Original Research Article

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Innovation in surgical curriculum teaching methodology: vertical integration revisited

Manmeet Kaur*, Alok V. Mathur

Department of Surgery, Shri Guru Ram Rai Medical and Health Institute, Dehradun, Uttarakhand, India

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*Correspondence:

Dr. Manmeet Kaur, E-mail: drmanmeetkaur79@gmail.com

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ABSTRACT

Background: Vertical integration refers to the learning of basic sciences in the context of clinical and professional practice. It has been seen to be more meaningful and relevant to students. Objective of the study was to design and implement a vertically integrated module for teaching thyroid surgery in a modified way to the MBBS students at Shri Guru Ram Rai Institute of Health and Medical Sciences, Dehradun.

Methods: Study was conducted in the Department of Surgery. A total of 200 students (50 each from four batches of MBBS at SGRRIH and MS, Dehradun), were enrolled to the same teaching modalities, materials and evaluation tools. At the end of the teaching lectures, a feedback questionnaire was filled by the students. Thirty MCQs were given both in pre and post session and results compared.

Results: Feedback from students was very encouraging. In MCQ assessment, pre-session only 40% secured marks in the pass range, where as in the post session questionnaire, 89% passed and 11% failed only marginally.

Conclusions: Vertical integration needs additional effort, time and teamwork from faculty members of different departments. It is useful to have smaller topics of clinical significance covered in one session rather than attempting to cover a broad area, as this often results in a loss of interest. Preparation of curriculum together by basic, preclinical and clinical teachers can lead to more relevant teaching.

Keywords: Curriculum, Thyroid, Vertical integration

INTRODUCTION

Vertical integration may be considered as one of the major reforms to prepare better physicians for the next century.¹ Vertical integration between basic sciences and clinical medicine has been found to stimulate profound rather than superficial learning, and thereby results in better understanding of important biomedical principles.² Vertical integration improves motivation, enhances deep learning, prepares for lifelong learning, and practicality. It can generally be defined as a curriculum approach that facilitates curricular reforms, enhances clinician's reflections on scientific practice and enhances scientist's

reflections on clinical application and research.³ Curriculum integration is an approach to teaching and learning that is based on the philosophy that purposefully draws together knowledge, skills, attitudes and values from within or across subject areas to develop a more powerful understanding of key ideas. Curriculum integration occurs when components of the curriculum are connected and related in meaningful ways by both the students and teachers.⁴ Dissatisfaction with the traditional curricular model has included student's complaints about lack of relevance and faculty members concerns about student's failure to recall relevant basic science knowledge during their clinical education. Medical students have viewed the basic science curriculum as a hurdle to be overcome in order to earn the right to step onto the hospital wards and clinical teachers have complained that when students arrive on the clinical rotations, they have no intellectual curiosity, having spent the first phase of medical school memorizing unrelated facts rather than learning to think like a clinician.⁵ So the aim was to design and implement a vertically integrated module for teaching thyroid surgery in a modified way to the MBBS students at Shri Guru Ram Rai Institute of Health and Medical Sciences. In the process authors tried to eliminate the gap between basic, preclinical and clinical sciences in undergraduate teaching.

METHODS

Medical education unit of the institute was oriented to the process of implementing integrated curriculum, having completed the revised basic course workshop at the designated Medical Council of India nodal centres. The learning objectives, clinical cases, learning strategies, time table and assessment tools for the module were finalized after several discussions among the team members coordinated by team leader. Every member contributed effectively and equally in the process. A total of 200 students (50 from four batches of MBBS at SGGRIH and MS, Dehradun), were enrolled to the same teaching modalities, materials and evaluation tools in April 2017.

Designing the lectures

Teaching modalities have large impact on the quality of student learning. Attempts were made to ensure the vertical integration of the different topics rather than just repetition of theoretical facts in each lecture. Clinical scenarios, covering most of the objectives related to thyroid were designed after various meetings between the team. Special consideration was given to the case scenarios keeping in consideration future practical needs of an Indian Medical Graduate, and to stimulation of selfdirected learning by encouraging students to analyse the difficulties and search from the literature.

The beginning of the lectures was done by case scenarios, to drive relevant learning and to highlight the importance of theoretical information given in lectures. Basic idea was to integrate basic and clinical concepts and help the students in understanding the surgical basis of various thyroid disorders. Videos of surgical procedures with highlighting of surgical anatomy were also included to make the lectures more understanding and easy to grasp.

Assessment planning

The medical education team employed objective rather than subjective assessment techniques. Authors made it a point to assess the higher levels of cognition, such as understanding, comprehension, interpretation, analysis and decision-making skills rather than simple recall of knowledge. A blueprint for the assessment was developed, in which categorization of each objective was done on basis of Miller's pyramid. After peer review, a total of 30 MCQs dealing with various aspects of the thyroid surgery were selected and used in the examination. These MCQs were given both in pre and post session and results compared.

Students feedback

At the end of the teaching lectures, a feedback questionnaire was filled by the students. It consisted of a five-point Likert scale and open-ended questions about the positive and negative aspects of the integrated teaching. It was an anonymous questionnaire. The questionnaire also had a comment section for suggestions for improvement from the student's perspective. These comments were thoroughly analysed to help us in the future projects planning.

RESULTS

Ninety-five percentage students agreed (52.5% strongly) that Integrated teaching is a good way to learn a topic in totality; makes learning and understanding easy. Out of the total 74.5% found this method better than the single subject lectures and 82% wanted that Integrated teaching should become a regular part of the curriculum. Out of total 94% agreed that this method of teaching stimulated their critical thinking and helped them understand clinical concepts better. Out of total 89% agreed that they would like integrated teaching methods applied for other topics also. Out of total 96% agreed that the knowledge acquired in the session would help them in clinical application. 71% felt that the method would help them study the course material better than when they study alone, 27 % were not sure of this. Out of total 91.5% found this method useful and interesting. Out of total 90.5% had satisfactory overall experience of integrated teaching method. Out of total 83% felt motivated by this type of learning to study more.

