ORIGINAL ARTICLE

"Early clinical exposure: boon or bane" Perception of medical undergraduate students: a cross-sectional study

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ABSTRACT

Background: Early clinical exposure was introduced in the medical curriculum in 2019 to enhance the quality of education as well as a better understanding of the undergraduates by focusing primarily on the clinical aspect. Thus, the purpose of this study was to study the perception of Medical Undergraduates regarding early clinical exposure as a part of the medical curriculum. **Methods**: The data was collected from 260 students (104, 1st year students and 156, 2nd year students) using a cross-sectional study. Data was collected in questionnaires which consisted of 4 sections: Demographic profile [5 Questions], Knowledge [5 Questions], Attitude [6 Questions], Perception [6 Questions]. The study was conducted over one month. Data was summarized using frequency, percentage, and summary statistics. The distribution of data was represented using appropriate diagrams. The comparison of scores between batches (and genders) was done with a t-test and Wilcoxon sign rank test for normal and normal scores respectively. Statistical analysis was done using R 4.3.1 software. **Results**: The majority of the students about 78.85% of undergraduate medical students were aware of ECE and amongst them, 51.15 % were satisfied with the ECE sessions. There was no significant difference in knowledge, attitude, and perception of ECE between gender (or batch of students) **Conclusion**: After conducting the survey and analyzing the results it was concluded that the early clinical exposure is beneficial for the students as it provides learning skills with practical knowledge as well as live visualization instead of just a theoretical approach.

Keywords – Early clinical exposure, Bachelor of medicine and bachelor of surgery, Clinical Skills, communication skills.

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Introduction

Since 1820's Indian medical education system has been flourishing by adapting various forms to yield doctors providing health care services. Bachelor of Medicine and Bachelor of Surgery (MBBS) aims at better diagnosis and management of common health problems of the individual and the community and also develops a compassionate analytical and ethical approach in the delivery of health care for all.

In the traditional curriculum of MBBS, students attended theoretical classes only in the form of lectures and laboratory classes with little exposure to clinical setupwhich eventually burned out the enthusiasm and passion of the developing doctors. The traditional curriculum consisted of the three-phase framework of preclinical or first MBBS (12 months); Para clinical, or second MBBS (18 months); and clinical or third MBBS (24 months) plus internship (12 months).[1]Despite that there were a few flaws in the traditional curriculum as it did not concentrate on the clinical aspect; it provided only one-way communication with little active participation. As a result of this when the students were promoted to clinical year, they lacked clinical experience. Students were not prepared to face clinical situations and lacked the skills to face the situation thus were not able to use their medical knowledge. Taking into account, different approaches were considered to improve the teaching and learning quality of medical sciences, among which Early Clinical Exposure

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(ECE) was one of the prime approaches whichwere introduced in phases I (1st year) and II (2nd year) in the medical curriculum in 2019. [2,3]ECE introduces aspects of the clinical and social contexts of patients and also it focuses on early exposure in the healthcare environment that provides motivation and confidence to students. Additionally, it peaks interests, communication, teamwork, leadership qualities, and understanding of the students, leading to their professional growth anddevelopment. [4]

However, since ECE has been recently introduced, students as well as faculties are still learning to adapt to this approach. Many students sometimes find it difficult to manage their schedule with this newly added approach. Therefore, to find out how medical undergraduatesfeel and relate to ECE we conducted a study on 1st and 2nd-year medical undergraduates.

Aims And Objectives

To study the perception of Medical Undergraduates regarding EARLY CLINICAL EXPOSURE as a part of medical curriculum

Methodology

A cross-sectional study was conducted amongst 1st and 2ndyear medical undergraduates of a medical college in Central India. Students were briefed about the study and those who were present and gave their consent were included in the study. Data was collected in questionnaires which consisted of 4 sections: Demographic profile [5 Questions], Knowledge [5 Questions], Attitude [6 Questions], Perception [6 Questions]. The study was conducted over a period of one month.

