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Original Research Article

Comparative analysis of medical pharmacology books based on competency based undergraduate curriculum followed by MBBS student in Rani Durgavati Medical College, Banda

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ABSTRACT

Background: National Medical Commission (NMC) has implemented competency based undergraduate curriculum for training of new M.B.B.S. students. As per these curriculum authors of Medical Pharmacology books also changed their book content to fulfill the subject requirement.

Methods: A systematic comparison of books carried out in department of pharmacology Rani Durgawati Medical College, Banda, Uttar Pradesh. There was comparison of 5 books of medical pharmacology of Indian author belongs to edition after 2019. The books included were Essentials of Medical Pharmacology (Jaypee Publication, 8th Edition, 2021), Medical Pharmacology (CBS Publishers And Distributors Pvt Ltd, 7th Edition, 2021), Pharmacology and Pharmacotherapeutics (Elsevier Publication, 26th Edition, 2021), Pharmacology for MBBS (Avichal Publication Company, 2nd edition, 2021) and Pharmacology for Medical Graduates (Elsevier Publication, 4th Edition, 2020). All the books were examined for the competencies described in the pharmacology syllabus. The table was prepared for the availability of topics according to the competencies of different section of syllabus. The chapter/page numbers mentioned in competency table were looked upon for the respective competencies and presence or absence of the topic was noted down.

Results: All the books mainly covered competency given in the knowledge section of the syllabus. Few competencies in skill and communication sections were also covered in the text books.

Conclusions: When all the five books were evaluated according to pharmacology competency in syllabus, none of the books covered whole pharmacology syllabus. This may be because authors considered the competency topics in skill and communication section as a part of practical or because many practical books or manuals are available in the market which covered topics in these sections.

Keywords: National medical commission, Competency based undergraduate curriculum, Pharmacology competencies, Medical Pharmacology

INTRODUCTION

Medical science has been changing drastically in the light of new cutting-edge research and rapidly changing technology. This leads to an imperative of educating and training doctors and providing them the skills and tools to

tackle different diseases both old and newly emerging. In past few decades elimination of many diseases has become possible with help of education and research. With the changing healthcare need of society, better medical education and training is necessary which should be evidence based. To fulfil this goal the erstwhile medical

council of India has implemented competency based post graduate curriculum for the post graduate courses in year 2000.

In India, allopathic medical professionals are trained at the graduate level (MBBS) and later for postgraduate and super specialization level. The standard of medical education in India was framed and maintained by medical council of India until recently (till 2018). MCI had formulated an outline for the MBBS program in the form of Graduate Medical Education regulations 1997 (GMR 1997) (amended up to 2018). Later on, the government of India has dissolved the MCI and replaced it by National Medical Commission (NMC). NMC has implemented competency based UG curriculum for the training of new MBBS graduates from August 2019. Both regulations have many similarities and differences.

Graduate Medical Education Regulations 1997¹

Released and implemented in 1997, it was the guiding document on how to approach the students during MBBS course. It was constantly amended to meet the rapidly changing standard in medical science. The prime goal was to train students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative and rehabilitative aspect of medicine and he/she should be able to meet internationally acceptable standards. In pharmacology subject it tried to achieve the inculcation of knowledge about rational and scientific basis of prescribing medicines.

The pharmacology syllabus focused upon the detail knowledge (like pharmacokinetics, pharmacodynamics, indication, contraindication, adverse effects, etc) about essential and commonly used drugs. It also prescribed for the students to have knowledge of management of common disease and common poisoning, knowledge of clinical pharmacology, environment and occupational pollutant. It also helps to acquire the knowledge of pharmacoeconomics, safety and efficacy of drugs. It also helps students to acquire skills for prescribing drugs for common diseases and will be able to recognize adverse drug reactions of drugs and its interaction. It also integrates pharmacology subject with clinical departments.

Competency based undergraduate curriculum for Indian Medical Graduate 2018^{2,3}

The new competency-based curriculum for Indian Medical Graduate is the result of evolution of fundamentals followed in graduate medical regulation 1997. The undergraduate curriculum aims to make medical education more learner centric, patient centric, gender centric, outcome oriented and environment appropriate. In pharmacology subject, the competencies in the syllabus are divided into knowledge topics, skill topics (clinical pharmacy, clinical pharmacology, and experimental

pharmacology) and communication topics.² Syllabus also described vertical and horizontal integration with other subjects.

