Original Article

Early Clinical Exposure through Modular Curriculum in Undergraduate Medical Students: Student Experiences

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ABSTRACT

Objective: To explore experiences and perceptions of early clinical exposure (ECE) in undergraduate medical students under a modular curriculum through a mixed-methods approach.

Methodology: This cross-sectional mixed-methods study was conducted at Rashid Latif Khan University Medical College, Lahore from July to September 2025, following a recently introduced modular curriculum after ethical approval. The participants were second-year MBBS students who had completed at least one year of learning under the modular system with early clinical exposure components. After obtaining written, informed consent, 100 students were included using non-probability convenience sampling technique. Quantitative data was collected through a structured questionnaire using 5-point Likert scale assessing integration of basic and clinical sciences, motivation to learn, communication with patients, and overall satisfaction. Qualitative perceptions were obtained through focus group discussions (FGDs), transcribed verbatim and analyzed thematically using NVivo software. Quantitative data was analyzed using Statistical Package for the Social Sciences (SPSS) version 25.

Results: The majority of the students were of the opinion that ECE resulted in enhanced incorporation of basic and clinical sciences (mean Likert score 4.3/5), it also improved the motivation to learn (4.5/5), and better-quality communication skills with patients (4.2/5). Qualitative data analysis with thematic analysis discovered four major themes, i.e. (1) Linking theory and practice; students recognized the significance of learning in a specific context (2) Motivation through realistic exposure - clinical learning environment stimulated them for enhanced learning (3) Professionalism and communication - students felt an improvement in their self-confidence, communication skills and empathy with the patients; and (4) Challenges and barriers - despite major positive outcomes overcrowding, lack of time, and inconsistent faculty input posed difficulties.

Conclusion: The majority of the students perceived early clinical exposure within modular curricula positively. It enhanced students' motivation, understanding, and communication skills. Fixing the logistical and faculty training challenges can maximize the impact.

Keywords: *Clinical competence. Professionalism. Empathy. Curriculum.*

INTRODUCTION

Globally, medical education has shifted from traditional, discipline-based curricula to modular and competency-based frameworks for the undergraduate medical and dental students. Such an integrated curriculum incorporates basic science disciplines with clinical subjects from early years, allowing the bridging of knowledge with clinical application. The majority of such curriculum designs have a key feature of early clinical exposure (ECE), providing them a learning experience of patient care and communication from the initial years of medical education.[1]

Early clinical exposure is believed and proven to bridge the gap between basic medical learning and actual patient interaction. It enhances students' motivation, understanding, and learning in clinical contexts by providing them an exposure to clinical environments from the beginning. It not only enhances context specific learning and professionalism but also helps in early acquisition of communication skills and empathy among the medical students. Literature review suggests that a structured early clinical exposure improves self-assessed professional competence and confidence in clinical skills.[2] Studies conducted within Pakistan have almost similar findings, providing evidence of benefits to the undergraduate medical students perceiving it as a helpful tool of instruction in concept building and enhancing engagement during the pre-clinical years.[3]

Apart from bridging the gap between theory and practice, ECE has the advantage of contributing significantly to the holistic professional progress of medical students by building their professional identity and emotional endurance. Learning in clinical contexts indirectly inculcates empathy, ethical values, and reflective thinking. Such qualities are expected to be essential in a lifelong learner who is providing compassionate care.[4] Early clinical exposure in a specific clinical environment not only helps the students in a better understanding of the complexities of healthcare systems but also provides

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insight to interprofessional collaboration, and social determinants of health in the local context. The opportunity of working and learning in an authentic clinical situation during early educational years provides an additional benefit of adopting the values and responsibilities of the medical profession by the students. Hence, it incorporates a sense of determination and belonging that provides continuous motivation throughout their training.[5]

