

Research Methodology Course for Postgraduate Students by National Medical Commission: A Welcome Step That Needs Complimentary Action

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ABSTRACT

After decades of administrative hibernation, the Medical Council of India (MCI), now National Medical Commission (NMC), started deliberating on reforms in medical education a few years back. The MCI/NMC introduced vertical corrective actions, yet there is a need for horizontal integration, and these measures require adequate guidance on implementation strategies. All postgraduate medical students must conduct a research project as a “Thesis.” This crucial opportunity to instill scientific thinking is excellent, along with patient care and clinical training. This opportunity has a long-term impact on clinical practice and research and development in medicine if implemented well. To enforce this step, the Board of Governor introduced a compulsory course in basic research methods for all postgraduate medical students, but alas, without adequate deliberations on implementation and complementary mechanisms. This critical review provides a brief history of the evolution of medicine and medical education in India and reforms in medical education. Further, it presents a balanced critique of the process, intending to brainstorm in improving the process and achieving the expected outcome from this course. Albeit many relevant issues need attention, this article will focus mainly on ways to leverage infrastructure optimally to imbibe scientific thinking in medical students of India with cursory deliberation of the relevant issues.

KEYWORDS: *Medical council of India, research, students*

Prelude

The Medical Council of India (MCI) governs the medical education and medical profession in India. The Board of Governors (BoG) superseded MCI from September 2018 as a transitory arrangement. A new body National Medical Commission (NMC), in September 2020, replaced MCI. The BoG made it mandatory for all postgraduate students to complete an online course in “Research Methods” through a Gazette notification (No. MCI-18 (1)/2019-Med./171700) dated December 13, 2019. [Available from: <https://drive.google.com/file/d/1wFW3HPVy2GrtdbshJKwchNn2Wm5Y4829/view>].

EVOLUTION OF MEDICINE AND MEDICAL EDUCATION IN INDIA

India is a land that witnessed one of the most ancient and flourishing civilizations in the world. It has a rich cultural as well as scientific heritage. A multitude of medical systems developed in India, including Naturopathy, Siddha, and Unani, although Ayurveda dominated the Indian medical system for eras. Ayurveda is a part of the Atharva-Veda and means “Science of Life.” It is one of the oldest medical systems that

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emphasize a holistic approach to health. Ayurveda developed through an organized theoretical framework supplemented with reasoning and critical thinking. Two subspecialties of Ayurveda, namely Dhanvantari and Atrey strengthened over centuries. Dhanvantari paved the way for the school of physicians, and Atrey paved the way for the school of surgeons. Charaka Samhita and Sushruta Samhita are early classical texts in these subspecialties.^[1]

Sushruta considered the father of surgery, elaborated on various surgical instruments and used gourds and dead animals for low-fidelity simulation training. The education system was residential and supported by the rulers and people at large.^[2] Unfortunately, foreign invasions and an unstable socio-political milieu hampered the organized education system.^[1] Portuguese introduced modern medicine or allopathy to India in the 16th century, and the East India Company established the medical departments in the then Bombay, Bengal, and Madras presidencies in 1775 catering to military and British citizens in India. In due course of time, establishing various medical colleges to train the natives in Western medicine, albeit initially, it was proposed for financial reasons. Portuguese also started a medical college in Goa in 1840. After some initial hiccups, Western and India's indigenous medical systems like Ayurveda, Unani etc. started contemplating but the later withered as they were ridiculed as inferior in knowledge and scientific rigor.^[3]

REFORMS IN MEDICAL EDUCATION

In the west, Abraham Flexner and William Osler's work undoubtedly shaped the reforms in Medical education. While Flexner was known for integrating basic sciences in the preclinical curriculum, Osler's work provided directives for clinical training.^[4] While Western medical schools struggle to cope with a shortage of patients for clinical training through community settings,^[4] the abundant clinical material remains untapped in India.

