

Use of Haematology Reports as a Tool for Early Clinical Exposure in Undergraduate Medical Students

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Abstract

Background and Objectives: Early Clinical Exposure (ECE) aims to bridge the gap between pre-clinical and clinical subjects, offering early exposure to the healthcare system using laboratory reports and clinical scenarios. This study aimed to explore student attitudes and difficulties encountered during the implementation of ECE in 1st MBBS Physiology.

Materials & Methods: A total of 133 students were included in this study, who had completed both the theoretical and practical components of their hematology classes. To create a realistic setting, clinical scenarios and laboratory forms were developed using genuine laboratory reports obtained from the pathology department. Subsequently, group discussions and consultations with faculty members were conducted. Throughout the process, careful attention was paid to the students' attitudes, which were duly observed and recorded.

Results: A significant majority of students expressed positive views towards this instructional approach, considering it both engaging and superior to conventional methods. They perceived it as instrumental in enhancing comprehension of theoretical and practical concepts, as well as facilitating improved exam preparation and clinical correlations. However, approximately half of the students either agreed or remained uncertain about the level of difficulty associated with ECE.

Conclusion: The positive student attitude towards Early Clinical Exposure (ECE) signifies its successful integration of basic science and clinical subjects. ECE facilitates a better understanding of the relevance of basic science and makes subject concepts easier and more interesting. However, the challenges faced by students should be acknowledged, and additional practice sessions may be warranted.

Keywords: Early Clinical Exposure, Attitude, Students, Hematology.

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Introduction

The Hematology section of the 1st-year MBBS physiology syllabus is typically taught through theory classes and practical sessions, with a limited introduction to clinical disorders. In the traditional curriculum, students were taught basic science concepts without any patient exposure or discussion of clinical scenarios. As a result, students faced difficulties recalling important basic concepts when they encountered clinical settings, rendering part of their academic education impractical. Consequently, there was a recognized need to provide early exposure to clinical settings during students' initial stages of professional learning [1].

The Medical Council of India (MCI) has emphasized the importance of ECE and integrated

teaching in undergraduate medical education, as outlined in its "Vision 2015" document. As part of this vision, the MCI, in collaboration with the National Medical Council, has developed an ECE module for the year 2019, which has been incorporated into the undergraduate curriculum [2-5].

The primary objective of ECE is to minimize the gap between pre-clinical and clinical subjects, while also enhancing the appeal and effectiveness of learning basic subjects. ECE serves as a form of vertical integration between pre-clinical and clinical disciplines. This educational model has been widely embraced by numerous medical colleges and universities worldwide as part of undergraduate medical education [6-8].

ECE offers several evident advantages, including early exposure to the healthcare system during the early stages of professional development, fostering a patient-centered approach, and boosting motivation for classroom learning. Consequently, ECE plays a crucial role in introducing students to the field of medicine. Active learning strategies are often found to be more beneficial for most students compared to the traditional lecture format [9-11]. This study aimed to explore the efficacy of incorporating clinical laboratory reports of patients as a means to integrate the learning of hematology with real-life clinical scenarios. The specific objectives were to assess the usefulness of utilizing laboratory reports as a method of ECE for learning hematology, examine the advantages of using laboratory reports to facilitate the integration of basic and clinical hematology in the first-year MBBS curriculum, sensitize students to the practical application of hematology, and identify any difficulties faced by students when studying and analyzing clinical scenarios in the field of hematology. By investigating these objectives, the study sought to enhance the educational experience and promote a comprehensive understanding of hematology among students.

Material & Methods

This study was done as a part of the revision process just before the Prelims examinations of the 1st-year MBBS program, after the completion of the theory and practical syllabus of hematology. The laboratory reports of patients were collected from the pathology department with the necessary consent, under the supervision of the faculty from the Physiology department. Case scenarios were developed based on these reports. The study was done in adherence to ethical considerations [12].

The entire group of 150 students was divided into six subgroups for the activity. Participation in the

activity was voluntary, and a total of 125 students chose to participate. Each subgroup was further subdivided into four teams on every day of the activity. The students were given a briefing about the team activity in advance and were asked to come prepared for their participation. During the activity, each team was provided with a case scenario and a laboratory investigation form. They were instructed to discuss the potential causes and recommend the necessary laboratory tests on the form based on their understanding of hematology. The teams were also encouraged to provide comments on the normal laboratory values and expected changes in the given case scenario. Additionally, they had the freedom to suggest any other relevant laboratory investigations that were not explicitly mentioned in the laboratory format, such as serum ferritin, serum iron, and electrophoresis. Each team presented their case scenario, and the discussions took place among all the teams. The faculty summarized the discussions, and the actual laboratory reports were shared with the students for further reference and learning.

