

INTRODUCTION OF HORIZONTAL INTEGRATION AND COMPARISON WITH TRADITIONAL TEACHING METHODS IN PHYSIOLOGY

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INTRODUCTION

Today's medical education system aims at imbibing new Teaching-Learning methods so as to fulfill the national goal of health for all under MCI Vision 2015. Physiology is the backbone of medical knowledge and a better understanding of the subject can be achieved when integrated with Anatomy and Biochemistry. Aim and Objectives: The present study was conducted to compare integrated teaching with traditional lecture method for First MBBS students in our institution. Material and Methods: Out of 100 students 82 students participated in the study voluntarily. Two study groups each of 41 students were formed. Group I was exposed to integrated teaching and Group II to traditional lecture method. A test was conducted subsequently and the data was analyzed using students unpaired t test. Feedback questionnaire form was obtained from students and teachers.

Result and conclusion: Statistically significant difference in the marks was obtained and the integrated teaching was found to be more effective than the traditional lecture method. Teachers' and students' feedback was positive towards the integrated teaching method. Thereby it was concluded that integrated teaching is a better method that needs to be implemented on a wider scale in medical education.

Keywords: medical education Teaching-Learning methods Physiology integrated teaching traditional lecture method

INTRODUCTION

For any system to progress and achieve excellence, it has to be subjected to suitable changes. The field of medical education, being an increasingly demanding and dynamic profession also requires changes. Earlier studies have proved that students learn best when they are engaged by different materials of learning presented in variety of ways

and formats ^[1] and the concept of integrated teaching is one of them ^[2, 3]. Thus to improve the quality of students and to have effective diagnosis and better treatment of the patients, integrated teaching is need of hour ^[4, 5, 6].

The term integration in education means coordination in the teaching learning activities to ensure harmonious functioning of the educational processes ^[7]. It is defined as organization of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments ^[8]. Integrated teaching aims to provide knowledge to the students in a complete organized and wholesome manner, while the burden of integration has traditionally fallen primarily on the students ^[9]. To put it simply, instead of imparting knowledge on a topic in disintegrated manner, a particular topic can be taken by two or more departments by forming a co-ordinated integrated teaching programme. It is akin to different systems in our body working in a co-ordinated manner to achieve homeostasis ^[10].

Medical Council of India in Vision 2015 desires the incorporation of integration in the medical curriculum ^[11], in order to provide the students with holistic rather than fragmented learning perspectives ^[12]. Hence the concept of integrated teaching was developed and adopted in this project. Though many studies have been done involving second and third year MBBS students integrating topics vertically where disciplines traditionally taught in different phases of the curriculum are integrated showing a positive approach but this new method of integrated teaching has not been exposed to the first year MBBS students.

Physiology is the backbone of medical knowledge that a student gathers and like any other branch of medicine is progressing by leaps and bounds ^[13, 14]. What a student learns and imbibes in the first year of MBBS curriculum forms the base of future

education. In this case, if the departments of Anatomy and Biochemistry co-ordinate with the department of physiology, it will be called as Horizontal integration. Earlier studies have emphasized on such horizontal integrated sessions to prevent repetition of same topics by different faculties, to save time, leading to a better understanding of a topic and avoiding confusion amongst the students^[15, 16].

Hence this study was designed to introduce the method of horizontal integration for undergraduate medical students for the first time in our medical college at Navi Mumbai, India. The topic of 'Thyroid gland' was selected and taught by both traditional and integrated method for two study groups. The results were compared along with students' and teachers' feedback.

AIMS AND OBJECTIVES

- 1) To evaluate the effectiveness of horizontal integration in the teaching learning methods
- 2) To analyze the viewpoints of students and teachers alike regarding the present teaching methods and horizontal integration
- 3) To build a platform where excellence can be achieved with the motto " Quality over Quantity"
- 4) To motivate teachers to work as a team

MATERIALS AND METHODS

The study was approved by Institutional Ethics Committee. Out of 100 First MBBS students, 82 students participated in the study voluntarily. Prior informed consent with explanation that the internal assessment marks will not be affected was taken from each student participant. Students were divided into two study groups; Group I and Group II randomly with each group comprising of 41 students.

Group I (n=41) was introduced to integrated teaching on the topic selected i.e Thyroid gland. Integrated teaching was implemented by the active involvement of departments of Physiology, Anatomy and Biochemistry. In the pre-preparatory phase of this study, one faculty member from each department i.e Physiology, Anatomy and

Biochemistry sat together and discussed the sequence and contents of the topic amongst themselves before the integrated teaching session was conducted by them.

Group II (n=41) had traditional lectures on the same topic by each of the three First MBBS department faculty separately instead of integrated teaching.