The healthcare system and medical education in India probably share the same path – A good head start followed by exponential decline. The early postindependence era showed a great promise in medical education, and the Government of India invited every system on board to deal with poor health indicators like low life expectancy and high maternal and child mortality. The goal was to produce family physicians to deal with most ailments at the local level. The mimicking of British Raj systems continued with little effort to make medical education contemporary and contextual until recently.

The current medical education system is not even at par with practice in Nalanda and Takshashila. The guru used

to impart the knowledge and skills artfully through small group discussions diligently, and the teacher-student ratio was in line with current recommendations.^[3] Until recently, the regulator's response toward reforms in medical education in India was slow, albeit with a systematic path.

As India exports many medical graduates to other countries, India's quality of medical education has global ramifications.^[5] There are almost countless committee reports and other deliberations recommending urgent and drastic reforms in medical education in India.^[5-7] Autocratic regulatory body, outdated curriculum, mushrooming of private medical colleges, a severe shortage of faculty coupled with almost nonexistent faculty development programs, selection of medical students, and poor research culture have been identified as common problems in the current medical education system in India.^[5-7]

RESEARCH: THE NEED FOR IT

We define research as the "spirit of inquiry." It is almost impossible to overemphasize the importance of research (or in popular rubrics – Research and development). Research is a hallmark of any progressive civilization. The 20th century witnessed an unprecedented transformation in science and technology. The health sector also followed the suit. The population structure that was static for millions of years changed drastically. The life expectancy increased steadily, followed by a decrease in fertility rates globally. This change is at least partially attributable to the industrial revolution along with advancements in modern medicine.^[8]

Flexner may not be credited fully for the medical advances in the "post-Flexner" period. However, he stressed science and articulated the importance of science in medical education.^[4] American Government established the National Institutes of Health (NIH) to promote research after the second world war, and today the budget of NIH is more than the national budget of many countries. The hegemony in research made America a true superpower in a short span. On the contrary, dependency on research and development can ruin a nation economically and politically. While many opportunities in research and development have global appeal, countries need contextual and pertinent research to tackle local issues confined to that particular country. The prevalence of head-and-neck cancers is very low in the west except probably in northern France. Hence, research on head-and-neck cancer management will not be the priority in the west. In India, the prevalence of head-and-neck cancers is almost 35%, and it is a priority research area. Undernutrition in children is yet another

issue pertinent to India and neighboring countries. Thus, countries like India need to identify priority research areas and develop local evidence to guide healthcare policy.

INDIAN SCENARIO

A scientometric analysis revealed that India's research output in medicine is abysmal.^[9] Adding insult to the injury, they have consistently shown that only a handful of medical colleges produce most of the research, and further, a handful of researchers contribute a significant chunk of research.^[6,10,11] Initially, research was a tool for early promotions; in 2009, after the Medical Council of India (MCI) made corrective measures, it became mandatory for faculty to propagate "publish or perish" without enough adjuncts to provide a conducive environment for research. The implementation was too quick without systematic training in research methodology for the faculty. Soon after this dictum, there was a mushrooming of predatory journals where one can publish quickly for a fee under the pretext of open access charge. As a corrective action, MCI rectified the rules from time to time regarding the type of journals and authors credited for the work, creating unnecessary chaos in academia. Finally, the National Medical Commission (NMC) arrived at an amicable solution in 2020, providing some wonderful choices to authors for selecting journals and crediting the first three and the corresponding author for the work, and this is probably the best solution to maintain checks and balances against gift authorships but allows credit to more authors.

ROLE OF THESIS/DISSERTATION DURING POSTGRADUATE STUDIES IN MEDICINE

There has been a heated debate on thesis/dissertation as a requirement in postgraduate medical education. Anantkrishnan, over 20 years back, well-articulated the objectives of the thesis.^[12] Many educationists pointed to insufficient knowledge of research methods as the main barrier in conducting a good thesis.^[13,14] The opposition is not in principle but how to conduct and facilitate.

