

Eight Steps for Implementation of Selective Subspecialty module for Undergraduate Medical Students

*Osama Mustafa Hassan Mohamed¹, Ali H. Algamdi², Atif Hassan Khirelsied³,
Essam Mady³, Usama Akh¹, Walyeldin Elfakey^{4,5}

1. Department of Surgery, Faculty of Medicine, AlBaha University, Saudi Arabia

2. Department of Ophthalmology, Faculty of Medicine, AlBaha University, Saudi Arabia

3. Department of Biochemistry, Faculty of Medicine, AlBaha University, Saudi Arabia

4. Department of Pediatrics, Faculty of Medicine, AlBaha University, Saudi Arabia

5. Department of Pediatrics, Faculty of Medicine, University of Bahri, Sudan

Corresponding Author: Walyeldin Elnour Mohamed Elfakey,

Abstract:

Introduction: The undergraduate medical curricula should be planned to prepare the students for their future work which include the selection of their major specialties and the subspecialties. We described in this report how our curriculum achieved this.

Objectives: This paper describes how we introduced the concept of selective subspecialties for undergraduate medical students.

Methods: We followed 8 steps to plan, design and implement the selective subspecialty module. These steps include need assessment and objectives, educational strategies, course contents, teaching methods, educational environment, course management, assessment and course evaluation.

Results and Discussion: The course is planned and implemented for the sixth-year medical students. At this time the students are about to graduate and are able to understand the concept of subspecialty. The results of the students and academic staff evaluation of the course were excellent and encouraging. However, both the students and academic staff pointed to some areas of weaknesses which will be targeted for improvement in the future.

Conclusion: It is not an easy task to provide the medical students with all the tools that they may need to use in their future career, but at the same time it is not impossible.

Keywords: selective subspecialty; undergraduate curriculum; clinical module

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I. Introduction

The undergraduate medical teaching aims to prepare the students for a future job, as well as for further studies and research⁽¹⁾. To select the area of specialization and further studies and research in the future, the undergraduate medical students need to be oriented during the undergraduate study years⁽⁵⁾. At the current time, there are a lot of specialties and subspecialties which are emerging, so it is not an easy task to sum all these specialties and subspecialties and teach them to the undergraduate medical students. Hence our efforts to plan and design the selective subspecialties module (SSM) was towards the simplification of that task and making the students understand the concept of subspecialties. That is to say, the course should not be deformed by being much summarized but brief, concise and include all the aforementioned objectives. To plan, design and implement the course we followed the 8 steps that includes:

1. Need assessment, course aim and objectives
2. Educational strategies
3. Course contents
4. Organization of the contents and teaching methods
5. The educational environment
6. Module communication and management
7. Assessment
8. Feedback and evaluation

1) Need assessment, course aim and objectives:

Though our curriculum contains considerable and a variety of subjects based on the planned outcome for undergraduate students^(2,3), the module committee found gaps related to subspecialties. The question raised by the module committee is that, is the subject matters delivered to the students enough to make them know well about the subspecialties that they may choose in the future after graduation?

The analysis showed that still, our students are in need to explore the field of subspecialties. And the undergraduate teaching has great impact in future subspecialty preference⁽⁴⁾

Based on this analysis, we set our objectives to include the consolidation of the concept of subspecialties for undergraduate students. An integrated curriculum like ours differs from the classical curricula, as in this curriculum the borders between disciplines and subspecialties disappeared⁽²⁾. In this case, the student may find himself at loss and may not be able to imagine the borders between different specialties. This module which planned to be at the end of the sixth year will help them to know the attributes of each subspecialty. The other aim is to prepare the graduates for their future selection of subspecialty. Many agencies, licensing and professional bodies before accepting graduates in their training programs, usually test the graduate knowledge in the selected program. Definitely, those who are oriented and know the program will pass and enroll easily. So those who came prepared will pass easily.

