

PERCEPTION OF HORIZONTAL INTEGRATION OF BASIC AND CLINICAL SCIENCES AMONG STUDENTS IN UNDERGRADUATE DENTAL CURRICULUM

Dr. Kapila Chakarvarty, Dr Shivani Aggarwal, Dr Ashim Aggarwal, Dr Shivam Singh Tomar
Manav Rachna Dental College

ABSTRACT - Aim and objectives: To evaluate the perception of students toward horizontal integration as a teaching and learning method versus traditional teaching in health sciences curriculum.

Material and methods: This study was conducted among 3rd and final year UG dental students (n=123). A survey questionnaire based on role of integration in teaching and learning on likert Scale was used. The questionnaire was constructed after extensive literature review.

Statistical analysis and Result: There was 100% response rate in this study. The total no of UG dental students responded in the study were n=123. The mean score and standard deviation was calculated using SPSS software. The average score vary from 2.705 ± 0.8700 to 4.073 ± 1.2176 .

Conclusion: The students perceive integrated method of teaching more effective than traditional method of teaching.

Keywords -Horizontal integration, integration, traditional teaching

INTRODUCTION & OTHER HEADINGS

A lecture is a process by which the notes of teacher become the notes of student without passing through the minds of either (O' Donnel 1997). Bligh in 'what's the use of lectures?' summarized that although a lecture helps the students to acquire knowledge it however cannot makes one apply it in a practical situation or in changing the attitudes to bring about an innovation [1].

The dental school curriculum is designed as such that education starts with basic sciences, preclinical sections in the first half followed by clinical stages in second half where they deal with diagnosis care and cure of diseases. This traditional method of teaching involves compartmentalization of subjects into basic sciences, preclinical and clinical sciences which lead to repetition and overlapping of the subjects. To improve the quality of learning different methods of teaching methodologies have been adopted, the integrated teaching is one of them.

The term integration has grown popular in UG and PG curricula over the last few decades. The dictionary meaning of "Integration" (unification or combination or amalgamation) means "the action or process of integrating". Bean (1977) was first to introduce integrated curricula in general education literature. The Mc Masters in Canada was one of pioneers in implementing integrated curricula in medical education [2]. In medical education the term was introduced by Harden et al in 1984. As defined by Harden integration is "the organization of teaching matter to interrelate or unify subjects frequently taught in separate academic courses or departments." [3]. It provides a crosslink between basic sciences and clinical training, also factual assessment of clinical signs and symptoms can be done by bringing together different units and disciplines of a subject [4]. An integrated approach allows students to investigate the information about topics without constrains enforced by traditional teaching methodology [5]. The integrated medical curricula emphasizes more on active learning methods such as problem based learning where learner can construct their own knowledge based on prerequisite knowledge [6].

Two main form of integration in medical education are horizontal and vertical integration. In horizontal integration, courses that are within a subject are integrated with each other. For example, basic sciences and clinical courses such as oral surgery, oral pathology and oral medicine and radiology are integrated. In vertical integration, courses from basic to advanced levels of training in the dental curriculum can be integrated [7]. Another form of integration is spiral integration, which is combination of horizontal and vertical integration, defined as curriculum involving "learning both sciences (basics and clinical) across time and subject matter" (Bandiera et al 2013).

The present study is done to assess the student perception of horizontal integrated curricula in dental education.

Material and Methods

This study was conducted in Manav Rachna Dental College, Faridabad. The study was conducted to assess the impact of horizontally integrated teaching methods in improving the knowledge and attitude of students. A total of 123 students of third year and final year participated in this study. This was a questionnaire based study and was conducted on three topics integrated horizontally among different years and with different departments. The questionnaire (Table 1) consisted of 26 questions. Feedback of students was assessed on five point Likert rating scale (5=strongly agree, 4=agree, 3=indifferent, 2=disagree,

1=strongly disagree). The data was entered and analyzed using SPSS software. Mean \pm SD for student response of different items of questionnaire was calculated.