The regulator (MCI) has taken many actions towards reforms in medical education in the last decade. The development and implementation of Medical Education Technology through basic and advanced courses and FAIMER fellowships are notable efforts to improve clinician-educator. The integration of preclinical, para-clinical, and clinical modules provided avenues to impart competency-based medical education holistically. Workshops like Attitude, Ethics and Communication Model (AETCOM) supplemented it. However, the

doctor-patient ratio is skewed, with one doctor responsible for seeing 100 patients. There is very little time for research in such a scenario despite massive clinical data; hence, dedicated time should be allotted for research without hampering clinical work.

In yet another move to improve the quality of medical education and particularly postgraduate thesis, they introduced a mandatory course in biomedical research in 2019. It is a well-intended step, although quite late. National Institute of Epidemiology (NIE) conducts the course in collaboration with the Indian Council of Medical Research (ICMR). Some educators may suggest minor modifications in course contents based on their experience and preference, but overall, it is a well-designed course.

Decentralise

There are advantages of single-institution conducting the course specifically concerning standardization of delivery and assessment. However, considering the number of expected participants, it is advisable to share the task with regional institutes so that NIE, an institute of national repute, can focus on other important national goals. The course uses the digital platform to deliver the contents that also allow stalwarts from other institutions for the delivery. A national portal can easily archive lecture videos and notes by experienced faculty across India (in future across the globe as well). It will make up an excellent resource for students/faculty with the freedom to study the material at their own pace. The portal can be updated every 3 years to incorporate new knowledge.

Handholding

Imparting knowledge in research methods is necessary but not sufficient. Mentoring by experienced researcher/s is a key in shaping a future researcher. At Charutar Arogya Mandal, Karamsad, Gujarat, they established Central Research Services in April 2009. They supplemented the workshop-based model to empower the faculty in various aspects of research with handholding and mentoring that significantly improved the quality and quantity of research. It is challenging to cater to other institutions with a limited workforce. A Regional Resource Centre (RRC) can cater to all the needs of researchers across that region. However, sufficient funding must be ensured. Another advantage of these RRCs is that people trained in other domains like statistics, public health, medical sociology, advanced computing can be appointed proportionate to the need. These proposed RRCs should be autonomous and recognized competitively.

Short-term sabbaticals for postgraduate students

It is common to complain that students and faculty do not get sufficient time to think and develop the research proposal for the thesis. Many Departments of Charutar Arogya Mandal tried short-term sabbatical for faculty, and the quality of proposals improved almost instantaneously. A 1-week sabbatical in each year of residency will surely help students organize their thesis-related work in a much better way. The option could be a set time and place for research in each department during the week.

Catch them young

This probably is the most crucial intervention required in the Indian education system. As the familiar banter goes – “Rome was not built in a day”. The foundation of scientific thinking must start even before students enter medical school. The Indian education system borrowed from British Raj encourage rote learning and discourage logic, reasoning, and critical thinking. The new education policy provides some hope for positive changes in this direction right from childhood.

Digitalisation

Encouraging electronic medical records with data entry operators, involving data analysts is the way forward to capture data and aid research.

RESEARCH IN INDIAN MEDICAL SCHOOLS: OPPORTUNITIES AND CHALLENGES

It is heartening to note that most doctors who pursued research did it for personal interest and recognition rather than just monetary benefits.^[15] The significant challenges in performing pertinent and methodical research are lack of knowledge, lack of mentor/guide, and other resources like access to journals and funding. A medical student echoed similar challenges.^[16] Beyond monetary gains, research is exciting and provides a sense of fulfillment. A pool of good researchers can make the country knowledge-generating rather than knowledge importing.^[17]

Interlibrary loans and consortium of libraries are uncommon in India. The motivated students lose interest quickly due to the lack of such basic amenities. The NMC should relax the current rules and encourage more online journals and consortiums purchasing the journals rather than individual institutions. In the digital era, asking for X number of print and Y number of online journals is redundant. Universities have a shared pool of journals funded by the central Government. The NMC can establish similar systems for all medical colleges in India for a nominal fee. The individual colleges can form other consortiums to add more journals to their pool as per their own perceived needs.