1-Educational strategies:

Based on spices model⁽⁵⁾ SSM is mainly teacher centered despite the fact that the students are interviewed before implementation to determine their understanding of the subspecialties in relation to what they are taught. We combine both problem-solving and information-gathering strategies in this module. That is to say, we apply case-based learning scenarios. In each of the scenarios, many subspecialties are needed to deal with the problem. On the other hand some concepts are delivered through lectures and students are encouraged to gather more information from other sources. Despite the fact that the main activities of SSM are hospital-based, but community-based activities took place during the implementation of this module. As an example of community-based activity or exposure, field visits for pharmacies were arranged and supervised by our clinical pharmacists. The module was planned and implemented, adopting the standard strategy in choosing and delivering the contents because being that the aims and objectives of the modules are to consolidate the concept of subspecialties it should be delivered in standard approach and by expert members.

Contents:

As stated elsewhere in this paper, the main aim of this module is to consolidate the importance of subspecialties for our undergraduate medical students. This will let them know different subspecialties that relates to each of the major disciplines⁽⁴⁾. Moreover, it will make them go deep in each subspecialty and explore its contents and the needed knowledge and competencies, doing this will help them to be prepared for their future endeavor⁽⁶⁾.

It was a difficult task to select suitable contents to achieve these goals, as the subspecialties are very wide and in each discipline, many of subspecialties with different contents are found.

So before selecting the contents, a careful revision of the college curriculum is carried by the module committee assisted by the college academic affairs and college quality assurance committees. These revisions allow the committee to explore the uncovered fields to be included and the well-covered subspecialties to be excluded.

According to the above preparations, the subspecialty module selects contents related to the following 5 themes:

- 1- Subspecialties related to the disciplines of pediatrics, surgery, orthopedics and internal medicine. Though the analysis of the curriculum showed that most of these subspecialties are well-covered like for example pediatric cardiology and adult cardiology are well-taught in the cardiology and cardiovascular module in the 4th year, but some of the subspecialties related to these disciplines are not taught. Examples include metabolic disorders in pediatrics and some subspecialties related to surgery and orthopedics.
- 2- Subspecialties related to special senses, anesthesia, and critical care. Despite the fact that some parts of these subspecialties exist in some modules, but they are scattered and not well-organized. In this module, they are placed together to be delivered as one unit.
- 3- Subspecialties related to basic medical sciences, radiology and images. The analysis revealed that the students are in need to understand these subspecialties and elaborate more in the recent advances in these fields which has led to the emergence of new subspecialties.
- 4- Plastic, skin surgery and obesity medicine and surgery. Most of the concepts related to these subspecialties are delivered in different ways in the curriculum. The selective subspecialty module organizes them.

5- Pharmacology, clinicaltherapeutics and obstetric subspecialties. Medical students elsewhere ignore the specialties related to pharmacology and most of the time leaves this to pharmacists. Recently there is a global development of subspecialties in these fields, so this module by including this theme will make our graduates up-to-date and may help them to subspecialize in these fields in the future.

Organization of the contents and teaching methods:

Based on the above themes the contents are selected. Instructional methods include lectures, skill laboratory sessions, hospital-based clinical teaching, problem-solving sessions, seminars and self-directed learning. The topics were determined according to the course objectives and organized to be delivered by the above mentioned instructional methods as shown in table 1. The themes and instructional methods were chosen to suit the college curriculum ⁽⁷⁾.

The educational environment:

The educational environment was good and motivating for both the students and the participating staff. We tried to apply the rules that described for the medical teacher to create a favorable teaching environment ⁽⁸⁾.

The students:

Motivation can be intrinsic (from the student) and extrinsic (from external factors) ⁽⁹⁾. In our case, the strong intrinsic factor is that the students are motivated to explore these subspecialties and to find out which of them fits their future endeavors. They are enthusiastic even without encouragement from the teachers and the module planners. The extrinsic factors that motivate our students are the final assessment and the teachers help the students to understand the nature of the module and its relation to their future.

