



Setting objectives for a competency-based undergraduate obstetrics and gynecology curriculum

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Abstract

Introduction: Little emphasis on standardization, less stringent outcome measurement and resource constraints can result in deteriorating competencies among medical graduates in a country with rapidly increasing number of medical institutions like India. A competency-based curriculum is where we carefully design curricular experiences to achieve pre-identified outcomes. In this study, we aimed to define the outcome objectives of a competency-based undergraduate Obstetrics and Gynaecology curriculum which is comprehensive, and is based on the present day need of our society. These objectives can serve as the basis for designing a suitable curriculum with aligned teaching learning and assessment methods.

Methods: This is an observational study in which a Delphi technique was used to identify the outcome objectives representing competencies specific to the subject of obstetrics and gynaecology at graduate level. The six core competencies identified by Accreditation Council for Graduate Medical Council formed the framework to identify these competencies. Then, a cross-sectional countrywide survey was conducted among purposively sampled teachers and clinical experts through a postal questionnaire to know the relative importance of the identified outcome measures and need for their inclusion in a contemporary outcome-based curriculum.

Results: Ninety four medical teachers and clinical experts, belonging to institutes across the county, with demonstrable interest and expertise in the field of medical education identified 38 outcome objectives for the curriculum. There were twenty one “vital”, fourteen “essential”, two “desirable” and one “optional” outcome objectives identified. There were eighteen outcome objectives for “patient care” domain, nine for “medical knowledge”, four for “Practice based learning and improvement”, three for “professionalism”, two for “system based practice”, and two for “interpersonal and communication skills”.

Conclusion: The outcome objectives for a competency-based obstetrics and gynaecology curriculum in an Indian context were defined.

Keywords: Outcome, Objectives, Competency, Obstetrics, Gynecology, Curriculum

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Please cite this paper as:

Halder A, Joshi A, Mehrotra
R, Rathinam B, Shrivastava
S. Setting objectives
for a competency-based
undergraduate obstetrics
and gynecology curriculum.
J Adv Med Educ Prof.
2018;6(4):147-154

Received: 18 February 2018

Accepted: 2 September 2018

Introduction

India has seen an exponential increase in the number of teaching medical institutions after the Medical Council of India's effort to ease out the norms for establishing new institutes. This was done in order to improve the dismal doctor patient ratio in India. In fact, India has the largest number of medical colleges in the world as a single country at present with around fifty thousand graduating students every year (1). Little emphasis on standardization, less stringent outcome measurement, and dearth of resources may result in deteriorating outcome in terms of competent medical graduates (2). Moreover in the large process-oriented method (3) of teaching and assessment, students are left to gain whatever they can in the fixed duration of the curriculum and are graded at the end of the time in a summative assessment. So-called low achievers are phased out and they carry a punitive impression about the three hour examination, the content of which may have a wide disconnection with the real life situations. The alternative method (3) could be keeping the outcome objective constant and let the student achieve predefined goals in controlled curricular exposure with varying durations (4). A competency-based curriculum is, therefore, where we carefully design curricular experiences to achieve pre-identified outcomes. Of course, the content and duration of exposure may have to be student-specific with the avoidance of any stigma of poor performance among peers. This requires tailored support from the teachers based on continuous formative assessment. The first step in this regard is to identify the objective of a course or curriculum. Needs-based, comprehensive and achievable objective setting at the outset irons out major frills in the success of any medical curriculum (5, 6). Teaching, learning, and assessment methods can thus be designed or chosen to suit best to the predefined objectives. In this study, we aimed to set the objectives of a competency-based undergraduate Obstetrics and Gynecology curriculum specific to the present day need of our country and society.

Methods

In an observational study, a cross sectional survey was conducted among the teachers and clinical experts of Obstetrics-Gynecology and Community Obstetrics through a postal questionnaire. Purposive sampling method was used to address the geographical and institutional variations while selecting the experts. Participants were asked to give their opinion

regarding what should be the outcome objectives of a contemporary Obstetrics and Gynecology curriculum with the relative importance of each of these identified outcomes.

