INTRODUCING INTEGRATED LEARNING IN 1ST YEAR MBBS STUDENTS

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ABSTRACT

BACKGROUND

Integrated modular system has recently evolved as an important strategy which aims to bring coordination in teaching learning activities. The lack of integration between the subjects in 1st year MBBS course, causes difficulties for students who need to understand how the parts function together as an integrated whole. The aim of this study is to introduce Integrated Learning in 1st Year MBBS Students.

MATERIALS AND METHODS

It is a mixed study design. The study includes 100 students from 1st year MBBS admitted in the year 2017-2018 at Jorhat Medical College. Study was conducted in the department of Physiology in collaboration with the MEU and Anatomy and Biochemistry Departments of Jorhat Medical College. The purpose of the study was to introduce integrated learning in 1st year MBBS students. Both the faculty members and students were sensitized following which the topics were delivered. Immediate feedback was taken from the students and faculties and a focus group discussion was also conducted with the students and faculties.

RESULTS

In this study it was evident from the feedback that integrated sessions enhanced student learning and the faculties were motivated to hold further integrated classes. Also, the students and faculties felt that integrated teaching should be a part of undergraduate curriculum.

CONCLUSION

The faculties and students had a positive attitude towards this new teaching innovation. It was seen that integrated teaching learning sessions were well appreciated by both students and faculties and the coordination between various departments was excellent. They viewed learning and teaching in a holistic way.

KEY WORDS

Coordination, Curriculum, Horizontal, Holistic.

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BACKGROUND

The term integration in education means coordination in the teaching learning activities to ensure harmonious functioning of the educational processes.^[1] Integrated modular system has recently evolved as an important strategy which aims to bring coordination in teaching learning activities. It helps in better learning and understanding the integration of the human body and that no system functions in isolation but operates in an organized and interdependent manner to achieve optimum level of functioning. As stated by Bradely and Mattick, "integrated curriculum aims to provide students with better learning opportunities that will facilitate the development of knowledge that is relevant and meaningful to clinical practice, is deep and retrievable and which is amenable to alteration, updating and development as a part of ongoing process of lifelong learning."^[2]

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In traditional medical curriculum basic science is taught in the initial years and clinical sciences in the later years and while teaching basic sciences the subjects are taught individually giving students a view of the parts, but not the whole, of the structure- function relationship. This discourages students from learning, and they get disinterested in applying knowledge achieved into practice.^[1] Moreover, period of MBBS course is much longer than other professional streams and there is negligible opportunity for interlinking of concepts learned in one discipline with the other.

Medical teachers should present the vast amount of information to the students in a planned, organized and integrated manner.^[1] Harden conceptualized a 11 step ladder of integration ranging from individual discipline based to interdisciplinary and trans disciplinary designs.^[3] Most universities use integrated curriculum where there is both horizontal and vertical integration. Horizontal integration is within the disciplines of preclinical basic sciences and vertical integration is integration of disciplines from preclinical to clinical sciences. Integrated teaching enables learning across multiple domains. So, Medical Council of India, in its document Vision 2015, desires the incorporation of integration in the medical curriculum,^[4] in order to provide students of holistic rather than fragmented learning process.^[5] The human body comprises various anatomical and functionally interlinked systems. Teaching in parts in

various specialties is often perceived as independent of one another. Integrated teaching helps in bridging the connections.^[6]

In the present system each subject in basic science is taught in different blocks and we leave no scope for the students to correlate and integrate their gained knowledge. The need for integration is also felt by the students. Students find the preclinical subjects drab and boring. One of the main reasons is the theoretical and fragmented manner,^[7] in which they are taught by each preclinical department at different times, without any awareness of what is taught by other departments. Also, we can see that in spite of increasing the number of Post-Graduate seats, the students are reluctant to pick up basic science subjects because they do not have any interest for the subject, and this is because we are not being able to give them what they aspire for. Therefore, there is an urgent need for innovation and integrated teaching is one such innovation. Teaching different aspects of a topic by faculty members of relevant departments will create linkages which will help the students to assimilate the knowledge of the topic for better learning and understanding of the subjects, in drawing attention of the students to pre-clinical subjects and also to remove the confusion from their minds and therefore they will enjoy studying the subjects. With this backdrop in mind, the study was planned.

