

Delivering endocrinology and reproduction in an integrated modular curriculum

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Abstract

Objective: To ascertain the perceptions of students and faculty of Shifa College of Medicine, Islamabad regarding the delivery of Endocrinology and Reproduction module as a component of the newly introduced Integrated Modular Curriculum.

Methods: A descriptive study, using mixed qualitative and quantitative method, starting from June 6 to August 15 2008. A period of 10 weeks was spent on the study including 8 weeks of planning, 2 weeks of delivery and assessment and a 2 weeks period of post hoc analysis and data collection. A multidisciplinary team of faculty developed themes, clinical cases, objectives and table of specification of the Endocrinology and Reproduction Module for Fourth Year MBBS Class. Continuous assessment was done by theme-based assignments and student presentations. Summative assessment was done by Multiple Choice and Short Answer Questions. Likert scale-based student feedback questionnaire was administered while the students were also encouraged to comment on the module for improvement. Feedback was obtained from the faculty in a similar manner.

Results: Out of a class of 86 students, 47 (55%) agreed to a balance between basic and clinical concepts addressed in the module, 21 (24%) agreed that emphasis on clinical concepts was appropriate, 37 (43%) agreed that learning strategies were well integrated, 50 (58%) were of the opinion that the assigned learning material was consistent with the session objectives, while 39 (45%) agreed that case-based instruction was useful, and 40 (47%) students were of the opinion that large group discussion was useful. Faculty feedback was positive towards integrated learning.

Conclusions: Integrated Endocrinology and Reproduction module received mixed response from students. This led us to modify and tailor the curriculum to better cater for the needs of students. Feedback from students and faculty is essential for improvement in the quality of educational interventions.

Keywords: Education, Medical, Undergraduate, Curriculum, Integrated, Pakistan. (JPMA 62: 937; 2012)

Introduction

Traditionally, teaching approach in the developing world's medical education systems has been teacher-centred. These strategies promote passive learning and discourage critical thinking, while adult learners rely on their existing knowledge to build new knowledge.¹ Conversely, information presented in a relevant manner is more likely to be retained and used for practical application. Moreover, subject-specific curricula tend to focus on content details with little clinical relevance thus overburdening the students with factual knowledge. Strong subject boundaries in undergraduate medical education create disconnect from the real life task of a physician i.e. patient encounter. In subject-specific traditional curricula, information is presented in a disintegrated fashion with compartmentalization of knowledge, which lacks relevance. Thus knowledge acquired in pre-clinical years is difficult to apply when confronting actual clinical situations subsequently.^{2,3} For example, endocrinology and reproduction in the traditional discipline-

oriented curriculum is taught in a piecemeal manner by various disciplines with very little clinical relevance. It is left to the students to synthesize and integrate knowledge to solve patient related problems. However, introduction of the integrated curriculum has allowed the disciplines to be taught in both horizontal and vertically integrated fashion thus making learning more meaningful and clinically relevant.

The modern approach to undergraduate medical education is to target competencies and outcomes. There are various competency frameworks available and one of them is "Tomorrow's Doctors" by General Medical Council, United Kingdom⁴ and has been stressed upon by the Pakistan Medical & Dental Council.⁵ It is imperative that curricula should address these competencies right from the beginning to prepare physicians to cater to community needs more efficiently. Modern day integrated curricula emphasize student centeredness, early clinical exposure, application of knowledge and clinical relevance.

Undergraduate medical education in Pakistan is going

through major reforms both in public and private sector.⁶⁻⁸ It has been realized that the traditional system needs to be modified to make students self-learners, problem solvers and professional doctors, who can see the patient as a "whole." Pakistan Medical and Dental Council and Higher Education Commission have given clear instructions to move towards integrated curriculum. Shifa College of Medicine, Islamabad, switched from subject-based to an integrated modular curriculum from the year 2008; a system promoting self-learning and critical thinking, thus shifting the teacher-centred approach to a student-centred approach. We describe our experience pertaining to integrated teaching of endocrinology and reproduction (ENR) to 4th Year MBBS Class in a five year curriculum.

