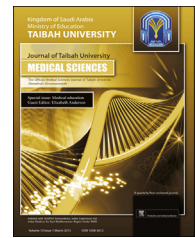




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Educational Article

A preliminary plan for developing a summer course on practical research engagement for medical students at Tabuk University



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المخلص

ظهر في السنوات الأخيرة اهتمام متزايد بالبحوث الطلابية، بين كل من طلبة الطب وأعضاء هيئة التدريس، وذلك لأن المشاركة في البحوث الطلابية تحسن التفكير التحليلي والنقدي لدى الطلاب وتزيد من اهتمامهم بالدراسات العليا. يتم تدريس طلاب الطب مبادئ منهجية البحث، ويسمح لهم بإجراء أبحاث مجتمعية بسيطة كجزء من منهجهم الدراسي؛ إلا أن هذه التجربة القصيرة قد لا ترضي الراغبين في التخرج مع سيرة بحثية قوية.

توضح هذه المقالة الخطوط العريضة لخطة أولية لتطوير مقرر المشاركة البحثية العملية لطلاب الطب، من جامعة تبوك في المرحلة السريرية. سيشارك الطلاب تحت الإشراف التام من قبل أعضاء هيئة التدريس خلال جميع مراحل المقرر، بدءاً من مرحلة إعداد المقترحات البحثية إلى مرحلة النشر. سيتم عرض أهداف المقرر، ومناقشة مسؤوليات المشرفين في هذه المقالة. يمثل هذا المقرر خطوة عملية نحو تكامل البحث العلمي مع التعليم الطبي والأنشطة السريرية.

الكلمات المفتاحية: المرحلة الجامعية؛ ارتباط؛ إشراف؛ اختياري

Abstract

There is increasing interest in undergraduate research among both medical students and faculty members. Participation in undergraduate research enhances students' analytical and critical thinking and increases their interest in postgraduate studies. As an integral component of the undergraduate curriculum, medical students

are taught principles of research methodology and are further allowed to conduct simple community-based studies. This brief experience, however, may not satisfy those willing to graduate with strong research portfolios. This article describes the general outlines of a preliminary plan for developing a practical research engagement course for phase III medical students at Tabuk University in the Kingdom of Saudi Arabia (KSA). As per the guidelines, the participants will be completely supervised during all stages of the course, from the preparation of research proposals to the publication of their results. This article describes the objectives of the course and key roles and responsibilities of the supervisors. The course represents a stepping stone towards the integration of scientific research with medical education and clinical activities.

Keywords: Engagement; Elective; Supervision; Undergraduate

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Introduction

Scientific research is essential for the progress of medicine and the improvement of patient care. Graduated doctors should be armed with the faculty of critical thinking, scientific reasoning and generation of new ideas in order to practice medicine in an evidence-based environment. These skills can be achieved by engaging medical students in

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scientific research early. Research-oriented students who are supplied with these competencies are expected to succeed in any medical specialty. As part of their medical curriculum, research programs and courses are developed to teach medical students at Tabuk University the principles of research methodology. After completing these courses, medical students conduct a short community-based study under the supervision of the Community Medicine Department. These mandatory courses, however, may not provide all necessary research skills or satisfy those willing to graduate with impressive research portfolio. Realizing the integral role of research training in medical education, some universities have established special centres or offices to facilitate, supervise, and provide funding opportunities for independent undergraduate research.^{1,2} They provide teaching courses and seminars for beginners and publishing opportunities for those who complete their studies. Some of these centres offer undergraduates the possibility to engage in faculty-mentored studies regardless of their examination scores, whereas others restrict research opportunities to distinguished students.¹ At other universities, a special associate dean for research is assigned to organize research ideas in the medical faculties and lead their institutions in innovative research directions that attract external support.^{3,4} Furthermore, the attitude and practices of most researchers towards undergraduate research seem to be highly encouraging. A recent study that examined the responses of approximately 40,000 faculty members from different educational institutions in the United States found that more than half of them spent some time supervising undergraduate research, and the majority perceived the importance of independent student research.⁵ It is worth noting that in the United States, the Council for Undergraduate Research (CUR) has been in existence since 1978.⁶ This unique council is a national, not-for-profit educational organization whose mission is to support and promote high-quality undergraduate research and scholarship.⁶ In addition to the provision of funding opportunities, this council hosts undergraduate poster sessions, national conferences and research publications.⁶ The great expansion of undergraduate research in the United States over the past three decades was described by some researchers as a “movement”.⁷ In other countries, different scientific societies and networks of universities organize regular or occasional international undergraduate conferences.^{8,9} These conferences give undergraduate students the opportunity to introduce their research to large numbers of colleagues and teachers; at the same time, they will expand their knowledge and improve their communication and presentation skills. Participation in these conferences increases undergraduates’ confidence and encourages them to build a strong record in medical research.