The framework of the questionnaire was based on the outcome project undertaken by Accreditation Council for Continuing Medical Education (ACGME) USA in 1999 which defined the general core competencies for medical graduates and postgraduates (7). The core competencies were divided into six major domains which provided the framework for designing medical courses and setting outcome goals (8). We wished to develop our obstetrics and gynecology curriculum based on the principles of core competency as suggested by the outcome project. The challenge was to convert the general core competences into outcome objectives specific to the discipline of obstetrics and gynecology fit for medical graduates serving the Indian society (9-11). Therefore, to identify the core competencies corresponding to obstetrics and gynecology, we developed a questionnaire based on the six core competencies defined by ACGME namely: 1. *Patient care*, 2. *Medical*, 3. *Practice-based learning and improvement*, 4. *Professionalism*, 5. *System-based learning*, and 6. *Interpersonal and communication skills*.

For the development of an instrument, six core competency domains were put before were put before the investigators and external investigators and external experts having demonstrable inclination and documentation in medical education. This core group decided to follow Delphi technique (12) for preparing the first draft of the questionnaire. Multiple rounds of structured interactions and justifications were conducted and at the end the group made consensus on 59 items reflecting AGME domains in Indian context. Each item was supposed to measure the single dimension of desired outcome objective. This first draft of the questionnaire was distributed among a larger group of experts and they were asked to comment categorically on the syntax, appropriateness, difficulty, relevancy and ambiguity, if any, to ensure face validity. It was specifically asked to emphasize the inapplicable/incompatible/redundant items and those items which needed inclusion but were missed by the core group for ensuring both precision and comprehensiveness. This exercise led to dropping of several redundant items with reframing of several others. Finally, 38 items remained and 21 dropped. Five choices were given to mark the importance of each outcome which defines importance for inclusion in the curriculum "0" *need not be included*, "1" *may or may not be*

included, “2” nice to include, “3” good to include, and “4” must be included.

This study was conducted among the experts in 15 different medical schools of India. Participants were selected by purposive sampling. Institutions from wide geographic locations situated across the country were selected. Inclusion criteria were compulsory medical council of India registration for participating institutes and willingness to give formal permission for participation. Upon agreement, a pre-identified sample of 10 teachers per institute was requested to participate in the postal survey. The idea behind inviting a small pre-defined sample from each institute was to capture the institutional variability of implementation of curriculum with maximum representation of different geographical areas.

The responses were entered into Microsoft Excel 2007™ (Washington, USA) and further analyzed with Epi-Info™7 (CDC, Atlanta USA). As all the responses were recorded on an ordinal scale, measures of central tendency were determined as median and mode value for each item. In statistical analysis, dispersions of the scores were calculated by *Inter- Quartile Range*. The frequency of the *Mode* was also taken into consideration. A decision of significance was

taken at this stage by considering the item as “Vital” if it received score of 4 in both measures of central tendency, ‘*Essential*’ if at least one score obtained was 4 and other was 3, and ‘desirable’ if any of the responses was 2. If both mean and the median were “<2”, then those outcome measures were taken as “*Optional*” items for inclusions by experts.

The project was approved by the Research Review Board of All India Institute of Medical Sciences Bhopal and the Institutional Human Ethics Committee (Code IM00032) with the waiver for written consent as the project required the participants to express their perceptions only without their personal identity being disclosed and that it did not involve any intervention. Administrative permission from each participating institution was taken before sending the postal questionnaire.

