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Author

Chandran, Viji Pulikkel, Khan, Sohil, Kulyadi, Girish Pai, Khera, Kanav, Devi, Elsa Sanatombi, Thunga, Girish

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Review article

Evidence based medicine and pharmacy curriculum: an insight into Indian perspective

Viji Pulikkel Chandran¹, Sohil Khan², Girish Pai Kulyadi³, Kanav Khera⁴, Elsa Sanatombi Devi⁵,
Girish Thunga⁶

Abstract:

World Health Organization recommends doctor population ratio as 1: 1000 and in India the ratio is 0.62: 1000. With the ever growing population and tremendous patient pool in India the significant challenge faced by clinicians is lack of skilled allied health professionals who can assist in providing timely, unbiased, critically appraised health information. Pharmacists are the most accessible health professionals and thereby crucial in facilitating rational medication usage and working closely with the public and multidisciplinary health care team. The goal of patient care can be achieved through the focused skill development programs embedded in health students' curriculum. Indian pharmacy curriculum should be fostered with inclusion of evidence based medicine focused training programs, workshops, case studies, digital stories, e - pocket cards and simulations. This article represents current status of evidence based medicine learning and teaching in Indian pharmacy curriculum.

Keywords: Evidence based medicine; Evidence based practice; Pharmacy curriculum; Pharmacy education; Teaching

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Introduction

Evidence based medicine (EBM) is an emerging field in integrating information technology with health science and clinical practice¹. EBM is defined as the "conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients"². The practice of EBM is called as evidence based practice (EBP), which is the integration of clinical expertise with currently available best evidence from systematic research and incorporation

of consumers need and values for better patient outcomes. EBM and EBP are used interchangeably¹⁻². EBM involve specific skill of health information retrieval alongside critical appraisal for validity, impact and applicability of information³.

EBM utilizes research evidence as per the quality which is broadly classified based on hierarchy. The hierarchy pyramid of scientific evidence depicts the level of evidence and grade of recommendation based on their discrimination ability to minimize

1. Viji Pulikkel Chandran, Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, 576104, Karnataka, India.
2. Sohil Khan, School of Pharmacy and Pharmacology, Quality Use of Medicines Network, Menzies Health Institute, Griffith University, Gold Coast, Queensland, Australia.
3. Girish Pai Kulyadi, Department of Pharmaceutics, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, 576104, Karnataka, India.
4. Kanav Khera, Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, 576104, Karnataka, India.
5. Elsa Sanatombi Devi, Department of Medical Surgical Nursing, Manipal College of Nursing, Manipal Academy of Higher Education, Manipal, 576104, Karnataka, India
6. Girish Thunga, Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, 576104, Karnataka, India

Correspondence to: Dr. Girish Thunga, Assistant Professor, Department of Pharmacy Practice, Manipal College of Pharmaceutical Sciences, Manipal Academy of Higher Education, Manipal, Udupi, Karnataka, 576104, E mail: girishthunga77@gmail.com

possible risk and to explain the effect and cause in human beings⁴. In pharmaceutical research and patient care, the type of evidence selected is likely to be limited by potential of bias (i.e. any factors that leads to deviation from and/or wrongly influence true scientific outcome). Searching for evidence on the internet is highly prone to such bias. Hence, knowledge and skill in differentiating quality over quantity of medical evidence is crucial^{3,5}. EBM/ EBP is an interdisciplinary approach primarily focused on the enhancement of quality of patient care. Critical appraisal and application of scientific evidence is the base of EBM/ EBP. The knowledge, attitude, and skills of health care providers are needed to be updated on a regular basis as health information is a changing domain highly prone to information overload that may compromise patient care⁶.

Clinical questions pertaining to drug therapy and disease condition arise at various point of time in patient care. The urgency of these questions are particularly high with significant practitioner: patient burden in a country like India wherein a practitioner could hardly spend more than 2-3 min for a specific health query. Healthcare practitioner (e.g. Pharmacist, Clinician) or an intern accepts the information available from readily accessible resource (or opinion driven from peers) and thereby sacrificing quality (without following evidence based practice) over convenience. This is likely to compromise the quality of information and impact the patient outcomes⁷⁻⁸.

Historically, all the clinical decisions associated with patient care were taken by clinicians but now relevance on clinical decision making is heavily stressed as a team work between healthcare practitioners with involvement of patient or their care givers⁹. The concept of patient care will be fulfilled if the clinical decisions are taken by a multidisciplinary team of experts. This practice is more evident in developed countries when compared to developing countries. The evolving role of health care providers in providing optimum pharmaceutical care as a multidisciplinary team, knowledge, attitude, and skills in EBM/ EBP is the essential requirement in clinical decision making¹⁰.