Question	
Knowledge	Q1. Are you aware about the Early Clinical Exposure (ECE) concept?
	Q2. Do you know in which year ECE was implemented in MBBS course?
	Q3. Do you know what subject wise distribution of ECE in MBBS course is?
	Q4. Do you know what is time allotted for ECE in MBBS course?
	Q5. Do you know how ECE is evaluated in MBBS course?
Attitude	Q6: Do you think your attendance has improved in classes because of ECE?
	Q7: Do you think your academic performance has improved due to ECE?
	Q8. Do you think understanding and learning are easier in clinical posting than in reading books?
	Q9. Do you think your interest in clinical subjects has improved due to ECE?
	Q10. Do you think ECE has helped in overall development of your skills {ex: communication, confidence}?
	Q11. Do you find it difficult to give equal time to your Pre and Para clinical subject along with ECE?
Perception	Q12. Does ECE motivate students to develop a better insight into medical profession?
	Q13. Do you find your ECE session enjoyable and satisfactory?
	Q14. Do you think ECE is time consuming module?
	Q15. Are you worried about infectious disease exposure during ECE?
	Q16. Do you think you are able to correlate theoretical and clinical knowledge because of ECE?
	Q17. Is ECE helping in creating a healthy competitive environment?

Statistical Analysis: Statistical analysis was done using R 4.3.1 software. Data was summarized using frequency, percentage, and summary statistics. The distribution of data was represented using appropriate diagrams. Knowledge score (max=5, min=0) was calculated by assigning 1 to yes answer and 0 to No/don't know the answer. Attitude score (max=18, min=-18) was calculated by assigning the 3, 0, -3 to positive, neutral, and negative attitudes respectively. Perception score (max=18, min=-18) was calculated by assigning the 3, 0, -3 to positive, neutral,and negative perceptions respectively. The comparison of scores between batches (and genders) was done with a t-test and Wilcoxon sign rank test for normal and normal scores respectively. A knowledge score greater than 3 and less than or equal to 3 was considered as adequate and inadequate knowledge respectively. Attitude (or perception) scores greater than 12, greater than 6 but less than or equal to 12, and less than 7 were considered as

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positive, neutral, and attitude (or perception) respectively.

Results And Observations:

Table 1: Demographic characteristics of students (n=260)

Characteristics		Frequency	Percentage
Gender	Female	134	51.54
	Male	126	48.46
Religion	Christian	12	4.62
	Hindu	230	88.46
	Jain	4	1.54
	Muslim	12	4.62
	Sikh	2	0.77
Batch	2021	153	58.85
	2022	104	40.00

In Table 2 the demographic distribution of 260 students reveals a slight majority of females (51.54%) compared to males (48.46%). The majority of students identify as Hindu (88.46%), followed by Christian (4.62%), Muslim (4.62%), Jain (1.54%), and Sikh (0.77%). Regarding batches, a larger portion of students belong to the 2021 cohort (58.85%) compared to the 2022 cohort (40.00%).

Table 2: Distribution of Knowledge

Question	Yes		No/Don't Know	
	Frequency	Percentage	Frequency	Percentage
Q1	205	78.85	55	21.15
Q2	90	34.62	170	65.38
Q3	101	38.85	159	61.15
Q4	93	35.77	167	64.23
Q5	80	30.77	180	69.23

The table 2 summarizes participants' knowledge of Early Clinical Exposure (ECE) in the MBBS course. Most were aware of the concept (Q1: 78.85%), but fewer knew specifics like implementation year, subject distribution, time allotted, or evaluation methods (30.77% to 38.85%). A significant portion (61.15% to 69.23%) lacked details about these aspects. While many knew about ECE broadly, there's a noticeable gap in understanding its finer points within the MBBS curriculum.