Results

The questionnaire was sent to 15 medical schools situated in various geographical locations across the country. A total of 150 participants were approached (ten per institute) to participate, but we received only 94 completed questionnaires with a response rate of 62.6 percent. Among

Table 1: Student outcome objective for patient care domain

I. Patient care	Mode (Frequency of mode)	Median (1 st -3 rd Quartile)	Interpretation
1. Students should be able to explain about disease condition, prognosis, treatment options available, its cost and expected complications for the patients and hence facilitate the process of informed decision making.	4(54)	4(2-4)	Vital
2. Students should be skillful to identify risk factors in antenatal mothers through history and examination.	4(72)	4(3.75-4)	Vital
3. Students should be skillful enough to demonstrate counseling skills effectively during their encounters with patients in outpatients/inpatients.	4(50)	4(3-4)	Vital
4. Students should have sufficient knowledge of preventive health services (like IFA supplementation, Diabetes screening among ANC, tetanus immunization among ANC) and further value the implementation of those services for promotion and protection of health.	4(64)	4(3-4)	Vital
5. Students should have sufficient knowledge and skills to advise on neonatal follow-up and universal immunization.	4(62)	4(3-4)	Vital
6. Students should be knowledgeable and skillful enough to perform general physical examination.	4(70)	4(3.3-4)	Vital
7. Students should be knowledgeable and skillful enough to perform abdominal obstetrical examination.	4(72)	4(4-4)	Vital
8. Students should be knowledgeable and skillful enough to perform PAP smear test.	4(54)	4(3-4)	Vital
9. Students should be knowledgeable and skillful enough to perform IUCD insertion.	4(52)	4(2.3-4)	Vital
10. Students should be knowledgeable and skillful enough to conduct normal vaginal delivery.	4(66)	4(3-4)	Vital
11. Students should be knowledgeable and skillful enough to perform episiotomy repair.	4(62)	4(3-4)	Vital
12. Students should be sensitive enough to understand the importance of work within a team.	4(48)	4(2-4)	Vital
13. Students should be able to clinically differentiate the wellbeing status of a newborn and further administer essential newborn care.	4(46)	3(3-4)	Essential
14. Students should be knowledgeable and skillful enough to perform bimanual vaginal examination.	4(44)	3(2.3-4)	Essential
15. Students should be knowledgeable and skillful enough to perform cervix biopsy.	4(32)	3(1-4)	Essential
16. Students should be knowledgeable and skillful enough to perform assessment of the progress of labor.	4(40)	3(2-4)	Essential
17. Students should be knowledgeable and skillful enough to perform endometrial biopsy.	4(28)	2(0.3-4)	Desirable
18. Students should be knowledgeable and skillful enough to perform colposcopy.	0(30)	1(0-3)	Optional

the 94 participants, 45.68% of the teachers were university examiners and were involved in formative as well as summative assessment of students in the subject of obstetrics and gynecology. The average teaching experiences of this group was counted as 5.36 years. Nearly, 31% of them had a teaching experiences of >10 years.

The domain “*Patient Care*” (Table 1) broadly deals with counseling and educating patients, performing skill-based diagnostic or therapeutic procedures, and demonstrating the ability to work within a team. There were 18 competencies identified in the patient care domain which could be possible goals for obstetrics and gynecology curriculum. Twelve of these were considered *vital* and four *essential*. Identification of the risk factors among antenatal women, informed decision making, and advice on preventive health care were considered vital. The neonatal follow up and immunization was considered *Vital*, but newborn care was considered *essential*. Skills which were considered *vital* were general physical examination, obstetrical abdominal examination, normal vaginal delivery, episiotomy repair, IUCD insertion and pap smear test. Skills considered *essential* were assessment of progress of labor, bimanual vaginal examination, and cervical biopsy. Endometrial biopsy was considered in the category of *Desirable* and colposcopy was considered *Optional*.

The second domain, “*Medical Knowledge*” (Table 2), deals with the capability of analytical thinking and use of basic sciences knowledge

in clinical care. There were nine competencies identified under this domain. Five were considered to be *Vital*. With the inclusion of routine antenatal care, risk identification and preliminary management of obstetric emergencies, almost all the constituents of basic obstetric care (BMOC) were included in the *vital* category. There was a high number of teachers stated that the graduates should be able to identify, provide early management and arrange transit care for obstetric emergencies. Moreover, the knowledge and skills required to advise the clients on contraceptive use was also included in the vital category. Management of complicated obstetric conditions, screening and diagnosis of malignancies were included in *essential* category. Management of sub-fertile couples was predictably characterized as *Desirable*.