Result

A total of 123 students participated in the study. The overall response rate was 100% (123/123). SPSS II was used for analysis of result. The feedback of students for horizontally integrated lectures is shown in Table I. The mean and standard deviation of student's response for 26 questions are given in Table II.

A total of 82.9% student agreed that horizontal integration is better than traditional methods and 88.61% says that it allow better understanding of subjects. 78.8% and 77.1% agreed that integration develops interest and enables them to relate basic and clinical sciences respectively.

A total of 61.1% agreed that interactive lectures provide much information in less time while 71.5% agreed that it improve academic performance. Only 57.17% agreed that session was time consuming while 30.08% agreed that it was difficult to focus throughout the lecture and 20.3% students were indifferent.

Table III list the alternative methods of teaching proposed by the students in which 43.08% of students were in favor of group discussions while 34.1% in favor of power point presentations.

Discussion

Dental education follows "2+2" curricula in which basic and preclinical science is taught for 2 years and clinical science for next two years which lacks patient centered education in first two years of curriculum. The integrated aims at combining basic and clinical science by breaking the barrier between the two and thus helps in correlating signs, symptoms to reach the diagnosis. In this study we statistically observed the perception of students toward horizontally integrated lectures. Our study shows that 82.8% of students agreed that horizontal integration is better than traditional methods of teaching while 88.5% agreed integrated lectures allow better understanding of subjects. According to a survey conducted by Hakea, interactive teaching methods seem to be more effective for improving student's performance in comparison with traditional teaching methods^[8]. The lectures based on interactive learning were successful and interactive. This was also supported by 71.45% of our students which agreed that it enhances interaction between teacher and students

R Doraisamy et al also suggested that integrated teaching improves the cognitive and psychomotor domains of student's and creates interest in topics^[9]. Our observation also shows that 78.8% of students agreed that integrated lectures develop interest in the topic. Alam SM et al in 2011 also suggested that an early clinical exposure, use of clinical scenarios and clinical examples in teaching sessions of basic medical sciences generates interest among the learners and help them to see why it is important to learn basic sciences^[10].

In our study 84.98% of students reported that horizontally integrated lectures help to inter-relate the topics while 77.1% students says that it enables them to relate basic & clinical sciences. Kevin P Ward in his studies shows that chiropractors can solve complex problems by integrating the curricula. He also stated that more relevant basic science education can be achieved by developing horizontally integrated curriculum in dental sciences^[11].

A study from Huang AH in 1997 reported that 89.4% people prefer interactive session for better comprehension of knowledge^[12]. In our study 80% of students agreed that integrated learning enhances the knowledge.

Overall the survey highlights the student's perspective about teaching. 73% of the students agreed that this type of teaching should be continued in future. Similar thoughts are expressed by P Haranath in 2013 in his article "Integrated teaching in medicine-Indian Scene" that medical council should officially introduce integrated teaching at institutional level, mere statements cannot achieve integration^[13]. Snyman WD and Kroon J in their working model on integration also concluded that it is practical to introduce integrated learning in to our curriculum^[14]. TC Postma and JG White who conducted an integrated session on preclinical case based learning and comprehensive patient care among third and fourth year cohorts received positive perception for integration^[15]. Similar study done by Grkovic in Australia highlighted the need for changing the fragmented traditional medical traditional curriculum to integrate^[16].

In our study 57.17% of students show disagreement toward integrated teaching saying that they feel it is time consuming and repetitive. S Venkatesh Murthy et al in a cross-sectional survey on year 2 medical students in James Cook University assesses the perception of students for integrated learning verses traditional learning. He stated that students prefer integrated lectures (IL) over traditional teaching (TT) while applying basic science to clinical cases while they prefer TT over IL with respect to 1) level of interaction/collaboration with other students and teachers, 2) help to learn what need for the subject, 3) enable to learn and understand the lecture content faster. He also reported that students find IT and TT roughly similar with respect to understanding of subject and quality of learning experience^[17]. William et al reported that first year medical students had learnt less in interactive session compared to lectures^[18].