Aim & Objectives

Aim

To introduce integrated learning in 1st year MBBS students.

Objectives

1. To study the impact of horizontal integrated learning in 1st Year MBBS students.
2. To study the perception of the students and faculty about integrated teaching learning methodology.

MATERIALS AND METHODS

Study Area

It is a mixed study design. Study was conducted in the Department of Physiology in collaboration with the MEU and Anatomy and Biochemistry Departments of Jorhat Medical College. Before conducting the study was sent for Institutional Ethics Committee approval and a waiver was received for the same.

Sample Size

Present study was carried out in 100 students from 1st year MBBS admitted in the year 2017-2018 at Jorhat Medical College.

Method

The three departments of 1st MBBS, i.e., Anatomy, Physiology and Biochemistry were approached and a brief introduction about the purpose of the study was given to the faculties. Three faculty members from each department volunteered for the study and they were further sensitized regarding what is integration and what would be done in the study. A meeting was held where all the faculties came to a consensus and decided the topics to be delivered in an integrated manner and accordingly the sessions, sequence and contents of the topics were planned. As some class adjustments had to be done permission was taken from the Medical Education

Unit of our institute to co-ordinate the timings of the three departments.

Before introducing the topics, the students were sensitized about Integration and thereafter the topics, Insulin and Coronary Circulation, were delivered to them on two separate days within a time frame of 1 hour for each topic. During that one hour one faculty each from all the three departments, i.e., Anatomy, Physiology and Biochemistry delivered their respective subtopics in an interactive manner using power point presentations. For each department fifteen minutes was kept for lecture and five minutes for interaction.

After the completion of the module, the feedback was collected on the last day by using a questionnaire. The questions were framed, keeping in mind the utility of the integration, the understanding and appreciation of their knowledge. It consisted of a five-point Likert scale and open-ended question about the student's suggestions to improve the integrated teaching.

A feedback form in the form of structured questionnaire was also distributed to the faculties after both the sessions were over. The questionnaires were first developed and validated, and they were asked to rate their experience on a 5-point Likert scale and the questions were framed to know about their perception on integrated teaching and also an open-ended question about their suggestions to improve the integrated teaching.

A Focus group discussion conducted with the students after 10 days were analysed qualitatively to explore their views, experiences, beliefs and motivations. It was conducted in the department of physiology. Fifteen students volunteered for the discussion but only 9 students participated in the discussion. I was the facilitator and one of my colleagues from the department of Microbiology acted as a co facilitator, who is also the coordinator of Medical Education Unit of our institute. The discussion lasted for 50 minutes where they shared their perception regarding integrated learning and gave suggestions for further improvement.

A focus group discussion was also conducted comprising of seven faculties who volunteered for it to explore their views, experiences and suggestions for further improvement in the methodology. The discussion lasted for ninety minutes during which they came up with many suggestions.

Analysis

Out of 100 students, only 86 students submitted the feedback questionnaire which were distributed and collected a day after both the sessions was over. Feedback was taken in the form of structured questionnaires which were first developed and validated. They were asked to rate their experience on a 5-point Likert scale. Feedback was also taken from the faculties to know about their perception on integrated teaching. The opinions were tabulated and analysed quantitatively by Microsoft Excel.

Many views and suggestions came up in the Focus Group Discussion and the comments of the students and faculties were noted down and then analysed qualitatively.

RESULTS

The following points were observed after analysing the feedback questionnaire of the students and the faculties. The quantitatively analysed data are shown in Fig 1, 2 and 3.

