PERSPECTIVE

Lack of Research Amongst Undergraduate Medical Students in India: It's time to Act and Act Now

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ABSTRACT

Participation in research is important in producing doctors with an understanding of evidence-based medicine. Though a mandatory part in post-graduation medical course, research has largely been invisible from the under graduation medical course in India. Very few opportunities are available at under graduate level. The reason behind this is lack of encouragement, lack of basic infrastructure, facilities and structured mentorship programs, no extra incentives to researchers and the long journey to get academic acclaim. Another additional aspect is of lack of writing skills for biomedical publication. Additional incentives to students as well faculty members are required to foster the research environment in India.

Keywords: *Mentoring, Publication, Scholarship, Thesis.*

Research is one of the key areas which help in advancement of scienceit 'refreshes' and 'updates' the whole knowledge of that subject and thus paves the path for further addition, improvement, up-gradation and introduction of discoveries and new innovations. Research enables a to collect and compile information, assess them objectively, analyze it critically and finally come with a conclusion, all of which are important in clinical decision-making and patient care [1].

Although research has been considered traditionally as the fiefdom of professionals and experts, there have been many instances where students have ventured into research with substantial outcome (***Box* 1**).

BOX 1 SOME ACHIEVEMENTS OF MEDICAL STUDENTS' RESEARCH

- Jay Mclean, a medical student working at John Hopkins University discovered Heparin [2].
- Lorenzo Bellini was only 19 years when he published his discovery (1662) of the kidney tubules [3].
- Charles Herbert Best's, a medical student contribution to medicine nearly won him a Noble Prize.
- Paul Langarhans in 1869 discovered the Islets of Langarhans which bear his name [4].
- Niels Stensen (Steno), A Danish anatomist Niel Stensen was a medical student when he discovered in 1961, the parotid duct in sheep [4].

In addition to medical students' talents, chance, luck, observation, serendipity and "sudden unexplained understanding" of the fact, this was possible also due to proper atmosphere and encouragement induced by their teachers [4]. While most of the medical student researchers hailed from Western countries, there have been very few instances where some discoveries could be attributed to the Indian medical students. The medical education system in India concentrates mainly on preparing more and more basic doctors who were trained in allopathic sciences but seldom promoted research activities. Students in India have almost no formal pathway to become physician-scientists or academicians [5].

The Current Scenario

Irrespective of research subjects, a total of 157 researchers per million populations were reported in India in 2010, much less than the global average of 1023 [6]. As far as research in medical sciences is concerned, India scored 12th position among the productive countries of the world in medicine during 1999–2008 with a mere 1.6% share in the world research output [7]. But most of these researches were faculty members/scientists from reputed medical institutes, and very little had been contributed by students [1].

Medical students, especially undergraduates, during their academic tenure get very few opportunities and research avenues, and very rarely the students show interest in even these limited opportunities. Although there is a mandatory provision of writing a thesis/research project during post-graduation, which give an opportunity for conducting research, but somehow most of the their research is just for the sake of research. Most of these theses fail to get published or are widely disseminated once they have been submitted to the University [8,9].

The Bachelor of Medicine and Bachelor of Surgery (MBBS) curriculum does not provide an adequate platforms for promoting research aptitudes in undergraduates. Most of the medical college managements show very little interest in student's research activities. Actually, rather than a part and parcel of medical education, student's research is considered as an "extra- curricular" activity by most of the medical college authorities. Also there seems to be a disparity between the government and private medical colleges in India with respect to funding, autonomy, and collaborations in basic research, which affects the involvement of medical students [5]. It was estimated in a study that in 2007, about 96 % of the research publications in India emanated from only nine medical colleges [10]. Another paper [11] estimated that a whopping 57 % of the total medical colleges did not have a single publication during this period!.

The funding for research in general and student research in particular is meagre or non-existent [12]. Apart from funding, qualitative and/or quantitative insufficiency in supervision is another important issue [13]. In India, although a lot of medical faculty members are stalwarts in their respective fields and liked by students at large but not all of them may have the skill required to be a good mentor [14]. Good mentors are not always easily available. There is a visible lack of structured mentorship programs in medical colleges in India. As there is no incentive available for faculty

members to mentor student research in form of remuneration, credit points, promotional avenues or recognition, most of the faculty members rarely show any interest in undergraduate students' research activity.

Recognition of the efforts put in for research project in form of a publication is also lacking. It is not uncommon to find the senior-most author as the first author (even in case reports) due to their premium position. This practice of denying credit and first authorship to junior researchers whose contribution is often the maximum, is disheartening to the students and thus their interest in research starts diminishing [1,15]. In addition, the attitude of the medical students towards research is another important aspect. Studies have reported that most of the students considered research as waste of time / not worth while participating; some others said they did not have interest in research [16,17]. Many students felt that research as a career choice was neither financially rewarding nor had that 'status' [18].

Another dimension of students' research is the dilemma over mandatory inclusion of medical research in medical academics in India. A mandatory eight week 'Critical Enquiry' course attended by students at Queen's university, Canada demonstrated that students recognized development of critical appraisal, information literacy, and critical thinking skills as potential benefits [19]. As a part of its primary care clerkship, College of Medicine at Drew University, in 1995, created a curriculum requiring medical students to take up a research project [20]. A study on student views on Mentored Students Project (MSP) in Indian medical colleges reported about 61% of students agreed that MSP should be a mandatory requirement for the completion of the MBBS program [14,21]. In India, Only 10% of the projects funded to Indian medical colleges ended up in publications in indexed journals [7]. Thus the compulsory research program ensures research experience for students but it also needs a parallel process to achieve a higher rate of publication [22].

