

Comparison of the effectiveness of horizontal integration with traditional teaching approach in first-year MBBS students

Vijaya Lakshmi Gaddam¹, Vikram Gowda², Kannan Vaidyanathan³

¹Department of Anatomy, Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala, India.

²Department of Physiology, Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala, India.

³Department of Biochemistry, Pushpagiri Institute of Medical Sciences and Research Centre, Thiruvalla, Kerala, India.

Correspondence to: Vijaya Lakshmi Gaddam, E-mail: seenuvijaylakshmi@yahoo.co.in

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Abstract

Background: The traditional curriculum is “discipline based” with high degree of compartmentalization of different subjects into preclinical, paraclinical, and clinical branches. Students often fail to get a comprehensive knowledge of the subjects, resulting in poor performance in the examinations. The relevance of the various subjects is not appreciated, and the knowledge gained is inadequate for clinical application. The outcome of the curriculum gets defeated when the students on graduation are unable to meet the needs of the society as “physicians of first contact.” This study was conducted to know whether integrated teaching results in better performance in the examinations.

Objective: To compare the effectiveness of horizontal integrated approach with traditional teaching approach in first-year MBBS students in the study of the structure, function, and relevant biochemical aspects of the bone.

Material and Methods: Hundred students of first-year MBBS were randomly allocated into the study group and the control group. The students of the study group were exposed to horizontal integrated teaching of bone by faculty from the departments of anatomy, physiology, and biochemistry. The students of the control group were exposed to traditional lectures by the same faculty on different days during the routine class schedules. Assessment was conducted on both the groups by a written examination, and their results were tabulated. Statistical analysis was done using unpaired *t*-test. The students of the control group were also given the integrated session after the assessment was completed, and a feedback was obtained from both the groups.

Result: There was significant difference in the marks obtained on comparison between the two groups of students ($P = 0.0022$; 95% confidence interval: -8.705, -1.985). Feedback from the students showed that 75% of them felt that integrated teaching helped in better comprehension of the subjects. Majority of the students (70%) felt that integrated approach to teaching was better than the traditional, and 64% of the students felt that it helped in better retention of knowledge and easier recollection during the examinations.

Conclusion: The learning outcome as measured by the assessment was better in the group that was exposed to the integrated approach of teaching, compared with that exposed to traditional teaching.

KEY WORDS: Medical curriculum, integrated approach, traditional approach, better comprehension

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Introduction

The medical curriculum is based on different disciplines, and the approach to the teaching learning process had been traditionally compartmentalized into various subjects. This fragmented approach to the curriculum results in disjointed learning of the various aspects of medicine. The present stand-alone type of teaching employed by different departments

has repercussions at different levels and leads to the various problems.

The relevance of the basic subjects is not understood in the preclinical and paraclinical phases, resulting in lack of motivation and interest in studies.^[1] Traditional teaching drives learning into an intensive examination-oriented manner with an aim to just pass the examinations, rather than an attempt to grasp the subjects in a comprehensive manner. Contrary to the students' expectations, lack of comprehension of the subjects results in poor retention of the knowledge, leading to poor performance during the examinations.^[2]

In traditional approach of the curriculum, there is no correlation between the different subjects and topic areas. As a result, the knowledge gained by the students becomes irretrievable and inadequate to apply in clinical situations.^[3] Lack of integrated approach to the different subjects during learning period results in bringing out graduates lacking holistic approach toward the patients and the community while practicing medicine.^[1]

The picture gets more complicated by rapidly expanding scientific knowledge, technological advancements, and growing expectations from the society.^[4] The time available for the MBBS course needs to be effectively and efficiently managed. Vast amounts of information can be delivered in a concise, comprehensive, and meaningful manner by integrated approach to the curriculum. It gives the best possible solution by avoiding overloading of the subject contents, eliminating redundant information and preventing overlapping and repetition in different phases.^[5] The Medical Council of India, in its Regulations on Graduate Medical Education, 2012, clearly states the necessity to integrate the curriculum to the maximum extent possible (both vertical and horizontal) to enhance interest among the students and to enrich the student learning.^[6]

Although the integrated approach of teaching in undergraduate curriculum has been addressed to and appreciated, the curriculum continues to be compartmentalized and isolated. Integrated learning programs are being conducted by the initiatives from certain committed faculties in few medical colleges in India, but the entire curriculum is yet to be integrated on the whole.^[7-9] The necessity to include integrated teaching in the curriculum through official policy had been voiced by medical educationists.^[5]

This study was conducted with an objective to know whether horizontal integrated teaching in first-year MBBS students results in better comprehension of the subjects, which in turn leads to better performance in the examinations, in comparison with traditional discipline-based approach.