Impacts & Challenges

Evidence based medicine is aimed to improve the use of clinical research of high quality in clinical decision making. The key distinction between evidence based medicine and current treatment approach that, the recent research evidence is taken into account by EBM in a considerable period of time, while the latter approach does not. EBM is not a “cookbook” with recipes, but it brings better healthcare with its good application. It is also a cost effective method. Evidence based practice is a lifelong, self directed, problem based learning process in which care of patients demands clinically relevant information to solve health care queries and issues¹¹.

With ever growing population and tremendous patient pool in India the significant challenge faced by clinicians is lack of skilled allied health professionals who can assist in providing timely, unbiased, critically appraised health information. This is not easy unless the current healthcare students undergo focused training in skill development as a part of EBM/EBP learning and teaching. Major challenge currently faced by the educators and practitioners alike is health information explosion. Several reports show that more than 75 trials and 11 systematic reviews are published daily in various medical journals. Interpretation and utilization of these scientific findings are required skills of health care providers as well as students in healthcare^{3, 12, 13}. This complicates the existing problem to multiple times. Lack of time, lack of availability of resources, paid access, lack of knowledge (i.e., in clinical decision-making to identify, assess, interpret, and applying best evidence in practice to solve clinical problems) are found to be major barriers in practice of EBM/EBP¹⁴.

The current challenge could be addressed by training future practitioners and allied health professionals in the information mastery skills through uptake of EBM/EBP in healthcare curriculum¹⁵. With the proper training and knowledge in critical appraisal of evidence and as well as utilization of this knowledge in daily practice makes the searching process easy and it can be incorporated into every busy practice schedule. The key to establishing the concept is not

just by teaching as a part of the curriculum of various health science courses. To foster the attitude of change in habit various strategies has to be developed to achieve the goal.³ India is one of the largest consumers of medicines that include prescription, over the counter (OTC) and complementary-alternative medicines (CAM). At least 50% of the average family from India, spending on medicines is incurred on irrational or unnecessary drugs and diagnostic tests. Factors related to medication misuse in India are multifactorial and broadly classified into regulatory aspects, healthcare providers lack of training and/or time and perception among consumers to readily access the medicines such as antibiotics through a pharmacist. One of the key adverse outcome as reflected by the World Health Organization (WHO) is irrational antimicrobial usage and highest incidence of drug-resistant pathogens from India. Pharmacist is the most readily accessible healthcare practitioner in India and act as a key link between the consumers and clinicians. It is crucial to assess the current-status of EBM/EBP training among pharmacists and students undergoing pharmacy education in India¹⁶⁻¹⁷.

Pharmacy Education in India

There are number of pharmacy programs in India. With the most basic level as a diploma (2 year Diploma in Pharmacy - DPharm), undergraduate degree (4 year Bachelor of Pharmacy - BPharm), post-graduate specialization in various streams of pharmacy and pharmaceutical sciences (2 year Master of Pharmacy - M Pharm) and Doctor of Philosophy (PhD) in Pharmacy. Doctor of Pharmacy (Pharm D) was introduced a decade ago with an objective to enhance uptake of pharmaceutical care and recognize the role of clinical pharmacist as a healthcare team member¹⁸. Pharmacy Practice or Clinical Pharmacy is one of the post-graduate specializations (M Pharm) currently in its twentieth year. India generates substantial number of practicing pharmacist every year. Among that around 55% are working in the community, 20% in hospital, 10 % in industry and regulatory and 2 % in academia. The clinical role of pharmacist is very limited and they often experience powerlessness in regard to dealing with inappropriate prescription alongside lack of

skill in critical appraisal of medicine information¹⁹.

Dr. A. P. J. Abdul Kalam, former President of India released Pharma Vision 2020 in the year 2003 at 55th IPC (Indian Pharmaceutical Congress) at Chennai, Tamil Nadu, India. The Pharma Vision 2020 was focused on “promoting the highest professional ethical standards of pharmacy, focusing the image of pharmacists and competent healthcare professionals, sensitizing the community, government, and others on vital professional issues and supporting pharmaceutical education and sciences in all aspects”. In the 58th IPC, held in 2006 at Mumbai, Maharashtra, India pharma profession leaders presented the road map to achieve Vision 2020²⁰. In February 2018 two days national convention was organized by Indian Pharmaceutical Association at the Crescent University, Vandalur, Tamil Nadu, India for the release of the initial draft of “Pharma Vision-2030: Planning the Future”. The event explained the need and importance of planning the future in such a way that pharmacists can hold all the responsibilities towards health care in community, hospital, pharmaceutical industries, research and development, clinical research organizations, policy making to bridge the existing gap for a better future¹⁹. But the biggest limitation is that the present curriculum is not providing generic set of knowledge and skills to compete with all the requirements in diverse workplace. To achieve the pharma vision the pharmacy curriculum need updation and customization to meet the expectation of ever-changing healthcare workplace and to upgrade skills of future practitioners in the area of pharmaceutical care.

