DOI: 10.7860/JCDR/2025/75632.21090

Original Article

Pharmacology Section

Impact of a Module on Early Clinical Exposure in Pharmacology: A Prospective Interventional Study from a Medical College in West Bengal, India

SARMILA NATH[1], KALYAN BRATA MANDAL[2], ANJANA GHOSH DASTIDAR[3], QUAZI SHABNAM WAHEED[4]

ABSTRACT

Introduction: The National Medical Commission (NMC) has introduced the concept of Early Clinical Exposure (ECE) in the undergraduate medical curriculum to provide some clinical relevance to what students are studying in their preclinical years. Past studies conducted across different disciplines have proven the effectiveness of ECE sessions. Against this background, a module on ECE was designed and implemented among Phase 2 students studying Pharmacology at a Medical College in West Bengal, India. The perceptions of participating students and faculty regarding the module were obtained through feedback forms.

Aim: To evaluate the impact of a module of ECE for teaching the topic on anaesthetic drugs to undergraduate medical students studying Pharmacology.

Materials and Methods: The study was conducted over a period of three months at a medical college in West Bengal. A total of 180 Phase 2 students studying Pharmacology and six faculty members from the Departments of Pharmacology and Anaesthesiology participated in the study. Following informed consent and sensitisation, students were randomly divided into a control group and a study group. The study group was exposed to ECE sessions, followed by lecture classes involving both the study and control groups. The impact of the ECE sessions on knowledge gain was assessed through a formal test one week after the lecture classes. Perceptions from students and faculty were obtained through a Google Form containing semiclosed questions. Quantitative analysis was conducted using the Independent t-test, Chi-square test and percentages as appropriate. Following the entire process, faculty members from both departments held a meeting to discuss the challenges in implementing the module and how to overcome these barriers in the future.

Results: There was a significant increase in knowledge among the study group (p-value: 0.0018) compared to the control group. About 155 (86.1%) of students considered the module to be an effective learning tool and 138 (76.7%) students opined that the sessions were well planned. A total of 66.67% of faculty members believed that this module of ECE could be implemented in the curriculum.

Conclusion: The current module on ECE had a positive impact on the participating students. With a few modifications, it could be included in the undergraduate Pharmacology curriculum in the future.

Keywords: Education, Students, Clinical contact

INTRODUCTION

Medical education primarily aims to enhance efficient patient care by cultivating proficient Indian Medical Graduates. The Bachelor of Medicine and Bachelor of Surgery (MBBS) is a wholly professional course that cannot be taught without the context of patients and a clinical environment. To provide undergraduate students with a sense of the clinical and social context of patient care during their initial years, the Medical Council of India (renamed the National Medical Commission or NMC since 2020) introduced the Concept of ECE in the Competency-Based Medical Education curriculum in 2019 [1].

Harden MR, was the first to recognise the significance of interdisciplinary and transdisciplinary integration in the medical curriculum. He introduced the 11-step integration ladder as a tool for integrated learning [2]. Integration can be horizontal, i.e., among disciplines within the same phase, or vertical, i.e., integration across different phases [3]. Depending on the module, ECE can be utilised for either horizontal or vertical integration between basic medical sciences and clinical disciplines. Past studies have established the effectiveness of ECE programmes in various preclinical and paraclinical curricula [4-6]. However, an extensive literature search failed to identify any such study in the discipline of Pharmacology.

Pharmacology is a phase 2 discipline dealing with the use of drugs in humans [7], which includes the use of anaesthetic drugs in the curriculum. Unlike other drugs used for systemic diseases, such as hypertension, fever, diarrhoea and malaria, with which students have some familiarity, it is challenging for undergraduate students to grasp the clinical context and application of anaesthetic drugs.

