

Research as a requirement in a problem-based learning medical curriculum in Saudi Arabia

*Hani M. Tamim, PhD, Hanan M. Al-Kadri, MD, PhD,
Mohammed F. Zamakhshary, MD, FRCSc,
Ibrahim A. Al-Alwan, MD, Mohamed S. Al-Moamary, MD,
Rana M. Tamim, PhD, Essam A. Al-Banyan, MD,
Mobi M. Magzoub, MD, PhD, Abdullah A. Al-Sayyari, MD, PhD.*

Within the medical field, and particularly in light of the importance of Evidence Based Medicine (EBM) practice, a strong understanding of research methodologies and processes are essential for the physician to critically judge the relevance of publications in practice.¹ More importantly, proficiency in conducting medical research is crucial for the progression of medical universities and research centers in any given country. Researchers have indicated that, physicians do not have a strong grasp of research methodologies,² and thus, there is a need to focus attention on the research component in any medical program. In this paper, we will report the experience of integrating a Medical Research Program (MRP) within the 4-year Problem Based Learning (PBL) Medical Curriculum. The readers will be provided with a description of the program integration and assessment during the period between June 2004 and June 2009 (implementation until graduation of the second group of students).

This observational descriptive research was conducted in 2010 in the Department of Medical Education at King Saud Bin Abdulaziz University for Health Sciences (KSAU-HS), College of Medicine (COM) in Riyadh, Kingdom of Saudi Arabia. The COM at KSAU-HS was inaugurated in 2004 to bridge the gap between the increasing demand for physicians in the country and the shortage in medical school graduates. The World Federation for Medical Education accredited the College in 2008 with more than 90% satisfaction of the basic and quality standards. The college accepts graduates from high school, science colleges, applied health sciences, and pharmacy and is implementing a PBL curriculum adopted from Sydney Medical School (SMS), Sydney, Australia.³ The duration of the medical

program is 4½ academic years for the enrolled students. All accepted students go through a pre-professional phase (phase I) that spans over one academic semester. Once students satisfactorily complete their first phase, they will pass through an integrated basic and medical sciences phase (phase II) followed by a clinical phase (phase III). During phase II and III of the medical curriculum, enrolled students have to go through an intensive MRP that requires them to conduct a full research project under the supervision of a faculty member during the course of their studies. The scope of the required research project may cover medical sciences, clinical research, public health, and medical education. The students (41 students representing the first 2 batches without any exclusion) have to plan, design, and implement a research project that provides them with the opportunity to explore the world of biomedical research, ranging from basic descriptive community-oriented research to the more sophisticated analytical clinical sciences. The program aims at providing medical students with a deeper understanding of the scientific basis of medicine that goes beyond what is offered in the core curriculum, and a greater appreciation for the processes and methods of scientific research. Moreover, the program focuses on graduating future medical practitioners capable of communicating advances in biomedical research that in turn will translate into major advances in the health of society. Dedicated physicians, medical scientists, and educationists are assigned to supervise students during the program. The key role of the supervisor is to help the student learn more about the process of scientific investigation and to convey the knowledge, skills, and attitudes required for this aspect of the practice of medicine. This allows the MRP to help students in: a) overcoming a weakness or a gap in knowledge or skill; b) broadening understanding through a project based approach; c) expanding horizons in humanities or social sciences; d) exploring a particular literature; and e) preparing students for any potential postgraduate studies.

The program has 2 consecutive components; namely, the MRP I and II (Figure 1). The MRP I carries a weight of 4 credit hours and runs longitudinally during phase II of the curriculum. The student identifies the area or field of study, chooses a supervisor, decides on a topic, completes a literature review, and plans a methodology for the study. Rules and regulations entail that each student completes an initial learning contract and one individual proposal in the first 2 years under the supervision of an approved faculty member. The proposal should follow the research guidelines of the

Disclosure. Authors declare no conflict of interests, and the work was not supported or funded by any drug company.