Materials and Methods

A case-control study was conducted on 100 students belonging to first-year MBBS of 2014 admission. The students were briefed about the study, and informed consent was obtained from them. They were then divided into two groups of 50 each by random sampling. One group served as the experimental group, and the other group acted as the control.

The students in the experimental group were exposed to integrated teaching approach on "structure, function, and relevant biochemical aspects of the bone" by faculty from the departments of anatomy, physiology, and biochemistry. The students in the control group were given lectures (traditional approach) on the same topics by the same faculty but on different days during the routine schedule of the respective departments.

Both the groups were assessed on the basis of a written examination comprising multiple-choice questions, fill up the blanks, and short answer questions. Marks obtained by the students in both groups were tabulated and analyzed using unpaired *t*-test.

An integrated session on the same topic was carried out on the control group, and a feedback was obtained from both the groups. The data collected from feedback were charted out and analyzed.

Results

The students of the experimental group who were exposed to integrated teaching scored higher compared with the students of the control group exposed to traditional stand-alone lectures on different days [Table 1]. The difference in the marks obtained by the two groups was statistically significant with a *P* value of 0.0022 and 95% confidence interval of (-8.705, -1.985). There was a 25.97% increase in the marks obtained by the students belonging to the study group.

Analysis of the feedback showed that 70% of the students felt that integrated approach to teaching was better than the traditional approach; 75% of the students felt that integrated teaching helped in better comprehension of the subjects and 64% of the students felt that it was easier to remember and recollect during the examination [Figure 1].

Discussion

The goal of the medical curriculum, as stated by the Medical Council of India, is to produce Indian medical graduates who would serve as physicians of first contact.^[6] Integrated approach to the curriculum delivers the concepts and the principles in a relevant and time-bound manner, which can be used as a platform to explore challenging, clinical situations and arrive at newer solutions. The newer insights developed initially promote self-directed learning, gradually unfolding into lifelong learning.^[3]

Integration plays a great role in focusing the students' attention to the relevance of the subject content delivered. It also improves the students' diagnostic approach to the

Table 1: Average marks obtained by the two groups of students

	N	Mean ± SD
Control group	47 (3 absent)	20.559 ± 7.0092
Study group	47 (3 absent)	25.904 ± 9.2243

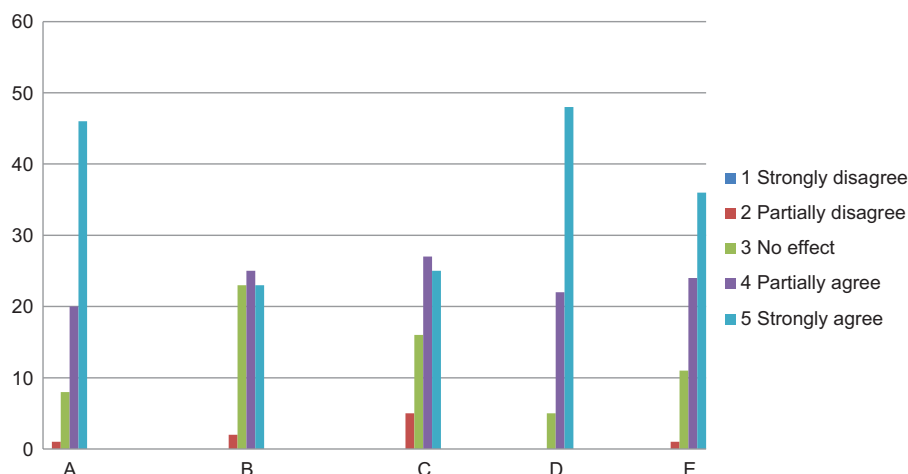


Figure 1: Feedback analysis: (A) integrated better than traditional; (B) increased interest in the studies; (C) increased motivation; (D) better comprehension of the subjects; (E) easier to remember and recollect in the examination.

patient. Problem-based discussions based on case scenarios when combined with integrated teaching improve the ability to handle clinical problems.^[10] Clinical tuning of attitudes and behaviors of the students begin early in the duration of the course and strengthen into confidence by the end of the curriculum.