Opportunities for Medical Research in India

Lack of a fully functioning academic committee to promote research both within and outside the institution, and a separate Dean for academic are other lacunae in many medical colleges in India. Only few organizations, like Indian Council of Medical Research (ICMR), promote research in medical sciences by providing Short Term Studentship (STS) [23]. The Kishore Vaigyanik Protsahan Yojana (KVPY); Central Paramilitary Forces under Ministry of Home Affairs, Government of India; and Indian Oil Corporation (IOC) also provide financial support to encourage students' research in India. But these scholarships are provided to encourage the brilliant students from the weaker socio-economic population to join medical courses and not precisely for research activities [24, 25,26].

Apart from the government initiatives, some informal groups too have initiated activities for the same cause. There is a group known as INFORMER- The Forum for Medical Student's Research- which is an all India medical students' body; created in 2009 to advocate and promote research

amongst undergraduate medical students and encourage them to present their research work at a national level [27,28].

The Possible Solutions

The students could be encouraged to take a few times off from their traditional course-work to focus on research during their medical school training [5]. The Medical Council of India needs to make research activity by medical students mandatory. To motivate students into research, few marks could be linked to their internal examinations on completion of a research project by them [5].

There could be regular discussions on recent advances in medical science in the academic curriculum of all professional classes, and the responsibility of its co-ordination could be handed over to department of Medical Education. In the long run, this activity would inculcate the research aptitude among medical students as discussions like these would give them the food for thought.

Funds should be demarcated by medical college authorities for research just like fund demarcated for sports and extra-curricular activities. Workshops on research methodology should be organized utilizing these funds. Support from Government on medical research is required as per its commitment in National Health Research Policy which intends to promote research culture in educational institutes so as to build a critical mass of health researchers and also intend to invest at least 2% of national health expenditure in research and research capacity strengthening [10].

Promotion of inter-institutional collaborative research is the need of the hour to promote research in a competitive environment. Involvement of corporate houses to promote innovations in medical sciences at under graduate and post graduate level could be attempted by colleges/ universities. Research proposals, having the potential to come up with useful medical / health innovation, could be screened by corporate houses and sponsored thereafter. The medical colleges should have co-ordination with local media so as to promote the findings of thesis/ research of medical students which could be helpful for modification in local health policies and programs as per the study results. This will also encourage the students as their work will get recognition in local area and to a wider audience [12].

Annual regional and National conference of various associations of medical professions should have prominent focus on undergraduate students' research presentation, and awards [27]. Box 2 summarizes the steps required to promote under graduate medical research in India.

BOX 2 SUGGESTIONS TO PROMOTE UNDERGRADUATE RESEARCH

- Additional credit in internal assessment for ICMR-STS like research projects.
- Peer reviewed, indexed publication by students.
- Some fee waiver on paper presentation at national/ international level.
- Prizes to students with research projects/publications in college annual functions.
- Regular exposure of undergraduate of recent medical research through discussion session, newsletter etc.
- Separate fund for students research by college authorities.
- Annual state, zonal and national level conferences exclusively for medical students.
- Promotion of inter-institutional collaborative research and corporate involvement.
- Mandatory Structured mentorship programs in medical Colleges to promote research.

There should be some incentives for the teachers also. Publications and research projects do not earn them any credit point. Thus to promote research by faculty and to persuade them to become mentor for student's research, few credit points should be given for every peer reviewed indexed publication by the medical teachers. Similarly the teachers mentoring students in research projects like of ICMR-STS should be awarded credit points and out of turn promotions after the research project has been finally accepted by ICMR. These steps will help in recognition of work done by the teachers and promote research attitude among other faculty members. The need of structured mentorship programs cannot be stressed more. There is an urgent need to introduce mandatory structured mentorship programs in medical colleges. In India, vast availability of experienced faculty and abundant clinical material in medical colleges will help in creating an atmosphere of producing future physician-scientists by implementation of these mentorship programs [14].

Almost every medical speciality in India has their national level associations who publishes national journal of their specialty. These associations should come forward with one or two special issues in a year exclusively for students (just like The Lancet Student, International Journal of Students' Research, Student BMJ and The International Journal of Medical Students). This special edition for students will help students to send their manuscripts precisely to the journal as per the topic of their research [12].

CONCLUSION

There appears to be a lack of scientific temperament in medical graduates in India. With a view to encourage research among medical students, a structured mentored medical student research program should be set up to introduce medical students to a potential career in patient-oriented/ community-oriented research including interdisciplinary research. Research based scholarships like STS are

provided only by very few organizations like ICMR. So various government agencies and corporate should come forward to support new innovations and ideas in young talented students.

Medical writing is a neglected area and comparatively few young Indian doctors get published in the international level medical and science journals. So there is an urgent need to develop the scientific temperament for writing articles in medical journals at the undergraduate level. Scientific writing sessions should be conducted during their under graduation studies. To encourage research, students can be given credit for research activity in medical school in the form of internal assessment. Faculty should also be given extra incentives in promotion, credit points etc. to mentor research projects of students. There is an urgent need for increasing capacity building of young health students /professionals in medical research so as to utilize their research health data at local and national level. This will definitely change the face of health services/ medical education in India in the long run.

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