A feedback form was administered at the conclusion of the exercise to gauge the students' perspectives on this novel approach to learning. The purpose of the feedback form was to gather their perceptions and opinions regarding the newly implemented instructional method.

Results

Table 1 presents the percentage distribution of students' feedback in response to close-ended questions, while Table 2 displays the percentage distribution of students' feedback in response to open-ended questions. To gain further insight into the students' perspectives on the ECE sessions, a thematic analysis was conducted. The results of this analysis are summarized in Table 3.).

Table 1: Students' feedback to close questions.

Topic	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
The group problem-solving activity was engaging.	65%	35%	2%	0%	0%
The utilization of laboratory reports in learning was superior to the conventional teaching approach in theory and practical classes.	48%	42%	5%	2%	3%
The assigned task positively contributed to a better understanding of hematology.	62%	34%	3%	1%	0%
The activity has potential value for application in both theoretical and practical examinations.	55%	28%	16%	0%	1%
The assigned task posed challenges in completion.	6%	20%	23%	48%	3%
The assigned task holds significance for future clinical correlations.	70%	27%	2%	1%	0%
The task was uninteresting and failed to generate interest.	0%	0%	10%	0%	90%

Table 2: Students' feedback to open questions.

Open-ended question	Response %
What was the best part of this new method of learning by case scenarios with laboratory reports?	
• Group discussion and team involvement increased interest and knowledge of the subject - 72%	70%
• Helps in better understanding of the subject (Hematology) - 60%	65%
• Helps in correlating the appropriate laboratory investigations with the scenario of the patient - 60%	65%
• Could appreciate clinically important concepts from the theory syllabus - 40%	45%
How this task could be made better?	
• By making this a prime tool of teaching practical hematology - 80%	85%
• Increasing the number of such activities - 40%	45%
• Providing Assignments	35%

Table 3: Thematic Analysis of students' responses.

Theme	Frequency	%
Developing a comprehensive understanding of hematology	82	65.6
Interesting and better approach compared to conventional methods	75	60
Helpful for Exams preparation (Theory and practical)	79	63.2
Helpful for clinical correlation in future	68	54.4
Might be a tough task	32	25.6
Not better than routine methods	11	8.8

Discussion

The study's findings revealed several key observations. Firstly, a significant majority of students expressed a high level of interest in the learning method employed, which involved group activities focused on solving clinical scenarios based on laboratory investigations. Secondly, most students agreed that this method surpassed the routine approach and contributed to a better understanding of hematology. Thirdly, students found the discussion activity valuable in establishing connections between laboratory investigations and clinical scenarios, as well as aiding in the comprehension of theoretical concepts. Moreover, the majority of students believed that this learning method would be beneficial for their theory and practical examinations, as well as for their future clinical placements. Based on the feedback received, students strongly advocated for integrating this type of activity as a central teaching tool in hematology, suggesting that it be given more prominence in the curriculum. Merely focusing on teaching the detailed concepts of physiology alone may not necessarily foster a strong interest in learning the subject. However, introducing students to clinical scenarios has the potential to generate greater enthusiasm and enjoyment in the learning process. This can be achieved by incorporating case discussions into the classroom setting, utilizing various resources such as paper cases, laboratory reports, photographs, radiographs, and electrocardiograms (ECGs). It is important to note that ECE and the associated development of knowledge and skills should not replace the foundational understanding provided by basic science subjects. Instead, ECE serves to enhance and contextualize the learning experience, providing students with a more comprehensive and practical understanding of the subject matter [10, 11]. The

implementation of ECE in education facilitates the cultivation of higher-order thinking skills, encompassing the cognitive domains of application, analysis, synthesis, and evaluation. ECE plays a pivotal role in nurturing critical thinking abilities and enhancing reasoning and problem-solving skills [12, 13]. Research conducted by Warkar and Asia, Ghosh, and Dawka has demonstrated that combining ECE with theoretical coursework can establish a framework for the effective integration of basic science education within a traditional program. Research has indicated that the incorporation of ECE in education provides various benefits. Students who engage in ECE experience reduced stress related to patient handling, enhance their clinical reasoning abilities, and achieve positive learning outcomes. ECE specifically enables students to interpret clinical findings based on fundamental hematology concepts. By connecting their prior knowledge with patient history and laboratory reports, students actively learn about diseases and appreciate the significance of basic sciences in clinical settings. Furthermore, perceiving the clinical relevance of a basic science subject enhances retention and understanding of the subject matter. Consistent with these findings, our study revealed that students found the ECE method, particularly with laboratory reports of patients, to be highly engaging and superior to routine teaching methods. This approach facilitated their learning and understanding of the subject matter, highlighting the effectiveness of incorporating ECE in the educational process. [14-19].