In this context, a module of ECE on anaesthetic drugs was designed and implemented among Phase 2 students in a medical college in Eastern India. At the end of the study, the impact of ECE on the cognitive domain was assessed through a formal test using a post-test questionnaire. The perceptions of students and faculty towards the module were also evaluated using prevalidated semistructured questionnaires. The results from this study could be utilised to incorporate the module into the undergraduate Pharmacology curriculum in the future.

The aim of this study was to design and implement a module of ECE for teaching the pharmacology of drugs used in anaesthesia among second professional MBBS students. The objectives were to assess the impact of the module on the gain and retention of knowledge and to evaluate the perceptions of participating students and faculty towards the module.

MATERIALS AND METHODS

This prospective, interventional study was conducted in the Department of Pharmacology and the Department of

Anaesthesiology of a tertiary care hospital in Eastern India. The study period lasted three months (August, September and October 2023) and the participants included Phase 2 MBBS students and faculty members from both departments. After obtaining permission from the Institutional Ethics Committee (MC/KOL/IEC/NON-SPON/2129/06/2023 dated 23/06/2023), written informed consent was obtained from the participating students and faculty.

Inclusion criteria: All Phase 2 students who provided written consent to participate in the study and whose responses were complete and legible were included in the study.

Exclusion criteria: All incomplete and illegible responses were excluded from the study.

Sample size calculation: Extensive literature search failed to find similar projects from Pharmacology. Expecting significant gain in knowledge among 50% of the students exposed to ECE sessions, a confidence level of 95% and 5% margin of error, the sample size comes to 152 when the total number of students in class was 250.

$n=N\times X/(X+N-1)$ where $X=\{(Z_{\alpha/2})^2\times p(1-p)\}/(MOE)^2$

Where, n=The sample size, N=The population size, X: $\{(Z_{\alpha/2})^2\ p(1-p)\}/(MOE)^2$

$Z_{\alpha/2}$: The critical value of the normal distribution at $\alpha/2$

MOE: The margin of error

p: The sample proportion (here, 250, as total number of students in the class was 250)

Allowing for a 10% dropout rate, the minimum number of students to be included in the study was 168. A convenience sampling method was employed and those students who provided written informed consent were included in the study.

