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ORIGINAL ARTICLE

Perception of Undergraduate Medical Students about Integrated Modular Curriculum and Factors Affecting

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ABSTRACT

Aim: To explore the perceptions of undergraduate medical students about integrated modular curriculum and to identify the factors affecting it.
Study design: Mixed method study
Place and duration of study: King Edward Medical University (KEMU) from 1st November 2021 to 30th April 2022.
Methods: The questionnaires were distributed to 391 MBBS students. In depth interviews were conducted from 16 students and audio-recorded.
Results: Three hundred and fifty seven (91.3%) considered integrated curriculum a useful approach, 88% preferred this approach over traditional, more than 70% considered it useful for clinical insight and improvement in academic performance. Many (43%) of the students complained that the institutional environment was not helpful regarding implementation of integrated curriculum which was further explored by in-depth interview.
Conclusion: The majority of students have shown a positive response to the modular integrated curriculum .It has helped them in improving academic performance and clinical insight. There is a need to improve university environment to implement integrated assessment more effectively.
Keywords: Integrated modular curriculum, undergraduate, medical students, perception

INTRODUCTION

Curriculum is derived from New Latin, which means a "course of study." The International association of Medical Science Educator's review of Flexner's influence, proposed the integrated model which could result in better retention of knowledge across the basic and applied sciences. Integrated curriculum is the way forward and is a medium to introduce future capabilities in the students. The role of students, teachers and curriculum leaders is very important as far as any type of curriculum implementation is concerned[1].

The medical education in Pakistan is provided by number of medical colleges both in public and private sectors. It is a five year course in which first three years are dedicated to basic medical sciences and the last two years to clinical sciences. This traditional system has been criticized due to lack of connection between clinical and basic subjects, difficulty faced by the young graduates to integrate the both during their clinical practice and content overload[2].

In an integrated curriculum, the key concepts from various disciplines are combined together in a logical manner and individuals acquire more knowledge, retain and apply it effectively. A number of studies have been conducted which have come to the conclusion that implementation of integrated curriculum in medical schools is overall associated with high levels of student satisfaction[3,4].

The students perceive the integrated curriculum in a positive manner as seen in many of the studies conducted. They feel that integrated Curriculum helps them in developing team spirit, improved working habits, attitudes and better attendance. The students feel more motivated when they work on real life situations[5,6].

In Pakistan, work on integrated curriculum has been done in medical colleges to see its impact on the students. There are a number of factors which affect students' perception like students' background, environment of the institution, teachers' ability and methodology, innovation in curriculum, level of difficulty etc. There are local and international studies available on the subject conducted on a relatively small sample size[7].

The rationale for conducting this study is to explore the perception of the undergraduate medical students regarding the integrated modular curriculum and the factors affecting it on a large and varied sample. The results will help us in devising new strategies and in successful implementation of integrated curriculum successfully in other medical institutions.

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METHODOLOGY

This was a concurrent mixed method study conducted at KEMU, Lahore over a period of 6 months from November 2021 to 30th April 2022. The Undergraduate students studying at KEMU, between 18 to 25 years of age were included in the study. Those unwilling to participate were excluded. This study was conducted after informed consent and taking approval from the institutional review board. Half of the students were male and half female. For the quantitative aspect a sample size of 391 was calculated keeping margin of error as 5% and 95% confidence interval. Pretested structured Questionnaire was distributed to students for collection of the data on features. The questionnaire consisted of questions related to demographic details, those having answers in yes/no and few questions ranging from strongly agree to strongly disagree on Likert Scale. Quality Enhancement Cell of KEMU was involved. Systematic random sampling was used**.** List of all undergraduate MBBS students was obtained from the university and a sampling frame was constructed.

The data was entered and analyzed by using SPSS 20.0. Data for year of education, gender, residential status, educational Background and responses of students were described by using frequency and percentages. Preference to the education system was presented by using Pi-chart, and multiple bar diagram was used to present response to the questions on Likert scale. The responses in relation to gender and the year of study were compared by using chi-square test. P-values ≤ 0.05 were considered significant.