Students/Integration of the topics helped

- 94% students to clear the basic concepts and also made the topics interesting for them.
- 86.04% students felt that understanding of the topic is better when compared with Traditional Teaching.
- The session helped 70.93% students to increase their attention in class.
- 67.44% students had the perception that Integration will reduce the amount of time needed for self-study.

Figure 1. Students Feedback on The Experience of Integrated Learning

Many views and suggestions came up in the Focus Group Discussion which was conducted after 10 days with the students. Some comments of students regarding Integrated Teaching Learning Methodology which were given during the discussion are-

1. "I think Integrated teaching learning method has brought us closer for the first time to the integrity of the three subjects and made us realize the importance of integration in order to understand the patient as a whole."
2. "I believe that learning by Integration is an effective way of learning. It increased my attention in the class and also helped me to correlate the whole aspect of the topics."
3. "Although more time should be given to each topic, I feel this is the best method of learning holistically."
4. "I thoroughly enjoyed the sessions as they made the topics interesting, but I also feel that...it would be more effective if tests are taken after every session. By doing

this we can also check how much we have understood and how much it is retained."

5. "I consider Integrated Medicine subject is very enriching, as it allows one to integrate what one has learnt in a holistic manner."
6. "I feel that learning in an integrated manner is very effective tool as understanding is better and helped me clear my basic concepts. I also feel the need of group discussions and seminars which will further help us to retain our gained knowledge."

The qualitatively analysed salient points which came up in the discussion are-

- The students considered the Integrated sessions as an effective learning tool
- They felt that such type of sessions should be conducted more often and all the broad topics of different systems, especially from Central Nervous System, should be discussed.

- They also suggested that more time should be given to each topic and tests should be conducted after each session.
- The students also suggested that more group discussions and seminars should be conducted and on a regular basis.

Faculty

On analysis of the Faculty feedback questionnaire (Fig. 2), it was seen that, all the faculties agreed that the current

curriculum occurs in blocks of different subjects. All the faculties felt that integrated teaching was useful for the students.

- For 70% faculties Integrated Teaching was not time consuming and it did not add any extra burden in their routine schedule.
- According to 90% faculties Integrated Teaching increases the attention of the students in the class.

A focus group discussion was conducted with the faculties and some comments of faculties regarding Integrated Teaching Learning Methodology are-

1. "I think Integrated teaching learning methodology is very interesting and has brought us closer for the first time to the integrity of the three subjects and made us realize the importance of integration in order to understand the patient as a whole."
2. "This is a very good method and a good effort taken... I feel that the whole system can be taught in an integrated way. I also feel that the little more time can be allotted to the subtopics."

3. "Good method...good initiative. But still there is lack of sensitization of the faculties. I feel the faculties should be sensitized properly for better implementation of the method."
4. "I do agree that sensitization is very much essential for proper implementation. One thing I would like to add to is... addition of assessment method to see the retention of knowledge of the topics which we have taught in an integrated manner."

The qualitatively analysed points which came up in the discussion are-

- All the faculties considered the integrated sessions interesting and they were interested and motivated in conducting more such sessions.

- According to them, the current level of integration was not adequate as it needs more sensitization and of all the faculties.
- The system as a whole could have been taught in an integrate manner.
- The faculties also considered that the time allotted for the topics as well as for the subtopics was less.

- They suggested that the broad topics could be covered in an integrated manner and it would be better if retention of knowledge could also be tested.