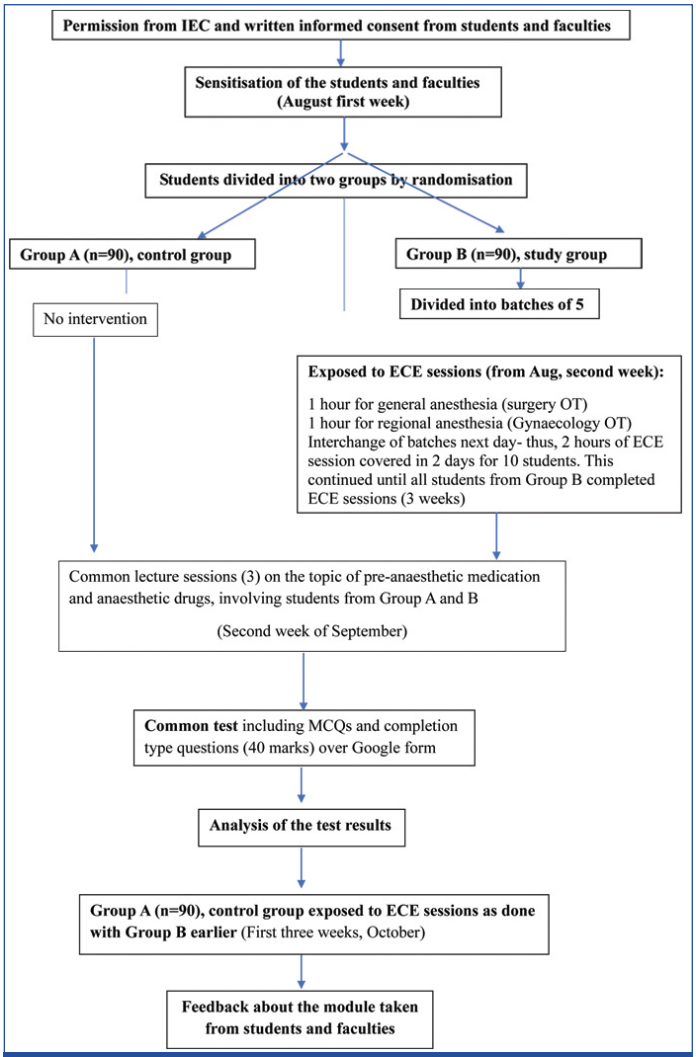
Study Procedure

A sensitisation meeting was conducted among the participating faculty members from both departments to decide on a module for implementing ECE. Competencies PH 1.17 and PH 1.18, as per the NMC curriculum-based competency volume 1, were selected as the topics for the planned ECE module [8]. These competencies encompass general anaesthetics, local anaesthetics and preanaesthetic medication.

The consenting 182 students were randomly allocated into two groups using a computer-generated random table. Group A (control group) comprised 90 students, while group B (study group) included 92 students. Two students from group B did not complete the feedback forms and were subsequently excluded from the analysis [Table/Fig-1].

Students in group B were sensitised about the concept of ECE and then divided into batches of five. Starting from the second week of August, one batch of five students attended the General Surgery Operating Theatre (OT) for one hour to observe General Anaesthesia (GA) under the guidance of faculty members from Anaesthesiology. Another similar batch attended The Gynaecology and Obstetrics OT for one hour to observe regional anaesthesia. On the following day, the two batches swapped OTs. Thus, 10 students attended a total of two hours of ECE sessions over two days. Since the total number of students in the study group was 92, a total of 9 x 2=18 days were required to complete ECE for group B. Most cases in the general surgery OT are performed under general anaesthesia, while regional anaesthesia is very commonly administered in the gynaecology OT; therefore, these two OTs were selected to illustrate the two methods of anaesthetic drug usage.

In the OT, the students were briefed about the different drugs used for anaesthesia, followed by a practical demonstration of the anaesthetic procedures and the machines and instruments employed, conducted by faculty members from Anaesthesiology. The discussions and demonstrations were brief and aligned with the level of learning required for the participating students.



[Table/Fig-1]: Flowchart of the methodology.

After group B had completed the observation process, three common lecture sessions were held in the second week of September in the Department of Pharmacology. These sessions covered the topics of preanaesthetic medication and drugs used in general and regional anaesthesia for both group A and group B.

Seven days after the lecture sessions, a test session consisting of 20 Multiple Choice Questions (MCQs) and 20 completion-type questions (total marks: 40) was conducted in the fourth week of September 2023. Students from both group A and group B attended the test. The scores achieved by both groups were compared to detect any significant gain in knowledge in the study group.

After the completion of the test, students from group A were divided into similar batches of five and taken to the OTs, following the same procedure used for group B earlier. By the third week of October, all students had completed the ECE sessions.

The perceptions of the students and six faculty members regarding the ECE module were then assessed through a prevalidated questionnaire. The questionnaire was developed based on those from previously published studies [6,9] and was validated by two faculty members from another institution. Following validation, the questionnaire was piloted with 10 students to assess its comprehensibility and clarity of language. The final questionnaire for students included seven questions on their perception of ECE and five questions on their perception of the module. The reliability score (Cronbach's alpha) was 0.71.

The questionnaire for faculty included seven questions regarding their perception of the effectiveness of the ECE module as a teaching and learning method and seven questions relating to the challenges they faced while conducting the sessions.

STATISTICAL ANALYSIS

Microsoft Excel and Statistical Package for Social Sciences (SPSS) software version 28.0 were used to analyse the data obtained for the study. The assessment of the cognitive domain was conducted using the Student's unpaired t-test, with a p-value of <0.05 considered significant. A five-point Likert scale was employed to assess the perceptions of students and faculty regarding ECE. The results were expressed in percentages.