The teachers:

For the teachers, they were enthusiastic as they were participants from the start. They participated in all steps in the module development. For that reason, they are motivated to participate in the implementation and to see how the outcome is. So the teachers as planners, they are concerned with implementation environment and worked hard to make it encouraging and productive ⁽³⁾.

Table 1: Organization of the contents and the instruction methods

Instruction method	Topic title
Lectures	Introduction
	Pediatrics Immunology
	Immunodeficiency in pediatrics
	Allergens immunotherapy
	Pediatrics infectious diseases
	Genetics and chromosomes abnormality basic aspects
	Genetics and chromosomes abnormality clinical aspects
	Metabolic disorders in children
	Clinical approach to metabolic disorders in children
	Neurodegenerative disorders
	Pharmacology: Antibiotics classifications, and mode of action I
	Pharmacology: Antibiotics classifications, and mode of action II
	Pharmacology: Immunosuppressant medications
	Trauma from neurologic aspects
	Joints problems, congenital and acquired
	Intensive care: basic mechanical ventilation
	Intensive care: vascular access
	Organ transplant: large organs
	Organ transplant: small organs
	Radiology as diagnostic tool
	Invasive and therapeutic radiology
	Plastic: Keloid & hypertrophic scars
	Plastic: Breast & chest wall reconstruction
	Genetics: Genes in diagnosis
	Genetics: Gene therapy
	Sport medicine
	Sport injuries
Nerve injuries and reconstruction	

	Tendons transfer
	Laparoscopic surgery: indications
Skill laboratory sessions And hospital procedures	Principles of laparoscopic surgery
	Advanced procedures in selected surgical techniques
	Recent techniques in Bariatric Surgery
Problem-solving sessions	Case scenario I
	Case scenario II
	Case scenario III
Seminars	Management of organ transplants and its complications
	Bariatric Surgery
	Alternative medicine in practice
	Neurocutaneous syndrome
Self-directed sessions	Fetal Medicine
	Prenatal Diagnosis
	Prenatal: fetal therapeutic interventions

Module communication and management:

Module management is simple as the case in our college. The module committee is formed from the faculty staff that has relation to the module topic. The module committee designs a study guide that includes all module components including the assessment. Then the medical education, the academic affairs and the hospital teaching units revise this study guide and approve it. The product passes through the quality assurance before being presented to the faculty board for approval. During implementation, a module coordinator and a module director are responsible for the managements and students’ organization. We maximally make use of the module study guide as stated by Harden, Laidlaw and Hesketh which facilitates the communication between the students and all other module components ⁽¹⁰⁾. The hierarchy of module development and management is described in figure (1).