Methods and Materials

Planning: When Shifa College of Medicine switched to system-based modular curriculum in 2008, multidisciplinary module teams were formed headed by a course coordinator for developing these modules. The planning team for Endocrinology and Reproduction module consisted of members from disciplines of Physiology, Anatomy, Biochemistry, Surgery, Medicine, Paediatrics, Pathology and Gynaecology. In our spiral curriculum, Endocrinology and Reproduction ENR was offered in years 2, 3 and 4 with increasing complexity.

A number of meetings were held to develop SMART (specific, measurable, attainable, relevant and targeted) objectives. These objectives for 4th Year MBBS Class were delivered through ten clinical themes and sub-themes. One of the themes developed to deliver objectives for thyroid disorders is shown as an example in Figure-1. Clinical cases relevant to these themes were also developed (Figure-2). The team subsequently developed a comprehensive blue print for assessing various objectives for both low (formative) and high (end-of modular test) stake assessment. The weightage of various objectives in assessment and the type of assessment tool relevant to the objectives were identified in the blue print. The objectives for 4th Year MBBS mainly

Intolerance to heat/cold	
1.	Recall the normal Hypothalamic-Pituitary axis and describe synthesis, transport, functions and regulation of thyroid hormones and their co-relation with iodine deficiency.
2.	Identify clinical features of under and over functioning of thyroid gland.
3.	Identify various causes of neck swelling/enlarged thyroid gland and correlate them with morphological changes in the structure of thyroid gland (benign/ malignant causes).
4.	Make an appropriate management plan according to the treatment modalities available and long term follow up and the need to continue replacement therapy.

Figure-1: Theme with objectives.

<p>Case 1 A 35-year-old woman came to the outpatient clinic with History of increasing irritability, intolerance to heat, poor sleep, weight loss and palpitations. She had an unremarkable past medical history and had an uneventful pregnancy 4 years ago. She denied history of depression but felt exhausted during her routine work. She recalled that her late mother had an operation on her neck in her twenties. On examination, she had a moderate diffuse swelling in the lower neck which moved with swallowing. She also had an audible bruit, a tremor and a resting heart rate of 110 beats per minute. Her eyes were prominent and puffy.</p> <p>Case 2 A 19-year-old young man presented to the medical OPD with H/o constipation, generalized weakness and increasing pallor. His mother who had type 1 diabetes mellitus and hypothyroidism, reported him to be a 'lazy sod ... difficult to get out of bed in the morning. His schoolwork had been poor and he had worn sweaters even during the summer. His pubertal development was delayed by several years. A moderate size goiter was palpable. On examination he was found to be short for his age His investigations showed haemoglobin of 9 g/dL white cell count 7600 cells/ cu mm, ESR 18 mm after 1 hour.</p> <p>Figure-2: Example of case scenarios for the theme, "Intolerance to heat/cold."</p>

revolved around pathology, epidemiology, health promotion, disease prevention, community exposure and internal medicine. The module was scheduled for two weeks and a time table was prepared. The number of hours for the delivery was based on the content to be delivered in the third spiral of ENR. Starting from June 6th- August 15th a period of 10 weeks was spent including 8 weeks of planning, 2 weeks of delivery and assessment and 2 weeks for post hoc analysis and data collection The whole plan was presented in faculty meetings and after detailed discussions the consensus of the entire faculty was obtained.

Learning strategies: A variety of learning strategies were used for the delivery of module including Large Group Interactive Sessions (LGIS), Small Group Discussions (SGD), Self Directed Learning (SDL), Role Plays and Integrated Practical Sessions (IPS).^{9,10} The distribution of various learning strategies is shown in Figure-3. Home

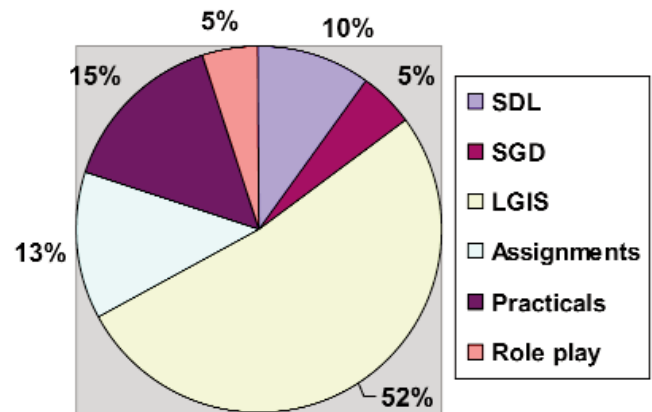


Figure-3: Learning strategies used during the module.

assignments on topics to be discussed in small groups were given one day in advance.