The Integrated Teaching Learning method was well accepted by the faculty as well as the students and both (90% faculty and 81.30% students) recommended that it should be regularly incorporated in the curriculum (Fig. 3)

DISCUSSION

Till the 1970s, the medical subjects were taught in such a manner that every subject is different from another and one subject's teacher being totally unaware and unconcerned about the topics taught in other subjects. By doing so, the knowledge acquired by the students was piecemeal.^[8] Later, it was realized that fusion of knowledge from different disciplines was very much needed, and to the concept of integrated teaching was evolved. Integrated teaching is a relatively new teaching-learning method which cuts across the subject matter lines and brings focus on broad areas of study, which is interactive and motivates the students to learn how to solve the real problems.^[9]

Medical Council of India has been compelled to adopt a need based curriculum for undergraduate medical education in India. "Regulations on Graduate Medical Education, 1997" recommended a teaching approach characterized by maximal efforts to encourage IT between traditional subject areas using a problem-based learning approach and de-emphasize compartmentalization of disciplines so as to achieve both horizontal and vertical integration in different phases in order to provide the students with a holistic rather than fragmented learning perspectives.^[10]

Muller JH et al felt that integrating a curriculum is a complex process. It is differentially understood and experienced by students and faculty, and can refer to instructional method, content, faculty work or synthesis of knowledge in the minds of learners.^[11] It can occur at

different rates and some subjects are integrated more easily than others. Kingsley et al in 2008 stated that curricular integration was one method for improving the teaching and learning of the complicated and interrelated concepts, thus providing an opportunity to incorporate the research training and objectives into traditionally separate didactic courses.^[12]

The present study was designed to introduce the method of horizontal integration for first year undergraduate medical students in our medical college at Jorhat. Earlier a study by Lata H et al in 2008 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.^[13]

The study was an attempt to improve the quality of medical education with a strategy to teach Insulin and Coronary Circulation in an integrated manner which revealed that Integrated teaching was better than Traditional teaching; the results of which were similar to some other previous studies.^[1,14-18]

Our study revealed that integrated teaching reduces the time for self-study. A similar study was noted by Kalpana Kumari M et al in 2008 emphasized that considering the volume load which the students are subjected to; integrated teaching can definitely save their time and energy, and give them better insight into the subject ^[19]. Our study also

revealed that integration of the topics increases the attention of the students in the class.

In our study, the students felt a positive attitude of Integrated teaching, they told that it had enhanced the student's understanding of the topic, they recognized that integrating the topics was useful and of interesting to them, and that it should be continued; they felt that there was a positive interaction which helped them to correlate whole aspect of topic, which was similar to studies by Dandannavarin 2010 at Karnataka, Nikam and Chopade in 2012 at Mumbai, Soudarssanane and Sahaiin 2007 at JIPMER, Kadam and Sane in 2013 at Maharashtra, Kumari et al. in 2008 at Bangalore, Mahajan et al. in 2013 at Ahmedabad and Rehman et al. in 2011 at Pakistan.^[16-22]

Majority of the students agreed that the integrated sessions helped them in clearing the basic concepts and considered it as an effective learning tool. A similar finding was noted by Vyas et al. in 2008.^[23]

Studies by Joglekar et al. in 1994 at Seth GS Medical College, Maharashtra; by Kate et al. at MGM Medical College, Navi Mumbai, India; by Ghosh and Panday in 2008 at Pramukhswami Medical College, Karamsad, Gujarat; by Dandannavarin 2010 at Jawaharlal Nehru Medical College, Belgaum Karnataka and by Nikam and Chopade in 2012 at Terna Medical College, Nerul, Navi Mumbai revealed that the marks obtained by the students who had undergone Integrated teaching was statistically greater than those who did not.^[7,14-17] Unfortunately, we did not do this in this study.

However in a study by Kadam and Sane in 2013, the statistical comparison between the evaluation after integrated and traditional lectures, at Rajiv Gandhi Medical College, Kalwa, Thane, Maharashtra had not shown significant impact of integrated lectures.^[20]

In another study which was done in Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER) Pondicherry by Soudarssanane and Sahai et al. in 2007, the integrated teaching of epidemiology and the incorporation of the presentation and discussion of the actual studies, which were conducted in the local population with the involvement of the clinical departments, was a novel attempt in the lecture discussions of the subject. This method was well appreciated by their students.^[18]

In the present study 80% faculty strongly agreed that integrated method of teaching is very useful for students. They told that they are interested in more integrated sessions, but the current level of integration was not adequate as it needs a lot of effort by the faculties and support from the administrators. Other previous studies also addressed this topic.^[16,24-27] However in our study the faculties felt that it was not time consuming and it did not add any extra burden to them.