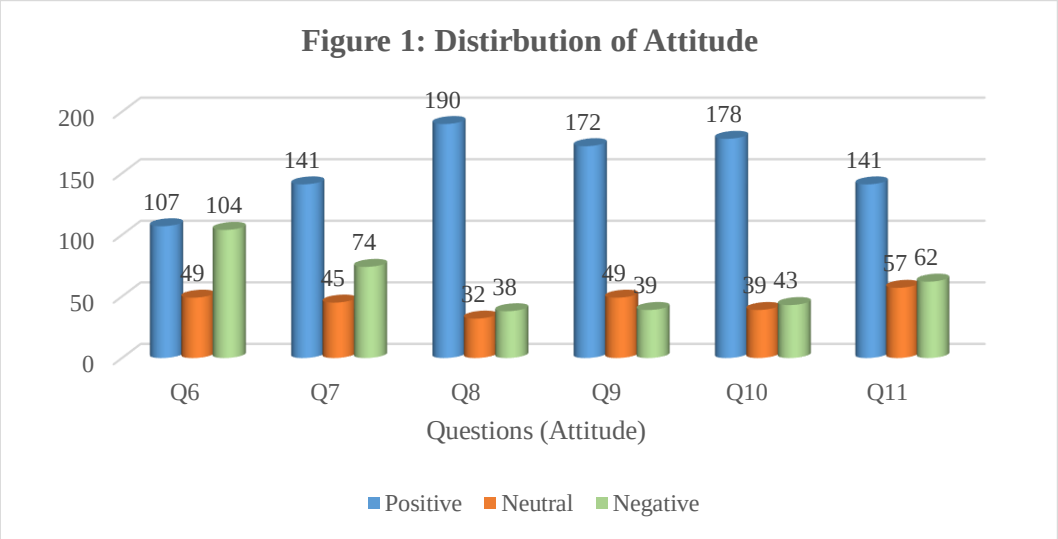

Figure 1 shows participant attitudes toward ECE in the MBBS course, highlighting predominantly positive sentiments (41.15% to 73.08%). Notably, 73.08% viewed ECE as aiding understanding in

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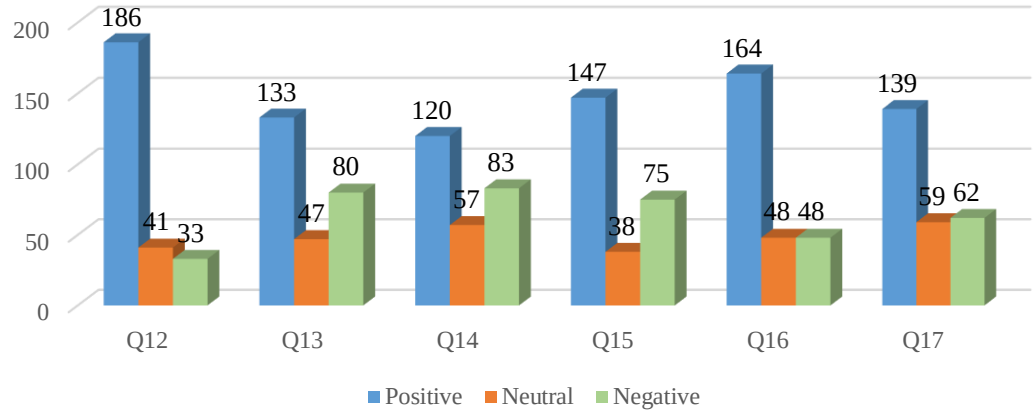
clinical postings (Q8), while 54.23% felt it increased interest in clinical subjects (Q7) and offered insight into the medical profession (Q11). Yet, concerns emerged, notably in Q6, where 40.00% worried about ECE impacting attendance. Despite some reservations, overall positivity dominated participants' attitudes toward ECE.

