

Perception of Phase I MBBS Students on the Early Clinical Exposure Module in Anatomy: A Cross-sectional Study

ANIL KUMAR DWIVEDI¹, NIYATI AIRAN²

ABSTRACT

Introduction: Early Clinical Exposure (ECE) is an innovative approach in medical education that introduces MBBS students to patient care from the very beginning of their studies. By linking theoretical learning with clinical experience, ECE helps students better understand and apply basic science concepts. This early clinical exposure not only strengthens core medical knowledge, but also develops empathy and social awareness, key qualities in effective healthcare. Early and consistent exposure to clinical settings improves communication skills, sharpens clinical abilities, and enhance confidence, shaping students into compassionate and capable future doctors.

Aim: To introduce structured ECE module in anatomy and to assess perception of phase I MBBS students about ECE.

Materials and Methods: The present cross-sectional study was carried out among MBBS phase I students between March to June 2025. Purposive sampling was used and 150 students were selected for the study. Structured and validated ECE module was used to conduct session of ECE with the support of Department of surgery. Patients' images and video of clinical findings and examination of branchial cyst, branchial fistula, thyroglossal cyst and fistula was used as case scenarios during session on pharyngeal apparatus. After the session,

student's perception of ECE were recorded with ten closed ended questions based on a five-point Likert scale having 0 to 4 marks for strongly disagree to strongly agree. The response was represented as frequencies, percentages, and bar charts.

Results: Out of 150 students 141 (94.00%) students perceived ECE is more interesting teaching learning method in comparison to tradition didactic lectures. 137 (91.33%) students observed that Early Clinical Exposure (ECE) enhanced their attentiveness during class sessions. Majority of students noticed that ECE developed interest in the topic, helped in understanding, motivated to read more and better retention. The majority of students believed that early clinical exposure facilitated a stronger correlation between anatomy and clinical cases, and suggested its inclusion across other topics in anatomy as well as in other preclinical subjects.

Conclusion: First-year MBBS students showed a positive response to early clinical exposure. Engaging with clinical scenarios deepened their understanding of anatomy, continued their enthusiasm and strengthened their commitment to learn. ECE proved to be an effective strategy for integrating basic sciences with clinical context, promoting better comprehension and retention.

Keywords: Anatomy, Clinical, Competency based education, Curriculum, Medical education

INTRODUCTION

Medical education is the structured process of training future doctors with essential scientific knowledge, clinical skills, and ethical principles [1]. Traditional medical education has primarily relied on didactic lecture-based teaching, where knowledge is delivered in a one-way format from instructors to students. Although lectures efficiently deliver large amounts of information, they often limit student engagement and practical application. Their passive format can hinder understanding and retention of complex concepts. As a result, students may struggle to connect theory with clinical practice [2]. Conventional teaching approaches emphasize memorization, hindering the growth of students' critical thinking and clinical abilities [3].

The limitations of traditional teaching learning methods have driven educational reforms, leading to the incorporation of more innovative approaches. These innovations aim to create more dynamic, student-centred environments that reflect the evolving needs of healthcare education [4,5].

The ECE helps medical students develop essential clinical skills and real-world understanding [6]. Essential soft skills like communication, empathy, and teamwork are frequently overlooked, even though they play a key role in developing skilled and caring medical professionals. Addressing gaps in the medical curriculum requires introducing students to clinical exposure early in their

training. Connecting classroom lessons to real-life scenarios makes their learning more relevant, engaging, and effective. Recognizing the need for reform, the Medical Council of India (MCI) proposed early clinical exposure as a key change in his vision 2015 document [7] to produce more competent Indian medical graduates. These initiatives were later incorporated in competency-based medical education implemented from batch 2019 [8].

Early Clinical Exposure engages students in clinical environments from the beginning, enhancing their enthusiasm and supporting their professional development [9]. It deepens understanding of basic sciences, boosts academic learning, communication skills, and confidence, shaping compassionate and competent future doctors [10]. It will also help students to develop better clinical reasoning abilities. This could translate to more accurate diagnoses and treatment plans later in their careers [11]. The ECE can be carried out through hospital visits, interactions with real patient in classroom or by using clinically relevant materials such as case histories, lab reports, radiological images, clinical case photo and video to familiarize students with different medical conditions [6]. ECE brings real-world medical experience into the classroom, helping students connect theory with practice. As a result, it improves their understanding of medical topics and helps them develop the skills needed to care for patients with kindness and confidence [12].