Following all the students were evaluated by conducting a test of 20 marks consisting of 2 short answer question (SAQs) of 4 marks each and 12 multiple choice questions (MCQs) of 12 marks. Statistical analysis of the data was done by using unpaired't' test. P value below 0.05 was considered to be statistically significant and P value below 0.01 was considered to be highly significant.

Feedback questionnaire form were obtained from students' and teachers' to evaluate their response and analyze the merits and demerits of integrated teaching

Group II which had traditional lectures was exposed to integrated teaching method subsequently.

RESULT

Table 1 shows Mean and Standard deviation values of the total marks obtained in the test conducted post traditional and integrated teaching for both study groups (Group I and II) respectively and the inter-group comparison of significance using Students unpaired t-test. The total marks obtained in the test were significantly higher in integrated teaching study group (Group II) than the traditional method study group (Group I). Highly significant results were obtained on statistical comparison (P=0.000).

	TOTAL MARKS				
	N	MEAN ± S.D	S.E OF MEAN	t-VALUE	P-VALUE
GROUP I	41	14.52 ± 1.80	0.28	7.89	0.000**
GROUP II	41	10.87 ± 2.35	0.37		

TABLE 1: COMPARISON OF TOTAL MARKS OBTAINED IN THE TEST POST INTEGRATED (GROUP I) AND TRADITIONAL TEACHING (GROUP II).

**P < 0.01 - Statistically highly significant

Table 2 and 3 depicts Mean and Standard deviation values of MCQ and SAQ marks separately out of total marks obtained in the test for both the study groups (Group I and II) respectively with inter-group comparison of significance. The MCQ and SAQ marks were higher in study group of integrated teaching (Group I) than traditional teaching (Group II). Statistically highly significant results were obtained on comparison for MCQ marks ($P=0.000$) but the differences of SAQ marks between two study groups were not statistically significant ($P= 0.634$).

MCQ'S					
	N	MEAN \pm S.D	S.E OF MEAN	t- VALUE	P-VALUE
GROUP I	41	10.44 \pm 1.14	0.17	10.57	0.000**
GROUP II	41	6.90 \pm 1.81	0.28		

TABLE 2: COMPARISON OF MCQ'S MARKS OBTAINED IN THE TEST POST INTEGRATED (GROUP I) AND TRADITIONAL TEACHING (GROUP II).

** $P < 0.01$ - Statistically highly significant

SAQ'S					
	N	MEAN \pm S.D	S.E OF MEAN	t- VALUE	P-VALUE
GROUP I	41	4.09 \pm 1.28	0.20	0.48	0.634
GROUP II	41	3.96 \pm 1.01	0.16		

TABLE 3: COMPARISON OF SAQ'S MARKS OBTAINED IN THE TEST POST INTEGRATED (GROUP I) AND TRADITIONAL TEACHING (GROUP II).

$P > 0.05$ – Statistically not significant

Student's feedback:

96 % of students felt that integrated teaching was more interesting and less time consuming than traditional teaching. 94 % students felt that integrated teaching was non- repetitive and less confusing. 90 % students opined that the topic was better understood by integrated teaching than traditional method and was more helpful in retaining and performing better in examinations. However 4% students felt that this new approach will be time consuming with the simultaneous traditional method of teaching and will not help in writing examinations. While 6% students remained undecided regarding this new integrated approach.

Overall 98% students were enthusiastic about the new integrated approach and felt that it should be implemented for all the topics from the beginning of the curriculum.

Teaching Faculty feedback:

75% of faculty were agreeable to this new integrated method of teaching; however 25 % felt that it was time consuming and lot of time was spent on teaching of a single topic with syllabus burden and time as constraints for one year course of first MBBS and late admissions of students. The final decision was to implement integrated teaching in the first MBBS curriculum after more detailed planning.

DISCUSSION

The new method of integrated teaching was found to be more effective than the traditional one. Statistically significant results were obtained on comparing the marks obtained by the students in the test post integrated method with the traditional method group. We received overwhelming response and suggestions through student's feedback such as conducting more integrated teaching sessions on difficult topics like CNS and more frequently throughout the year. Students as well as the teaching faculty were excited to implement this new tool of education and accordingly participated enthusiastically. The findings and the experience we have got in this study support the view of other studies that such newer methods of education help to enhance teacher-student and teacher-teacher interactions and reduce redundant content^(7,8).

The need for integration is currently felt both by students and teachers. Our experience concurs with the finding of similar study that integrated teaching method avoids fragmented manner of teaching when teachers are not aware of what is taught in other subjects, prevents unnecessary repetition, loss of valuable time and confusion in the student's mind⁽⁸⁾. It also removes subject phobia and develops interest in the topic^(6,8).