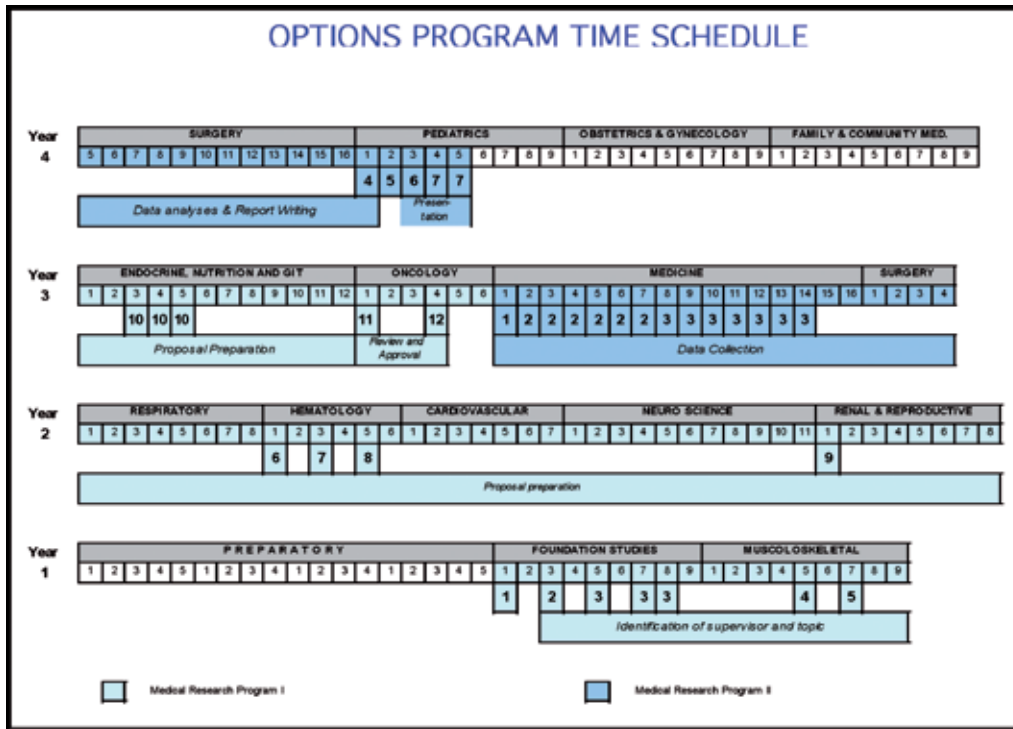


Figure 1 - An outline of the schedule for Medical Research Programs I and II as incorporated in the medical curriculum.

King Abdullah International Medical Research Center (KAIMRC) and is reviewed by the COM-Research Committee. Based on the committee members' input, the student is expected to implement any suggested modifications before receiving Institutional Review Board (IRB) approval for implementation of the project.

The MRP II carries a weight of 3 credit hours and runs longitudinally during phase III of the curriculum. The MRP II component mainly entails the actual implementation of the research project including data collection, data entry and cleaning, data analysis, and reporting of results for presentation and dissemination. As a final outcome of the MRP II, students are expected to submit a final report to the COM-Research Committee, which should be in a manuscript form. Students are scheduled to present their project during a session allocated for that purpose. Several integrated sessions are offered to students to help them accomplish each task included in the MRPs (I and II). The integration of these sessions is carried out so each precedes the task to be carried out by at least 2 weeks. These sessions include, but not limited to the following: how to write a proposal, how to conduct a literature review, different study designs, sampling technique, sample size calculation, data collection,

data management and statistical analyses, writing a manuscript, as well as preparing an oral presentation.

The MRP I is assessed based on 4 components: drafting the learning contract, constituting 10% of the final grade, whereas the learning contract constitutes 20%, and the full proposal constitutes 40%. Finally, the oral presentation of the proposal constitutes 30% of the final grade. The MRP II is assessed based on 3 components; namely, supervisor's evaluation constituting 30% of the final grade, whereas the presentation of the final report is worth 30%, and evaluation of the final report is worth 40%. The overall evaluation of the Research Methods Program is under the jurisdiction of the COM-Research Committee and the COM-Curriculum Evaluation Committee with feedback from supervisors and students being an integral component. The COM-Research Committee is expected to oversee the overall flow of the MRP. The Committee includes 12 faculty members who have different expertise in related fields and who are devoted to the successful accomplishment of the program.