RESULTS

A total of 180 completed responses were analysed. Data from [Table/Fig-2] demonstrate that the two groups were comparable in terms of age and gender distribution (p-value >0.05).

Parameters	Group A (n=90)	Group B (n=90)	p-value
Age (years) (Mean±SD)	20.60±0.97	20.56±0.76	0.76$
Sex	M=55 F=35	M=60 F=30	0.437$$

[Table/Fig-2]: Demographic profile of the students.
$Independent t-test, $$Chi-square test

[Table/Fig-3] displays the mean scores obtained by the students in the assessment. An Unpaired t-test was applied to evaluate whether there was any significant difference in the knowledge gained between the two groups. It is evident from the table that the scores obtained by group B (the study group) were significantly higher than those obtained by group A (the control group).

	Score (Mean±SD)	p-value
Group-A (n=90)	25.755±5.555	0.0018**
Group-B (n=90)	28.2333±4.910	

[Table/Fig-3]: Scores obtained in the theoretical exam on the topic.

From [Table/Fig-4], it is clear that 164 (91.11%) students agreed that ECE helped them to comprehend the topic better and 127 (70.56%) of them felt they could discover the clinical implications of what they were being taught in theory classes. Although many (48.89%) expressed the concern that ECE could overload their curriculum, all of them indicated a desire to attend similar sessions in the future.

Statement	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
ECE in anaesthesiology help to understand concepts better compared to traditional teaching	0	0	16 (8.89)	141 (78.33)	23 (12.78)
ECE helped me to correlate theory with practice	0	0	53 (29.44)	116 (64.44)	11 (6.11)
ECE helped to create interest in the topic	0	0	20 (11.11)	132 (73.33)	28 (15.56)
ECE helped me in better retention of knowledge	0	0	56 (31.11)	121 (67.22)	3 (1.67)
ECE sessions were enjoyable	0	0	2 (1.11)	23 (12.78)	155 (86.11)
ECE would be an extra burden on students	0	44 (24.44)	48 (26.67)	88 (48.89)	0
I would like to attend more ECE sessions in future	0	0	0	160 (88.89)	20 (11.11)

[Table/Fig-4]: Perception of the students towards the ECE experience (n=180).

[Table/Fig-5] documents the perceptions of the students towards the implemented module. The majority of students provided positive feedback about the module, with the only downside noted being the limited time allotted for it.

Statement	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
ECE module provided an effective learning tool	0	0	25 (13.89)	75 (41.67)	80 (44.44)
Faculties conducting ECE were competent	0	0	54 (30)	78 (43.33)	48 (26.67)
ECE sessions were well planned	0	2 (1.11)	40 (22.22)	113 (62.78)	25 (13.89)
Students were appropriately sensitised	0	0	60 (33.33)	111 (61.67)	9 (5)
Time allotted for the ECE session was inadequate	9 (5)	41 (22.78)	30 (16.67)	97 (53.89)	3 (1.67)

[Table/Fig-5]: Student perception of the implemented ECE module.

All the participating faculty members commented positively on the inclusion of ECE in the curriculum, stating that the conduction of such sessions increased student engagement during lectures. Despite the challenges posed by time constraints and additional burdens on faculty members, most (66.67%) believed that the implementation of this module is practicable [Table/Fig-6].

Statement	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
ECE should be implemented in the curriculum	0	0	0	6 (100)	0
ECE sessions increased attendance in lecture classes	0	0	0	3 (50)	3 (50)
It is feasible to implement the current module of ECE	0	1 (16.67)	1 (16.67)	4 (66.67)	0
Conducting ECE sessions were challenging for the faculties	0	0	0	4 (66.67)	2 (33.33)
ECE helped create interest in the topic	0	0	0	4 (66.67)	2 (33.33)
ECE helped in retention of knowledge	0	0	2 (33.33)	4 (66.67)	0
ECE would help in creating better Indian Medical Graduates (IMGs)	0	0	0	4 (66.67)	2 (33.33)

[Table/Fig-6]: Faculty perception of the implemented ECE module.