Assessment: Formative assessment was done by theme-based assignments and student presentations. Summative assessment was done at the end of the module as integrated Multiple Choice Questions (MCQs), Short Answer Questions (SAQs) and Integrated Practical Examinations (IPEs). Each IPE of four minutes had 3-4 tasks consisting of identification of histopathology slides and/or specimens, data interpretation, provocative test interpretations, images, x-ray films and two stations of structured viva based on a clinical case scenario. Post-hoc analysis of both written and practical assessment were presented in the weekly faculty meetings for psychometric reliability and parameters as per classic test theory.¹¹

Feedback: We have established a system where the Department of Medical Education constantly engages students to address their apprehensions and provide them a counselling service to adjust to the new format of learning. A mid-module student feedback is followed by an end of the module feedback and all issues and concerns related to the organization, delivery and content are addressed.

To assess the acceptability of the module by the students, a 3-point Likert scale questionnaire was designed and administered at the end of the module immediately after the final assessment. Students were also encouraged to give comments on the module for future improvement. The student response was also shared with the faculty. Another instrument was designed to obtain feedback from the eighteen faculty members involved in the delivery and assessment of the module. The statements were rated on a 5-

point Likert scale.

Results

Student feedback: A feedback questionnaire which was administered immediately after the final assessment is shown in Table-1 obtained from a total of 86 students (what is the response rate). Majority of the students 60 (70%) thought that clinical concepts were given more emphasis. Most 69 (80%) wanted scheduled time to be increased, while 50 (58%) were of the opinion that assigned learning material was consistent with the session objectives. Thirty nine (45%) students agreed that case-based instruction was useful in learning while 40 (47%) were of the opinion that large group discussion was a useful method of learning. Majority 60 (70%) disagreed that assessment reflected the modular learning objectives.

Free comments by students: Qualitative data revealed that students were of the opinion that the module was well organized and they obtained sufficient help from the facilitators. Students wanted the module duration to be increased to cover the course material. They also thought that clinical sciences were given more weightage when compared to basic sciences. They deemed home assignments less useful as a self-learning strategy. However, some students found it difficult to adjust to the new system because of the added responsibility of self-learning.

Faculty feedback: Eleven (78%) of the faculty agreed that small group discussions promoted deep learning and critical thinking. All faculty members agreed that interactive learning promotes relevance and helps create connections across various disciplines. Most of the faculty

Table-1: Student feedback (n=86).

Question	Agree (%)	Neutral (%)	Disagree (%)
Basic science and clinical concepts were well-balanced	48 (55.7)	8 (9.8)	30 (34.4)
Learning strategies were well-integrated	37 (43.3)	16 (18.3)	33 (38.3)
Issues related to ethical aspects were well-integrated with medical knowledge	40 (45.9)	25 (29.5)	21 (24.6)
Laboratory exercises were useful in helping to learn	41 (47.4)	25 (29.8)	20 (22.8)
Assessment methods promoted deep learning	35 (41)	28 (32.8)	23 (26.2)
Large group discussion teaching method was useful in helping to learn	41 (47.4)	20 (22.8)	25 (29.8)
Small group discussion teaching method was useful in helping to learn	29 (33.9)	29 (33.9)	28 (32.2)

Table-2: Faculty feedback (n=14).

Statements in the survey	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)	Strongly disagree (%)
Small group discussion promoted active participation	3 (25)	11 (75)	0	0	0
Small group discussion promoted deep learning and critical thinking	1 (10)	10 (65)	3 (25)	0	0
Interactive way of teaching promotes relevance and motivation for the students and helps create connections across various disciplines	7 (50)	7 (50)	0	0	0
Senior faculty members promoted active participation of students	0	5 (35)	8 (55)	1 (10)	0
Appreciation and cooperation extended by senior faculty members was a source of motivation for the students	0	7 (50)	1 (10)	6 (40)	0

members 12 (86%) agreed to the concept of promoting better understanding of various disciplines by integrating practical sessions. Half of them remained neutral to the question that innovative learning strategies were welcomed by the students. About half of them 7 (50%) agreed that students came prepared for small group sessions (Table-2).

