



Determining competencies for the development of curriculum of Community Medicine and Family Medicine for undergraduate medical students

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ABSTRACT

Objective: This research was planned to determine the set of competencies for training of undergraduate medical students in the Department of Community Medicine & Family Medicine (CMFM), so that the graduates can develop the skills to perform the expected roles in providing health care to the community. **Methods:** Different qualitative methods were used for determination of competencies in phases, amongst which the Delphi was the important technique for this study to arrive at a consensus regarding core competencies and skills to be acquired during undergraduate training. Two Delphi rounds were conducted. The experts from different specialties e.g. academicians, consultants, researchers etc were invited to participate through e-mail and data collection was done through this process only. **Results:** In Delphi I round 46 participants responded and after analysis of Delphi I round, the modified questionnaire was sent to all the Delphi I participants again. In Delphi-II, only 26 participants responded. These responses were considered in the preparation of final lists of competencies and skills. Based on the findings, the consensus was made on the core competencies and skills. **Conclusion:** The various skills listed in the document will help in developing competency-based curriculum in CMFM which needs to be reviewed time to time as per the requirement.

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INTRODUCTION

The past decade has seen a revolution in developing, revising and implementing changes in medical education across the globe. The concept of the “five-star doctor” was proposed as an ideal profile of a doctor possessing a mix of aptitudes to carry out the range of services that health settings must deliver to meet the requirement of relevance, quality, cost-effectiveness and equity in health. The five sets of attributes of the “five-star doctor” were summarized as care provider, decision-maker, communicator, community leader, and manager [1]. Despite these well-defined roles, there has always been a concern raised about the mismatch between the health professionals’ education, health care delivered, and societal health needs [2,3]. In India, the Graduate Medical Curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative & rehabilitative aspect of Medicine [4].

To achieve this objective, the specialty of Community Medicine is expected to train medical graduates as community and family physicians. At the end of this training, they are expected to be the primary care physicians who should apply and integrate medical knowledge, clinical skills and professional attitudes in their provision of care. So, the training of undergraduates in Community Medicine needs to be appropriately structured to produce competent

medical graduates so that they can practice their profession in resource poor settings also and be able to deliver primary health care services.

Competency is an observable ability of a health professional, integrating multiple components such as knowledge, skills, values and attitudes. These are formed through an individual’s knowledge, skills and abilities and provide a framework for distinguishing poor and exceptional performance. Competencies can be applied in organizational, individual, team, occupational and functional levels. For addressing the misalignment of training and the efforts at making the ‘competencies’ as the chief driving force of medical training and curricular planning has gained momentum since the turn of the century [2,3,5].

In India, there has been a relatively recent need-driven movement towards competency based medical education. The Graduate Medical Education Regulations 1997 (GMER) of the Medical Council of India (MCI) mention the term ‘competent’ under institutional goals. Following a series of meetings and deliberations, reforms were suggested in the form of ‘Vision 2015’ document in 2011 [6,7]. For the first time, the outcomes of graduate medical education were expressed as the competencies that an ‘Indian Medical Graduate’ would develop so as to function as a ‘Basic Doctor’ or a physician of first contact to the people of India and the world [8].

With the objective of imparting quality medical education as well as super specialty care to all, Government of India has started six new All India Institute of Medical Sciences (AIIMS) in 2012. Government of India has taken initiative to start the Department of Community Medicine & Family Medicine (CMFM) in these six new AIIMS since inception. As there are no set guidelines regarding the curriculum for Community Medicine and Family Medicine (CMFM) for undergraduates, this research was planned to determine the core competencies with the clearly defined skills. So, the prime objective of this research is to establish consensus on competencies in CMFM curriculum for undergraduate medical students through Delphi technique and use these suggested competencies for development of curriculum for CMFM.