Need of EBM in Pharmacy Curriculum

Clinical pharmacist, community pharmacist and hospital pharmacist primarily act as a bridge between clinicians and patients. Clinical pharmacist is involved in clinical decision making along with the healthcare team by providing recent information about various details of drugs (dose, dosage form, dosage adjustment, adverse drug reaction, drug interaction, fixed dose combination). Currently, Pharm D and M Pharm in Pharmacy Practice programs are eligible for working as a clinical pharmacist. Patient counseling,

intravenous admixture, drug information and poison information services are also performed by the clinical pharmacist. B Pharm qualified students are working as community pharmacist and hospital pharmacist in many places in India and abroad. The areas such as patient counseling, OTC medication, and self-medication are largely handled by the community pharmacists.

Currently healthcare information is readily available on the internet and consumers are proactively seeking information. Provision of pharmaceutical care to consumers need adequately trained pharmacy professionals in the area of evidence based medicine. This is crucial because medication related information obtained through online resources could be biased, invalid and misleading.

Despite of the importance of critical appraisal of medicine information, pharmacy curriculum in India lacks EBM focused learning and teaching. In M Pharm Pharmacy Practice syllabus evidence based practice is covered as a theoretical concept in one-off delivery module without integration of the theory to practice which comprise the fundamental aspect of case/problem based learning^{3, 5, 6, 9}. A cross-sectional collaborative study comparing Indian and Australian EBM learning among pharmacy students highlights significant gaps on lack of training among students from India²¹.

Flaws in the Present System

Knowledge domain is well structured in Indian curriculum. But unskilled ways of practical and lab training in the institutes as per the outdated curriculum is the major limitation. This leads to the generation of unskilled healthcare practitioners/researchers and professionals. The specialized way of teaching and learning methods are to be followed in all health care curriculums to foster students' attitude as a motivated learner rather than didactic learning. The present era especially medical education promotes self-directed learning in students. Pharmacy curriculum on EBM needs to integrate this method of learning²². Competency based education has been rising as an essential need to improve skills of students. From basic degree curriculum onwards,

our healthcare professionals' syllabus has to upgrade to meet the established, specified competency levels. Self directed and problem based learning is the best strategy appraises the competency level^{23, 24}.

Recommendations

Education or training programs and their curricula act as a primary media for moulding the knowledge, attitude and skills of health care professionals and thus play a vital role in deciding the quality of care provided. Unambiguous recommendations have to be made regarding the widespread integration of EBP throughout the academic curricula and clinical practice. This integration will be enabled by the inclusion of EBP as a core competency in professional requirements and standards as well as accreditation processes. In practice, this needs a systematic approach to move away prevailing didactic learning to clinically interactive and integrative teaching and learning.

The incorporation of EBP tasks into daily clinical practice has capability to foster consistent involvement and implementation of EBP. Internet facilities at the point of clinical decisions making providing access to protocols, guidelines, critically evaluated evidences and recommendations. This can foster a culture that supports EBP observation and fulfillment in daily practice^{25, 26, 27}.

Conclusion

Incorporation of evidence based medicine in the pharmacy curriculum is crucial with ever increasing roles and responsibility of pharmacist to cater informed consumers need on medication use and misuse. The present Indian pharmacy curriculum lacks integration of EBM skills to train students adequately as future leaders in provision of unbiased and critically appraised medicine information. Implications of such gap has resulted insignificantly high incidence of medication misuse, emergence of multidrug resistance organisms and irrational therapies in India. The revival of pharmacy education according to the present needs and foster students attitude to become a self-directed learner to meet the competent skills is the need of the hour and in future.

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Author's Contribution

Contribution details	Author 1	Author 2	Author 3	Author 4	Author 5	Author 6
Data gathering and idea owner of this study	√	√	√	√	√	√
Study design	√					√
Data gathering	√	√	√	√	√	√
Writing and submitting manuscript	√					
Editing and approval of final draft		√	√	√	√	√

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