The University of Health Sciences (UHS), Lahore has introduced the modular integrated curriculum 2k23 in 2023 in its affiliated medical colleges. Data pertaining to ECE is limited to the introduction of clinical lectures in the first two years, while the modular integrated curriculum 2k23 provides a real-time clinical interaction with students learning relevant clinical skills in a specific clinical setting.[6] The responses across institutions are variable, and students' perception has not yet been explored in the local context. Therefore, we decided to conduct a mixed-method study to explore experiences and perceptions of the students undergoing ECE in the modular integrated curriculum 2k23. This mixed-method study seeks to explore the perceptions, experiences, and challenges of the undergraduate medical students undergoing ECE within the UHS modular integrated curriculum 2k23. By integrating quantitative survey data with qualitative insights, the study aims to provide a comprehensive understanding of how ECE contributes to learning, motivation, and professionalism in the early years of medical education. We believe that the conclusions from this research will not only provide guidelines to curriculum organizers but will also suggest measures for faculty development and capacity building. It will also assist the policymakers and degree awarding bodies in promoting the early clinical learning experiences across Pakistani medical schools.

METHODOLOGY

This cross-sectional mixed-methods study was conducted at Rashid Latif Khan University Medical College, Lahore from July to September 2025 that implemented a modular MBBS curriculum in 2023, after ethical approval (Letter No. RLKUMC/IRB/0063, 24-06-2025). The participants were second-year MBBS students who had completed at least one year of learning under the modular system with early clinical exposure components. After obtaining informed written consent, 100 students were included using non-probability convenience sampling technique.

Data was collected through a structured, pretested questionnaire. It was developed following AMEE Guide No. 87 for developing questionnaire, the literature review, development of relevant items, and preliminary questionnaire, pilot testing with revision and refining based upon the feedback of pilot testing. This was followed by pre-testing to validate the questionnaire. A Cronbach's alpha of 0.7 was obtained indicating internal consistency of the item. It was a structured questionnaire consisting of statements rated on a 5-point Likert scale (1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree). The survey covered four key domains of the ECE experience: integration of basic and clinical sciences, motivation to learn, communication with patients, and overall satisfaction.

In-depth qualitative insights were gathered through two FGDs with students (n=10 in each) enrolled through purposive sampling. Each FGD was facilitated using a semi-structured guide that encouraged students to discuss the benefits, challenges, and suggestions regarding early clinical exposure. Open-ended questions were designed to explore experiences corresponding to themes. These questions related to themes are given in Table 1.

Table 1: Qualitative Research Questions Aligned with Themes

Theme	Qualitative Research Question
Bridging Theory and Practice	In what ways has early clinical exposure helped you connect with what you learn in lectures with actual patient care?
Motivation through Real-Life Exposure	How did meeting real patients early in your training affect your motivation or interest in learning medicine?
Professionalism and Communication	Can you describe how early patient interactions have influenced your communication skills or professional behavior?
Challenges and Barriers	What difficulties or barriers have you encountered during your early clinical exposure sessions?

STATISTICAL ANALYSIS

Quantitative data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. The descriptive data, including frequencies (percentages) and mean±standard deviation (SD) for each item and domain of the questionnaire (integration, motivation, communication, and overall satisfaction) were calculated. These are mentioned in Table 2. As the study population comprised only 2nd year MBBS students, the analysis focused on summarizing response trends rather than subgroup comparisons. To analyze the trends of students' perceptions, combined scores from each domain were calculated.

For qualitative data, NVivo software (version XX) was used. We followed the principles of Braun and Clarke for qualitative data analysis to generate themes and thematic analysis. Audio recordings from the two focus group discussions were transcribed verbatim and introduced into NVivo for coding and organization. Utilizing thematic analysis approach, repeated patterns and categories were identified inductively from the data (Figure 1). This was followed by iterative coding to draft emerging themes connected to students' perceived advantages, challenges, and proposals for improvement regarding early clinical exposure. For refining and validation of final themes, thematic maps and query functions in NVivo were used to safeguard reliability and uniformity of interpretation.

RESULTS

Hundred students gave consistently positive ratings to their early clinical exposure. Most of them agreed that ECE improved their understanding of the relevance of basic sciences in a clinical context (82% agreement; mean Likert score 4.3/5), enhanced their motivation to learn (88% agreement; mean 4.5/5), and increased their confidence in communicating with patients (76% agreement; mean 4.2/5). In terms of overall impact, 80% of the students rated the ECE experience as beneficial to their education (Table 2).