Figure 2 : Distribution of Perception



The figure 2 illustrates participants' perceptions of Early Clinical Exposure (ECE) in the MBBS course. Generally, positivity prevails, with the strong agreement (71.54% to 63.08%) on ECE enhancing insight into medicine (Q12) and aiding in correlating theory with clinical practice (Q16). However, concerns arise regarding time, with around 30% feeling ECE might be time-consuming or less satisfactory (Q13 and Q14). Overall, while positivity dominates, time-related concerns stand out in perceptions of ECE.

Table 3: Gender-wise Comparison

Score	Male			Female			P value
	Median	Mean	SD	Median	Mean	SD	
Knowledge	2	2.2619	1.6355	2	2.1194	1.425	0.4922
Attitude	3	4.9524	7.752	6	6.3134	7.8063	0.0827
Perception	6	5.2381	7.0375	6	6.4478	7.7823	0.1253

Table 3 compares male and female scores on knowledge, attitude, and perception of Early Clinical Exposure. While both genders show similar knowledge levels, females tend to express slightly more positive attitudes and perceptions toward ECE. However, these differences aren't statistically significant based on the provided P values.

Table 4: Batch-wise Comparison

Score	Batch 2021			Batch 2022			P value
	Median	Mean	SD	Median	Mean	SD	
Knowledge	2	2.2372	1.4902	2	2.1154	1.5907	0.5358
Attitude	7.5	6.0192	7.8416	6	5.1058	7.7296	0.3543
Perception	6	6.5192	7.5293	6	4.875	7.2309	0.0786

Table 4 compares scores between two batches, 2021 and 2022, in knowledge, attitude, and perception of Early Clinical Exposure. Both batches showed similar knowledge levels, while attitudes varied slightly with Batch 2021 initially scoring higher. Perception differences were noticeable but not statistically significant (P values > 0.05). Overall, no substantial differences were found between the batches in their understanding, attitude, or perception of ECE.

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Table 5: Association of Knowledge with Gender

Gender	Knowledge Score		P value
	Adequate	Not Adequate	
Male	29 (23.02%)	97 (76.98%))	0.3059
Female	23(17.16%)	111(82.84%)	

The table 5 compares knowledge levels (Adequate and Not Adequate) between male and female participants. Around 23% of males and 17% of females had Adequate knowledge, while the rest had Not Adequate knowledge. The P value (0.3059) indicates no significant association between gender and knowledge levels in the study.

Table 6: Association of Attitude with Gender

Gender	Attitude Score			P value
	Positive	Neutral	Negative	
Male	26(20.63%)	30 (23.81%)	70 (55.56%)	0.4164
Female	37 (27.61%)	28 (20.89%)	69 (51.50%)	

Table 6 compares attitude scores (Positive, Neutral, Negative) between males and females. Around 20-28% of males and females had a Positive attitude, while 51-56% held a Negative attitude. The P value (0.4164) suggests no notable association between gender and attitude scores in the study.

Table 7: Association of Perception with Gender

Gender	Perception Score			P value
	Positive	Neutral	Negative	
Male	14 (11.11%)	30 (23.81%)	82(65.08%)	0.09228
Female	24 (17.91%)	40 (29.85%)	70 (52.24%)	

Table 7 compares perception scores (Positive, Neutral, Negative) between male (11.11%, 23.81%, 65.08%) and female (17.91%, 29.85%, 52.24%) participants. The P value (0.09228) suggests a potential but not a significant association between perception levels and gender.

Table 8: Association of Knowledge with Batches

Batch	Knowledge Score		P value
	Adequate	Not Adequate	
2021	31 (19.87%)	125 (80.13%)	0.9999
2022	21 (20.19%)	83 (79.81%)	

Table 8 compares knowledge scores (Adequate, Not Adequate) between Batch 2021 (19.87%, 80.13%) and Batch 2022 (20.19%, 79.81%). The P value (0.9999) suggests no significant association between knowledge levels and batches, indicating similar distributions across both batches.