There are few funding options like Short Term Studentship (STS), Kishore Vaigyanik Protsahan Yojana (KVPY), but the funding options are limited, and the amount is insufficient. RRCs can serve the purpose. These measures are advocated more than a decade back^[18] without much deliberations and subsequent action.

The grading of STS applications should be available in the public domain with comments from reviewers to bring transparency to the selection process. It will also allow young and mid-level faculty guides to reflect upon the challenges in the proposals and improve. Comments from the experienced reviewers rather than the final decision, communicated to the aspirant researchers is an audit of their work.

There have been few attempts to improve the quality of research conducted by medical students. They tried two primary models – A workshop-based model for imparting knowledge about research methods and mentored students’ project model.^[19,20] The only fly in the ointment is that these models measured knowledge/perceptions of students after the intervention, but not the tangible outcome.

Investigating a pertinent health problem methodically is an essential first step towards knowledge generation. It must be supplemented by converting the research into some form of scholarship. The conversion rate is lacking in developing countries.^[21] The situation is not different in India.^[22] Thousands of students conduct some research through thesis/STS/KVPY. The whole exercise is futile unless the learnings are not shared. In this digital world, a platform to share at least the gist of the project with contact details of the supervisor is need of the hour.

Role of medical societies; In India, almost all subspecialties established associations/societies for a long time. Some are very active in promoting research. For example, the Indian menopause society, Federation of obstetrics and gynecology societies of India, Indian Academy of Pediatrics conducts research methods and scientific writing workshops. These societies can act as a catalyst in various ways. They can provide small grants for pertinent research in their field. Some societies can collaborate to develop a national priority project and invite postgraduate students to work on these projects as a thesis. For example, Pediatrics, Community Medicine and Psychiatry can develop a project to investigate screen time use and models to minimize it across India.

The students will work on pertinent national issues, and they will learn the finer nuances of research, teamwork, communication by working under the guidance of stalwarts.

Inter-sectoral collaboration may appear utopian in India, where compartmentalization and hierarchy dominate in academia. Talent from other streams like statistics, basic sciences, information technology has a lot to offer in health research. Medical schools are not much successful in attracting such talent for the benefit of the people at large.

We would deliberate on such issues and potential solutions shortly. ICMR is propagating these ideas through Multidisciplinary Research Units and Model Rural Health Research Units. Sadly, the regional representation of such ICMR units is disproportionate, and it is prudent to leverage the experience of these units to strengthen RRCs in identifying and solving a complex web of regional health research needs.

Many educationists had advocated persistently the need to improve research in Indian medical schools.^[6,11,18,23-25] It is blatant to evaluate how India fared in medical research considering resources, educational environment and students' attitudes. India's contribution to worldwide biomedical research was just about 2%. However, with this meager contribution, India ranks 12th with just four countries viz. US, UK, Germany, and Japan were contributing almost 50% of the worldwide research. It is a matter of pride that even though India lagged, the research output from India is steadily increasing.^[9] Interestingly, China recorded a leap in research contribution from 1999 to 2008 – From 16th to the fourth rank. Unlike India, medicine is a graduate program in the US, and most students in the UK take a yearlong intercalated graduation program before entering medical schools. The students thus have a better opportunity to explore research and enter a physician-scientist career.

The students' attitude toward research globally is quite motivating. Students from developing countries reported a lack of mentors, time, and infrastructural support as main barriers in research.^[26] There have been various attempts to instill research skills in medical schools. These mainly include Mandatory Research Projects, Elective Research Projects, and Audit Projects.^[27] In both these endeavors, India leads the developing world. The critical question is whether India should incorporate a mandatory research project in undergraduate medical education. The answer is not straightforward and needs some serious brainstorming. At present, an elective research project, along with strengthening research training through a national-level portal, sounds workable.

Summary

The quality and quantity of methodical and pertinent research need to be scaled up. The education in research

should start at the undergraduate level. The Government should ensure enough resources for training and conduction of research. Handholding/mentoring is a key to shape future researchers. We may try innovative approaches like RRCs and amending the rules by NMC that restrict optimal use of resources.

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