Discussion

There has been much criticism of teacher-centred approach of the present medical education system for giving irrelevant information to the students and overloading the curriculum.^{12,13} Consequently, and in compliance with the directives of PMDC and HEC, Shifa College of Medicine decided to adopt the integrated system of education in 2005. A total of sixty faculty meetings finally yielded an integrated spiral curriculum for all the modules. Our experience with the development of curriculum was similar to that of Ziauddin Medical University, Karachi.⁶ However, instead of restricting ourselves to basic health sciences to formulate objectives, we used case scenarios as triggers to give the students clinical relevance of the subject.

Curriculum integration has been dismissed by some educators as being a passing 'fad',¹⁴ while others feel their departmental domains threatened by integration. However, except for a few senior members most of our faculty embraced the new idea enthusiastically. The junior faculty was actively involved in implementation of the new system from the very beginning and most of them found it very challenging. However, some of the senior faculty members who were set in their teaching methods, which they had been practising for decades, found it difficult to adjust to the new system and were quite critical of it. We feel that most of them can also be taken onboard if their apprehensions and sensitivities, especially those regarding infringement of their intellectual freedom are properly addressed.

Capacity building of the faculty to implement the new system has been a major challenge for medical institutions.¹⁵ We tackled the issue by conducting faculty training workshops on various modalities of teaching required for delivering integrated learning. These included Problem Based Learning (PBL), development of integrated MCQ's, small group learning and Integrated Practical Examinations (IPE). An ongoing drive for faculty members to constantly upgrade their educational skills in our college is helping to overcome the demands of delivering the revised curriculum. The feedback from our faculty members was positive after the delivery of the module, with 88% agreeing to the new approach of teaching. The positive response of our faculty and students to the new system is similar to that from Pramukhswami Medical College in Karamsad, India, who are also in the process of implementing the new integrated curriculum.¹⁶

Integrated Practical Examination is a new concept. Practical sessions in traditional curriculum mainly focus on old laboratory methods such as haemoglobin estimation, protein detection in urine, frog's nerve preparation, etc. The IPE format brought in clinical application and relevance, which joined the pieces of jigsaw puzzle to create a meaningful outcome from practical sessions. This IPE is a modification of the format used by Brady et al, who used real life cases in preparation of IPEs.¹⁷ However, we used both standardized patients as well as paper case scenarios as a stimulus in our examinations. Again faculty feedback was positive, with a majority (87%) saying that IPEs promote better understanding of various disciplines by integrating the various practical sessions.

Our students, who were used to traditional teaching methods found it slightly difficult to adjust to the new system where they were made more responsible for their learning, and where the teachers' active role was changed to that of a facilitator. However, this is to be expected and similar teething problems have been encountered by other centres implementing the new system.¹⁸⁻²¹ This was probably the reason why they favoured large group lecture format as a learning strategy where they could relax as passive learners. However case based instruction and small group learning were also appreciated by a third of students

The positive rating of the integrated system of learning by a majority of our students, their acceptance of various student-centred active learning strategies and an excellent rating of the system by the faculty is most encouraging. We feel that as the system matures and gains wider acceptance, apprehensions of some of the students and faculty would be allayed. In this regard, student feedback would help the system to mature and fill up the delivery gaps in future. We have established a system where the Department of Medical Education constantly engages students to address their apprehensions and provide them a counselling service to adjust to the new format of learning. A mid-module student feedback is followed by an end of the module feedback and all issues and concerns related to the organization, delivery and content are addressed.

Conclusion

In conclusion, integrated Endocrinology and Reproduction module can be implemented in an environment where students are used to passive learning. It can also be introduced even at an advanced stage of the course to students going through traditional model of teaching. The feedback from students is important in evaluating and refining the learning process.

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