The domain of “*Practice-based learning and improvement*” (Table 3) broadly deals with analyzing own practice and improvement based on evolving evidence, ability to understand basic research methods, and statistical tools. All the competencies were considered *Essential* as these cannot be visualized separate entities but adjunct to medical practice in general. There were four competencies identified in this domain.

“*Professionalism*” (Table 4) includes compassion, abiding ethical principles and demonstrating sensitivity and responsiveness to patient’s culture, age, gender and disabilities. Two competencies were identified in this domain as *Vital*. The third competency which expects the

Table 2: Student outcome objective for medical knowledge domain

II.	Medical knowledge (Outcome objectives)	Mode (Frequency of mode)	Median (1 st -3 rd Quartile)	Interpretation
1	Students should be knowledgeable and skillful to prescribe the routine investigation for antenatal women.	4(58)	4(3-4)	Vital
2	Students should be knowledgeable and skillful enough to identify high risk pregnancy through history, examination, and investigations.	4(52)	4(3-4)	Vital
3	Students should be sufficiently skillful to take first aid measures in emergency situations associated with pregnancy like eclampsia, PPH, maternal collapse and transit care to higher center.	4(60)	4(3-4)	Vital
4	Students should have the necessary background knowledge about contraceptive methods and wisdom to prescribe those to eligible couple in judicious manner.	4(50)	4(3-4)	Vital
5	Students should have sufficient background knowledge of basic sciences and the application of this knowledge while dealing with Obstetric and Gynecological cases.	4(52)	4(2-4)	Vital
6	Students should be knowledgeable and skillful enough to order and interpret investigations pertaining to common complications which may arise in pregnancy like abortions, PIH, GDM, IUGR, etc. during MBBS course.	4(42)	3(3-4)	Essential
7	Students should have sufficient knowledge and skills to advise on screening of premalignant and malignant diseases of female genital tract and breast.	4(44)	3(2-4)	Essential
8	Students should have necessary knowledge of symptoms and signs of malignancy and examine clinically and prescribe relevant investigations.	4(36)	3(2-4)	Essential
9	Students should have necessary knowledge to take appropriate history, order and interpret basic investigation pertaining to a subfertile couple, examine clinically, and initiate relevant investigations.	2(32)	2(2-4)	Desirable

Table 3: Student outcome objectives for problem-based learning and improvement domain

III. <i>Problem-based learning and improvement</i>	Mode (Frequency of mode)	Median (1 st -3 rd Quartile)	Interpretation
1 <i>Students should be sensitized/oriented enough in any ways (like through seminar, CMEs/ special lectures/symposium/forums) apart from didactic lectures and clinical postings to know about recent advances and practices in OBGY.</i>	4(38)	3(2-3)	Essential
2 <i>Current routine teaching learning practices in OBGY should have the optimum inclusion of recent evidence and updated guidelines.</i>	4(38)	3(2-3)	Essential
3 <i>Current routine teaching learning practices in OBGY should have the optimum inclusion of methods to orient students about methods of medical research and basic biostatistics.</i>	4(32)	3(2-3)	Essential
4 <i>Current routine teaching learning practices in OBGY should have the optimum inclusion to make the effective use of internet-based tools (like search engine, databases) to promote self-directed learning in OBGY.</i>	4(30)	3(2-3)	Essential

Table 4: Student outcome objectives for professionalism domain

IV. <i>Professionalism</i>	Mode (Frequency of mode)	Median (1 st -3 rd Quartile)	Interpretation
1 <i>Students should be sensitive and vigilant enough to take care of gender and culture sensitive issues during independent or supervised patient care.</i>	4(58)	4(3-4)	Vital
2 <i>Students should be sensitive to maintain the professional secrecy and take proper informed consent during the MBBS course.</i>	4(58)	4(2.8-4)	Vital
3 <i>Students should show sensitivity about the patient's concerns emphatically and act in selfless (altruistic) manner when dealing with him/her.</i>	4(46)	3(2-4)	Essential

student to be altruistic is considered *Essential*. There are totally three competencies identified in this category.

