch) and Anatomy faculty in Terna Medical College, Mumbai, after ethical permission. Data was collected using a validated, anonymous, self-administrated questionnaire that also included clinical-based questions on thyroid glands and was assessed using a five-point Likert scale. Participants' and faculties perceptions about ECE were studied. In the control group, the traditional method is used.**Discussion:** ECE improves learning in all three areas of a medical student's learning - cognitive, psychomotor, and affective – indicating that it is an excellent strategy to supplement standard theoretical teaching.**Results and Conclusion:** ECE can be considered as an effective method of teaching, advantageous to the slow learners and an effective T-L method in teaching. 88.2% students feel that ECE should be an integral part of curriculum. 81.6% students feel there is significant improvement in knowledge in basic subject after ECE. But as per new guidelines by NMC 2023 number of hours for ECE reduced for phase 1 subject that should be revised.**Keywords:** Early clinical exposure, MBBS first professional, perceptions, teaching method.This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.**Introduction**

Traditional medical curricula have built a barrier between preclinical and clinical years of study, burying the importance of basic sciences in clinical settings. The Medical Council of India recently announced a number of reforms and upgrades to medical education, including the inclusion of "early clinical exposure" (ECE) in the newly proposed competency-based medical education.

ECE does not replace basic and clinical sciences; rather, it complements and contextualizes them, inspiring students to have a greater understanding of the medical field. [1] Throughout the past decade, the traditional medical education system in India has been founded on a teaching model that confines Phase I medical students to a classroom

and laboratory setting for their curriculum, with clinical subjects being introduced only in their second year. The MBBS curriculum has therefore been modified such that clinical exposure can be introduced earlier along with the basic sciences. Students will be able to learn the basic and clinical sciences by means of integrating learning activities, like early clinical contact, clinical skills, communication skills or task-based learning sessions. [2] The key elements of ECE are provision of clinical correlation to basic sciences learning, provision of authentic human contact in a social or clinical context that enhances learning in the early/pre-clinical years of undergraduate

education and introduction to humanities in medicine. [2]

ECE is just one modus operandi of contextualizing medical education. It is one method of modifying the curricula to meet tomorrow's need. It is basically "A teaching and learning methodology which fosters exposure of medical students to patients (actual human contact) as early as the first year of medical college, in a social or clinical context that enhances learning of health, illness or disease, and the role of the health professional." [3] ECE is an archetype of "vertical integration" in medical education, with an immense interdisciplinary contribution.

A tremendous teamwork is required, and the same is encouraged for the success of this offbeat yet resourceful format. At the same time, the teachers (both basic science and clinical) are primarily facilitators, like a lighthouse, showing the path that the students take. This imparts the students a sense of responsibility and encourages them with self-directed learning. [4]

Aims & Objectives:

Aim: Evaluation of effectiveness of early clinical exposure in learning Anatomy to 1st MBBS students.

Objectives:

1. To assess the knowledge and skill of 1st MBBS students after early clinical exposure.
2. To estimate the improvement in scores of 1st MBBS students on periodic test after early clinical exposure.
3. To assess the perception of students about early clinical exposure.
4. To study feasibility of including ECE as a T-L method for phase 1 curriculum.

Materials and Methods

Study Design: Qualitative Educational Research

Setting: Terna medical college, Navi Mumbai.

Duration: Nov 2021 – Nov 2022

Participants: Data Collection Source: 1st MBBS students and Anatomy faculty of Terna medical college, Navi Mumbai.

Sample size: 100

Intervention: A prospective, nonrandomized, interventional study carried out among the students of 1st MBBS Terna medical college, Navi Mumbai. A protocol on ECE prepared through departmental discussion and under the guidance of

faculty. The prepared protocol validated by peer-expert. Faculty of department of Anatomy sensitized about the ECE on thyroid gland. Questionnaire for student participants designed and validated by peer and experts.