METHODS

The study design chosen for this research was primarily Delphi [8] but other qualitative methods were also used in different stages of curriculum development. In the last two decades, Delphi was extensively used in research and education. In the modern form, the information in the form of a questionnaire is collected from a group of experts within the field of investigation. The answers are analyzed anonymously, and fed back to the same group of experts as the basis for subsequent rounds providing them an opportunity to revise their judgments. The number of rounds depends on how quickly consensus is reached [9,10]. The reasons for choosing the technique was the anonymity of the experts which would prevent the dominance of the most outspoken and garrulous, a common scene in curriculum advisory groups. Also, experts from different institutes may give the core competencies of the curriculum a wide acceptance and opportunity for the participants to see the opinions of others.

The study was carried out at All India Institute of Medical Sciences, Jodhpur for a period of one year. The study participants were interns, residents, medical teachers from different disciplines, Family Medicine specialists, private general practitioners, practitioners from other health care settings, resident doctors and researchers.

The study was conducted in different phases using various qualitative methods. Initially the preliminary list of competencies and skills was prepared through literature review [3,11,12,13] and views of some experts of Community Medicine from all six new AIIMS at a meeting on curriculum development of Community Medicine and Family Medicine held in January 2013 at Bhubaneswar AIIMS in the first phase. In the second phase, the questionnaire was pilot tested amongst subject experts who volunteered to participate in this phase. The third phase was the heart of the study comprising of Delphi rounds, but was limited to two rounds only in this investigation [14]. In Delphi I round 46 participants responded. The participants were asked to list the number of competencies and skills that were necessary and give comments wherever it was required. There were very good inputs from the participants and it was obvious from

the comments that a lot of thought process was involved behind the suggestions. After analysis of Delphi first round competencies and skills were rearranged in descending order of agreement and those with less than 50% were removed from the questionnaire. For Delphi round II, modified questionnaire with suggestions and feedback from Delphi round I was used. The participants who dropped out in the first round were excluded. The results in the form of agreement and disagreement were calculated and final list of competencies and skills was prepared. In Delphi-II round only 26 participants responded so, the responses of 26 participants were considered in the final analysis.

The informed consent from participants was taken through email. A LIKERT scale was used for the participant's responses[15]. The skills acquired during training were graded as Must Know/Should Know/Nice to know/Not required and core competencies were rated as agree/disagree. The participants were asked to fill their questionnaires and send it to the investigator through the mail. The data was analyzed using Microsoft office 2013 and SPSS version 21.

Subsequently, in the fourth phase, the list of competencies was presented and discussed in "Conclave on Community Medicine and Family Medicine in Institutes of National Importance with special Emphasis on new AIIMS" at (National Institute of Health and Family Welfare (NIHFW), New Delhi held in December 2013. This was finally approved by the expert members in a panel discussion for preparation of competency based curriculum of the subject.

Final document was presented before the Foundation for Advancement of International Medical Education and Research (FAIMER) faculty members and fellows at Seth GS Medical College, Mumbai in June 2014. This constituted the fifth phase.

RESULTS

In our study, the most important of all the methods used in the research was Delphi. In Delphi I round, 46 participants responded out of total 150 participants to whom the questionnaire was sent through email. In Delphi-II round, the analysis was done of 26 participants after the consideration of completeness of questionnaire and validation of responses. Out of the total 26 participants, around two-third (17) were academicians and the rest were consultants from diverse medical fields. The responses of the participants differed in two rounds. There were many competencies which were not considered worth by many experts during training of undergraduates. Even the participants changed their responses from Agree to disagree and disagree to agree in deciding competencies of the subject. It was observed that the professionals having experience less than 10 years were more consistent than the professionals having experience of more than 10 years in Delphi rounds. The responses opted for different skills by participants were 82.3% for "Must Know", 15.4% for "Should Know" and 2.3% for "Nice to Know". It was surprising that The skills mentioned in the list didn't get a single response

for “Not required” by any of the participants. Based on the findings of the study, the consensus was made on the core competencies and skills.

