

Effectiveness of integrated teaching module in pharmacology among medical undergraduates

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ABSTRACT

Context: Over the years with advancement of science and technology, each subject has become highly specialized. Teaching of medical students has still remained separate in various departments with no scope of integration in majority of medical institutes in India. Study was planned to have an experience of integration in institute and sensitize faculty for integrated teaching-learning (TL) method. **Aims:** To prepare and test effectiveness of integrated teaching module for 2nd year MBBS student in pharmacology and to sensitize and motivate faculties toward advantages of implementing integrated module. **Settings and Design:** Education intervention project implemented 2nd year MBBS students of Government Medical College and New Civil Hospital, Surat. **Subjects and Methods:** Students of second MBBS were divided into two groups. One group was exposed to integrated teaching sessions and another to traditional method. Both the groups were assessed by pre- and post-test questionnaire, feedback and focus group discussions were conducted to know their experience about process. **Results:** A total of 165 students of the 2nd year MBBS were exposed to the integrated teaching module for two topics in two groups. One group was taught by traditional teaching, and another group was exposed to the integrated TL session. Both the groups have shown a significant improvement in posttest scores but increase in mean score was more in integrated group. During analysis of feedback forms, it was noted that students preferred integrated TL methods since they help in better understanding. Faculty feedback shows consensus over the adaptation of integrated TL methods. **Conclusions:** Integrated TL sessions were well-appreciated by students and faculties. To improve the critical reasoning skills and self-directed learning of students, integrated TL is highly recommended for must know areas of curriculum.

Key words: Integrated curriculum, integrated teaching, medical education, strategies, undergraduate

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INTRODUCTION

Basic science courses are typically taught as standalone, independent content domains in most of the medical colleges in India, which give students a view of the parts, but not the whole, of the structure-function relationship. Every discipline wants to update medical student in their own way. Period

of MBBS course is much longer than other professional streams, there is negligible opportunity for interlinking of concepts learned in one discipline with the other. In the end, it becomes responsibility of the student to correlate and integrate all the knowledge gained for diagnosis and treatment of patients. Thus, the lack of integration in current curriculum models leads to poor conceptual understanding. Conventional methods are under criticism for placing too much emphasis on memorization of facts and figures and for overloading the students with excessive details.^[1] An

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integrated curriculum however organizes the material to be learned around an entity that is, conventionally taught by different disciplines.^[2]

There are many innovations and trends in medical education that have been undertaken globally which include self-directed learning, problem-based learning, integrated teaching, and community orientation.^[3] Various integrated medical curricula have been adopted by many medical schools all over the world to ensure holistic approach rather than a fragmented one which in turn encourages meaningful learning in medical education.^[4-10] Implementation of an integrated curriculum in its true sense is really not easy and appears to be a Himalayan task.^[11]

The students trained with such integrated curriculum, make a more accurate diagnosis than did students trained in a conventional curriculum.^[12] The Medical Council of India has stressed upon need-based curriculum that should stimulate student's interest and inculcate drive to learn more.^[13] This concept may not be relished by the teachers of both basic and clinical sciences who may feel their interests to be in jeopardy.^[14] With the existing medical practices, there is a general dissatisfaction. The main reason for such dissatisfaction has been identified as the present day medical curricula.^[15] The existing teaching program in basic sciences in most of the institutes in India is planned and implemented independently by departments without integration.^[16] This study was planned to implement integrated teaching module and test its effectiveness on 2nd year MBBS students as well as to sensitize and motivate faculty toward advantages of integration.

SUBJECTS AND METHODS

The 2nd year MBBS students are regularly attending clinics and wards and also being taught pathological and pharmacological basis of diseases in theory classes by different disciplines separately. Henceforth, the study was planned to make clinical aspects related with topic easily understandable. One sensitization workshop on integrated teaching was held. Faculties were exposed to the concept of integration with the resource person. Participants were given material to read and links for further information. Core group of faculties from nine departments (Medicine, TB and Chest, Psychiatry, Physiology, Microbiology, Pathology, Social and Preventive Medicine, Pediatrics, and Pharmacology) was formed.

Learning objectives and content for two topics "epilepsy and its management" and "tuberculosis (TB) and management" were finalized. Preparation of integrated teaching module was done in five meetings and continuous contact by emails.

Learning objectives and content were finalized with consensus between departments. Timetable rescheduling was done to accommodate integrated sessions, the sessions were conducted as per their routine sequence in the second term of second professional. Module was prepared for implementation. Student information sheets and informed consent forms were prepared. The study protocol was submitted before the Institutional Review Board and permission to carry out the project and ethical permission were obtained.

Pre- and post-test; feedback questionnaires for students and faculty; focus group discussion of students and interview of faculties were conducted by persons trained in qualitative research, for evaluation. All the students (165) were divided into two batches. One group has received traditional teaching method which is lectures in separate disciplines. Intervention group has been given integrated teaching by faculty of all departments involved. After completion of "epilepsy and its management" crossover of groups was done and then second topic "TB and management" was covered in a similar manner. Pre- and post-test were taken.

