Why Must Faculty Members in Medical Institutions Engage in Research?

The issue of whether faculty members in medical teaching institutions should be required to undertake research has long been a matter of debate in our country. There are strong views on both sides – with the proponents believing that research should be mandatory for all medical teachers, whereas the critics argue, equally vehemently, that research should be an optional activity. In recent years, the erstwhile Medical Council of India and now the National Medical Commission have weighed in in favor of the former opinion by requiring publication of a specified number of scientific papers for faculty members to be promoted to higher ranks.[1] However, the issue continues to remain controversial.

One of the best ways to look at any subject is to look at the past. Therefore, let us turn to Sir William Osler, often described as the father of modern medicine. The mantle in his office was adorned by a triptych with portraits of Thomas Linacre, William Harvey, and Thomas Sydenham.[2,3] These three greats stood for learning in the classics, science, and medical practice, respectively. This, according to Osler, represented the three strands of professional career of a learned physician – teaching, research, and service to patients, respectively.[4] In fact, if one goes by the order of arrangement of the three portraits, it appears that he placed research before patient care. Since Sir Osler is also credited with major advances in medical teaching such as starting bedside clinical training and creation of the first residency program for specialty training of physicians, his perception is all the more important for those engaged in teaching medical sciences, whether at the undergraduate level or at the postgraduate level.[5]

In the 20th Century, the role of research in a doctor's work has been best captured in the words of Dr. Jack Masur, the first Director of the Clinical Center at the National Institutes of Health, Bethesda, USA, in a plaque at the entrance of the Auditorium at this Center.

"*Hospitals with long traditions of excellence have demonstrated abundantly that Research enhances the vitality of teaching, Teaching lifts the standards of service, and Service opens new avenues of investigation.*"

He emphasized that research is desirable not only for its own sake but also helps improve the other two pillars of a medical teacher's work, i.e. teaching and clinical work.

India too has had its share of eminent physician–teacher–scientists. For instance, Dr. V Ramalingaswami in Delhi undertook path-breaking work on the treatment of iodine deficiency diseases,[6] Dr. VN Shirodkar in Mumbai on the treatment of incompetent uterine cervix,[7] and Dr. SJ Baker and Dr. VI Mathan at Vellore on tropical sprue.[8] Thus, it is clear that medical education and medical research have had a close relationship over time and across geographies.

Why then do we in India continue to argue over this issue? I believe that this has to do with three factors: (i) our misunderstanding of what biomedical research means, (ii) a general lack of scientific temper in our daily lives, and (iii) our poor understanding of research methods. Let us look at each of these.

What exactly does "research" encompass? Dictionaries of English language have variously described it as "a careful study of a subject, especially in order to discover new facts or information about it",[9] "a detailed study of a subject, especially in order to discover (new) information or reach a (new) understanding",[10] and "creative and systematic work undertaken to increase the stock of knowledge".[11] Thus, research is not only about new discovery but also involves careful study and a better understanding. It thus includes new insights into various phenomena and how one can positively change one's medical practice to improve outcomes – surely a useful thing for a medical teacher.

However, unfortunately, the word "research" in the Indian context is taken as meaning something that is done in a laboratory, and requires high-end equipment and a large amount of money. This belief is far from truth. The only requirement for research is a good research question and mental ability to think of an easy way to answer it with reasonable reliability. The question need not be fashionable but must be relevant to the health of the society or of the patients one deals with. Early in my career, I was particularly fascinated by a study, in which investigators were able to show that water spiked with *Escherichia coli* could be made potable by simple methods using solar heat and unutilized heat from the traditional Indian mud stove or chulha.[12] This work possibly did not lead to any 'citations' – which are often, albeit mistakenly, used as a measure of impact – but definitely had the potential to positively 'impact' the health of our rural brethren.