Almost all faculties and most of the students in our study believed that integrated teaching is an effective teaching learning tool; 90% faculties and 81.30% students felt the need for incorporating integrated teaching in the MBBS curriculum. A similar study by Dr Madhuri S. Kate et al in 2006, Introducing Integrated Teaching In Undergraduate Medical Curriculum where the faculties unanimously opined that this methodology should be incorporated in the MBBS curriculum after more detailed deliberations supported our work.^[28] The findings and the experience of this study

supports the view of other studies that integrated teaching is an effective teaching learning tool as it avoids fragmented manner of teaching where teachers are not aware of what is taught in other subjects. It also develops interest in the topics.

Limitations

Because of lack of time, only two topics, Insulin and Coronary Circulation were covered in an integrated manner which is very less to comment for any long-term change in habit.

CONCLUSION

We were convinced from our experiences during the study that our efforts involved in designing the integrated sessions was well worth and it supported the integration of the content into the minds of the learners. In spite of all the challenges the study showed that it was possible to conduct integrated teaching sessions under a conventional curriculum.

The faculties and students had a positive attitude towards this new teaching innovation. It was seen that integrated teaching learning sessions were well appreciated by both students and faculties and the coordination between various departments was excellent. They viewed learning and teaching in a holistic way.

Thus, we can emphasize that considering the volume load which the students are subjected to, integrated learning can definitely save their time and energy, and give them better insight into the subject. Adaptation of newer student-centered teaching learning strategies is the need of the hour.

Implications

Integrated learning in 1st year MBBS students will set a good foundation in the initial year and will help the students to appreciate the relevance of their learning for present and their future. In the long run it will help the students to assimilate the knowledge and skills in different disciplines and apply rightly for the benefit of the patients and the society in a holistic manner. Integrated teaching would help in drawing the attention and interest of the students who otherwise find these basic science subjects monotonous.

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ANNEXURES

Students Feedback Form

Batch

Perception of students regarding integrated teaching (✓ as single response)

Sl. No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Integrated teaching has helped me clear the basic concept.					
2	When compared with regular didactic lectures understanding of the topic is better with integrated teaching.					
3	Integrated teaching sessions helped me to correlate the whole aspect of the topic					
4	Integrated teaching will reduce the amount of time needed for self-study					
5	Integrated teaching made the topics interesting					
6	Integrated teaching helped me to increase my attention in class					
7	This exercise can be regularly incorporated in the curriculum.					

Suggestions for improvement:

Faculty Feedback Form

Name-

Department-

Designation-

Perception of students regarding integrated teaching (✓ as single response)

Sl. No.	Questions	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Integrated teaching provides better understanding of topics.					
2	Integrated teaching increases attention of students in class when compared with regular lectures.					
3	Integrated teaching is more time consuming.					
4	Integrated teaching adds an extra burden to faculty in their routine schedule.					
5	Integrated teaching is useful for the students.					
6	Current curriculum occurs in blocks of different subjects.					
7	Integrated teaching be implemented in routine curriculum in future.					

Suggestions for improvement:

Module for the Two Topics: Insulin and Coronary Circulation

Total Time Duration for each Topic is 1 hour

1. Insulin: 15 mins of interactive lecture and 5 mins for discussion was allotted for each subject-

Anatomy : Anatomy of Pancreas.

Biochemistry : Mechanism of action of Insulin.

Physiology : Functions of Insulin.

2. Coronary Circulation: 15 mins of interactive lecture and 5 mins for discussion was allotted for each subject-

Anatomy : Blood supply of the heart.

Physiology : Regulation of coronary blood flow.

Factors affecting coronary blood flow.

Biochemistry : Cardiac biomarkers.

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