One limitation of the study was the absence of direct exposure to actual patients. Instead, students engaged in discussions centered around case-based scenarios and laboratory investigations. It is widely

recognized that students may gain more comprehensive knowledge and experience when directly interacting with patients in hospital wards and outpatient departments [20]. However, arranging such patient encounters for ECE may not always be feasible due to various constraints.

Additionally, time constraints faced by faculty members in completing the syllabus within the allocated timeframe pose another challenge. Despite these limitations, efforts can be made to explore alternative methods of implementing ECE to enhance the learning of basic science subjects. While the study revealed a positive attitude among students towards ECE, suggesting their receptiveness to its implementation, it is crucial to consider other feasible approaches that can supplement and enrich the learning experience.

Conclusion

The optimistic outlook displayed by students highlights that ECE effectively combines fundamental scientific principles with clinical subjects. Additionally, it aids in grasping the significance of fundamental scientific topics. ECE makes the concepts within these subjects more accessible and engaging. Nevertheless, it is important to acknowledge the challenges students encounter and consider implementing additional practice sessions.

References

1. Littlewood S, Ypinazar V, Margolis SA, Scherpbier A, Spencer J, Dornan T. Early practical experience and the social responsiveness of clinical education: A systematic review. *BMJ*. 2005; 331:387-91.
2. Medical Council of India. Early Clinical Exposure for the Undergraduate Medical Education Training Program. New Delhi: Medical Council of India; 2019. p. 1-43.
3. Medical Council of India. MCI Booklet; Vision 2015 [Internet]. Available from: https://www.old.mciindia.org/tools/announcement/MCI_booklet.pdf [Accessed Jan 21, 2022]
4. 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:CC124.
4. Dahle LD, Brynhildsen J, Berbohm FM, Rundquist I, Hammer M. Pros and cons of vertical integration between clinical medicine and basic science within a problem-based undergraduate medical curriculum: Examples and experiences from Linköping, Sweden. *Med Teach*. 2002; 24:280-5.
5. 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; 10:141-3.
6. Verma M. Early clinical exposure: New paradigm in medical and dental education. *Contemp Clin Dent*. 2016; 7:2878.
7. Shah N, Desai C, Jorwekar G, Badyal D, Singh T. Competency-based medical education: An overview and application in pharmacology. *Indian J Pharmacol*. 2016;48: S59.
8. Bowe CM, Voss J, Aretz HT. Case method teaching: An effective approach to integrate the basic and clinical sciences in the preclinical medical curriculum. *Med Teach*. 2009; 31:834-41.
9. Bhattacharya AT, Bhinganiya PP, Hira D, Wankhede TS. Laboratory reports as a learning tool – Early clinical exposure in 1st-year MBBS physiology (hematology). *Natl J Physiol Pharm Pharmacol*. 2023;13(01):133-137.
10. Lujan HL, Stephen ED. First year medical students prefer multiple learning styles. *Adv Physiol Educ*. 2006; 30:13-26.
11. Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects. The World Medical Association. 2008.
12. Tayade MC, Bhimani N, Kulkarni NB, Dandekar KN. The impact of early clinical exposure on first M.B.B.S. Students. *Int J Healthc Biomed Res*. 2014; 2:176-81.
13. Kraemer D, Reimer S, Hornlein A, Betz C, Puppe F, Kneitz C. Evaluation of a novel case-based training program (d3web. Train) in hematology. *Ann Hematol*. 2005; 84:823-9.
14. Spencer J, Blackmore D, Heard S, McCrorie P, McHaffie D, Scherpbier A, et al. Patient-oriented learning: A review of the role of the patient in the education of medical students. *Med Educ*. 2000; 34:851-7.
15. Ghosh S, Dawka V. Combination of didactic lecture with problem-based learning sessions in physiology teaching in a developing medical college in Nepal. *Adv Physiol Educ*. 2000; 24:8-12.
16. Chari S, Gupta M, Gade S. The early clinical exposure experience motivates first year MBBS students: A study. *Int J Sci Educ*. 2015; 8:403-5.
17. Sawant SP, Rizvi S. Importance of early clinical exposure in learning anatomy. *Sch J Appl Med Sci*. 2015; 3:1035-8.
18. Das P, Biswas S, Singh R, Mukherjee S, Ghoshal S, Pramanik D. Effectiveness of early clinical exposure in learning respiratory physiology among the newly entrant MBBS students. *J Adv Med Educ Prof*. 2017; 5:6-10.
19. Warkar AB, Asia AA. Introduction to early clinical exposure as learning tool in physiology. *Indian J Physiol Pharmacol*. 2020;64 Supp_1: S62-9.

20. Li AS, Berger KI, Schwartz DR, Slater WR, Goldfarb DS. Facilitating the transition from physiology to hospital wards through an

interdisciplinary case study of septic shock. BMC Med Educ. 2014; 14:78.