Table 1: Students open comments and suggestions.

Suggestion
Add more videos and pictures
Provide reading material and video links
Post session handouts for quick revision
more activities involving the students
Keep the sessions short
Divide the module in 2 to 3 days
Frequent breaks between sessions

Out of total 66% found the session was too lengthy and time consuming but inspite of this negative aspect only 25% preferred traditional subject wise teaching to integrated teaching. Feedback depicted in bar diagram and open comments and suggestions of the students are summarized (Table 1, 2).

Assessment of students also showed the results in favour of vertical integration.

Pre-session only 40% secured marks in the pass range, where as in the post session questionnaire, 89% passed and 11% failed only marginally.

Table 2: Representation of student's responses to feedback questionnaire following vertical integrated teaching session.

Question	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
Integrated teaching is a good way to learn a topic in totality; makes learning and understanding easy	105	85	8	2	0
I find this method better than the single subject lectures	60	89	43	8	0
Integrated teaching should become a regular part of the curriculum	74	90	32	4	0
This method of teaching has stimulated my critical thinking and helped me understand clinical concepts better	74	114	8	4	0
I would like integrated teaching methods applied for other topics also	86	92	15	7	0
The knowledge acquired in this session will help me in its clinical application	79	113	8	0	0
This method helps me study the course material better than when i study alone	53	89	54	2	2
I find this method useful and interesting	55	128	13	4	0
My overall experience of integrated teaching method was satisfactory	43	138	15	4	0
This type of learning experience has motivated me to study more	60	106	30	2	2
The session was too lengthy and time consuming	51	81	30	28	10
I prefer traditional subject wise teaching to integrated teaching	10	40	87	49	14

DISCUSSION

Vertical integration brings more relevance and excitement in learning. To involve clinicians in preparation of basic medical science modules and vice versa is vital to develop vertical integration.⁶ Basic subject in isolation are difficult for the students to understand and surgical concepts without basic knowledge are not possible. Vertical integration brings together basic and clinical sciences. It refers to a combination of basic and clinical sciences in such a way that the traditional divide between preclinical and clinical studies is broken down, therefore basic science is represented explicitly in the curriculum within the clinical environments during all the years of undergraduate education and beyond into postgraduate training and continuing professional development. This means that the learning of basic science is placed in the context of clinical and professional practice and seen to be more meaningful and relevant to students.⁴ In a study done by Rafique N to teach respiratory physiology 85% of the students responded that teaching physiological concepts in integration with clinical scenarios is better approach than traditional teaching and 99% indicated that vertical integration makes learning and understanding easy.7 It is in accordance with the findings in present study. In addition, the students felt motivated to study more. In a study done by Kumar S et al, in students of first professional physiology class after completion of the traditional didactic lectures on thyroid gland and pancreas, the endocrinologist gave the first case-based lecture covering the same topics. The second case-based lecture covering the adrenal, pituitary and parathyroid glands followed by the remaining didactic lectures. This was followed by the hospital visit to see the patients. In 95% of the students felt that it helped them to understand the concepts better.⁸ In present study 96% agreed that the knowledge acquired in the session would help them in clinical application. Alam et al also indicated that an early clinical exposure and use of clinical scenarios and clinical examples in teaching sessions of basic medical sciences generates interest among the learners and helps them to appreciate the importance of basic sciences.⁶

In a report on case studies on vertical integration for two working groups established by GPET, Glasgow and Trumble reported potential advantages of vertical integration in general practice. Those specifically relevant to the sharing of teaching and learning roles across the learner phases include.

Increased collegiality between students, interns, registrars and GPs; Enhanced credibility of teachers, medical students can engage with teachers who are closer and possibly more "connected" to their situation; Creation of an environment for learners to share learning activities with their teachers, and thus to watch their teachers learn

Enhancement of the expertise, enthusiasm and satisfaction of teachers by having them involved in different stages of the continuum of the education process; and realisation of efficiencies.⁹

Glasgow and Trumble also reported a range of potential barriers to vertical integration including; limited physical resources, including space and information technology infrastructure; "change weariness" for those providing and receiving education; lack of financial resources, such as ongoing support for maintaining current program delivery and for innovative program development. program issues, such as dealing with large variability in prior learning experiences of students and registrars.⁹

Authors feel vertical integration need additional effort and teamwork from faculty members of different departments. The commitment and teaching skills of teachers is also a potential challenge. It may also be useful to have smaller topics covered in one session rather than attempting to cover a broad area, as this often results in a loss of interest. The use of audio visual aids and clinical scenarios may be a useful tool to enhance student interest in the early years of medical education.

Most of these challenges also apply to hospital-based teaching; the lack of integration and potential medical workforce shortages within hospital-based postgraduate education has received significant attention recently.^{10,11} In preparation for a working trial of vertical integration in the general practice setting, Dick ML et al, have developed a conceptual model the VITAL (Vertical integration in teaching and learning) model. VITAL is based on educational theory about vertical integration and on their hypothesis that teaching conducted by GP registrars will help link the different stages of learning and alleviate some of the pressures on the teaching workforce.¹² Vertical integrated studies hold much promise for undergraduate medical teaching especially in Indian Medical teaching.

CONCLUSION

Vertical integration the need of the hour to make teaching relevant and emphatic. Basic subjects in isolation are difficult for the students to understand and surgical concepts without basic knowledge are not possible, so curriculum together prepared by basic, preclinical and clinical teachers can lead to more relevant teaching.

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