The pharmacology books for undergraduate medical students available in the market also have changed the content according to the new pharmacology syllabus. Editions of books coming after year 2019 have modified content according to the new syllabus but whether these books should fulfil the new requirement as prescribed by NMC. So, we planned this comparative analysis upon these books based on Competency based undergraduate curriculum followed by MBBS student in Rani Durgavati Medical College, Banda.

METHODS

A systematic observational comparison of books carried out in Department of Pharmacology, Rani Durgavati Medical College, Banda over the period of 9 months from May 2021 to February 2022. The comparisons of editions after 2019 of 5 books were made. The students of the Rani Durgavati Medical College, who are in second year, were asked about the books they studied for pharmacology subject written by Indian authors. The books included were Essentials of Medical Pharmacology (Jaypee Publication, 8th Edition, 2021), Medical Pharmacology (CBS Publishers and Distributors Pvt Ltd, 7th Edition, 2021), Pharmacology and Pharmacotherapeutics (Elsevier Publication, 26th Edition, 2021), Pharmacology for MBBS (Avichal Publication Company, 2nd edition, 2021) and Pharmacology for Medical Graduates (Elsevier Publication, 4th Edition, 2020).⁴⁻⁸ All the books were examined for the competencies described in the pharmacology syllabus. The table was prepared for the availability of topics according to the competencies of different sections of syllabus. Each book had given the competency table just before the table of content or just after that. Competencies table had mentioned the chapter number or the page number or both where it can be found in the book. The chapter/page numbers mentioned in competency table were looked upon for the respective competencies and presence or absence of the topic was noted down.

RESULTS

All five books were examined for the different competencies of syllabus. The extent to which a competency was matched with the content given in the book is based upon the specific demand of the particular competencies. For example, in competency number 1.13, a student should be able to describe mechanism of action, types, doses, side effects, indications and contraindications of adrenergic and adrenergic drugs, the content related to adrenergic drugs in the books was examined for the mechanism of action, types, doses, side effects, indications and contraindications. The same criteria were applied for all the competencies given in the pharmacology syllabus (Table 1).

Table 1: The number of competency topics present in the book according to their respective competencies table.

Book name	Competencies in syllabus	Competencies covered in book Wholly or partially
Essentials of medical pharmacology (8th edition 2021)		Knowledge-63, Skill-5 Communication-0
Medical pharmacology (7 th edition 2021)		Knowledge-63, Skill-0 Communication-0
Pharmacology and pharmacotherapeutics (26 th edition, 2021)	Knowledge-64 Skill-14	Knowledge-61, Skill-4 Communication-0
Pharmacology for medical graduates (4 th edition, 2020)	Communication-7	Knowledge-52, Skill-2 Communication-0
Pharmacology for MBBS (2 nd edition, 2021)		Knowledge-61, Skill-0 Communication-0

Table 2: Competencies in knowledge section of pharmacology syllabus which are partially covered in the books.

Book name	Number of competencies partially covered
Essentials of medical pharmacology (8th edition 2021)	5
Medical pharmacology (7 th edition 2021)	8
Pharmacology and pharmacotherapeutics (26 th edition, 2021)	12
Pharmacology for medical graduates (4 th edition, 2020)	15
Pharmacology for MBBS (2 nd edition, 2021)	7

The books were also examined according to specific demand of competency-based curriculum for example mechanism of action, dose, types, side effects, indication and contraindication etc. All the books mainly covered competency given in the knowledge section of the syllabus. Few competencies in skill and communication sections were covered in the text books (Table 2).

All the books have given competency table with chapter number or page number or both in the beginning. In Essential of Pharmacology by Dr K D Tripathi only competency table with page number and chapter number is given in the beginning (after the table of content) but the competencies are not given at the start of chapter or between the chapters. In Pharmacology for MBBS by Dr. S. K. Srivastava the competencies are mentioned before the table of content and at the start of respective chapters. Two books, Pharmacology and Pharmacotherapeutics and Medical Pharmacology, have mentioned competency table after table of content and in between chapters where the topics related to it has been described. In Pharmacology for Medical Graduate content is given according to the competencies in the syllabus. Few topics were added in the books either at the end as additional competency topics (Essential of Pharmacology) or miscellaneous topics (Pharmacology for MBBS, Medical Pharmacology, and Pharmacology for Medical Graduate).