Many studies from India and around the world discuss students' views on ECE [6,10,11]. However, there is limited information on how first-year MBBS students in this region perceive ECE in anatomy [13,14]. Understanding their experiences and feedback can help drive valuable changes. Faculty can refine their teaching methods to better align with student needs, while curriculum designers can enhance ECE content to make it more engaging and clinically relevant. These improvements can elevate the quality of medical education and better prepare students for real-world clinical practice. The present study aimed to introduce structured early clinical exposure module in anatomy and to assess perception of phase one MBBS students about early clinical exposure.

MATERIALS AND METHODS

The present cross-sectional study was conducted in the Department of anatomy during March 2025 to June 2025 in a medical college located in Garhwal region of Uttarakhand, India. Ethical clearance from Institutional Ethics Committee was obtained before the commencement of the study (letter no. MC/IEC/2025/06). All 150 MBBS phase one students studying in anatomy were selected by using Purposive sampling technique.

Inclusion and Exclusion criteria: All consenting phase one MBBS students were included in the study, Non-consenting students were excluded from the study. Informed written consent was obtained from all the participants prior to beginning of study.

Study Procedure

A core group of two faculty members was formed (one from anatomy and one from surgery). The core team designed a structured ECE module as per National Medical Commission (NMC) guidelines [9]. The module was validated by Medical Education Unit (MEU) and Curriculum committee. Separate orientation sessions were held to sensitize faculties and students. The time was allotted to structured ECE module from ECE teaching hours of anatomy. One session of two hours was conducted with the support of Department of surgery. Patients' images and video of clinical findings and examination of branchial cyst, branchial fistula, thyroglossal cyst and fistula was used as case scenarios during teaching learning session on pharyngeal apparatus. The session was facilitated by faculties from Anatomy Department.

After the successful completion of ECE session, student's perception of ECE were recorded with ten closed ended questions based on a five-point Likert scale having 0 to 4 marks for strongly disagree to strongly agree. The questionnaire was given to the participants as a hard copy. The prevalidated questionnaires were obtained from previous questionnaires-based survey on ECE in various subjects [6,10,15,16]. The questionnaires were reviewed by

faculty members of Department of anatomy and their suggestions were incorporated. The questionnaires were further reviewed and validated by expert members of the medical education team of the institute. The reliability of the questionnaires was assessed with the help of 10 senior batch students not involved in the present study. The purpose and other details of the study was explained in the participant information sheet, which was given to participant along with consent form before the questionnaires. The response of the questionnaires of all participants was entered in Microsoft Excel sheet.

STATISTICAL ANALYSIS

Statistical Package for Social Sciences (SPSS) 20 software was used to obtain frequencies and percentages from the response of all participants. Graphical data representation as bar chart was done using Microsoft Excel.

RESULTS

A total 150 MBBS phase one students (74 males and 76 females) having age range of 18 to 20 years participated in the feedback questionnaire after introduction of structured early clinical module in anatomy, which makes the response rate 100%. Perception of students about early clinical exposure was collected by ten close ended, prevalidated questionnaires based on a five-point Likert scale. The strongly disagree and disagree category was grouped as disagree, strongly agree and agree category was clubbed as agree for discussion purpose [Table/Fig-1].

Across majority of questionnaires, agree and strongly agree responses consistently exceed 84.67%, indicating strong student support of ECE as teaching learning method. 94.00% found ECE more interesting than traditional lectures, 91.33% felt it increased their attention in class, 88.67% reported developing interest in the topic, 84.67% agreed ECE stimulated thinking and idea generation, 92.67% said ECE improved understanding, 88.00% reported better retention, 90.67% found it helpful in correlating anatomy with clinical cases, 89.33% supported ECE integration into anatomy teaching and 87.33% favoured its inclusion in other basic sciences.