RESULTS

There were final year student in respective order were 60 (15.3%), 78(19.9%), 80(20.5%), 84(21.5%) and 89(22.8%). Almost one fourth, 107(27.4%) of them were males, 255(65.2%) were the hostel boarders. Majority of them (89%) were from educational background of having matriculation and F.Sc, 5.6% had O level/F.Sc and 4.9% had O/A level.

The responses of students recorded "yes" to eight questions, were compared between two genders and there was no significant difference found for various questions linked to pros and cons for usefulness, academic performance, and development of logical thinking, development of interest in subject or coverage of topics. The only thing found different was the institutional environment regarding the implementation of integrated curriculum with a p-value 0.013 with female's likeness of 61.1% compared to males as 46.3%. When same responses were compared by the year of students, response to improvement in academic performance was significantly different with p-value 0.044, while the usefulness of institutional environment was just insignificant with p-value 0.070. All other factors had similar response by the year of education in program (Table 1.)

The highest number of students responded strongly agree to the statement "Integrated teaching helps in the appreciation and application of basic science knowledge in health and disease", while strongly disagree or disagree was the response for maximum of students against the statement "the discussion on a given topic was adequate in integrated teaching", followed by "there was actual integration of the topics given" (Fig. 1)

There were 232(59.3%) of the students who preferred horizon**4** integrated teaching while remaining had a preference of ve approach. The interactive lecture was considered the most u approach by 178(45.0%) of students, followed by small g discussion, concept maps and mind mapping (Fig. 2)

In-depth Interview: Later sixteen students were subjected to in-c interview, their perception and about integrated modules was di into 6 themes and sub themes as follows:

Benefits of integrated curriculum

- To help meet expectations of the patient 13(81%)
- Improve healthcare delivery (achievement of outcome) 12(75%)

The students were satisfied with the integration of basic clinical sciences. They experienced early clinical exposure. integrated curriculum raised the confidence level of the students . could effectively communicate with the patients and use new clinical methods for evaluating the patients. One of the study participant said "Integrated Curriculum is preferable over Traditional Curriculum as basic and applied sciences are taught hand in hand." One of the students commented that "Integrated curriculum made us think like doctors at the very onset".

Students Learning

- Learning was student centered. 13(81%)
- It improved their academic performance. 13 (81%)

The students were of the view that their concepts were enhanced. The integrated curriculum raised the confidence level of the students. They found it very helpful in clarifying their concepts, inducing logical thinking and improving academic performance. It provided them with early clinical exposure which they found helpful during their later years. One of the final year students commented. "Integrated curriculum has made us adjust to international examinations in an excellent manner."

Faculty and teaching methodology: More training for Faculty required. 13(81%). Students' adjustment with the required teaching methodology. The students felt that the teachers were helpful and tried to guide the students to the best of their ability They were of the view that since newer teaching methodology was being used, the teachers should be trained enough to teach the students in the manner they are supposed to. One of the students said ' "Training of the faculty should be done as well as integrated and traditional curriculum are different from each other, necessitating faculty training."

The students expressed their concern about the lesser number of teachers who despite having dedication, and commitment, were sometimes unable to handle large number of students. Their grip on the subject was lost resulting in poor understanding of the subject.

The students showed more inclination towards interactive lectures. One of the students commented "Simply reading from the slides did not help in the understanding of the subject. Interactive lectures were of great help." While in small group teaching this issue was almost resolved. However, most of the students couldn't comment much on the mind and concept mapping as they had a limited exposure to that, usually in the final year. The comments of one of the students were **"Concept and mind mapping would have been very helpful as teaching methods, if they were started earlier.** Interactive lectures, Small Group teaching and especially concept and mind mapping should be started in the first year.