Integrated approach to teaching results in better comprehension of the subjects, which in turn leads to better performance of the students in the examinations. This study revealed that the average marks obtained by the students exposed to the integrated approach was much greater than the marks obtained by the students who were exposed to traditional fragmented approach ($P = 0.0022$). Similar results were obtained by Sharma *et al.*,^[5] Doraisamy and Radhakrishnan,^[1] Kate *et al.*,^[11] and Joglekar *et al.*^[2] Better performance in the examinations improves confidence in the students and helps them develop positive attitudes toward studies. It also forms an incentive for the hard work put in by them and paves the way for commitment toward studies in the next semesters.

Analysis of the feedback showed that majority of the students (75%) felt that integrated teaching helped in better comprehension of the subject matter. Many students (64%) of the students felt that it helped in better retention of knowledge and recollection during the examinations. Similar positive and encouraging feedback was received by several authors in their respective studies.^[2,5,7-12] Feedback was not collected from the faculty in this study. Many authors, who have collected feedback from the faculty in similar studies, have reported that integrated programs were welcomed by both the students and the faculty alike.^[5,8,9,11]

Literature review shows that horizontal integrated programs during the first year result in not only better correlation of the three preclinical subjects but also better performance during the subsequent clinical exposure.^[3,5,7,8] Students taught by integrated curriculum at their medical schools showed better diagnostic skills compared with those trained by conventional methods.^[13] Many authors opine that horizontal

integration improves the cognitive and the psychomotor domains.^[1,5] Integration during the course period gave the students a better insight into the subjects and improved their outlook towards medicine.^[2]

Integration of the curriculum achieves interdisciplinary teaching and is based on the principles of adult learning in terms of outcome objectives. It strives to deliver knowledge in a conceptual and contextual manner relevant and sufficient for adequate patient management. This is also in accordance with the constructivist theory of learning in retention of knowledge. Vertical and horizontal integration forms the key to achieve the optimum in the outcome-based curriculum.^[14]

Although several studies have shown the benefits of integrated teaching, medical educationists have raised concerns over the existing traditional university examination pattern. Integration in the curriculum becomes relevant only when the examinations also become integrated.^[2,8,14] Strong leadership is required to break the intradepartmental and interdepartmental barriers. Meticulous planning and commitment toward excellence are important prerequisites for contemplating on curricular reforms.^[7] Effective inclusion of integration in the curriculum in a structured manner uniformly in all medical colleges in India can be effected through official policies.^[5]

Integrated teaching has been advocated by many medical educationists since several years, and a handful of studies have demonstrated integrated teaching resulting better student outcome. This study highlights the need for moving from discussion into implementation in order to bring up the dignity in medical education of our country. The study also discusses the need to make official policies regarding integrated teaching to be made compulsory. The limitations of the study are this study was conducted only among the first-year students and that it includes a small sample size from a single medical college. We plan in future for horizontal and vertical integration in conjunction to be studied in all the semesters of the medical curriculum to have an effective result.

Conclusion

Integrated teaching in the medical curriculum provides correlation between the various subjects taught enabling the students to grasp medicine in its entirety. It improves their insight into the subjects, provides better outlook toward the management of clinical conditions, and enables them to have a holistic approach to the patients on graduation. During pre-clinical phase, integration brings relevance to the subjects taught, thereby increasing interest in the subjects. Better correlation among the subjects results in better comprehension and in turn better performance in the students. The outcome as measured by the assessment was better among the students who were taught by the integrated approach compared with the traditional one. The feedback from the students was also encouraging, and majority of the students showed a positive attitude toward integrated approach and asked for more integrated sessions in future.

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