Thus, we need to look at simple questions, particularly those that are relevant to our patient population, but are unlikely to be important for the physicians in developed countries. In fact, as physicians, if we look around, there are questions everywhere – in our outpatient clinics, during our ward rounds, during academic sessions such as journal clubs and seminars. All one needs is an observant eye, a roving mind and an ability to ask questions, though broad reading and general knowledge do help. Somehow, it appears that the

atmosphere in our medical schools has a dumbing effect on our students and resident doctors, when it comes to asking questions. They seem unable to ask even one question where several exist. One wonders whether it is our "Indian value system" of respect for those in authority – seniors, elders, and teachers – and obedience that prevents us from doing so. We need to encourage everyone, who disagrees with the conventional view, to pick up the gauntlet – to identify the question and to study the issue in greater detail to find a more definitive answer.

The second issue is the lack of scientific temper. We are willing to easily believe in everything as an established fact and to follow what we are told. The recent COVID-19 pandemic illustrates it well. Most of our physicians have been content to empirically prescribe whatever they have come across – remdesivir, convalescent plasma, hydroxychloroquine, ivermectin, zinc, vitamin D, and povidone-iodine gargles. Even after several good-quality scientific studies have shown that a particular drug does not work, many of us have still continued to prescribe it – to the extent of causing shortages. This shows our lack of willingness to act on scientific data from research studies and of faith in scientific method. Till we remain poor believers in and consumers of scientific data, we are unlikely to respect research as a higher-level activity and to engage in it.

The third issue is the inadequate knowledge about research methods in our medical institutions. Somehow, we are unable to distinguish between wheat and chaff – good science and bad science. It is all too common to hear the sentence: "But this is published" – as if anything that is published has to be good science. Every association is interpreted as causation. Our understanding of factors that may lead to false associations such as confounding, selection bias, measurement bias, etc., is quite weak. Many of us fail to appreciate the difference between quality of evidence from a small, retrospective case series, and that from a large randomized controlled trial. This failure to understand the finer nuances of science leads to an inability to appreciate good science and to enjoy the thrill that it can give – just as only a connoisseur of music can understand a maestro and appreciate his compositions.

One often wonders whether it is our lack of faith in research findings that leads to our poor interest in research and the low quality of our research, or vice versa. I believe that the relationship is bidirectional and that an improvement in one would enhance the other.

If we engage in good-quality research more often, we will develop a better appreciation of the others' research studies, and that will help us improve our medical practice and teaching. In fact, the available evidence supports this. In a literature review that addressed whether research engagement by clinicians and organizations improves health-care performance, 28 of the 33 identified studies reported improvements in indicators of health service, including 7 that also reported improvement in health outcomes.[13] In a study in the UK, the NHS trusts with a higher level of research activity, as measured by research funding received and number of subjects recruited in research studies, had better risk-adjusted patient survival rates, even after adjustment for staffing and other structural factors.[14]

Why this is so is easy to understand. Good practice of medicine requires one to understand well the literature and guidelines on which clinical practice is based, as also to evaluate one's own practice. Such evaluation, of the medical literature and of one's own practice, requires several abilities – to question, critically evaluate, and test different approaches. These abilities are identical to those required for research. Participation in research allows the development of these skills, and this serves to improve one's practice. There is no reason why we too in India cannot use a greater engagement in research to improve our medical practice.

Similarly, education and research too mutually reinforce each other. A teacher who engages in research is more open to questions and is likely to encourage the students to develop an enquiring mind. Furthermore, he is more likely to question his own teaching methods and to take steps to improve these.

Thus, the main reason for the faculty members in a medical teaching institution to engage in research is primarily to improve the quality of their patient care and teaching, and not merely to improve their institution's or the country's research output scores. In fact, as I have tried to argue above, a greater engagement with research is mandatory if we wish to improve our health-care services and medical education.

Rakesh Aggarwal

Department of Gastroenterology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India

Address for correspondence: Dr. Rakesh Aggarwal, Department of Gastroenterology, Jawaharlal Institute of Postgraduate Medical Education and Research, Dhanvantri Nagar, Puducherry – 605 006, India.
E-mail: aggarwal.ra@gmail.com

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