

EFFECTIVENESS OF HORIZONTAL INTEGRATED TEACHING PROGRAMME IN MEDICAL CURRICULUM

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Abstract

Introduction: Traditional curriculum has several limitations and drawbacks such as repetition, overlapping and lack of correlation among subjects. Medical educationist realized that there was need for integrating basic and clinical medical sciences. Integrated teaching is a step towards learning basic sciences alongwith developing approach to solve clinical cases. It was the first batch of M.B.,B.S. students in RUHS College of Medical Sciences (RUHS CMS), a constituent medical college of Rajasthan University of Health Sciences, Jaipur and an attempt was made to introduce horizontal integrated teaching aiming towards better understanding of basic sciences so that medical students enhance their diagnostic skills at an early stage and develop interest in pre-clinical subjects. **Aims and objectives:** To study if integrated teaching helps students understand and apply basic sciences to practice in dealing with patients and to study if integrated teaching programme aids in improving their performance and scores in examinations. **Methodology:** For implementing Horizontal Integrated Teaching programme, the committee framed a common table for the selected topics in concurrence with other faculty members, which were taught over a period of 4 weeks. To execute the study, 100 students of first year MBBS admitted (year 2014-15) in RUHS College of Medical Sciences, Jaipur were included and divided into two groups. A series of meetings were held to discuss Integrated Teaching Programme. Attempts were made to ensure maximum integration of topics and to avoid repetition. Teaching & learning methods were discussed and finalized to ensure active participation of students. Assessments were taken after integrated teaching sessions and after completion of overall study, student's feedback in the form of structured questionnaire, based on five point likert scale was collected. Feedback from teaching faculty was also taken. **Results and discussion:** Database collected in the form of feedback questionnaire and was analyzed. In the present study 93% students responded that horizontal integrated teaching is more interesting than traditional teaching and less repetitive. 81% of students responded that they were able to correlate clinical picture of the disease after integrated teaching sessions and 85% of students were agreed that there was a good correlation of all three pre-clinical subjects. **Conclusion:** The present study concludes that Student grasp a more authentic understanding when integrated teaching is adopted and performance of majority of students improves.

Keywords: horizontal integrated teaching, traditional teaching, curriculum.

Introduction:

Traditional curriculum is being usually followed in medical colleges which is a compartmentalised discipline wise model. This has several limitations and drawbacks such as repetition, overlapping and lack of correlation among subjects. Medical educationist realized that there was need for integrating basic and clinical medical sciences¹. First M.B.,B.S. curriculum includes pre-clinical subjects viz. Anatomy, Physiology & Biochemistry. Anatomy is the study of the structure of the body. It is conventionally divided into topographical or gross anatomy (which includes surface, or 'living' anatomy, neuroanatomy, endoscopic and imaging anatomy), microscopic anatomy or histology and embryology (the study of the embryo and fetus)². Physiology is the scientific study of the normal function in living systems³ and biochemistry or biological chemistry, is the study of chemical processes within and relating to living organisms. Biochemistry may be described as the science of the chemical constituents of living cells and of the reactions and processes they undergo⁴. Integrating the topics of these subjects is a non compartmentalized approach to basic science learning⁵.

Integration is defined as the organization of teaching matter to interrelate or unify the subjects which are frequently taught in separate academic courses or departments⁶. Departments teaching concurrently in a single phase of curriculum when integrate, it is known as horizontal integration. Traditional curricula are under criticism for placing too much emphasis on memorization of facts⁷. **William Osler** stated that "there is, in truth, no speciality in medicine, since to know fully many of the most important diseases a man must be familiar with

their manifestations in many organs". Integrated teaching is a step towards learning basic sciences alongwith developing approach to solve clinical cases.

“Regulation on undergraduate medical education (1997)” recommends a teaching approach which is characterized by maximal efforts to encourage integrated teaching between the traditional subject areas by using a problem based learning approach and to de-emphasize the compartmentalization of the disciplines, so as to achieve both the horizontal and vertical integration in the different phases⁸. It was the first batch of M.B.,B.S. students in RUHS College of Medical Sciences (RUHS CMS), a constituent medical college of Rajasthan University of Health Sciences, Jaipur and an attempt was made to introduce horizontal integrated teaching aiming towards better understanding of basic sciences so that medical students enhance their diagnostic skills at an early stage and develop interest in pre-clinical subjects.