DISCUSSION

Early Clinical Exposure is an important aspect of medical education, has been widely implemented by institutions across India and world. Introducing students to clinical settings early in their training helps them develop familiarity with diagnostic reasoning and therapeutic approaches [6]. The present study was conducted to know the perception of 150 phase one MBBS students about early clinical exposure. 94.00% of the respondents agreed that ECE is a more interesting teaching learning method as compared to traditional didactic lecture. The similar findings were reported by Yadav S et al.

S. No.		Strongly Disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly Agree N (%)
1	ECE is more interesting method of teaching -learning compared to traditional lecture	0 (0)	7 (4.67)	2 (1.33)	60 (40.00)	81 (54.00)
2	ECE has increased my attention in class	0 (0)	5 (3.33)	8 (5.33)	80 (53.33)	57 (38.00)
3	I developed interest in the topic	0 (0)	6 (4.00)	11 (7.33)	84 (56.00)	49 (32.67)
4	Method stimulated me to think on that topic and generated new ideas	0 (0)	1 (0.67)	22 (14.67)	81 (54.00)	46 (30.67)
5	ECE motivated me to read more about the topic	0 (0)	2 (1.33)	33 (22.00)	77 (51.33)	38 (25.33)
6	ECE helped me to understand the topic better	0 (0)	6 (4.00)	5 (3.33)	81 (54.00)	58 (38.67)
7	ECE has helped me in better retention of the topic	0 (0)	5 (3.33)	13 (8.67)	86 (57.33)	46 (30.67)
8	ECE helped me in correlating Anatomy with clinical case	0 (0)	4 (2.67)	10 (6.67)	57 (38.00)	79 (52.67)
9	ECE should be incorporated as a teaching -learning method along with regular lectures for other topics in Anatomy for undergraduates	0 (0)	5 (3.33)	11 (7.33)	57 (38.00)	77 (51.33)
10	ECE should be incorporated as a teaching -learning method along with regular lecture in other basic science subjects for undergraduates	0 (0)	5 (3.33)	14 (9.33)	60 (40.00)	71 (47.33)

[Table/Fig-1]: Perception of students about Early Clinical Exposure.

2014 [15], Kharay SS et al. 2023 [17], Chaudhary RJ et al. 2022 [18], Quadras PR et al. found that 88% participants agreed that ECE is more interesting method [6].

Introduction of early clinical exposure in the beginning of learning, leads to meaningful academic progress at a stage when learners are most receptive [19]. In the present study 91.33% of students agreed that ECE increase their attention in the class. Similar findings were reported by S P Sawant et al. 2017 [20], Chaudhary RJ et al. 2022 [18] and P Sharma et al. 2017 [21].

Early Clinical Exposure integrates patient-centered learning, links basic sciences to clinical practice, and introduces medical humanities to enrich early medical education. the present study observed that 88.67% of students agreed that ECE is helpful in creating interest in the topic, Yadav S et al. 2024 found 88% of students developed interest and were highly involved in session [15]. Similar findings observed by Chaudhary RJ et al. 2022 [18], Singh RA et al. 2024 [10], Quadras PR et al. 2023 [6] and MS Khalil et al. 2023 [22], while Ewnte B et al. 2023 found only 60% participants agreed that ECE create interest in the topic [23]. 84.67% of the students supported the view that ECE stimulate to think on topic and help in generating new idea, Phalgunan V et al. 2022 reported similar findings [16]. Ewnte B et al. 2023 found in a study that only 49% participants were stimulated to think and was able to generate new idea by understanding underlying mechanism [23]. 76.67% of students in the present study agreed that ECE motivate to read more about the topic, Quadras PR et al. 2023 [6], observed that 88% students agreed ECE motivate to read more about the topic. Chaudhary RJ et al. 2022 [18], reported 84% students acknowledged that ECE motivate to read more on topic.

A significant majority (92.67%) of students in the present study agreed that ECE help in better understanding of the topic. Similar findings were reported by S Yadav et al. 2024 [15], Quadras PR et al. [6] 2023, and Aggarwal N et al. 2021 [24]. In the present study 88.00% of students agreed that ECE help in better retention of topic, Similar observation found by Aggarwal N et al. 2021 [24], Chaudhary RJ et al. 2022 [18], Singh RA et al. 2024 [10], Quadras PR et al. 2023 [6]. Total 90.67% students agreed that ECE help in correlating anatomy with clinical cases. Similar results observed by Singh RA et al. 2024 [10], Quadras PR et al. 2023 [6], Phalgunan V et al. 2022 [16], Chaudhary RJ et al. 2022 [18] and Aggarwal N et al. [24] 2021.