Our study provides insights about student's perception about horizontally integrated lectures. Based on the response of students, integrated curriculum should be implemented in teaching methods. Integration helps to interlink various disciplines which help to apply the available knowledge in new situation as opposed to the traditional way of teaching where students are overloaded with information with less/no practical application.

Conclusion

Integrated teaching is effective method over traditional method of teaching in terms of problem solving and decision making skills. Our study has limited no of students, further research should be carried out to implement integrated approach.

Table I : Questionnaire and Feedback of Students on lectures (in %)

S.No	Questions	Strongly Agree (5)	Agree (4)	Indifferent (3)	Disagree (2)	Strongly Disagree (1)
1	Horizontal Integration teaching is better than traditional methods of teaching	24.3	58.5	8.9	4.0	4.0
2	Allowed better understanding of the subject	22.7	65.8	5.6	2.4	3.2
3	It helps to inter-relate the topics	31.7	55.28	7.3	0.8	4.8
4	Provides much information in less time.	19.5	49.5	19.5	6.5	4.8
5	It is time consuming	17.03	34.14	20.3	21.95	6.5
6	Teaches what is not supposed to be taught.	10.5	25.2	17.03	37.3	8.9
7	Facilitate collaborative learning	22.7	58.5	11.3	4.8	2.4
8	Enhances the student knowledge	24.3	57.7	11.3	3.2	3.2
9	Helpful in future for better learning of clinical concepts	30.8	50.4	12.19	2.4	4.0
10	Enable to relate basic and clinical sciences	16.2	60.9	11.3	7.3	4.8
11	All the topics must be taught by teachers of different departments.	12.19	50.4	24.3	8.9	4.0
12	This mode of teaching should be continued in future	22.7	50.4	13.8	5.6	7.3
13	Was the Balance between the depth of material taught maintained	17.03	53.6	18.6	5.6	4.8
14	Prevent repetition and wastage of time	21.95	50.4	15.4	6.5	5.6
15	Develops interest in the topic taught	26.8	52.2	14.6	2.4	4.0
16	Enhances reasoning abilities	22.7	47.9	21.1	4.0	4.0
17	Enhance interaction between teacher and student	21.95	49.5	21.1	3.2	4.0
18	Should be used for theory classes	22.7	52.8	13.0	4.8	6.5
19	Should be used for practical classes	26.01	49.5	13.8	5.6	4.8
20	Should be done using clinical cases	25.2	50.4	13.8	5.6	4.8
21	Correlate preclinical and clinical subjects	24.3	50.4	15.4	4.8	4.8
22	Session confused me at theatrical level	7.3	18.6	29.2	36.5	8.1
23	Difficult to focus throughout the lecture	11.3	19.5	20.3	40.6	8.1
24	Improves academic performance	17.03	54.4	15.4	6.5	6.5
25	Session allow me to integrate topic among various disciplines	17.03	53.6	19.5	4.8	4.8
26	It was not Interactive session	6.5	13.0	28.4	39.0	13.0

Table II : Frequency distribution (Mean and Standar Deviation)

S.No	Questions	Mean	Standard Deviation
1	Horizontal Integration teaching is better than traditional methods of teaching	4.000	0.8963
2	Allowed better understanding of the subject	4.008	0.8731
3	It helps to inter-relate the topics	4.073	0.8700
4	Provides much information in less time.	3.748	1.0130
5	It is time consuming	3.211	1.2028
6	Teaches what is not supposed to be taught.	2.878	1.1845
7	Facilitate collaborative learning	3.862	0.9524
8	Enhances the student knowledge	3.878	0.9460
9	Helpful in future for better learning of clinical concepts	3.992	0.9188
10	Enable to relate basic and clinical sciences	3.707	1.0381
11	All the topics must be taught by teachers of different departments.	3.610	0.9804
12	This mode of teaching should be continued in future	3.659	1.1862
13	Was the Balance between the depth of material taught maintained	3.650	1.0242
14	Prevent repetition and wastage of time	3.715	1.0903
15	Develops interest in the topic taught	3.951	0.9483
16	Enhances reasoning abilities	3.820	0.9622
17	Enhance interaction between teacher and student	3.732	0.9502
18	Should be used for theory classes	3.772	1.0621
19	Should be used for practical classes	3.805	0.9889
20	Should be done using clinical cases	3.780	1.0600
21	Correlate preclinical and clinical subjects	3.828	0.9849
22	Session confused me at theatrical level	2.732	1.0718
23	Difficult to focus throughout the lecture	2.705	1.2176
24	Improves academic performance	3.691	1.0092
25	Session allow me to integrate topic among various disciplines	3.675	0.9709
26	It was not interactive session	2.49	1.066