Initially a long list of competencies was provided to the participants. Based on the agreement amongst experts, the core competencies finalized after both the rounds were (1) Clinician/Medical Practitioner (2) Communicator cum Health Advocate (3) Professional (4) Manager and Leader (5) Researcher. These competencies were unanimous and were considered essential from the subject point of view. The agreement was 100% for these competencies. The skills required to develop these competencies are listed in Table 1. The set of skills are to be acquired by students during the training of Community Medicine and Family Medicine.

DISCUSSION

The department of Community Medicine and Family Medicine established in all six new AIIMS of India needed a complete overhaul of curriculum of the subject. With this goal in mind, this research was done to establish the evidence based set of competencies and skills for the undergraduate students of CMFM. The literal meaning of competency is the ability to do something and can be viewed as ingredients of competence. The competencies of a particular discipline encompass various aspects and hence are best described as a statement of abilities in context to different stages of training (related to setting, experience and time) [16,17]. Here in the present study, the core competencies of CMFM came out to be a clinician, communicator, researcher, leader/manager and professional. These are the competencies which should be developed during undergraduate level in every student to fulfil the common roles and responsibilities as a medical practitioner. It is anticipated that these sets of competencies will be potentially useful for a range of audience [18]. The skills needed to develop these competencies are mentioned in the Table 1.

These sets of competencies and skills were finalized after going through the different stages of refining. The Delphi method was the most important instrument in determining these sets. The Delphi technique has been used in the past for curriculum development of different subjects to obtain consensus amongst the participants. The conventional methods used for curriculum development have many drawbacks which have been avoided in this study, e.g. difficulties in reaching consensus amongst the different intelligentsia group, dominance of few strong members and lack of pragmatism [14,19]. The positive experience of the practical Delphi method and flexibility in methodology may be useful in construction of modern teaching programmes in different disciplines [20].

The mentioned lists in tables (Table 1) represent the academic consensus on the core competencies and skills that an undergraduate should acquire during training. This will also assist the academicians and policy makers in medical education to provide a suitable platform to medical schools in establishing competency based curriculum in

the department of Community Medicine and Family Medicine. The felt need of core competencies and skills for Community Medicine and Family Medicine discipline is to ensure standardisation of training. It is important to note that this is the initial step in determining competencies and skills and may need to be changed and updated to reflect the dynamicity of medical education and lessons learnt as time passes. As the medical education is evolving, it should be reviewed constantly for further refining of the content of the lists.

There will also be a need of constant evaluation in the light of reports from different forums that graduates are lacking in certain core areas and will be improved upon with the constructive feedbacks. This is being practiced by different medical regulatory bodies all over the world and academicians as their research projects in medical education [21]. The process of developing competencies and skills may differ at different institutions and universities due to the different modes of teaching and learning practices. Understanding the heterogeneity, there should be a scope of flexibility. The concern should be the outcome which should match the standards rather than the process of achieving it [22].

Furthermore, it should be noted that clinical skills and competencies are not the entire curriculum. They are the essential elements relating to the development of competency based curriculum. A lot more needs to be done in regards to learning outcomes, assessment methods and principles relating to the portfolio of community and family physicians in India considering the varied health needs in different parts of the country and the world and matching the international standards [23]. The other components of the curriculum need to be worked out and further research is needed to develop the subject in totality. The evidence based medical education has renewed the attention of academicians of all subjects and discipline as it provides a conceptual and strategic approach for enhancing the educational enterprise in health professionals.

CONCLUSIONS

The list of competencies and skills offer an important benchmark in curriculum and will serve as the blueprint in rolling out the department of Community Medicine and Family Medicine in all medical schools especially in new AIIMS established in India. Furthermore this document will also provide a useful insight to the postgraduate programs already running in the country. It is relevant to health services as these skills will help define the norms and standards for services provided at different levels of health care. This will also enhance the competency and satisfaction level of faculty of teachers of the Community Medicine and Family Medicine while imparting education to medical graduates. The defined competencies inculcated in the learners and skills acquired during training are going to provide a patient centered, family focussed and community oriented physician.