Barriers and challenges in implementation of Integrated Curriculum: The introduction of latest technology and other issues need to be resolved. The students felt that the size of lecture theatres was small. The multimedia system available was of good quality but there was a dearth of projectors for the large number of number of students. One student had the following comments **"The backbenchers faced a difficult time in understanding the lectures as they had a difficulty in reading the slides. There was trouble with the mike system as well. They also created disturbance in the class due to this reason."** Also there were issues like temperature regulation and lighting arrangements of the lecture theatres which distracted the pupils' attention. Another student said "The **lecture theatres were too cold in the winters this issue made it difficult for me to concentrate."**

Challenges in Implementation of integrated curriculum: Planning for implementation of integrated curriculum: 12(75%), Dealing with Interdepartmental Shuffle. 13(81%)

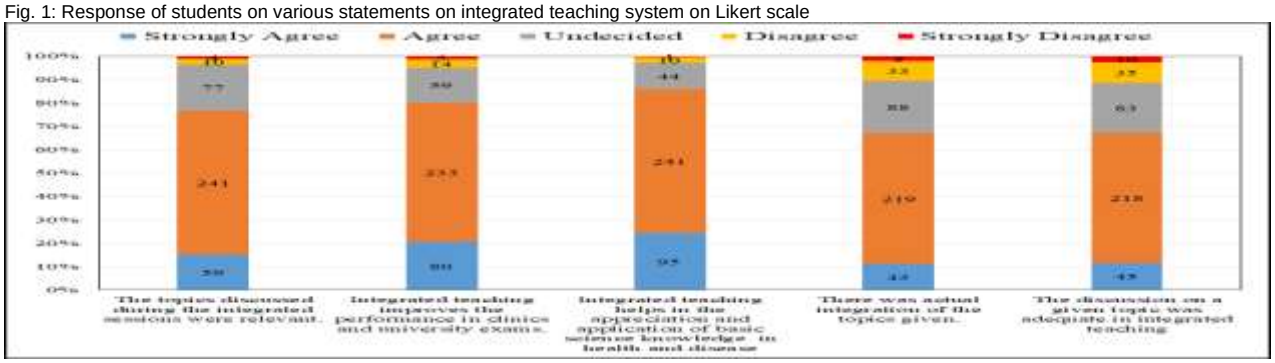
The students faced problems with the overlapping between the Integrated Modular and the Traditional curriculum. They also mentioned the lack of integration at certain levels. Many students felt that the subjects like Biochemistry, Forensic Medicine and Community Medicine were not properly integrated in the modular system. One of the students commented "**Sometimes I cannot not find relevance between Biochemistry and other subjects taught in first year ".** A few students felt that there was interdepartmental disagreement regarding the implementation of Integrated Curriculum at times. Most of the students received a mixed feedback from their seniors regarding the Integrated Modular Curriculum, some calling it a pathway too early clinical exposure and others calling it a system difficult to cope with initially, stressful and lengthy. One student commented**"** As I have come to medical school after doing F.Sc, I found this system to be stressful and difficult to cope with initially."

Introduction of integrated assessment: Coupling of Integrated curriculum with integrated assessment 14 (88%). As far as the assessment system is concerned, the majority of the students felt that subjects like Medicine, Surgery, Pathology, and Orthopedics which were taught in first Professional were not assessed at that time, making their retention less. One of the student had said**"** There is no point in teaching the subjects which are not going to be assessed simultaneously. We, then become more interested in the subjects which are going to be assessed in that particular year. " This element made many students skip these classes, indicating low interest of male students in these subjects. Moreover the students were not satisfied with the existing mode of assessment and wanted integrated assessment to be implemented.

Table 1: Comparison of response of students to the questions related to prose and cones of integrated curriculum between two genders and among MBBS years who responded "yes".