Feedback forms were filled by students and faculties to know their perception. It had two types of questions – seven questions to know their perception about integrated teaching method and its applicability questions with 5-point Likert scale; and two single response questions to know their perception about various teaching-learning (TL) methods. To know the perception of faculty, a feedback questionnaire with 5-point Likert scale was used.

RESULTS

A total of 165 students of 2nd year MBBS were exposed to new teaching intervention in the form of integrated TL sessions. Of these, 136 students gave pre- and post-test both. One hundred and ten students had filled feedback analysis. Exposure of clinical concepts early in MBBS years was liked by many students. Pre- and post-test statistics was calculated by paired sample *t*-test with the help of SPSS version 16 software. Both the groups (integrated and traditional teaching) had shown a significant improvement in posttest scores [Figures 1 and 2]. In epilepsy integrated group increase in mean scores is higher than in traditional group [Table 1].

Student found small group interactive learning sessions providing greater understanding and active learning opportunity than other TL methods. Students preferred integrated TL sessions second to regularly ongoing small group interactive sessions [Table 2]. Seventy-five percent of students agreed that integrated teaching sessions help them in a better understanding of topic. Many were of opinion this

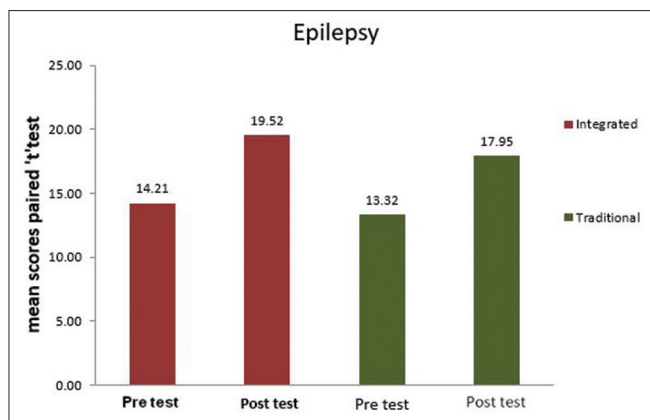


Figure 1: Pre- and post-test mean scores (paired t-test) epilepsy

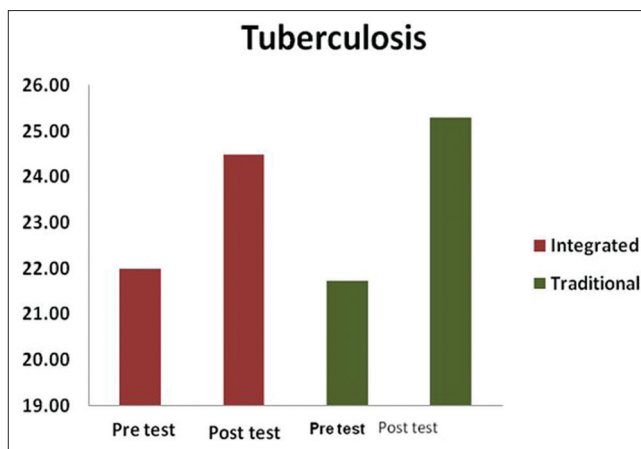


Figure 2: Pre- and post-test mean scores (paired t-test) tuberculosis tables

Table 1: Pre- and post-test scores: Paired samples statistics

	Paired samples statistics	Mean	n	SD	SEM
Pair 1	Intervention technique of integrated practice (epilepsy)	14.2131	61	4.49857	0.57598
	Intervention technique of integrated practice (epilepsy)	19.5246	61	4.87376	0.62402
Pair 2	Traditional teaching group (epilepsy)	13.3200	75	3.48805	0.40277
	Traditional teaching group (epilepsy)	17.9467	75	5.09609	0.58845
Pair 3	Intervention technique of integrated practice (TB)	22.0000	27	4.25170	0.81824
	Intervention technique of integrated practice (TB)	24.4815	27	6.57718	1.26578
Pair 4	Traditional teaching group (TB)	21.7333	30	5.90694	1.07845
	Traditional teaching group (TB)	25.3000	30	6.46556	1.18044

SD: Standard deviation; SEM: Standard error of mean; TB: Tuberculosis

Table 2: Teaching-learning method which provides greater understanding

L method	Gives greater understanding (%)	Provide opportunity for active learning (%)
Didactic lecture	9.9	11
Integrated teaching sessions	28.17	18.18
Tutorials	11.81	13.6
Small group interactive teachings	5	56.3

exercise in will reduce the time for study and will help them in understanding clinical aspects of topic from beginning. Some of them stated during focus group discussions that it can increase load of the study. They were not sure whether regular incorporation of this method in curriculum should be recommended or not [Table 3].