Table 1. Skills to be acquired during Community Medicine & Family Medicine undergraduate training

| A. Clinician/ Medical practitioner | |
|---|--|
| 1. | History taking |
| 2. | Performing a full physical examination |
| 3. | Assessing a patient's problem |
| 4. | Forming plans to investigate and manage a patient's problem |
| 5. | Making clinical decisions based on the evidence gathered |
| 6. | Preoperative assessment of patients |
| 7. | Performing a full mental-state examination |
| 8. | Measuring blood pressure |
| 9. | Measuring pulse rate |
| 10. | Measuring body temperature |
| 11. | Interpreting the results of commonly used investigations |
| 12. | Transcutaneous monitoring of oxygen saturation |
| 13. | Identification of 'High Risk Pregnancy' using simple procedures |
| 14. | Nutritional assessment |
| 15. | Carrying out basic respiratory function tests |
| 16. | Performing and interpreting a 12-lead electrocardiograph (ECG) |
| 17. | Managing an electrocardiograph monitor |
| 18. | Managing blood samples correctly |
| 19. | Taking blood cultures |
| 20. | Measuring blood glucose |
| 21. | Taking nose, throat, skin swab |
| 22. | Reading X rays |
| 23. | Advising patients on how to collect a midstream sample of urine |
| 24. | Pregnancy test |
| 25. | Urinalysis |
| 26. | Wound care and basic wound dressing |
| 27. | Skin suturing |
| 28. | Incision and Drainage |
| 29. | Catheterisation |
| 30. | Ryle's tube insertion |
| 31. | Basic life support |
| 32. | Administering a nebuliser correctly |
| 33. | Administering oxygen |
| 34. | Making up drugs for parenteral administration |
| 35. | Instructing patients in the use of devices for inhaled medication |
| 36. | Dosage and administration of insulin |
| 37. | Subcutaneous and Intramuscular injections |
| 38. | Establishing peripheral intravenous access and setting up an infusion; use of infusion |
| 39. | Venepuncture |
| 40. | Blood transfusion |
| 41. | Use of local anaesthetic |
| 42. | Calculating drug dosages |
| 43. | Correct techniques for transfer of patients and logistics |
| 44. | Splinting of fractures |
| 45. | Advanced life support |
| 46. | Use of personal protective equipment (gloves, gowns, masks) |
| 47. | Hand washing (including surgical 'scrubbing up') |
| 48. | Dealing with common emergency care situations |
| 49. | Giving information to the patient about the procedure, obtaining informed consent and ensuring appropriate after care |
| 50. | Writing safe prescriptions of drugs(individual and combination) |
| 51. | Infection control in relation to procedures |
| 52. | Safe disposal of clinical waste, needles and other 'sharps' |
| 53. | Filling MCCD (Medical Certification of Cause of Death) |
| 54. | Recognising and managing the acutely ill patients |
| 55. | Primary care provider |
| 56. | Skills about comprehensive care of individual, family and community levels |
| 57. | Applying the principles of holistic care |
| 58. | Applying knowledge of patient lifestyle, background or religion that may influence diagnosis and management of the patient |
| 59. | Applying knowledge of social and psychological factors on patients' health and care |
| 60. | Application of community based interventions such as "Gadchiroli model" |
| 61. | Special group care e.g., geriatric care, adolescent health |
| 62. | Applying basic screening tests and procedures |
| B. Communicator /health advocate | |
| 63. | Communicating clearly, sensitively and effectively with patients and relatives |
| 64. | Obtaining written, verbal and non-verbal consent |
| 65. | Breaking bad news to patients and/or relatives |
| 66. | Counselling |
| 67. | Communicating effectively with colleagues from a variety of health and social care professions |
| 68. | Interview skills |
| 69. | Dealing with difficult and violent patients |
| 70. | Communicating with individuals who cannot speak English, including working with interpreters |
| 71. | Communicating with patients who have mental illness |
| 72. | Health education |