Some of the major challenges faced by the participating faculty included a lack of adequate time, limitations on appropriate topics for conducting ECE sessions and the necessity for meticulous planning of the module [Table/Fig-7]. Additionally, there was an obstacle posed by the unfamiliarity of the clinical faculty with the preclinical curriculum, which created confusion regarding the depth of knowledge to be imparted.

DISCUSSION

The ECE, as conceptualised by the Medical Council of India (MCI), aims to serve as a connecting bridge between rote learning and the real-world application of knowledge. However, although the NMC has framed the outline of ECE for the preparatory preclinical years, there is flexibility in designing ECE modules according to the needs of the students as well as the topic of study. Previous studies on ECE have implemented their own modules to assess the applicability of ECE [10,11]. The current module was designed following the suggestions of Kumar PA et al., in their publication "Developing a Module for ECE: Experience of Five Years" [12]. The topic for ECE was selected based on the needs of the students and the availability of faculty members willing to undertake the task. Once the topic and team were decided, a sensitisation meeting was held and the roadmap of the module was designed step-by-step. This was followed by implementation and, finally, an evaluation of the effectiveness of the module.

Statement	Strongly disagree N (%)	Disagree N (%)	Neutral N (%)	Agree N (%)	Strongly agree N (%)
Lack of adequate time to conduct ECE sessions	0	0	0	3 (50)	3 (50)
Limitation of topics that can be taught through ECE	0	0	2 (33.33)	4 (66.67)	0
Selection of topics need meticulous planning	0	0	1 (16.67)	0	5 (83.33)
Need of highly dedicated faculties interested in conducting ECE	0	0	0	0	6 (100)
Unfamiliarity of clinical faculties with the learning objectives of preclinical students may cause problem in implementing ECE	0	0	3 (50)	3 (50)	0
Regular ECE sessions would pose extra burden on the faculties	0	1 (16.67)	1 (16.67)	4 (66.67)	0
Accommodating ECE in limited lecture hours would be difficult	0	0	3 (50)	3 (50)	0

[Table/Fig-7]: Challenges to implementation of ECE according to faculties.

A quantitative analysis of the test scores at the end of the lectures helped to determine whether ECE significantly influenced learning. The results demonstrated that the module had a significant positive impact on the knowledge gained by the students. Similar observations have been noted in other studies conducted previously. A questionnaire-based study was conducted in Lucknow in 2019-20 on a cohort of 130 Phase I medical students to assess the role of ECE [13]. The researchers concluded that ECE had significantly increased the knowledge gained from traditional classes. Other studies have also documented the effectiveness of clinical exposure on the development of concepts in basic medical sciences [14,15].

In the current study, 164 (91.1%) of students concluded that ECE helped them to build their understanding of the topic. Warkar AB and Asia AA, found similar results in their study, where 83% of students reported that ECE aided in integrating their knowledge [16]. A total of 70% of students in the current study indicated that ECE helped them to correlate theory with practice. This finding aligns with those from the study by Bhardwaj N et al., on ECE [17].

Moreover, 93% of the students participating in a multicentric study in Maharashtra conducted by Tayade MC et al., mentioned that "the method of ECE teaching aroused interest in learning" [18]. Reflecting on ECE sessions, students participating in a similar study from Ludhiana commented that "talking to real patients was very inspiring" [19]. In this study, 160 (89%) of participating students opined that ECE made studying more interesting and 178 (99%) enjoyed the sessions. Through the module, they were able to connect the gaps in their knowledge and realise the application of what they were learning in lecture classes. Similar findings were observed in many past studies on ECE, both in India and abroad [20,21].