Data collected using a validated, anonymous, self-administrated questionnaire which also includes clinical based questions on thyroid gland. It delivered to our study participants, after explaining the voluntary nature of the questionnaire and obtaining a verbal consent from the study participants. Participants' perceptions about ECE studied. In control group traditional method is used for teaching the topic thyroid gland. Pre-test and post-test taken. Perceptions of involved faculties also taken as feedback.

Data Analysis: analyzed by using SPSS software version 21.0 package.

Tool: The response assessed using five-point Likert scale each rated from 0-5 (Likert scale: 0, strongly disagree to 5, strongly agree)

Approval of the institutional ethics committee taken. An informed consent taken from the students before the study.

Inclusion Criteria: 1st MBBS Students who have consented to participate in the study and are willing to fill the feedback form at the end of ECE session included in the study.

Exclusion Criteria: Incomplete feedback forms excluded from the study.

The study was approved by the hospital ethical review committee and written informed consent was obtained before a respondent completed the questionnaire. The questionnaire didn't contain the name of the participants; thus, the confidentiality of the participants was maintained.

Results

When asked components of the ECE helped you to learn, 76% of them responded. The students commented that the ECE program was very interactive and clinical cases and discussions were very good. Participants response after ECE on basic subject interest shown in figure 1. The 84.2% of the students felt that ECE helpful in improving knowledge, shown in figure 2. The 88.2% of the students felt that ECE should be essential part of curriculum shown in figure 3. The students (88.4%) gave an overall rating of good/excellent to ECE on a five-point Likert scale. The mean score was 4.2, showing that the overall rating of ECE was good to excellent.

