



Perspective

Pioneering an online course on research methods for India's medical postgraduates & faculty members

Global agenda for research in medical education

Globally health and medical research has become a pivotal part of the medical practice and education in the past few decades, despite the Flexner report on overhauling medical education published in 1910¹. Medical education and research experts have been constantly calling for the integration of research with medical education². In 1993, a strong case was made by a Lancet editorial for the need to perform and consume research by doctors as a part of their profession³. Medical research, therefore, is considered an integral part of the practice of medicine.

Recent changes in medical education in India

The medical education landscape in the Indian subcontinent has been constantly evolving. Every year, approximately 70,000 undergraduate (UG) and 33,000 postgraduate (PG) students get admitted to more than 500 medical schools across the country (2020)^{4,6}. The National Medical Commission (NMC), erstwhile Medical Council of India is the apex national body responsible for regulating the medical education standards in the country. It has brought about several measures with the aim of transforming medical education in India. These include curriculum changes (introduction of a 6 wk orientation course for UGs), revision of norms for inducting medical teachers (requirement for indexed publications), continuing medical education credit points system (to ensure doctors stay updated) and the mandatory course in medical education technology to improve medical teaching^{7,8}. These measures are perceived to have been widely appreciated by the medical fraternity.

Role of health research in Indian medical education system

In line with the principles outlined above, in 2019, the NMC set out to improve the status of health research

conducted by the PG residents and faculty members of medical schools. Medical colleges in India have been shown to be a valuable partner in the implementation of national health programmes not only through the provision of diagnostic and treatment services but also through research⁹. However, according to reports, a large majority of the research is published by a handful of institutions and more than 50 per cent of medical institutions do not publish any research¹⁰. In India, all PG residents are required to design, conduct and report a thesis in partial fulfilment of their degree. The duration of this thesis can range between six months and 2½ years, usually submitted in the final year of the PG programme six months before the final examination¹¹. A group of experts who studied the quality of PG theses in India have highlighted several lacunae in PG research and cited the lack of properly trained PG teachers¹². Although PG theses can sometimes be of practical significance, a large majority of these have questionable quality and utility in the general medical literature. A single-institution evaluation pointed out that only 30 per cent of the PG theses were published in an indexed journal¹³. Although multifactorial, the primary reasons for this situation constitute the lack of qualified research guides and a course dedicated to health research within the UG/PG curriculum¹⁴. Only a few medical colleges, especially that of federal level and autonomous institutions, have taken efforts to train the PG residents in research methods. However, the medical education experts felt a need for such trainings to have uniform standards of delivery and built-in evaluations along with a mandatory requirement towards the postgraduate PG degree¹⁵. Thus, improving medical research and scientific publications in PG medical education has been recognized as a felt need in India. Leading medical researchers and research bodies and educationists have reiterated the need for capacity

building of India's medical teachers and PGs through the introduction of course on research methodology¹¹.

Genesis of the National Medical Commission (NMC) mandated online course in research methods

To improve the current situation, an important decision was taken by the NMC in 2019, making it mandatory for every PG resident and medical college faculty to complete an online course in research methods¹⁶. The online mode of teaching was chosen as a method of choice for this course because of its ability to reach a large number of participants and to provide a self-paced learning experience. According to this notification, all the residents admitted after the academic year 2019-2020 are required to obtain this certification. This certification was made a prerequisite to write the final year PG examination. By taking this course it was expected that the residents will be able to conduct and publish high-quality research and make meaningful contributions to the health literature in the country and the world. This course was also made a mandatory qualification requirement for medical faculty positions¹⁶, so that medical teachers can top-up their own research capability and in turn, mentor the residents more effectively.

Role of the Indian Council of Medical Research (ICMR)

As part of its mission to strengthen biomedical research in India, the ICMR fully supports the online course and provides funding for the core team and infrastructure towards its development and administration. The ICMR-NIE, under the aegis of the Department of Health Research, Ministry of Health and Family Welfare, Government of India, was mandated to design and execute this course. The ICMR-NIE has been previously collaborating with India's national massive open online courses (MOOCs) platform 'SWAYAM' set up by the Ministry of Education, Government of India^{17,18}. In partnership with one of SWAYAM's co-ordinators, the National Programme on Technology Enhanced Learning (NPTEL), the ICMR-NIE had been offering health-related MOOCs, namely- Health Research Fundamentals under the banner ICMR- NIE e-certificate courses (NIECer) since 2016¹⁹. This experience helped the NIE in putting together the online course for medical PGs in a short period. Faculty members from disciplines of public health, epidemiology, biostatistics and online teaching contributed to the online course

contents and aligned these with that of the NMC recommended syllabus. The MOOC named as 'Basic Course in Biomedical Research' was designed and launched in August 2019 to comprehensively cover the domains of conceptualizing, planning and conducting a research study, writing a protocol and understanding the epidemiological and biostatistical considerations in research through 23 topics. These topics are delivered through video lectures, handouts and assignments (multiple-choice questions) staggered over four months with two batches per year. The course material is intended to be covered over an average of 20 h in total. Apart from the lecture materials, the ICMR-NIE formed a core team of epidemiologists and biostatisticians to clarify the individual-level queries, so that both the PG students and the teachers develop a detailed understanding on research methodology. Successful completion requires ≥ 50 per cent score in assignments and successfully passing the final proctored examination. Successful participants receive a verifiable e-certificate from SWAYAM. Thus, the course is designed and delivered as per the four-quadrant approach of SWAYAM¹⁸. The conduct of the course and its progress is monitored by a course coordination committee appointed by the NMC. The Committee's functions are periodic review of the course progress, to advise on matters related to course design, curricular processes and delivery and liaison between the NMC and ICMR-NIE for course related matters.

Course performance and the way forward

In its inaugural cycle, 24,385 participants, hailing from every Indian State, registered for the course. These included 54 per cent postgraduate residents, 11 per cent medical faculty members and 35 per cent other types of participants. Subsequently, the absolute numbers of enrolments were substantially increased (Cycle 2=25,473; Cycle 3=39,492; Cycle 4=47,135) and the proportion of faculty members joining the course increased to 44 per cent in Cycle 4. An increase was observed in the proportion registering for exams (47% in Cycle 1 to 62% in Cycle 4) and getting awarded with completion certificates among those enrolled (47% in Cycle 1 to 44% in Cycle 2 to 22% in Cycle 3) with the on-going pandemic influencing the course participation in between.

Over the course period, constructive feedback was received from the learners and through periodical review by the course coordination committee. Consequently, challenges related to making the

course more user-friendly were identified, such as ease of enrolment, access to the course contents and submission of assignments. These issues are being addressed and the next cycle will be a better experience for the learners. Apart from this, participant queries related to the subject matter are handled by the core team at ICMR-NIE. The team is responsive to suggestions by updating the course materials. Thus, after completing the course, the PG students and faculty members become familiar with research methods. Inputs from the course may be useful to medical teachers in pursuing medical research and thus publishing quality research outputs. This may also contribute in improving their research mentoring ability. In the future, we envisage nodal institutions and mentors at the regional and State levels to act as resources for addressing technical and subject matter queries quickly and efficiently. Plans are underway to improve the contents of the course and reading materials. In the subsequent cycles, the course will annually cater to 30,000 to 60,000 PGs and about 40,000 medical faculty members.

This may usher in an erudite group of change agents comprising residents and their teachers who will address health priorities through quality research and contribute meaningfully to the health research space in India and the world.

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