Aims and objectives:

- To study if integrated teaching helps students understand & apply basic sciences to practice in dealing with patients.
- To analyse if implementation of integrated teaching programme assists in improving cognitive & psychomotor domains of students.
- To study if integrated teaching programme aids in improving their performance and scores in examinations.

Methodology:

A committee of Head of the Departments of pre-clinical subjects, Anatomy, Physiology & Biochemistry was constituted for framing a time table. A meeting of the committee members was held & two topics were selected to undertake the study viz. Renal Function Tests and Exocrine & endocrine functions of pancreas.

For implementing Horizontal Integrated Teaching programme, the committee formed a common table for the selected topics in concurrence with other faculty members, which were taught over a period of 4 weeks. To execute the study, 100 students of first year MBBS admitted (year 2014-15) in RUHS College of Medical Sciences, Jaipur were included and divided into two groups:-

Group 1 – included the students with odd roll number

Group 2 – included the students with even roll number

A series of meetings were held to discuss Integrated Teaching Programme. Attempts were made to ensure maximum integration of topics and to avoid repetition. Teaching & learning methods viz. use of Overhead Projector (OHP), Power Point, Board – Chalk, strategies, time table and assessment tools were discussed and finalized to ensure active participation of students.

A day in a week was allotted for integrated teaching and classes were taken in consecutive sessions by faculty of each subject. Anatomical, Physiological and Biochemical aspects of the chosen topics were covered in all three pre-clinical subjects respectively.

Horizontal Integrated Teaching was carried out as follows:-

Group	Topic	
	Renal Function Tests	Exo & endocrine functions of pancreas
1	Traditional lecture	Integrated lecture
2	Integrated lecture	Traditional lecture

Assessments were conducted in subsequent week of integrated teaching sessions which included oral Viva-voce and Multiple Choice Questions. After completion of overall study of 4 weeks, student's feedback in the form of structured questionnaire, based on five point likert scale⁹ was collected. Feedback from teaching faculty was also taken to evaluate the response and to analyse Integrated Teaching as a whole. Statistical analysis was performed using Microsoft Excel. t-test was applied and significance of the test was calculated by p-value.

Table-1. Perception of students regarding horizontal integrated teaching programme.

STUDENT FEEDBACK QUESTIONNAIRE					
Q. No.	Likert Scale				
	<i>Strongly Agree</i> 1	<i>Agree</i> 2	<i>Undecided</i> 3	<i>Disagree</i> 4	<i>Strongly disagree</i> 5
1	11	72	2	9	6
2	13	80	0	3	4
3	36	55	3	5	1
4	70	10	3	7	10
5	45	46	4	3	2
6	11	69	3	9	8
7	4	77	5	11	3
8	51	25	4	9	11
9	16	65	5	9	5
10	28	57	2	4	9

Graph-1. Graphical representation of student's response to horizontal integrated teaching programme.