Taking the importance of undergraduate research into consideration, the Saudi Ministry of Higher Education has organized the Annual Scientific Conference for undergraduates since 2010. The conference allows students from different universities to present their innovative research projects and creative ideas with the aim of spreading a culture of scientific research, developing scientific competition between the students, and providing them with communication and dialogue skills. A preparatory scientific meeting is held annually at all Saudi universities in the

months before the conference to nominate the best students to present their research at the event. It is worth noting that the participation of medical students in this great occasion is limited by the large number of participants from different colleges of the different universities. This raises the importance of a practical course that encourages the engagement of medical students in scientific research and improves their skills to effectively compete on such occasions. The aim of this article is to describe the general outline of a summer course that is planned to develop the research skills of medical students at Tabuk University.

Course objectives

This course provides practical research experience to medical students without interrupting their medical studies. The course gives students a valuable chance to learn different methods of research and acquire good research foundation. Similar courses and programs developed outside Saudi Arabia have received positive evaluations from both students and faculty members.^{5,10} The benefits of these courses include positive effects on analytical and critical thinking, improved understanding, and increased interest in postgraduate studies.^{10–12}

The course is intended for phase III (4th, 5th & 6th year) medical students who have already studied the principles of research methodology in the first years of their medical study as a prerequisite for the course. The specific objectives of the course are presented in [Table 1](#). Through this course, students learn how a research idea evolves from a simple proposal to full, publishable research. The elective nature of the course encourages those who are truly interested to expand their research knowledge and skills. Participants are expected to pursue their future careers as physicians with high competence in scientific research.

Course details

The course duration is 12 weeks beginning three weeks prior to the summer holiday; registration starts one month earlier. The research may be basic, clinical or epidemiological based on each student’s preference. Proposed areas of study include but are not limited to obesity, smoking, malignancy, chronic and infectious diseases, cardiac problems, ageing, and medical education. Each student is supervised by a member of the teaching staff according to the research area. The supervisor guides the student during all stages of the

Table 1: Specific objectives of the practical research engagement course for medical students.

No.	By the end of this course, the student should be able to:
1.	Select a research topic
2.	Write a research proposal
3.	Select appropriate research design
4.	Follow ethical principles of scientific research
5.	Use effective methods for data collection
6.	Participate in data analysis
7.	Present results in tables and figures
8.	Submit an abstract or a manuscript for publication

study, starting from the preparation of the research proposal to abstract/manuscript submission. A co-supervisor may be selected from outside the faculty. All research projects must be approved by a Course Advisory Committee prior to the commencement of the proposed study. Members of the Advisory Committee should have relevant experience in scientific research.

The 12 weeks of the course include the final three weeks of each academic year as a dedicated time for elective courses, plus the nine weeks of the summer break. By the end of the first three weeks, the student and his supervisor should have submitted a research proposal and started data collection. Data analysis, results and discussion may be completed by the end of the summer vacation, or they may require extra time. After study completion, each participant is expected to submit a structured abstract to the course coordinator before a specified dead time. Following that, the course coordinator receives a detailed evaluation from each supervisor describing the commitment and overall performance of his student. Students' scores in the course are based on both the abstract and the supervisor's comments. Successful students will receive a certificate of course participation.

All accepted abstracts will be published in an abstract book. The best abstracts will be selected by the course advisory committee to receive monetary awards. Distinguished students will be invited to present their work at a Medical Student Research Day during the first term of each new academic year. This event will be a one-day conference consisting of both oral and poster presentations. In the future, the Medical Student Research Day may become a National or even an International Medical Student Research Conference.

One of the major challenges in this course is how to promote active participation among the faculty members. They may find the process of supervision difficult and time consuming because it requires direct communication and frequent consultation with the students. In addition, many students and faculty members may prefer not to interrupt their summer holiday with this extra-curricular activity, and they may have to travel to another country. Another problem concerns funding issues and who will pay for the expenses. Conversely, students may be of great help to faculty members who experience difficulties in data collection for their own studies. Here, students can join a research group and develop their skills while working within a team.

Conclusion

The course described herein allows the teaching staff of the Faculty of Medicine at the University of Tabuk to transfer part of their knowledge and research experience to

their students. Although the process of supervision in this course increases the workload and consumes valuable time, previous studies have shown that participating faculty members benefit from these courses and experience significant improvement in the quality of their work.¹³ This course can also be regarded as a practical step towards the integration of scientific research with medical education and clinical activities. Through appropriate mentorship, medical students will receive valuable assistance in the development of research skills and the selection of future postgraduate studies. The course reflects the intention of the Faculty of Medicine to give scientific research all due consideration and full priority.

Conflict of interest

The authors have no conflict of interest to declare.

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