

Producing Physician Scientists

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Background and need for innovation

In spite of the fact that training in research methods correlates with a positive attitude to science, formal training in research methodology is not part of the medical undergraduate curriculum in most universities in India. Although students receive some orientation in statistics and research methods in the third year of medical school, only a few colleges have their students trained and actively involved in research.

Training in research competencies helps in developing critical thinking and therefore, better clinical decision making. It was felt that if undergraduate students attended a workshop on research methods, chose projects and were guided as they worked on their projects, they would inculcate the scientific attitude that would help them practice Evidence Based Medicine. Additionally, the quantity and quality of undergraduate medical research from the institute would increase. Our educational innovation involved training undergraduates in basic research methods followed by guiding them through research projects that they chose and developed.

The Innovation

The study was conducted in a teaching hospital in South India. Topics to be discussed in the workshop were finalized by discussion with resource personnel (who were medical college faculty with research experience). A pre-test based on these topics was developed to assess the students' baseline knowledge and understanding of the research process. A questionnaire to assess perceptions about research was also developed and pre-validated.

Institutional Review Board approval was obtained for the study. Informed consent was obtained from the students who participated in the study.

The pre-test and the survey questionnaire were administered to 85 Second Year medical students who participated in the one day workshop. The workshop included topics such as how to formulate a research question, literature search, bibliography writing, basic statistics and ethics in research. The teaching methods included interactive lectures, problem solving and group discussions. After the workshop a post-test was administered. Pre and post-test scores were compared to assess the change in knowledge about research methods. Responses to the questionnaire were analyzed.

Students were then asked to choose a topic for a research project and to work under the supervision of a faculty member on a research project for the next 8-12 months. Projects chosen were from various preclinical, paraclinical and clinical departments and spanned a variety of disciplines – ENT (Eg: Causes for Delay in Intervention in Hearing Impaired Children Admitted to Special Schools), Surgery (Eg: Efficacy of Modified Alvarado Score) and Medical Education (Eg: Choice of Post Graduate Specialty and Factors Influencing these Choices). Students had regular, scheduled meetings with their supervisors regarding progress of research and resolution of logistical, conceptual and scientific doubts.

A survey was sent to students 8 months after the workshop regarding factors which facilitated and hindered their research. This research training intervention workshop was followed by a mandatory, supervised research project. It has now been included in the institute program for undergraduates.

Outcome of the innovation

1. Eighty-five students attended the workshop and all took the pre-test and the post-test. A questionnaire was administered prior to the

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workshop, and a survey was conducted 8 months later. The Post-test mean (Standard Deviation) was 18.7 (2.50) and showed a significant increase over the pre-test mean standard deviation) of 12.28 (3.34) ($p < 0.0001$).

2. In the survey conducted prior to the workshop: sixty percent of students felt that the current training in research in the undergraduate course was inadequate while 57.7% stated that active involvement in scientific research during undergraduate study would improve their career prospects. 74.6% agreed that research training must be made mandatory in the medical school.

3. In the survey conducted 8 months after the workshop 72% strongly agreed that the training workshop enhanced their knowledge, attitudes about the process and practice of scientific research. It was revealed that at the end of eight months, 48.4% students had completed their projects, and had written their reports, while 46.9% had collected data, and were in the process of statistical analysis and

report writing 4.7% of students had not completed their projects. Four students had presented their paper in a national conference, and one had received the best paper award. Twenty percent of the students who participated in the innovation said that lack of time was the main obstacle while 34% said that recognition and rewards from the institute for research would increase their interest in research.

Conclusion

Our study shows that many undergraduate medical students are interested in research and would like to be trained and guided in their projects. Inclusion of training in research methods in the undergraduate curriculum significantly improves student knowledge about research as assessed by the pre and post intervention tests. Protected time for scientific projects and recognition for scientific work done would enhance student interest in and ability to do research.