| | | |
|---|--|--|
| 73. Maternal and child health care | 107. Decision making skills | |
| 74. Knowledge to address common causes of morbidity & mortality | 108. Ability to be accountable for the outcomes of personal and professional actions | |
| 75. Applying the principles of promoting health and preventing disease | 109. Working as a team with other healthcare professionals | |
| 76. Able to answer community queries | 110. Ability to work effectively with colleagues of different lifestyles, backgrounds or religions | |
| 77. Advocacy regarding social issues | 111. Prioritising tasks effectively | |
| 78. Application of knowledge of biomedical waste management skills | 112. Crisis handling/management | |
| 79. Expertise in environmental health, including sanitation and hygiene | 113. Disaster management skills | |
| 80. Expertise in occupational health and hazards | 114. Demonstrating effective leadership skills | |
| 81. Advocacy regarding entomological components in the field | 115. Effective use of resources and logistics | |
| C. Professional | | |
| 82. Being honest with patients, colleagues and supervisors | 116. Demonstrating monitoring skills | |
| 83. Demonstrate a commitment to their patients, profession, and society through ethical practice | 117. Inventory control | |
| 84. Managing own health in order to protect patients and colleagues | 118. Health Planning | |
| 85. Demonstrates respect, and continuous regard for all classmates, faculty/staff, patients, families, and other healthcare providers | 119. Collaborating with other health and social care professionals for better understanding of the situation | |
| 86. Employing a patient centered approach | 120. Basic analytical skills in a given situation | |
| 87. Commitment to patient confidentiality | E. Researcher | |
| 88. Commitment to professional responsibilities | 121. Identifying own learning needs | |
| 89. Taking action if colleagues' health and performance puts patients at risk | 122. Describing the aetiology, pathology, clinical features, natural history and prognosis of common and important illness. | |
| 90. Commitment to improving quality of care | 123. Commitment to learning: welcomes and/or seeks new learning opportunities | |
| 91. Commitment to professional competence | 124. Able to maintain and enhance professional activities through ongoing learning | |
| 92. Commitment to maintaining appropriate relations with patients | 125. Ability to access medical and scientific literature | |
| 93. Demonstrating awareness of the policies and procedures to be followed in the event of problems in clinical practice | 126. Integrating scientific principles into clinical practice | |
| 94. Commitment to improving access to care | 127. Able to demonstrate a commitment to excellence | |
| 95. Using knowledge of legal and ethical issues in practice | 128. Applying core medical and scientific knowledge to individual patients and populations | |
| 96. Demonstrate a commitment to sustainable practice (follow up) | 129. Gaining knowledge of legal and ethical issues (e.g. Public health acts) | |
| 97. Commitment to maintaining trust by managing conflicts of interest | 130. Able to critically evaluate information and its sources, and applying it appropriately to practice | |
| 98. Able to project a professional image | 131. Basic data management skills | |
| 99. Identifying appropriate situations in which to seek help from a senior/other colleague | 132. Information and technology skills | |
| 100. Asserting and expressing views clearly to colleagues | 133. Applying evidence from the medical and scientific literature | |
| 101. Using knowledge of how errors can happen in practice and applying the principles of managing risks | 134. Applying knowledge of alternative and complementary therapies and how these may affect other treatments | |
| 102. Commitment to scientific knowledge | 135. Applying knowledge of common scientific methods to formulate relevant research questions and select applicable study designs. | |
| 103. Critical thinking | 136. Application of sampling techniques | |
| 104. Completing a learning portfolio of evidence to document the progress | 137. Ability to critically appraise medical and scientific literature | |
| D. Manager and Leader | | |
| 105. Managing time effectively | 138. Basic epidemiological skills | |
| 106. Problem solving skills | 139. Report writing | |
| | 140. Outbreak investigation ability | |
| | 141. Proper dissemination of data | |

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The study received permission from the head of the institution and institutional ethics committee. The informed consent of the participants was obtained and anonymity of the participants was maintained.

COMPETING INTEREST

None

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