Students were apprehensive about whether they have to read all the subjects by themselves after these sessions. Feedback questionnaire was filled by 14 faculties of nine departments. Almost all faculties agreed that traditional teaching occurs in

separate disciplines without any integration. 88.8% of them found integrated TL methods very useful for the greater understanding of the topic and they recommend this method for some “must know” areas of curriculum. Responses are summarized in Table 4.

DISCUSSION

It is a well-known criticism that our medical colleges are producing graduates who are not well-equipped to tackle the health care needs of the society.^[17] The relevance of Flexner’s recommendations to the current status of medical education in South Asia is striking, in terms of both the progressive nature of his thinking in 1910 and the need to improve medical education in Asia today.^[18] The human body comprises various anatomical and functionally interlinked systems. Hence, when students are taught different aspects of the human body separately, they struggle to merge the knowledge gained in the different disciplines whenever faced with a particular health problem. Teaching in parts in various specialty is often perceived as independent of one another. Integrated teaching simply means bridging connections between academic knowledge and practical.^[19]

In our institute, Department of Pharmacology is conducting small group interactive learning sessions since years, where instead of one single didactic lecture, small interactive sessions have been conducted by different faculty at the same time. More than 80% curriculum of pharmacology was covered with this method. Whereas only two sessions of integrated sessions were conducted, which can explain their preference for former TL method [Table 2]. Integrated TL sessions were not a routine strategy adapted in institute, attending two sessions where faculty from basic as well as clinical departments were teaching, can be the reason for student’s apprehension of increasing study burden [Table 3]. Medical education basically aims to produce medical personnel having sound clinical competences and community orientation with proficient communication

Table 3: Student feedback

Question	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Integrated teaching helped me to get a better understanding of topic	16 (14.5)	67 (61)	16 (14.5)	5 (4.5)	6 (5.4)
Understanding of the topic is better with this method when compared to lectures	16 (14.5)	47 (42.7)	21 (19)	21 (19)	5 (4.5)
This exercise can be regularly incorporated in the curriculum	10 (9)	35 (31.8)	35 (31.8)	21 (19)	9 (8.1)
Reduces the amount of time needed for self-study when compared with lectures	13 (11.8)	47 (42.7)	19 (17.2)	23 (21)	7 (6.3)
I would like to recommend integrated teaching to other departments	17 (15.4)	33 (30)	29 (26.3)	26 (23.6)	5 (4.5)
I have found that integrated teaching sessions help me learn course material more than if I just studied alone	17 (15.4)	56 (51)	19 (17.2)	14 (12.7)	4 (3.6)
Integrated teaching has increased my self-confidence and attitude toward learning	13 (11.8)	37 (33.6)	35 (31.8)	22 (19.9)	3 (2.7)

Table 4: Feedback from faculty

Questions	Strongly agree (%)	Agree (%)	Not sure (%)	Disagree (%)	Strongly disagree (%)
Current curriculum of medical education occurs in blocks of different subjects	44.4	55.5	-	-	-
Integrated TL program is a useful method of TL	22.2	66.6	11.1	-	-
With integrated TL program students would be able to understand the concept more easily	33.3	66.6	-	-	-
Concept of integrated TL program is much time consuming for us	11.1	33.3	44.4	11.1	-
This will need a lot of trainings and refresher training at the faculty level	22.2	33.3	11.1	33.1	-
Interdepartmental coordination is a very difficult task	22.2	55.5	11.1	11.1	-
This integrated TL program will help the students to perform better in clinical practice	44.1	44.4	11.1	-	-
Understanding of the topic is better with this method	22.2	55.5	22.2	-	-
This exercise can be regularly incorporated in the curriculum for must know areas of curriculum	33.3	66.6	-	-	-
It reduces the amount of time needed for self-study	22.2	55.5	22.2	-	-
Integrated learning will result in a more relevant, meaningful, and student - centered curriculum	33.3	44.4	22.2	-	-

TL:Teaching learning

skills.All these are very essential to develop critical reasoning skills which can help in solving challenging health problems.^[20,21]

To improve quality of students and to have effective diagnosis and better treatment of the patients, integrated teaching is need of hour.^[22] Students who are trained with such an integrated curriculum, make a more accurate diagnosis than did the students trained in a conventional curriculum.^[23] This was the first experience of integrated teaching in our institute, integrated teaching was implemented with coordination of nine departments. The results of the study helped in changing faculty attitude and will encourage them to adapt TL methods which will increase student's interest in self-study and improve their critical reasoning skills.

CONCLUSIONS

Integrated teaching learning sessions are well appreciated

by students and faculties. Coordination between various departments was excellent.Adaptation of more new student centered teaching learning strategies is need of time to increase critical reasoning skills of medical students.

Limitation

Because of lack of time, only two topics (one communicable disease and one noncommunicable disease) were covered in integrated manner, which is very less for any long-term change in habit.

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Conflicts of interest

There are no conflicts of interest.

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