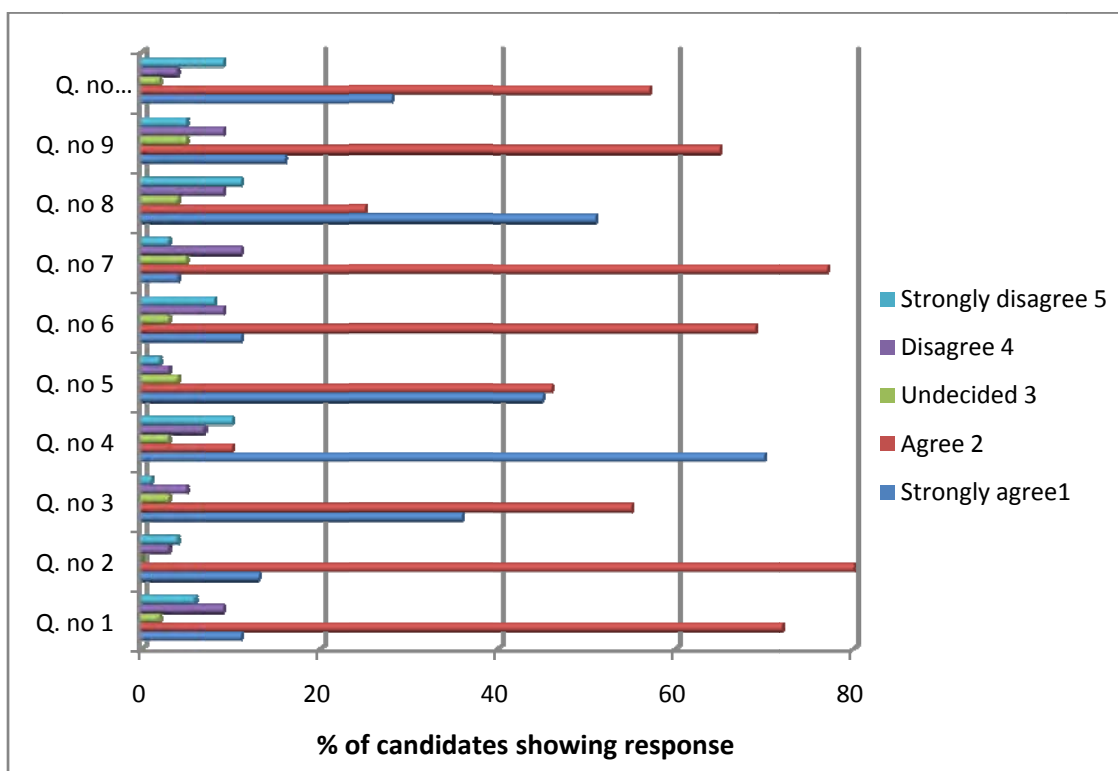


Table -2. Comparison of marks scored in assessment conducted post integrated teaching and traditional teaching.

Topic	Integrated Teaching (Mean \pm SD)	Traditional Teaching (Mean \pm SD)	p value
Exocrine & endocrine functions of pancreas	14.52 \pm 1.80	10.87 \pm 2.35	*0.000
Renal Function Tests	14.36 \pm 1.76	10.91 \pm 2.34	*0.001

* p-value <0.05 is significant.

Results and Discussion:

Database collected in the form of feedback questionnaire and was analyzed. In the present study 93% students responded that horizontal integrated teaching is more interesting than traditional teaching and less repetitive. A similar finding has been reported earlier¹⁰. Students's response shows that topics covered in integrated teaching were less repetitive and time saving with completion of full aspect of subject topics. Study also indicates that correlation of all three pre-clinical subjects was achieved during integrated learning programme. 81% of students responded that they were able to correlate clinical picture of the disease after integrated teaching sessions and can diagnose the disease while solving case studies during integrated lecture sessions. This is in accordance with previously reported studies¹¹. The results of the study also indicates that horizontal integrated teaching programme would be remarkably beneficial for the students to perform better during clinics exposure. Our results were supported by Ghosh S et al⁸. 85% of students were agreed that there was a good correlation of all three pre-clinical subjects (Table-1, Graph-1).

In analysis of student's performance in assessments, it was found that there was a marked difference in the marks between traditional and integrated teaching (table-2). On analysis statistically significant results ($p < 0.05$) were obtained. Students understanding was found to be enhanced regarding body systems (pancreas and kidneys) and they scored better during examination after horizontal integrated teaching. This indicates that integration leads to efficiencies and knowledge. Similar findings were also noted by Doraisamy R et al¹².

Teaching faculties favoured the integrated teaching and agreed that horizontal integrated teaching is beneficial for the students, as a good correlation of subjects was achieved and integration helped the students to make a diagnosis of the clinical diseases. Students understood the topics contextually and they are more able to understand the complete picture of the disease process and management of the disease. It clearly indicates that horizontal integrated teaching improves the cognitive and psychomotor domains of the students.

Although framing teaching time table and allotment of topics for integrated teaching is quite cumbersome, but inspite of all, present study with integration of pre clinical subjects for the first year of M.B.,B.S. students (batch – 2014-15) was undertaken with good success and results.

Conclusion:

Integrated teaching programme is beneficial for the students for better learning and understanding the subjects and clinical cases. Students scored better in assessments conducted after integrated teaching programme and it also saved time with less repetition of subject matter. Horizontal integrated teaching programme gave an insight in aspects of clinical diagnosis as a whole. Horizontal integrated teaching programme created interdepartmental co-operation. Integration of subjects was highly rated and responded by the concerned faculties. Therefore, the present study concludes that Student grasp a more authentic understanding when integrated teaching is adopted and performance of majority of students improves. Horizontal integrated teaching improves cognitive and psychomotor domains. It would be beneficial if implementation of integrated teaching in medical curriculum is made through official policy in consultation with faculty to ensure better results.

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