The domain of “*System-based practice*” (Table 5) is characterized by the competencies of cost effective treatment and the ability to help the patient understand and benefit from the larger health system of the state. The wisdom of prescribing cost-effective treatment and not compromising on patient outcome was considered as *vital*. The knowledge of the larger

health system of state in the form of government policies and programs was considered *Essential* by the participants.

The domain of “*interpersonal and communication skills*” (Table 6) includes caring and respectful behavior and ability to listen actively to capture useful information. The competency to work within a team is shared with the competencies of patient care and thus is not included here. It can be clearly concluded here that these competencies are vital to the success of

Table 5: Student outcome objectives for system-based practice domain

V. <i>System based practice</i>	Mode (Frequency of mode)	Median (1 st -3 rd Quartile)	Interpretation
1 <i>Students should have the wisdom to choose the optimal beneficial treatment to patient with due consideration of cost.</i>	4(48)	4(2-4)	Vital
2 <i>Students should be sensitive enough to understand interrelationship of their practices with the larger system.</i>	4(44)	3(3-4)	Essential

Table 6: Student outcome objectives for interpersonal and communication skills domain

VI. <i>Interpersonal communication skills</i>	Mode (Frequency of mode)	Median (1 st -3 rd Quartile)	Interpretation
1 <i>Students are sensitive enough to perceive the value of caring and respectful behavior towards patients and their relatives.</i>	4(68)	4(3-4)	Vital
2 <i>Students are skilled enough to interact with patients and to listen to them actively in order to extract useful information from the conversation.</i>	4(60)	4(3-4)	Vital

any medical graduate working across specialties and are thus marked as *Vital*.

Discussion

The societal need of producing effective and efficient primary health care physicians as a response to fragmented and economically inefficient care has indeed consigned major responsibilities to Indian medical schools. A need-based curriculum stands as the first milestone on the path to achieving a system of producing an effective primary physician. Approach to curriculum (3) at present is largely “*process-based*”, in which we deliberate on the need for undergoing a set amount of exposure, for example sufficient number of lectures, enough number of cases, etc. This method proposes a constant time frame in which a student gains the required knowledge, attitude and skills depending upon his/her personal capabilities and his/her teacher’s expertise. It becomes obvious that this system produces graduates of variable capabilities depending on individual baseline caliber of the student as well as the teacher, leaving a large room for uncertainties. But methods of assessment in Process-based Curricula are easy and low cost which make these methods suitable to us; thus, they continued to be followed in spite of strong contradicting evidence to their effectiveness (13). On the other hand, “*outcome-based curriculum*” strives to prepare a student towards achieving predefined evidence-based outcome goals. With the “*outcome*” as constant, the student may take variable time depending on his own capabilities to reach the set goals. This approach requires more student-centred approach and tailor-made treatment to students. Assessment is more difficult and resource intensive (14). However, outcome-based curriculum serves more effectively the purpose of producing useful and ready physicians (15, 16). Another important benefit is that since the goal is constant, people can innovate and design their own pathways to reach the same goal, leaving scope for locally relevant and feasible teaching learning methods as well as more scope of research in medical education without compromising the patient outcome. Therefore, the importance of defining the outcome comes even before the effective curriculum could be designed (5). The outcome of a curriculum could be either the competency (ability to repeatedly and efficiently perform) gained by the student or the final patient outcome. There is no doubt that the patient outcome remains the most valid indicator which directly reflects the performance of any educational system in medicine (17). However, patient outcome indicators have

stronger confounders and serve only on the long term assessments and are most suitable for evaluation of residency programs, rather than the summative assessment of individual students (18). On the other hand, student competency- based outcome goals are to be achieved by the end of the curriculum and are thus useful for assessment for individual students (19).