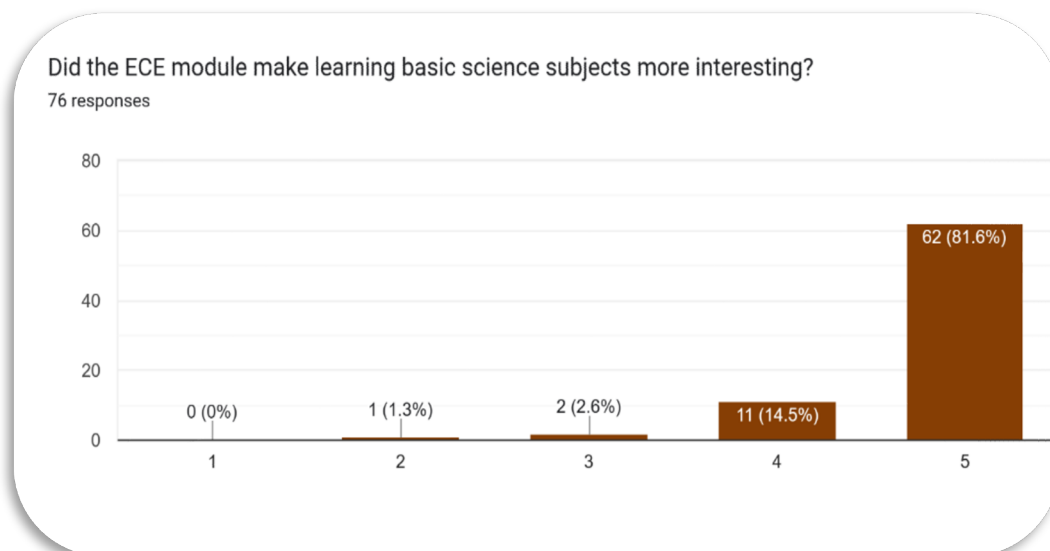


Figure 1: Participants response after ECE on basic subject interest levels

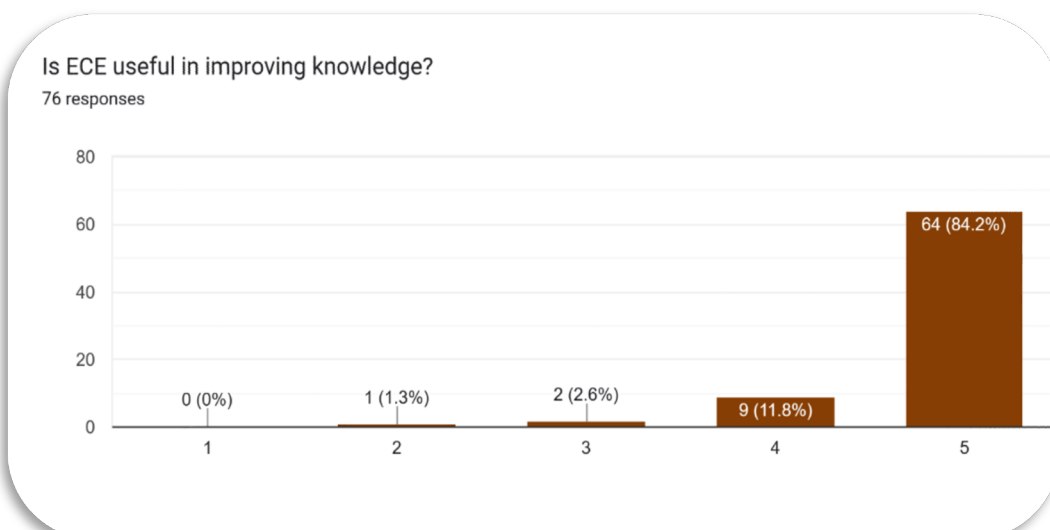


Figure 2: Participants response about ECE in improving knowledge

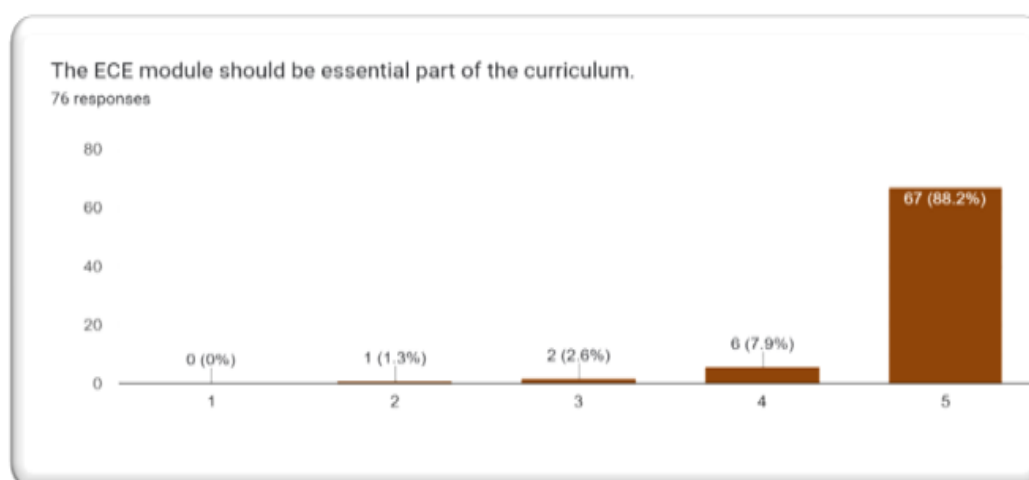


Figure 3: Participants response about ECE as essential part of curriculum

Pre and post training Questionnaire

* Indicates required question

Section AMCQ

Only one response allowed.