All the students participating in the current study expressed a desire to attend more ECE sessions in the future. Almost all past studies reflect students' eagerness to participate in ECE sessions [21,22]. This enthusiasm may stem from the fact that students in their formative years can relate their learning to practical applications.

While the students embraced the ECE experience with enthusiasm, many of them (49%, n=88) agreed that ECE may pose an additional burden on them. This percentage was lower than the findings of a study by Ewnte B and Yigzaw T from Ethiopia, where 79% of the students cited "heavy workload" as a challenge to the ECE programme [23]. The difference may arise from the fact that, unlike the current study, which involved preclinical students, Ewnte B and Yigzaw T included fifth-year medical students in their study. The fifth year serves as a clerkship year for Ethiopian students and they are thus already exposed to a clinical environment.

Faculty members have also shown interest in ECE. Tayade MC and Latti RG, conducted a study on medical faculty in 2015, assessing their attitudes towards the inclusion of ECE in the curriculum [24]. A total of 127 faculty members from the first phase, working in six different colleges, responded to a survey questionnaire. Of these, 83% agreed that ECE should be included in the curriculum. In the present study, all participating faculty members felt motivated and expressed a desire to include ECE in undergraduate medical teaching, perhaps to "give something back to the profession."

Shah C, in his study "ECE-Why and How?" mentioned that ECE may be conducted in a college classroom, hospital, or community setting [25]. With this objective in mind, the current study was carried out in a hospital setting. A total of 138 students (76.67%) of the participating cohort believed that the ECE sessions were well-planned and 120 students (66.67%) felt that they were adequately sensitised before the ECE sessions. Seventy percent (n=126) of students thought that the faculty conducting the ECE sessions were competent to lead the sessions. This was highly encouraging, particularly as there had been no prior ECE module in Pharmacology to guide the researchers.

About 55.5% of the participating students requested an increase in the time allocated for ECE sessions. Similarly, 50% of the faculty also complained about the lack of adequate time to conduct the ECE sessions. In a recent study, Shastry N et al., explored the opinions of medical faculty from an Indian medical institution regarding simulation-based ECE modules [26]. While the faculty appreciated the validity of the sessions, some expressed concerns about time and financial constraints in conducting such modules. Faculty members participating in the study by Chaudhary RJ et al., also opined that they "should be given time to revise the topic thoroughly" [5].

Despite prior sensitisation, faculty members from Anaesthesiology participating in this study commented on the difficulty in determining the extent and depth to which they should discuss topics while engaging with students. As evidenced in the study by Shastry N et al., detailed faculty training could help to overcome this challenge [26]. The majority of the faculty members believed that not all topics could be taught through ECE and they agreed on the need for meticulous planning and a greater number of dedicated faculty interested in conducting modules like the current one. This finding supports the outcomes of past studies [4,26].

Following the conclusion of the study, the concerned faculty held a discussion on how to overcome the challenges associated with the module. The following points were proposed [Table/Fig-8].

Major challenges	How to resolve
Time management for conduction of ECE sessions	Detailed planning by concerned faculties from both basic and clinical disciplines before the start of the academic year.
	Proper sensitisation of the faculties and students about the steps of the planned ECE sessions.
Limitation of topics to be taught through ECE	Faculties from both basic and clinical disciplines to consult and decide which topics to include for ECE.
Lack of motivation of students to attend ECE sessions	Designing formative assessment plans like maintaining activity log books, reflective writing of ECE sessions, group discussions on case-based scenarios etc., for ECE could motivate the students to take part.
	Knowledge-based assessments on the topic followed by feedback.
Unfamiliarity of clinical faculties with the learning objectives and level of learning of students	Meticulous planning and detailed discussion among faculties from basic sciences and clinical disciplines before implementation of ECE module.

Limited resources	Prior sensitisation of all concerned staff- technical and nursing about the module and involving them in the planning.
	Meticulous planning and careful designing for appropriate utilisation of logistics.
	Regular implementation of ECE session in the curriculum would help in proper use of limited resources.
Difficulty in assessing knowledge gained and skills achieved through ECE	Formative assessment: Log books, reflective writing, record of students' participation in various activities and discussion during ECE. Summative assessment: can include modified essay questions, clinical vignette-based short answer questions.