With this study the aims to evaluate and analyze teaching- learning methods, motivation of the teachers to work as a team considering the views of

students and teachers, were fulfilled. Therefore, we conclude that the newer concept of integrated teaching is a better and more effective Teaching-learning method to be introduced in the medical curriculum starting from the first year of the course with more comprehensive planning and proper selection of topics in the proposed time frame without overburdening the students.

LIMITATIONS

1. It is difficult to co-ordinate and manage the timings of the participating teachers from different departments.
2. Lot of planning and discussion sessions amongst the teachers are required before conducting integrated sessions.
3. Students' enthusiasm and motivation has to be kept alive for permanent implementation of integrated teaching method in the curriculum.

REFERENCES

- 1) Tennyson RD. An instructional strategy planning model to improve learning and cognition. *Computer in human behavior* 1998; 4: 13-22.
- 2) Dandannavar VS. Curriculum development for integrated teaching (Module) - MBBS Phase I students. *Asian J Exp Biol Sci* 2011; 2(3): 474-481.
- 3) Smith SR. Toward an integrated medical curriculum. *Med health R I* 2005; 88(8): 258-261.
- 4) Irby D, Wilkerson L. Educational innovations in academic medicine and environmental trends. *J Gen Intern Med* 2003; 18: 370-376.
- 5) Muller JH, Jain S, Loeser H, Teby DM. Lersone learned about integrating a medical school curriculum: perceptions of students, faculty and curriculum leaders. *Med Edu* 2008; 42: 778-785.
- 6) Dandannavar VS. Effect of integrated teaching versus conventional lecturing on MBBS phase I students. *Recent research in science and technology* 2010; 2(11): 40-48.
- 7) Kate MS, Kulkarni UJ, Supe A, Deshmukh YA. Introducing integrated teaching in undergraduate medical curriculum. *Int J Pharma Sci Research* 2010; 1(1): 18-22.
- 8) Joglekar S, Bhuiyan PS and Kishore S. Integrated teaching- our experience. *J Postgrad Medicine* 1994; 40(4): 231-232.
- 9) Huber MT, Hutchings P. 'Integrative learning. Mapping the terrain'. Association of American colleges and Universities and the Carnegie Foundation for the advancement of Teaching. 2004; 1-18.
- 10) Bhuiyan PS, Rege NN, Supe AN. The art of teaching medical students. *Medical Education Technology cell, Seth G.S. Medical college and K.E.M Hospital, Mumbai.* 2nd ed. 2002 ; 305-312
- 11) Medical Council of India - Vision 2015. MCI, Dwarka, New Delhi March 2011; 9-25.
- 12) Shimura T, Takumi A, Shimizu K et al. Implementation of integrated medical curriculum in Japanese medical school. *J Nippo Med Sch* 2004; 71: 11-16.
- 13) Ruth N. Communicating student evaluation of teaching results. Rating interpretation guides (RIGs). *Assessment and evaluation in higher education* 2000; 25: 121-134.
- 14) Richardson BK. Feedback. *Academic Emergency Medicine* 2004; 11: 1-5.
- 15) Lata H, Walia L, Gupta V. Student feedback on teaching and evaluation methodology in physiology. *South East Asian J Med Edu* 2008; 2(1): 31-37.
- 16) Sinha BN. One year course in anatomy for undergraduate MBBS students - A challenge. *J Anat Soc India* 1998; 48: 36-37.

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ANNEXURE 1: STUDENT FEEDBACK QUESTIONNAIRE

Kindly tick (✓) the appropriate option

1. Strongly agree
2. Agree

3. Undecided
4. Disagree
5. Strongly disagree

Sr. No.		1	2	3	4	5
1	You found integrated teaching more interesting as compared to lectures					
2	You found integrated teaching less time consuming as compared to lectures					
3	You found integrated teaching non-repetitive as compared to lectures					
4	You better understood the topic by integrated teaching as compared to lectures					
5	You found integrated teaching more helpful for writing papers in examinations as compared to lectures					
6	You found integrated teaching less confusing as compared to lectures					
7	Integrated teaching should be implemented for all the topics in the curriculum					

Suggestions / Other comments:

ANNEXURE 2: TEACHER FEEDBACK QUESTIONNAIRE

Kindly tick (✓) the appropriate option

1. Strongly agree
2. Agree

3. Undecided
4. Disagree
5. Strongly disagree

Sr. No.		1	2	3	4	5
1	You found integrated teaching more feasible and time saving as compared to lectures					
2	You found integrated teaching covered the whole topic with no unnecessary repetition as compared to lectures					
3	You found integrated teaching more reproducible as compared to lectures					
4	You are more comfortable with integrated teaching as compared to lectures					
5	You found integrated teaching more planned and organized as compared to lectures					
6	Integrated teaching should be implemented for all the topics in the curriculum					

Suggestions / Other comments:

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