1. Location of thyroid gland is--- * 1 point
- Mark only one oval.
- C 5 to T1
- C4 to T1
- C7 to T1
- C6 to T2
2. Epithelium of active thyroid gland follicles is--- * 1 point
- Mark only one oval.
- Simple squamous
- Pseudostratified
- Simple columnar
- Stratified squamous
3. Parafollicular cells secrete following hormone- * 1 point
- Mark only one oval.
- Parathormone
- T3
- Thyroxine
- Calcitonin
4. Inferior thyroid artery is a branch from--- * 1 point
- Mark only one oval.
- Brachiocephalic trunk
- External carotid artery
- Thyrocervical trunk
- Internal thyroid artery
5. Iodine deficiency can cause-- * 1 point
- Mark only one oval.
- Goitre
- Thyroid cancer
- Solitary thyroid nodules
- Thyroiditis
6. Grave's disease or Basedow's disease is due to-- * 1 point
- Mark only one oval.
- Hyperactivity of adrenal cortex
- Hypoactivity of the thyroid gland
- Hyperactivity of thyroid gland
- Hypoactivity of islets of Langerhans

7. Which of these diseases is not related to thyroid glands? * 1 point
- Mark only one oval.*
- Cretinism
- Myxoedema
- Goitre
- Acromegaly
8. This condition of chronic inflammation of the thyroid leading to under-activity is-- * 1 point
- Mark only one oval.*
- Thyroiditis
- Goiter
- Hypothyroidism
- Hyperthyroidism
9. Which gland mainly controls and regulates the actual thyroid activity? * 1 point
- Mark only one oval.*
- Pituitary gland
- Hypothalamus
- Both A and B
- Only A
10. Which of the following is the screening test for the diagnosis of thyroid disease? * 1 point
- Mark only one oval.*
- Thyroid Stimulating hormone
- Total T3
- Total T4
- Free T3

Case

A 55-year-old woman complained of midline nodular swelling on the front of her neck which moves up and down during swallowing. On the physical examination, it was found that she had slight tremors on outstretched hands, her pulse rate

11/min, BP 150/100 mm hg and there was slight bulging of her eyes. She also told that she had lost weight, usually felt feverish.

- a. What is her diagnosis? *
 - b. Why thyroid swellings move up and down during swallowing? *
 - c. Mention the anatomical basis of her symptoms. *
 - d. Is ECE useful in improving knowledge? *
11. Did the ECE module make learning basic science subjects more interesting? *
 12. The ECE module should be essential part of the curriculum. *
 13. Are you motivated to read further on this topic as a result of participating in ECE? *
 14. Did the ECE module make learning basic science subjects more interesting? *
 15. Enlist any two good things about this session. *
 16. Which components of the program helped you to learn? *
 17. Suggest changes in the program that will help you learn still better. *

Figure 4: Questionnaire

Discussion

Early Clinical Exposure (ECE) provides a clinical context and relevance to basic sciences learning. Early clinical exposure is a key technique for combating the limits of standard classroom learning methods for clinical skill development. [2,5] The ECE programme is a different way to enhance Anatomy didactic lectures. It has always been a difficulty to teach Anatomy to first-year medical students in a way that is both fascinating and beneficial to their learning.

When education is tailored to students' learning preferences and styles, student motivation and performance improve. [6] Teaching basic sciences to medical students in a way to make interesting, enhance learning and enable them to correlate with clinical aspect has always been a challenge. 81.6% students feel there is significant improvement in knowledge in basic subject after ECE. Planning of ECE can be done in different settings with the use of appropriate resources such as logbook, textbooks, notes, instruments, learning material, case record sheets and peer learning. [7]

The time allotted for ECE in first year (as per GMER, 2019) was 90 hours which has to be equally divided among the three preclinical subjects. So, the time available for each subject is 30 hours. But it is reduced to 27 hours as per new guidelines by NMC. [8] ECE will help students make the transition to medicine. It improves learning in all three areas of a medical student's learning - cognitive, psychomotor, and affective – indicating that it is an excellent strategy to supplement standard theoretical teaching. [9] ECE improves skills, which are required to transition our undergraduates into community-based primary care physicians. ECE improves the fundamental science performance of new medical students, relieves stress related to patient care, enhances clinical reasoning, and results in favourable learning outcomes. [6]

Incorporating this teaching-learning method in addition to conventional education in a few clinical circumstances will significantly improve the outcome, benefiting students, the economy, and society. Early clinical experience will benefit students since they will have a better understanding of the clinical aspects of the same topic and will be able to fine-tune their abilities and knowledge. [7,8] There is significant improvement in scores of first MBBS students on periodic test after early clinical exposure. In the long term, it will be beneficial to become a good physician. It helps to reinforce comprehension between normal and diseased state.