[Table/Fig-8]: Outcome of focus group discussion on the challenges faced in implementation of the module and possible solutions.

In summary, the present ECE module proved to be an effective tool for teaching the topic of anaesthetic drugs to the students of Pharmacology. The aforementioned points should be considered when planning ECE sessions in the future, taking into account the limited time and resources available.

Limitation(s)

The current study was unicentric, conducted in a single tertiary care hospital. The implementation of this module could be challenging in newly established medical colleges, where both faculty members and nursing staff are in limited supply and are already burdened with clinical duties.

CONCLUSION(S)

The implemented module had a positive impact on the comprehension and retention of knowledge on the topic. Participating students and faculty members accepted the module with enthusiasm. Those who did not consent to participate in the study expressed a desire to attend such sessions after hearing about the experience from their fellow students who took part in the project. Students and faculty also suggested a few modifications that could be incorporated in the future. Further similar studies would help to refine the module going forward. The proposed ECE module proved to be a feasible and successful teaching-learning method within the undergraduate Pharmacology curriculum.

REFERENCES

[1] Medical Council of India. Early clinical exposure for undergraduate medical education training program. 2019:1-43.
[2] Harden MR. The integration ladder: A tool for curriculum planning and evaluation. Medical Education. 2000;34:551-57.
[3] Module 4. Alignment and Integration. Curriculum Implementation Support Program. Board of Governors in supersession of Medical Council of India. Competency based undergraduate curriculum for the Indian medical graduate [Internet]. [cited 2025 Jan 01]. Available from: https://www.nmc.org.in/wp-content/uploads/2020/08/Alignment-and-Integration_03.10.2019.pdf.
[4] Shivkar RR, Gulajkar SR, Wali VV. Effectiveness of early clinical exposure module in biochemistry to understand the basis and rationale of biochemical tests for diabetes mellitus in first phase MBBS students. Indian J Med Biochem. 2020;24(3):89-91.
[5] Chaudhary RJ, Badyal D, Thomas M. Developing, implementing and evaluating early clinical exposure module in biochemistry: A cross-sectional study. Nat J Lab Med. 2022;11(4):BO16-BO20.
[6] 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.
[7] Samal P. Pharmacology: An essential branch of medicine and science. J Med Med Sci. 2024;15(6):01-02.
[8] Competency based undergraduate curriculum for the Indian medical graduate 2018. Medical Council of India, Pocket-14, Sector- 8, Dwarka, New Delhi 110 077 [Internet]. [cited 2024 Dec 20]. Available from: https://www.nmc.org.in/wp-content/uploads/2020/01/UG-Curriculum-Vol-I.pdf.
[9] Gupta K, Gill GS, Mahajan R. Introduction and implementation of early clinical exposure in undergraduate medical training to enhance learning. Int J Appl Basic Med Res. 2020;10(3):205-09.
[10] Nanaware NL, Gavkare AM. Impact of early clinical exposure to boost applicative aspects of learning in first MBBS physiology students. Natl J Physiol Pharm Pharmacol. 2020;10(2):141-43.
[11] Vidja K, Patel J, Parmar J, Akhani P. Perception of Indian medical students regarding introduction of early clinical exposure. JPBI ((Jurnal Pendidikan Biologi Indonesia). 2023;9(3):483-91.
[12] Kumar PA, Govindarajan S, Ramalingam S, Kumar PN. Developing a module for early clinical exposure: Experience of five years. J Educ Health Promot. 2023;12:57.