The two notable efforts which have aimed to define the competencies in the specialties of obstetrics and gynaecology are the sexual and reproductive health core competencies for primary health care workers by World Health Organization in the year 2002 and the ACGME efforts to develop competencies for the subject of obstetrics and gynaecology. Rather elaborate effort was made by ACGME in 2011 (20) to develop the obstetrics and gynaecology core competencies. This was in continuation of the outcome project (7) in which six domains of competencies were identified. It has been demonstrated that after the introduction of the six general core competencies as the frame of reference for medical graduate education related teaching learning and assessment, there has been notable improvement in the outcome of residency programs in USA (21). Based on this premise, the ACGME core competencies formed the framework on which each of the medical specialties could identify their own specialty-specific competencies. Later with the help of Obstetrics and Gynaecology milestone framing committee, milestone working group and milestone advisory group, specific core competencies for obstetrics and gynaecology were defined. First, the experts in the field of obstetrics and gynaecology developed a very extensive list of objectives which was shortened and streamlined by the working group in consultation with the advisory group (22). They developed in total 28 obstetrics and gynaecology competencies spread across the six ACGME competency domains. As in the case of the present study, maximum 18 competencies were for *Patient Care*. Ten competencies were there to address the competencies of *Practice-based learning and improvement*, *Professionalism*, *Interpersonal and communication skills*, and *System-based practice and improvement*. These competencies formed the framework on which the curriculum for obstetrics and gynaecology residency programs could be developed and evaluated.

Another notable effort of defining the core competencies for sexual and reproductive health (SRH) at the primary health care level was undertaken by World Health Organization in 2002

(23). While developing these core competencies for the primary health care providers, WHO expert group also used a Delphi research process (12). The WHO core competencies for SRH were intended to be used at the primary health care level and not specifically by an individual but by the group of people working in the facility with varied capacities. WHO identified thirteen core competencies which could be divided into four major domains, namely: a) *Attitudes for providing high-quality sexual and reproductive health care*, b) *leadership and management* c) *General sexual and reproductive health competencies for health providers*, and d) *Specific clinical competencies*.

The present set of competencies which have been identified by a novel statistical method in this study is intended for obstetrics and gynecology curriculum for graduate training. Unlike the SRH-WHO core competencies which are intended for service at the primary health care level, our competencies are meant to be demonstrated by a single student, and thus helpful assessment at the end of the course helps him make a competent Indian medical graduate. On the other hand, the ACGME core competencies are meant for designing the curriculum and assessment of students but those are meant for postgraduated residency programs and thus more elaborate.

We have been able to develop the obstetrics and gynecology core competencies for undergraduate medical courses in the Indian context. These competencies will be a useful guide for framing competency-based obstetrics and gynecology curricula and will form a benchmark for continuous quality improvement and betterment of obstetrics and gynecology training and education. This will also ensure that all obstetrics and gynecology training and education meet the society's needs and expectations. It should be emphasized here that regular efforts are required to redefine what constitutes the core competencies in obstetrics and gynecology and what curriculum is necessary to develop most competent and up-to-date obstetrics and gynecology medical graduates. It goes without saying that the effort to define undergraduate core competencies for obstetrics and gynecology will be grossly incomplete without defining the competencies of other subjects and also when the ultimate goal is a competency-based undergraduate curriculum. Relative importance of the competencies as expressed by the outcome objectives will guide us to design the curricular experience so that the vital ones get more detailed exposure followed by essential outcome objectives.

While defining behavioral objectives for a medical curriculum, we will have to be clear

about the fact that being objective can keep us focused but should not make our vision narrow so as to miss the need for achieving higher analytic and assimilative thinking of a doctor (24).

Conclusion

Outcome objectives of a competency-based undergraduate obstetrics and gynecology curriculum have been developed by taking the opinion of stakeholders through a structured questionnaire developed for the purpose by using an elaborate Delphi Process.

Limitations of the study

In order to keep the list of competencies realistic and doable, we have included only those objectives which have a higher likelihood of getting a favorable response.

Acknowledgment

Authors convey their sincere thanks to participating institutions.

Conflict of Interest: None declared.

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