DISCUSSION

There are total 64 competencies in knowledge topics, 14 competencies in skill topics and 7 competencies in communication topics in pharmacology syllabus given in Competency based undergraduate curriculum. Each competency is classified in core and non-core

competencies. Syllabus also classifies the competencies into different domain and levels which is desirable for the undergraduates.²

MBBS students are usually recommended for the pharmacology books by faculty members, for the self-study, or they seek guidance from their seniors. Books are meant to give them sound knowledge of subject and to guide them in future. They constitute an important part of learning process in any academic year. The same is true for the pharmacology books for MBBS. The books should cover the syllabus wholly and should be able to impart them adequate knowledge of the subject which is desirable in the syllabus, so that students should be able to achieve the goals enumerated in the MBBS curriculum for Indian medical graduate. With the above intent these books, being studied by the second professional MBBS students, were evaluated for the content according to competency-based pharmacology syllabus.

The editions of pharmacology books for undergraduate students, prior to year 2019, were designed and written to fulfill the goals in the syllabus in the Graduate Medical Regulation 1997.⁹ Almost every book had the same pattern of design and scheme of content. The whole content of the books was divided in different segments/sections/units like general pharmacology, drugs acting on autonomic nervous system, drugs acting on central nervous system, hormone related drugs, antimicrobial agents and chemotherapy etc. The approach was same for all the books available in market. Secondly the chapters in each segment also had same pattern of the drug description. It started with the classification of drugs for particular system or disease and detail description of prototype drug followed by salient characteristics of other/newer drug of the same class.

Pharmacology books also described the management of few disease conditions and poisoning in different chapters.

Editions of pharmacology books released after the implementation of competencies-based curriculum claimed to have made changes according to the Pharmacology competencies but the basic design of the books remains the same as it was in editions prior to it. The content of the books is divided in the same pattern as it was in the editions prior to year 2019 e.g., general pharmacology, systemic pharmacology, anti-microbial agents and chemotherapy etc. All the books have given competency table with chapter number or page number or both in the beginning. The respective competencies are mentioned in either in the beginning of chapter (except Essential of medical Pharmacology) or in between chapter (except Essential of Pharmacology and Pharmacology for MBBS).^{4,7} All five books mainly covered the knowledge topics section of pharmacology syllabus. Each competency topics have specific components and books almost covered all those components of but there are some topics which are not covered completely for example competency topic number PH1.7, “define, identify and described the management of adverse drug reaction”, is not given in medical Pharmacology, management not given in Essential of Medical Pharmacology, identification and management is not given in Pharmacology for medical Graduate, management of adverse drug reaction is not given in Pharmacology for MBBS.^{5,10,11}

The competency topics which are partially covered in books were those topics which were not mentioned in pharmacology syllabus in the GMR1997. Competency topics, which are either not covered or partially covered, are newer topics added in pharmacology syllabus e.g., Drugs of Abuse (PH1.22), Management of Organ Transplant Rejection (PH1.50), Occupational and Environmental Pesticides, Food Adulterant, Insect Repellants (PH1.51), Pharmacogenomics and Pharmacoeconomics (PH1.60), Neutraceuticals (PH1.61), Drug Regulations (PH1.63) and Good Clinical Practices (PH1.64).

All five books didn't cover all competency topics in skill and communication part of syllabus. Only few skill topics like use of ORS, dose calculation, prescription writing and p-drug are covered. Rest of the skill and communication topics are missing from the books. Though book titled as Manual of Practical Pharmacology for MBBS is mentioned as 'B' book in the competency table mentioned in Pharmacology for MBBS which covers skill and communication competency topics of syllabus.¹²

CONCLUSION

When all the five books are evaluated according to pharmacology competency in syllabus, none of the books covered whole pharmacology syllabus. This may be because authors considered the competency topics in skill and communication section as a part of practical or because

many practical books or manuals are available in the market which covered topics in these sections. Though students are given content through lectures, seminar tutorials or small group discussion by faculty members in the department but it will be very helpful for them to have whole syllabus in one book. They will not waste time and resources from jumping from one book to others. Because new competency-based curriculum is implemented recently, it will take time for pharmacology books authors to modify the content of the books according to need of new competency-based pharmacology syllabus. The present study has limitation like only five books of pharmacology were considered for the study followed by students of single medical college.

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