Data examination through NVivo-assisted thematic analysis revealed that ECE not only improved integration between basic and clinical sciences, but it also improved student motivation and enhanced professional and communication skills. There were however, some challenges and contextual barriers that were identified by the students including overcrowding in clinical settings, time restraints, and unpredictable faculty guidance. In general, the findings in this study support the inclusion of structured and well-supervised ECE sessions in the early medical curriculum (Table 3).

Figure 1: Word Cloud Depicting Key Themes Emerging from Students Perspectives on Medical Education

Table 2: Mean Scores of Quantitative Domains of ECE

Domain	Description	Likert Score (out of 5) (Mean±SD)	Agree/Strongly Agree (Percentage)	Interpretation
Integration of Basic & Clinical Sciences	ECE enhanced the linkage between theory and practice	4.3±0.55	82%	Strongly positive
Motivation to Learn	ECE improved students' enthusiasm and engagement in learning	4.5±0.48	88%	Very positive
Communication Skills	ECE improved student–patient communication and confidence	4.2±0.6	76%	Positive
Overall Satisfaction with ECE Experience	ECE was perceived as a useful tool with positive impact on learning	4.33±0.54	80%	Positive

Table 3: Thematic Analysis of Qualitative Data

Theme	Subthemes (Identified Through NVivo Coding)	Representative Verbatim Comments
Linking Theory and Practice	Comprehending the significance of basic sciences through the incorporation of clinical examples	"When I saw the patient with anemia, I could eventually connect what we studied in physiology to the tangible problem. ECE facilitated me to understand why basic sciences actually matter."
	Strengthened classroom learning leading to context-based learning	"I couldn't understand the significance of studying physiology in so much detail in lectures unless I observed the clinical cases in ECE, everything started connecting in my mind"
	Augmented knowledge retention	"The anatomy of brachial plexus became so clear and easy when I saw a patient with a fractured humerus, I could visualize exactly which nerve was affected and why".
Motivation Through Realistic Exposure	Enhanced internal motivation of students	"I felt like a real doctor in training. After the ECE sessions, I went home and read more because I wanted to know what I had seen."
	Appealing, relevant, and meaningful learning	"When I learnt how to examine a patient's pulse and blood pressure, I instantly was eager to recall the physiology behind it. I wanted to comprehend what was happening inside the body."
	Clinical learning environment increased curiosity and self-study.	"After examining a patient with anemia in the ward, I felt inquisitive to understand the biochemical basis. For the first time, I read metabolism not for the test, but to connect it with real life."
Professionalism and Communication	Enhanced self-confidence during patient interaction	"Initially, I was under confident to talk, but now I can communicate more confidently with patients. I realized that patients are people, not just cases, ECE taught me compassion."
	Development of empathy and professionalism	"When I saw patients with multiple health problems, I realized how much empathy matters & it made me think beyond books and marks."
	Understanding the ethical aspects of care	"I learnt my first lesson about secrecy, patient confidentiality, and ethics during ECE, we were told not to discuss patient details outside the ward".
Challenges and Barriers	Overcrowding in clinical settings; limited time for observation	"The clinical batches had too many students at one bedside resulting it difficult to learn. Small batches might help in a better understanding"
	Inconsistent faculty facilitation	"Each teacher had a different approach in clinical methodology, it got confusing sometimes."
	Lack of structured debriefing	"There was generally no discussion on how we performed in ECE session. The sessions would have been more fruitful if there was a short debrief so we could clear our doubts and reflect on what we learned"

DISCUSSION

Early clinical exposure (ECE) is an educational approach that familiarizes medical students with patient interactions during the early stages of the MBBS program. It encourages students to enhance their academic knowledge, clinical abilities, and communication skills, thereby boosting their confidence.[7]