Statement of question, n (%)	Gender			Year of education					
	Female	Male	P-value	Final	Fourth	Third	Second	First	P-value
Is this Integrated Curriculum a useful approach? 357 (91.3)	258(91.2)	99(91.7)	1.000	77(86.5)	75(89.3)	73(91.2)	74(94.9)	58(96.7)	0.170
Is environment in your institution helping you with integrated curriculum? 223 (57.0)	173(61.1)	50(46.3)	0.011	51(57.3)	40(47.6)	42(52.5)	54(69.2)	36(60)	0.070
Do you prefer integrated teaching over traditional teaching? 344 (88.0)	249(88)	95(88)	1.000	74(83.1)	74(88.1)	71(88.8)	70(89.7)	55(91.7)	0.556
Is Integrated Curriculum providing you with sufficient clinical insight? 284(72.6)	205(72.4)	79(73.1)	0.989	66(74.2)	61(72.6)	52(65)	55(70.5)	50(83.3)	0.193
Has integrated curriculum improved your academic performance? 279(71.4)	197(69.6)	82(75.9)	0.267	57(64)	55(65.5)	56(70)	61(78.2)	50(83.3)	0.044
Does integrating teaching help in developing logical thinking? 345(88.2)	250(88.3)	95(88)	1.000	77(86.5)	77(91.7)	69(86.2)	70(89.7)	52(86.7)	0.768
Does integrated teaching help develop an interest in subjects? 337(86.2)	243(85.9)	94(87)	0.892	76(85.4)	75(89.3)	69(86.2)	64(82.1)	53(88.3)	0.721
Does integrated teaching help you revise topics covered in theory and practical classes? 304(77.7)	221(78.1)	83(76.9)	0.898	69(77.5)	65(77.4)	64(80)	63(80.8)	43(71.7)	0.747

Fig. 1: Response of students on various statements on integrated teaching system on Likert scale



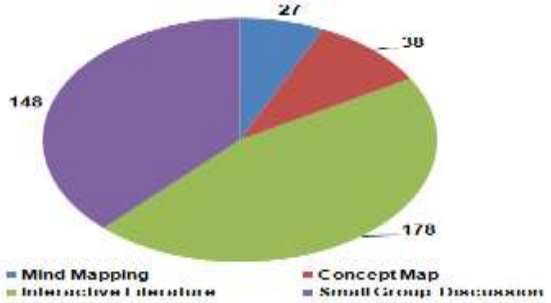


Fig. 2: Type of teaching preferred by the students as most helpful integrated teaching

DISCUSSION

Medical education is going through transformation rapidly and integrated curriculum is successfully replacing the traditional one in countries like ours. Integrated Curriculum has been implemented in few institutions in Pakistan and KEMU is one of them .Integrated modular form is being followed at KEMU.[8]

In a study conducted by Neeli et al[9], students perceived integrated teaching as a preferable method to improve clinical performance. In a study conducted by Kumari et al[10] and Rafique[11] reported that majority students agreed that that integrated teaching helped in the practical application of of basic science knowledge to. These findings are same as that of our study.

In the study by Kumari et al[10], the responses were equally distributed in the favor of integrated and traditional curriculum, while in our study majority was in the favor of integrated teaching. The preference for horizontal integration was seen in as in our study. The same preference for integrated Curriculum was shown in the study conducted by Neeli et al[9], Rafique[11] and Rehman et al[12] as well. Many students in these studies considered the sessions to be lengthy and stressful. This was seen in our study as well.

In studies conducted by Abid et al[13], when students were introduced to integrated teaching they indicated it to be more interesting, useful, interactive and satisfying Two main reasons against integrated teaching were being stressful and leading to wastage of time, the same as expressed by our students. In our study the preferred mode of teaching was interactive lecture, the same trend was observed in a study done by Neeli et al[9].

A few problems experienced by our students like lack of integration between subjects like Pharmacology and Community medicine with basic sciences, awarding too much time to subjects like pathology in early years, need for faculty training, need for integration within and across subjects and use of mapping for both the horizontal and vertical integration were also observed by Abid et al[13] in AKUH. The work done by Rehman[12] also suggests using concept mapping.

In a study conducted by Lajber and colleagues in Peshawar, majority of students appreciated integrated learning due to proper application of knowledge, logical thing, enhanced learning, better communication skills and learning. Negative perception was found only in minority[14].

The other environmental factors in the institution leading to difficulty in implementation of integrated curriculum like faculty training and deficient infrastructure were observed in in a study conducted by Anwer and colleagues.[15] The need for integrated assessment has also been emphasized by Iqbal.[16] The students in our study also wanted the integrated assessment.

CONCLUSION

The majority of students have shown a positive response to the newly introduced integrated modular curriculum. But there is a need to improve environmental factors related to implementation of integrated curriculum and to introduce integrated assessment.

Limitations: This study is being conducted in one University, generalizability cannot be done but the transferability of results is possible

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