In the present study 89.33% students of the present study supported the view that ECE should be incorporated for the other topic in anatomy and. 87.33% of students suggested that ECE should be incorporated in other basic science subjects. Similar findings were observed by Quadras PR et al. [6] 2023 and Aggarwal N et al. [24] 2021. Early Clinical Exposure gives students the chance to learn through real-life clinical experiences, helping them develop critical thinking, empathy, and a deeper understanding of healthcare challenges. It also encourages teamwork between anatomy and clinical departments, making learning more meaningful. A structured approach ensures the program can be used widely and adapted easily. Overall, it boosts student interest, connects basic science with clinical practice, and supports a more patient-focused way of teaching medicine.

Limitation(s)

The possible limitation of this study is that the participants were from single medical college, opinions of faculties regarding early clinical exposure was not considered.

CONCLUSION(S)

The responses recorded in this study showed that most students strongly support Early Clinical Exposure (ECE) as a teaching method.

They found it more interesting than traditional lectures and believe it helps improve attention, understanding, retention, and clinical correlation. Many students also felt motivated to explore topics further and think more deeply. Overall, students recommended that ECE should be included along with regular lectures in anatomy and other basic science subjects for undergraduate medical education.

Acknowledgements

The authors are profoundly grateful to the Head of the Department of General surgery for his enduring support and invaluable partnership in executing the Structured Early Clinical Exposure (ECE) module in anatomy. The authors also sincerely acknowledge the enthusiastic participation and support of the Phase I MBBS students, whose curiosity and feedback played a vital role in refining the module. This joint effort reflects the spirit of interdisciplinary learning and underscores the importance of early clinical integration in medical education.