[13] 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.
[14] Kar M, Kar C, Roy H, Goyal P. Early clinical exposure as a learning tool to teach neuroanatomy for first year MBBS students. Int J App Basic Med Res [serial online] 2017 [cited 2021 Jun 24];7(Suppl S1):38-41.
[15] Harish HA, Panchbhai A, Gawande MN, Patil SK, Sharma PN, Archana S. Early clinical exposure: An adjunct teaching-learning tool in dental discipline. J of Datta Meghe Institute of Med Sci Univ. 2022;17(4):877-80.
[16] Warkar AB, Asia AA. Introduction to early clinical exposure as learning tool in physiology. Indian J Physiol Pharmacol. 2020;64(Suppl_1):S62-S9.
[17] Bhardwaj N, Joshi A, Kataria DS, Katariya D. Analysis of perception of students and faculty on case based early clinical exposure in first year medical students. Mymensingh Med J. 2022;31(3):841-47.
[18] Tayade MC, Giri PA, Latti RG. Effectiveness of early clinical exposure in improving attitude and professional skills of medical students in current Indian medical education set up. J Family Med Prim Care. 2021;10:681-85.
[19] 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):01-07. Available from: https://aiimsbhopal.edu.in/FutureHealth/001.pdf.
[20] Quadras PR, Sultana Q, Varghese DM, Ramos A, Udayavar A. Early clinical exposure as an adjunct in learning anatomy among first-year medical undergraduates. Perspec Med Res. 2023;11(3):45-50. [internet]. Available from: https://www.pimr.org.in/2023-vol11-issue-3/originalarticle9_v3.php#:~:text=In%20their%20study%2C%2061.9%25%20(,the%20topics%20taught%20in%20ECE last accessed 21. 12. 24.
[21] AkbariRad M, Khadem-Rezaiyan M, Ravanshad S, Rafiee M, Firoozi A, Zolfaghari SA, et al. Early clinical exposure as a highly interesting educational program for undergraduate medical students: An interventional study. BMC Med Educ. 2023;23:292.
[22] Yadav SK, Piyush AR, Sethi Y. Shaping future healers: The impact and implementation of early clinical exposure in medical education. Indian J Forens Commu Med. 2024;11(1):01-04.
[23] Ewnte B, Yigzaw T. Early clinical exposure in medical education: The experience from Debre Tabor University. BMC Medical Education. 2023;23:252.
[24] Tayade MC, Latti RG. Perception of medical faculties towards early clinical exposure and MCI Vision 2015 documents in western Maharashtra. J Clin Diagn Res. 2015;9(12):CC12- CC14.
[25] Shah C. Early clinical exposure- Why and how? J Educ Techo Health Sci. 2018;5(1):02-07.
[26] Shastry N, Ullal NA, Thattil AMT, Maitreyee DS, Bangera SR, Mahmood LS. Faculty perceptions of the efficacy, benefits and challenges of simulation-based early clinical exposure for medical students in India: A qualitative study. Med Educ. 2023;68(4):350-54.

PARTICULARS OF CONTRIBUTORS:
1. Associate Professor, Department of Pharmacology, SCCGMCH, Uluberia, Howrah, West Bengal, India.
2. Assistant Professor, Department of Anaesthesiology and Critical Care, Medical College, Kolkata, West Bengal, India.
3. Professor, Department of Anaesthesiology and Critical Care, Medical College, Kolkata, West Bengal, India.
4. Postgraduate Trainee, Department of Pharmacology, Medical College, Kolkata, West Bengal, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Sarmila Nath,
BB 11/G, Salt Lake, Bidhannagar, Kolkata-700064, West Bengal, India.
E-mail: sarmilanath13@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Oct 18, 2024
- Manual Googling: Jan 03, 2025
- iThenticate Software: May 03, 2025 (8%)

ETYMOLOGY: Author Origin

EMENDATIONS: 8

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. NA

Date of Submission: **Oct 17, 2024**
Date of Peer Review: **Dec 07, 2024**
Date of Acceptance: **May 05, 2025**
Date of Publishing: **Jun 01, 2025**