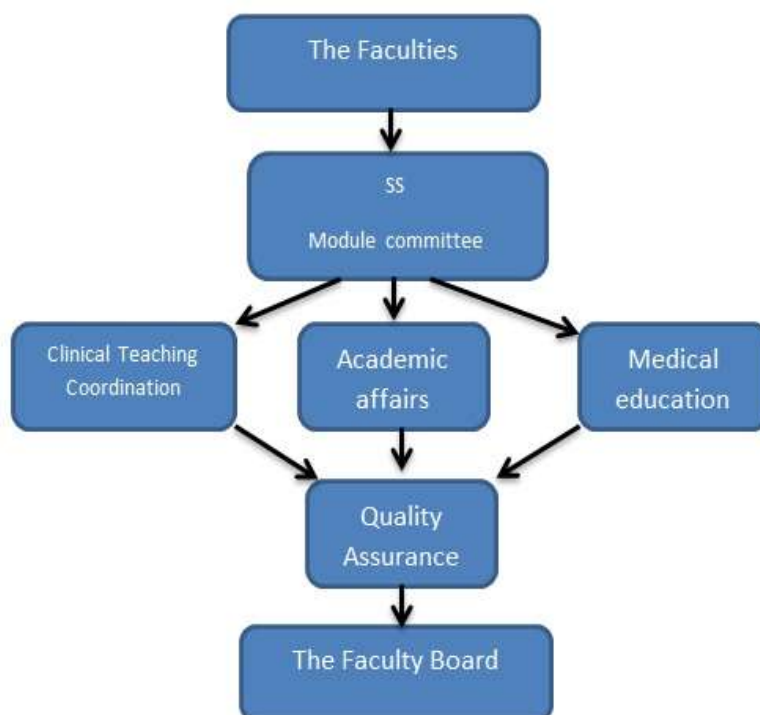


Figure 1: The hierarchy of module development and management(ss: selective subspecialties)

Assessment

The students’ performance is assessed by both formative and summative methods. The formative assessment which represents 60% of the total marks includes seminar presentation, problem-solving sessions, clinical cases and procedures portfolio, and quizzes. The summative assessment which represents 40% of the total marks is composed of two components. The first component is the written examination that includes multiple choice questions, extended matched questions and short essay questions. The second component is the clinical examination, which is an objective structured clinical examination (OSCE). The students’

performances were good and we observed that their performance in the coursework assessment (the formative) is better than the final (summative).

Feedback and Evaluation:

Obtaining feedback is the cornerstone in monitoring and improving all processes and procedures in medical education^(11, 12, 13). The students and the academic staff that participated in the module delivery were asked about their opinion on the module. They responded through 4-items Likert scale questionnaire as shown in Table 2.

A feedback was obtained from a total of 33 students and 28 faculties. They were asked to express their opinions about the following module components:

- 1- Module intended learning outcomes
- 2- Course objectives and skills required
- 3- The theoretical concepts and applications
- 4- The adequacy of coverage of the subject matter
- 5- The structure of the module
- 6- The balance between different instruction methods
- 7- The teaching methods encourage active participation
- 8- The methods of assessment
- 9- The opinion about the study guide
- 10- The opinion about the module as a whole

Table 2: results of the students and academic staff evaluation

Characteristic	Respondents	Excellent	Good	Satisfactory	Poor
1. The module intended learning outcomes	Faculties	8	10	2	0
	Student	4	28	0	1
	Total	12	38	2	1
2. The course objectives and skills required	Faculties	9	10	1	0
	Student	2	18	12	1
	Total	11	28	13	1
3. The theoretical concepts and applications	Faculties	8	8	3	1
	Student	5	19	8	1
	Total	13	27	11	2
4. The adequacy of coverage of the subject matter	Faculties	9	5	6	0
	Student	3	20	9	1
	Total	12	25	15	1
5. The structure of the module	Faculties	11	6	3	0
	Student	1	21	9	2
	Total	12	27	12	2
6. The balance between different instruction methods	Faculties	9	7	3	1
	Student	2	21	9	1
	Total	11	28	12	2
7. The teaching methods encourage active participation	Faculties	9	8	3	0
	Student	0	22	10	1
	Total	9	30	13	1
8. The methods of assessment	Faculties	8	7	4	1
	Student	0	10	16	7
	Total	8	17	20	8
9. The opinion about the study guide	Faculties	9	8	3	0
	Student	2	22	8	1
	Total	11	30	11	1
10. The opinion about the module as a whole	Faculties	8	10	2	0
	Student	4	28	0	1
	Total	12	38	2	1

As shown in Table 2, the perception of both students and the academic staff is generally good and they were happy with the components of the module and its implementation. The best-evaluated item by the students is the module intended learning outcomes, 4 and 28 students rated it as excellent and good respectively. And the least accepted by the students is the assessment methods, 16 and 7 rated it as satisfactory and poor respectively. The academic staff perceptions were average in all items and distributed in zones of excellent, good and satisfactory.

II. Conclusion

We followed eight steps to plan, design and implement a module of selective subspecialty for undergraduate medical students. After implementation, we feel that the module fulfills its objectives and the

feedback that was obtained from the students and the academic staff who participated in the module was encouraging.

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