The findings of our study demonstrate that early clinical exposure serves as an effective pedagogical approach in bridging the gap between basic and clinical sciences in the early years of medical education. The higher mean Likert scores across all domains; motivation to learn, integration of basic & clinical sciences, communication skills, and overall satisfaction underscore the strong positive perception of students towards ECE. Similar outcomes have been reported in other studies. In a study by Oshiro et al., integrated modular curriculum in Tokyo led to improved self-assessment scores of medical students in various professional competencies. The students were able to correlate basic sciences with the practical knowledge, contributing to long-term retention of concepts and better efficacy.[8] Another study from Ethiopia reported a positive role of ECE on the motivation of students to learn, problem-solving abilities, professional knowledge, and orientation towards the community.[9] Ahire et al. stated that ECE improved students' understanding of concepts, enhanced knowledge retention, and increased interest in the subject.[10] In a study, ECE positively influenced cognitive and affective learning domains. Students described a deeper comprehension of concepts of basic sciences when encountered in clinical contexts. The ability to visualize theoretical content in patient scenarios appeared to reinforce meaningful learning, aligning with the principles of constructivist and experiential learning theories. The sense of curiosity and intrinsic motivation described by students after ECE reflects self-directed learning behaviors, which is a key outcome desired in outcome-based medical curricula.[11] A study conducted at the Rawal Institute of Health Sciences, Islamabad assessed the effects of early clinical exposure in 3rd to final year MBBS students. The results of the study showed that ECE is associated with enhanced confidence, communication, and clinical skills of the students.[12] Similar to our study, a study revealed that 90% of the medical students were satisfied with the ECE program. Students reported that ECE facilitated adaptation to the clinical environment, increased confidence in communicating with supervisors & patients, and enhanced their abilities to learn clinical skills.[13]

In our study, another important finding was the improvement in empathy and professional attitude among medical students. According to a study from Dubai, early patient exposure fosters emotional intelligence and nurtures empathy, allowing students to view patients as individuals rather than disease entities. It contributes significantly to the development of professionalism and ethical awareness in undergraduate medical students.[14] In another study, ECE has also been shown to promote professional development in the initial stages of medical education.[15] Ingale et al. reported that ECE helps the students to learn clinical skills by providing an engaging learning environment, cultivate empathy, foster a patient-focused approach to care, and develop professional attitudes such as the value of teamwork, effective communication, and ethical decision-making.[16]

However, our study identified that despite the overall positive impact, students found challenges such as overcrowding during sessions, inconsistent facilitation, and lack of structured debriefing. These issues are consistent with other studies. A study pointed out that ECE has complex dynamics depending on a large extent on student-teacher relationship. This is because the students consider their clinical teachers as mentors and role models. Insufficient guidance and poorly structured programs can hinder the effectiveness of ECE.[16] Another study highlighted several barriers to implementing ECE, with increased workload of the clinical doctors as the most common challenge. Other significant obstacles included poor coordination between academic & healthcare institutions and inadequate orientation on the implementation process.[9] A study reported a decline in student satisfaction with ECE, attributed to the absence of structured programs in hospitals.[13]

CONCLUSION

The majority of the students perceived ECE within modular curricula positively. Early clinical exposure, when implemented systematically with adequate faculty support, can enhance motivation to learn, integration of basic & clinical sciences, communication skills, and overall satisfaction in early years of medical students. It also contributes to improvement in empathy and professional attitude among medical students. Its incorporation into the preclinical curriculum of Pakistani medical colleges should be encouraged to promote active, reflective, and patient-centered learning.

LIMITATIONS & RECOMMENDATIONS

The study included only second-year MBBS students from a single medical institution. Future research should include students from different academic years and involve multiple medical colleges following UHS integrated curriculum to provide a more comprehensive evaluation of ECE-integrated curricula.

It is recommended that smaller group rotations, faculty development workshops, and structured debriefing sessions be implemented to address existing barriers and enhance the effectiveness of ECE in improving learning outcomes.

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Authors' Contributions:
L.Y: Concept and study design, data analysis, final proofreading, and approval of the manuscript.
A.A: Literature review, and questionnaire administration, data validation, results compilation, and critical manuscript review.
M.A: Data collection, statistical analysis and interpretation of quantitative data.
M.F.A: Data collection, facilitation of focus group discussions and qualitative data analysis.
M.H.K: Literature review, bibliography, data collection, and formatting.
M.B.A: Literature review, bibliography, data collection, and formatting.

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