REFERENCES

- [1] Han ER, Yeo S, Kim MJ, Lee YH, Park KH, Roh HA-OX. Medical education trends for future physicians in the era of advanced technology and artificial intelligence: An integrative review. *BMC Med Educ.* 2019;19(1):1891-5.
- [2] Challa KT, Sayed A, Acharya Y. Modern techniques of teaching and learning in medical education: A descriptive literature review. *MedEdPublish.* 2021;e:1-26.
- [3] Fakoya AOJ, Ndrio M, McCarthy KJ. Facilitating Active Collaborative Learning in Medical Education; a Literature Review of Peer Instruction Method. *Adv Med Educ Pract.* 2023;14(3):1087-99.
- [4] Pananghat A, Kumar, Govindarajan S, Ramalingam S, Kumar PN. Developing a module for early clinical exposure: Experience of five years. *J Edu Health Promot.* 2022;12(57):1-6.
- [5] Gune AR, Nikam VR, Gaikwad VV, Wagh DT. The effectiveness of early clinical exposure in teaching anatomy: A study among 1st year medical students. *Natl J Clin Anat.* 2020;9:97-100.
- [6] Quadras PR, Sultana Q, Varghese DM, Ramos A, Udyavar A. Early clinical exposure as an adjunct in learning anatomy among first-year medical undergraduates. *Perspectives in Medical Research.* 2023;11(3):45-50.
- [7] Under Graduate Medical Education Vision 2015 Medical Council of India. New Delhi 2011. p. 1-60.
- [8] Competency Based Undergraduate Curriculum for the Indian Medical Graduate. New Delhi: Medical Council of India; 2018.
- [9] Medical Council of India. New Delhi: Early Clinical Exposure for the Undergraduate Medical Education Training Program; 2019. p. 1-43.
- [10] Singh RA. Perception of Early Clinical Exposure (ECE) among Phase I MBBS Students in a Medical College in Northeastern India. *J Med Sci Health* 2024;10(2):169-74.
- [11] Deolalikar S, Nandi J, Pramod J. Introduction of early clinical exposure to 1st year MBBS students in physiology. *CHRISMED J Health Res.* 2020;7:63-7.
- [12] Yadav SK, Piyush AR, Sethi Y. Shaping future healers: The impact and implementation of Early Clinical Exposure in medical education. *Indian J Forensic Community Med.* 2024;11(1):1-4.
- [13] Sheshgiri C, Komala N, Ashwini CA. Early Clinical Exposure In Anatomy. *Natl J Integr Res Med.* 2017;8(5):53-6.
- [14] Rani A, Rani A, Chopra J, Pandey A, A.K.Srivastava, Sharma PK. Learning Outcome Analysis of Preclinical MBBS Students Following Teaching by Anatomist and/ or Clinician. *Indian Journal of Basic & Applied Medical Research.* 2013;6(2):470-6.
- [15] Yadav S, Pandey P, Pasricha N, Bhatnagar R. Assessing the role of early clinical exposure in anatomy: A perception and feedback. *Int J Adv Res* 2024;12(08):1499-507.
- [16] Phalgunan V, Baskaran S. Evaluating the Effectiveness of Early Clinical Exposure Program in Learning Clinical Anatomy among Medical Undergraduates. *Acad Anat Int.* 2022;8(1):12-5.
- [17] Kharay SS, Vohra H, Puri S, Bansal P. Phase I Medical Students' Perceptions of Early Clinical Exposure in Classroom and Hospital Setting: A Qualitative and Quantitative Analysis. *Future Health.* 2023;1(1):1-7.
- [18] Chaudhary RJ, Badyal D, Thomas M. Developing, Implementing and Evaluating Early Clinical Exposure Module in Biochemistry: A Cross-sectional Study. *National Journal of Laboratory Medicine.* 2022;11(4):16-20.
- [19] Govindarajan S, Vasanth G, Kumar PA, Priyadarshini C, Radhakrishnan SS, Kanagaraj V. Impact of a comprehensive early clinical exposure program for preclinical year medical students. *Health Professions Education.* 2018;4: 133-41.
- [20] Sawant SP, Rizvi S. Role of Clinical Anatomy in First MBBS Curriculum. *MOJ Anat & Physiol.* 2017;3(1):1-6.
- [21] Sharma P, Sachdeva K. Students' Perceptions to Introduction of Problem-based Learning Modules in Anatomy. *Curr Trends Diagn Treat.* 2017;1(1):42-5.

- [22] Khalil MS, Alrumaihi N, Feda J, Alnuaim L, Abdulghani H, Fouda K, et al. Students, faculty perceptions and effectiveness of the early introduction of clinical skills teaching in the medical curriculum. J Taibah Univ Med Sc. 2023;18(2):310-20.
- [23] Ewnte B, Yigzaw T. Early clinical exposure in medical education: The experience from Debre Tabor University. BMC Medical Education. 2023;23:1-10.
- [24] Aggarwal N, Bansal N, Mahajan R, Verma N, Gupta M. Perception analysis of an early clinical exposure module in anatomy for first year undergraduate medical students in a North Indian medical college. J Educ Technol Health Sci. 2021;8(2):26-32.

PARTICULARS OF CONTRIBUTORS:

1. Professor, Department of Anatomy, Veer Chandra Singh Garhwal Government Institute of Medical Science and Research, Srinagar, Garhwal, Uttarakhand, India.
2. Associate Professor, Department of Anatomy, Veer Chandra Singh Garhwal Government Institute of Medical Science and Research, Srinagar, Garhwal, Uttarakhand, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Anil Kumar Dwivedi,
Professor, Department of Anatomy, Veer Chandra Singh Garhwal Government
Institute of Medical Science and Research, Srinagar Garhwal, Uttarakhand, India.
E-mail: dranildwivedi2009@gmail.com

PLAGIARISM CHECKING METHODS: [Jan 11 et al.]

- Plagiarism X-checker: Sep 02, 2025
- Manual Googling: Nov 03, 2025
- iThenticate Software: Nov 05, 2025 (12%)

ETYMOLOGY: Author Origin**EMENDATIONS:** 6**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. No

Date of Submission: **Aug 10, 2025**Date of Peer Review: **Oct 18, 2025**Date of Acceptance: **Nov 07, 2025**Date of Publishing: **Feb 01, 2026**