Conclusion

ECE can be considered as an effective method of teaching as depicted in the study wherein the scores of students exposed to ECE were statistically significantly higher. Thus, it proved that ECE was not only effective in retaining knowledge, understanding concepts. But it also helped in correlating the basic science topics with the clinical conditions. Further, this method of teaching aroused interest in the subject and was advantageous to the slow learners. In addition, the positive feedback received both from the faculty and students has confirmed the utility of ECE as a new T-L method in teaching. 88.2% students feel that ECE should be an integral part of curriculum. But as per new guidelines by NMC 2023 number of hours for ECE reduced for phase I subject, which should be revised. Early clinical experience will definitely play a crucial role in medical education.

Future Prospects

ECE sessions could be organized for the same batch of students in Phase II and Phase III with added clinical aspects involving Peer learning, case-based learning. This would help the students in Phase II and III to enhance their interpretation skills and correlate it with the clinical conditions and thereafter the retention of knowledge in these students could be assessed.

Acknowledgments

I express a deep sense of gratitude to my senior faculties of GSMC and KEMH NMC nodal center and ACME batch mates and my colleagues for their continuous support and encouragement. I express my heartfelt thanks to faculty members of Anatomy department, Terna Medical College, Navi Mumbai in delivering the module. I also thank my first professional students for their participation in the study.

References

1. Govindarajan S, Vasanthb G, Kumarc PA, Priyadarshinib C, Radhakrishnand SS, Kanagaraje V, et al. Impact of a comprehensive early clinical exposure program for preclinical year medical students. *Health Prof Edu* 2018; 4:133-8.
2. Irby DM, Cooke M, O'Brien BC. Calls for reform of medical education by the Carnegie foundation for the advancement of teaching: 1910 and 2010. *Acad Med* 2010; 85:220-7.
3. Mandal A, Ghosh A, Sengupta G, Bera T, Das N, Mukherjee S. Factors affecting the performance of undergraduate medical students: A perspective. *Indian J Community Med* 2012; 37:126-9.
4. Das P, Biswas S, Singh R, Mukherjee S, Ghoshal S, Pramanik D. Effectiveness of early clinical exposure in learning respiratory physi-

- ology among the newly entrant MBBS students. *J Adv Med Educ Prof* 2017; 5: 6-10.
5. Sathishkumar S, Thomas N, Tharion E, Neelakantan N, Vyas R. Attitude of medical students towards early clinical exposure in learning endocrine physiology. *BMC Med Education* 2007; 7:30
 6. Verma M. Early clinical exposure: New paradigm in Medical and Dental Education. *Contemporary clinical dentistry*. 2016 Jul; 7(3):287.
 7. Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsmakers JFM. Early clinical exposure in medical curricula across Europe: An overview. *Eur J Gen Pract*. 2009 Jan 1; 15(1):4–10.
 8. Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. How can experience in clinical and community settings contribute to early medical education? A BE-ME systematic review. *Med Teach*. 2006 Feb; 28(1):3–18.
 9. Başak O, Yaphe J, Spiegel W, Wilm S, Carelli F, Metsmakers JFM. Early clinical exposure in medical curricula across Europe: An overview. *Eur J Gen Pract*. 2009 Jan 1; 15(1):4–10.
 10. Dornan T, Littlewood S, Margolis SA, Scherpbier A, Spencer J, Ypinazar V. How can experience in clinical and community settings contribute to early medical education? A BE-ME systematic review. *Med Teach*. 2006 Feb; 28(1):3–18.