Table III : Alternate methods

S.No	Methods	
I	Black Board Teaching	23.5
II	Vertical Integration	23.8
III	Viva Sessions	8.1
IV	Flow Chart presentation	34.1
V	Seminars	32.5
VI	Group Discussions	43.08
VII	Traditional Methods	8.94

REFERENCES

1. Donald Bligh "whats the use of lectures?" Penguin 1972.
2. Brauer DG, Ferguson KJ. The integrated curriculum in medical education: AMEE guide no 96. *Med Teach*. 2015;37:312-22. [Pubmed: 25319403].
3. Harden RM, Sowden S, Dunn WR. Some educational strategies in curriculum development: The SPICES model. ASME medical education booklet number 18. *Med Educ* 1984;18:284-97. [PubMed: 6738402]
4. Cooke M, Irby DM, Sullivan W, Ludmerer KM. American medical education 100 years after the flexner report. *N Engl J Med*. 2006;355:1339-44.
5. Pigdon, K. & Woolley, M. (1992). *The Big Picture*. Chap 1 – 3. Victoria: Eleanor Curtain Publishing.
6. Kaufman DM. applying educational theory in practice. *BMJ*. 2003;326:213-16. [PMCID: PMC1125068] [PubMed: 12543841].
7. Hassan SH. Concepts of vertical and horizontal integration as an approach to integrated curriculum. *Educ Med J*. 2013;5(4):e1-e5. doi: 10.5959/eimj.v5i4.163.
8. Hakea RR. Interactive-engagement vs. traditional methods: A six thousand-student survey of mechanics test data for introductory physics courses. *Am J Phys*. 1998;66:64-74.
9. Doraiswamy R, Radhakrishnan S. the effectiveness of integrated teaching over traditional teaching among first year MBBS students: A preliminary study. *Med J DY Patil Univ* 2013;6:139-41.
10. Alam Sher Malik, Rukhsana Hussain Malik Twelve tips for developing an integrated curriculum *Med Teach*, 33 (2011), pp. 99-104
11. Kevin P Ward. *J chiropr Educ*. 2010 Fall;24(2):194-97.
12. Huang AH, Carroll RG. Incorporating active learning into traditional curriculum. *Am J Physiol*. 1997;273:S14-23. [PubMed: 9435742].
13. Haranath P. integrated teaching in medicine- Indian scene. *Indian J Pharmacol* 2013;45:1-3
14. Snyman WD, Kroon J. Vertical and Horizontal integration of knowledge and skill – A working model. *Eur J Dent Educ*. 2005 Feb; 9(1):26-31.
15. TC Postma, JG White. Student perception of vertical and horizontal integration in a disciplined based dental school. *Eur J Dent Educ*. 2017 May; 21(2):101-107.
16. Grkovic I. Transition of the medical curriculum from classical to integrated: A problem based approach and the Australian way of keeping academics in medicine. *Croat Med J* 2005; 46; 16-20.
17. Shashidhar Venaktesh Murthy, Torres Woolley, Yeshwanth Rao K, Nagaraja Haleagrahara, Bunmi Malau-aduli: Lessons learnt from implementing blended 'integrated' learning into an undergraduate medical curriculum DOI: <https://doi.org/10.15694/mep.2017.000129>
18. William S. SaB, Nunes P, Stevenson K, Williams S, Bidyadhar S etal. Communicating with first year medical students to improve communication skill teaching in the university of West Indies. *Int J Medd Edu* 2010;1:5-9.