Reflecting on the implemented program, integrating research in medical programs is of high importance due to its effect on students' future perceptions and attitudes towards research.⁴ The longitudinal implementation

of the MRP at KSAU-HS is one of the rare instances of extensive integration of research within a medical program in the Arab Region. We believe that this 4-year program will enable the students to have firsthand experience with all stages of the research processes, and allow them to relate theory with practice. The implemented design aimed at enhancing students' positive attitude towards research through real life practice that influence students' personal attitudes, and behavior.⁵

Different administrative and logistic limitations and challenges were faced during the implementation process. Of the administrative challenges were allocating the credit hours to the program while addressing Ministry of Higher Education criteria in Saudi Arabia, and including the MRP as a mandatory requirement of the medical curriculum and securing the approval of the curriculum committee. Resolving these issues required higher clarity in the program design to convince the accrediting committees of its significance. Another major challenge was securing the diverse faculty cohort (in terms of their interests and expertise) needed to address the program requirements. More importantly, the challenge was to attract and train an adequate number of faculty members of busy medical practitioners who are interested and willing to supervise the students throughout their research program. This challenge was overcome by offering educational sessions to potential supervisors, raise their awareness regarding the importance of the program, discuss the educational objectives, supervisory strategies, and follow-up procedures. Finally, although this work is limited by the fact that it is the isolated experience of one academic institution, we feel that the experience obtained is transferable to others who plan to implement a similar program.

We conclude that the MRP at KSAU-HS appears to be a viable and potentially successful approach for the enhancement of medical research. Overall, the success of the MRP depends on 3 key stakeholders: a) the student; b) the supervisor; and c) the COM-Research Committee.

Received 23rd June 2012. Accepted 5th October 2012.

From the College of Medicine (Tamim H, Al-Kadri, Zamakhshary, Al-Alwan, Al-Moamary, Al-Banyan, Magzoub, Al-Sayyari), King Saud bin Abdulaziz University for Health Sciences, Riyadh, Kingdom of Saudi Arabia, the Department of Internal Medicine (Tamim H), Faculty of Medicine, American University of Beirut Medical Center, Beirut, Lebanon, and the College of Education (Tamim R), Zayed University, Dubai, United Arab Emirates. Address correspondence and reprints request to: Dr. Hani Tamim, Department of Internal Medicine, Faculty of Medicine, American University of Beirut, PO Box 11-0236, Riad El-Solh, Beirut 1107 2020, Lebanon. Tel. +961 (1) 350000 Ext. 5450. Fax. +961 (1) 738025. E-mail: hani_t@hotmail.com / htamim@aub.edu.lb

References

1. Windish DM, Huot SJ, Green ML. Medicine residents' understanding of the biostatistics and results in the medical literature. *JAMA* 2007; 298: 1010-1022.
2. Leira EC, Granner MA, Torner JC, Callison RC, Adams HP, Jr. Education Research: The challenge of incorporating formal research methodology training in a neurology residency. *Neurology* 2008; 70: e79-e84.
3. Goulston K, Oates RK. Changes to the University of Sydney medical curriculum. *Med J Aust* 2008; 188: 461-463.
4. Pruskil S, Burgwinkel P, Georg W, Keil T, Kiessling C. Medical students' attitudes towards science and involvement in research activities: a comparative study with students from a reformed and a traditional curriculum. *Med Teach* 2009; 31: e254-e259.
5. AlFaris E, Abdulgader A, Alkhenizan A. Towards evidence-based medical education in Saudi medical schools. *Ann Saudi Med* 2006; 26: 429-432.

Related Articles

Okka B, Demirci M. The curriculum and education of medicine after Galen in Alexandria, Egypt. *Saudi Med J* 2012; 33: 937-941.

Al-Faris EA, Naeem N. Effective teaching in medical schools. *Guiding principles*. *Saudi Med J* 2012; 33: 237-243.

Alghanim SA, Alhamali RM. Research productivity among faculty members at medical and health schools in Saudi Arabia. *Prevalence, obstacles, and associated factors*. *Saudi Med J* 2011; 32: 1297-1303