Table 9: Association of Attitude with Batches

Batch	Attitude Score			P value
	Positive	Neutral	Negative	
2021	41(26.28%)	37(23.72%)	78(50.00%)	0.3869
2022	22 (21.15%)	21(20.19%)	61(58.65%)	

Table 9 compares attitude scores (Positive, Neutral, Negative) between batches 2021 and 2022. Batch 2021 showed about 26% Positive, 24% Neutral, and 50% Negative attitudes, while Batch 2022 had roughly 21% Positive, 20% Neutral, and 59% Negative attitudes. The P value (0.3869) indicates no substantial link between attitude scores and batches, suggesting similar attitude distributions across both batches.

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Table 13: Association of Perception with Batches

Batch	Perception Score			P value
	Positive	Neutral	Negative	
2021	29(27.88%)	40(38.46%)	87(83.65%)	0.0847
2022	9 (8.65%)	30 (28.85%)	65 (62.50%)	

The table compares perception scores (Positive, Neutral, Negative) between batches 2021 and 2022. Batch 2021 showed a higher Positive perception (28%) and a significantly higher Negative perception (84%) compared to Batch 2022, which had a lower Positive perception (9%) and a lesser Negative perception (63%). The P value (0.0847) indicates a possible but not significant association between perception scores and batches, suggesting some differences in perceptions between the two batches.

Discussion

The survey was conducted to investigate the knowledge, perception, and attitudes of undergraduate medical students regarding Early Clinical Exposure (ECE). The survey was conducted amongst 1st and 2nd year students in which around 260 students took part.

Attitude

It was observed that the majority of students in this survey considered ECE as an effective tool in building professional knowledge. About 73.08% of students have a better understanding with easy learning through clinical postings in comparison to the traditional method of reading only books. Overall interest in clinical subjects has also improved due to ECE for about 66.15% of students. Similarly, 68.46% of students were observed to have gross development of skills through ECE {E.g.:communication,confidence,teamwork}.[6,7,8]
This can be explained by the fact that the medical students as keen observers, observe various situations in the hospital during clinical postings such as minor surgeries in OT, patient interaction, and patient response. Actual visualization of medical or surgical procedures rather than theoretical reading and rote learning can have a higher impact on memory retention and the development of competency.

Perception

The survey showed that most of the students (about a frequency of 186) were motivated and had better insight intothe medical profession through ECE. It facilitates the integration of basic and clinical aspects thus improving student's perception of medical care. The Early clinical concept provides hands-on experience to the students helping them to understand the job.[9,10]

Knowledge

In the survey, we found out that 78.85% of undergraduate medical students were aware of ECE contrary to 21.15% of students not knowing about it. The foundation classes conducted in the initial days of the MBBS course are possibly the reason for the high percentage of students knowing about the concept of ECE.The survey also highlighted the lack of basic knowledge of ECE among the students, for example, 69.23% of students did not know about the evaluation of ECE in the MBBS course. Similarly, 61.15% of students lack knowledge of the subject-wise distribution of ECE in MBBS courses. Thepossible cause could be that details regarding the distribution of time and subject are not thoroughly discussed in the orientation classes. [5]

Around 63.08% of the students can correlate theoretical and clinical knowledge because of ECE, the reason being after reading the theory they can see the thing which helps them to understand better and also builds up an interest. (For Example – students understand the meaning of pallor and icterus better when they see it.) [11]

When asked whether they were able to enjoy and were satisfied with the ECE sessions, 51.15 % voted positively stating that ECE sessions are enjoyable and satisfactory. This is because of the interactive sessions with the patients and the practical knowledge being provided to them in ECE classes.[12]

Conclusion

After conducting the survey and analyzing the results it was concluded that the early clinical exposure is beneficial for the students as it provides learning skills with practical knowledge as well as live visualization instead of just a theoretical approach.

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Limitations:

The data comes exclusively from a single medical college located in central India, which might limit its applicability to broader contexts.

Conflict Of Interest:

The authors confirm no conflicts of interest associated with this paper's publication

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