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Medical Education

Initiating and strengthening medical student research: Time to take up the gauntlet

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Abstract
Self-directed learning and evidence-based medicine are becoming increasingly important in medical education. Medical student research projects can enable students to learn research methodologies and critical analysis skills. Medical schools in developed countries have introduced research programmes for medical students. A few medical colleges in developing countries have initiated student research programmes. South Asia has a huge population and massive health problems and research may be helpful in finding solutions. Student research can contribute to the published output of institutions. Research projects can help students to develop critical analysis skills, teach them to write for peer-reviewed publications and can foster student-faculty interaction. In Nepal, opportunities and funding for research are limited. Principles of scientific research should be taught to students. A community research project should be made compulsory. Funding for research should be boosted and infrastructure strengthened. Faculty members actively involved in research can serve as powerful 'role models'. Marks should be allotted for research projects and students must be encouraged to publish their findings. Publications and projects should be considered during admission to postgraduate courses. Student research should be initiated, actively pursued and strengthened.

There has been an explosion in the volume of information available to doctors and medical students and medical colleges find it increasingly difficult to teach medical students 'all they need to know' within a medical course. It is becoming increasingly vital for students to acquire the skills and attitudes necessary for lifelong learning.[1] The revised curriculum of Kathmandu University emphasizes problem-based, self-directed learning.[2] Self-directed learning requires the development and nurturing of 'transferable skills'.[1]

Medical knowledge is advanced by the research endeavours of students and practitioners.[3] Evidence-based medicine (EBM) is becoming an important part of medical decision making and requires understanding and use of scientific principles and methods.[4,5] Medical student research projects (MSRP) may provide an opportunity for students to learn research methodologies and skills for the critical analysis of published literature.[6,7] It has also been argued that MSRPs will increase the number of persons who will pursue biomedical research careers.

Student research in developed countries

Recognizing the importance of student research developed countries have introduced research programmes for medical students. An urban medical school in the United States has made it mandatory for medical students to develop, design and implement a research project during their clinical years of study.[8] The University of California, San Diego, United States of America (USA) runs the UCSD Research Associate Program to successfully integrate undergraduates with emergency medicine research.[9] The Queen's University, Ontario, Canada includes a 'Critical Enquiry' elective which allows students to pursue a medically-related hypothesis of the students' choice.[10] The department of Family Medicine at the University of Colorado, USA, provides financial support for student research, a core of faculty mentors and research agendas geared to student schedules.[11] The rural summer studentship program at the University of Western Ontario, Canada places students with preceptors in small communities where they can perform rural health research combined with clinical learning.[12]

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Student research in developing countries

In Croatia, a transitional country in Europe during undergraduate study, 23% of students were involved in research projects.[13] In a medical college in India students have conducted case-control and community-based epidemiological studies.[14] A medical school in Delhi, India has been training interns in population-based research.[15] Medical students at Aga Khan University, Pakistan have a well-established research infrastructure and have published widely in medical journals.[16] In Nepal, students do family studies and community diagnosis studies. Nepalese students have presented research papers at conferences. At the Manipal College of Medical Sciences, Pokhara, Nepal a short student research project was carried by the fourth semester students. However, student research efforts has been scattered and sporadic and MSRPs have not become an integral part of the activities of medical schools.

Importance and advantages of student research

Nepal has 62 researchers per million inhabitants[18] compared to 4,526 researchers per million citizens in the United States.[19] Research is essential to guide improvements in health systems and to develop new initiatives. South Asia has a quarter of the world's population, weak health care in the public sector and a heavy disease burden all of which combine to make research especially important.[20] A long term strategy of promoting health research is to target medical students and involve them in research.[16] Student research can contribute to the published output. In Germany medical students were involved in 28% of publications in a particular institution.[21]

MSRPs have been helpful in teaching students to critically evaluate medical literature, providing assistance with the learning of the scientific method, teaching them to write for peer-reviewed publications and improving student-faculty contact.[22,23] MSRPs have been shown to enhance the ability of students to practice clinical medicine.[22] Research experience can improve the skill of students in searching and critically appraising medical literature and enhancing the ability for independent learning.[10,22] Student research has been helpful to select an area of study and form contacts for postgraduate training.[10] An American study had strongly suggested that student research increased interest in an academic career and stimulated additional research by the students after MSRPs.[24] Research would be helpful in making students aware of the health problems of the community and country.

Problems in initiating medical student research

Student research is dependent on research activity at a regional and national level. In many developing countries, opportunities for medical student research are limited. In most countries research is not a part of the medical curriculum.[16] In a study in India, 91% of interns reported no research experience in medical school.[15] In a study in Pakistan only 11 of the 55 postgraduate trainees surveyed read journals monthly and only 7 had written articles for a journal.[16] In Nepal, it was observed that students were accustomed to rote learning and had problems adjusting to self-directed learning and there was a perception that the projects interfered with the students' preparation for assessment tests.[17] The funding for research in general and student research in particular is meagre or non-existent and role models are not always available. Migration of good academic clinicians and teachers from the third to the first world robs students of 'role models'. In a study at the University of Helsinki, Finland qualitative and quantitative insufficiency in supervising was regarded as the main obstacle in carrying out research.[25]

Encouraging student research

At the University of Zagreb, Croatia, a mandatory course in scientific methodology and communication has been introduced in the medical curriculum.[25] A mandatory eight week 'Critical Enquiry' course is conducted at Queen's university, Canada.[10] These courses will be helpful in sensitizing medical students to research. Student opinion is divided on whether completion of an independent research project should be required for graduation.[22]

Funding for research should be boosted and the research infrastructure should be strengthened. Each institution and funding agencies should set aside a certain portion of their budget for promoting student research. A mandatory course in medical research and a compulsory community research project can be used to stimulate students' interest in research. Community-based learning is carried out in many medical schools in Nepal following its initiation at the Institute of Medicine, Kathmandu in 1978.[27] The students carry out small studies but expanding the studies, applying the principles of scientific research and publication of the findings are not actively pursued.

Students should be made aware of the importance of research and how research may be helpful in solving health problems of the community.[16] We believe that faculty members who are actively involved in research can serve as powerful 'role models' for young students. A teaching scholars program at the

McGill University, Canada has created faculty members who have taken on new leadership roles in medical education.[28] Training programs for faculty members can be helpful in creating 'incubators' for research. Marks should be allotted for research projects and the projects should be planned during periods when the clash with academic and assessment requirements is minimal. Students should be encouraged to publish their research findings. International journals like the Student BMJ, McGill Journal of Medicine, Journal of Young Investigators publish student research. PLOS Medicine has started a student forum. In Nepal, the Kathmandu University Medical Journal has started a Student Forum. Similar initiatives can be considered by other Nepalese journals. Publishing their findings can be a powerful motivating factor for encouraging research among medical students. Medical students can get letters published in journals[29] and can also try to get their findings published in newspapers.[30] The circulation rates and readership of newspapers greatly exceed those of medical journals. It is encouraging to note that Nepalese newspapers often publish findings of research projects conducted by students.

Scholarship and financial incentives should be given to students actively pursuing research. Publications and research projects should be considered during the process of admission to postgraduate courses. Nepal has many pressing health problems. Encouraging student research will ensure that future doctors are equipped to investigate these health problems and possibly suggest and implement solutions.

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