

Review Article**Participation of Medical Students in Health Research: Local and International Experiences****Yasmeen Zaki¹, Basem Eldeek², Nasra Ayuob*², SafwanAltayeb¹, Reda Jamjoom³**¹Medical Intern, King Abdulaziz University²Medical Education Department, Faculty of Medicine, King Abdulaziz University, Jeddah and Faculty of Medicine, Mansoura University, Egypt³Assistant professor & Consultant of vascular and endovascular surgery, Department of Surgery and Head of Medical education Department, Faculty of Medicine, King Abdulaziz University, Jeddah***Corresponding author**

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Abstract: Medical Students' role in health research is of great importance. It is trending worldwide that medical students learn and apply research skills early during their undergraduate studies. The objectives of this article are to explore the students research activities in national and international medical schools, and to postulate some actions to effectively enhance students' participation in research. In this review article, research conduction by medical students at some local and international studies were being surveyed; along with methods medical schools (including Faculty of Medicine, King Abdulaziz University) are using to improve the medical students' involvement in research. Many studies have proved effectiveness of specific approaches for enhancing students' research. There were still many actions to be taken by the medical schools which are willing to improve their students' participation in research. Depending on this review we suggest that efforts, finance and time should be appropriately invested to promote and early student's involvement in research. Integrating the research further in the curriculum, promoting the extracurricular research activities, providence of research protected time for students and the establishment of a student medical research unit is all recommended.**Keywords:** Medical Students, Research, Saudi Arabia, International, Medical schools.

INTRODUCTION

It is of great importance for medical students to get introduced early to scientific research methodology and the benefits of conducting their own scientific research. It was previously reported that medical Students researches represent an essential part in health research at any institution [1].

Student participation in research conduction has potential benefits for them, their institutions and the academic community as a whole [2-8]. Regards the benefits the medical student gains, Frishman [9] and Houlden *et al.* [7] reported that student's involvement in research can help them acquire the essential skills of conduction while nurturing a deeper understanding in an area of interest. Adding to that the research publication was chosen as one of the indicators to assess the students' qualities and their personal and career development ability [10]. Adding to that the specific competencies that could be enhanced through medical students' involvement in research that include improving their long term career prospect and broad knowledge base, boosting their career profile, evolving their critical appraisal and thinking, increasing their

information literacy as well as helping shape the medical students by cultivating their critical judgment in addition this enhancement will increase the publication output of their medical school [7, 9, 11].

Taking into consideration all these benefits of medical students' involvement in research in addition to the impact of having published researches on the acceptance of Saudi medical students in international schools that was observed, Faculty of Medicine (FOM), King Abdulaziz University (KAU) as well as many other Saudi medical Schools are taking steps to integrate research into the undergraduate medical school curriculum. The objectives of this work are to review the research activities taking place in national and some of the international medical schools, and to recommend systematic steps to effectively enhance students' participation in research.

METHODOLOGY

One of the international academic standards in medical education, The Liaison committee of Medical Education (LCME), as well as a national one, The National Commission for Academic Accreditation and

Assessment (NCAAA) in addition to The General medical council (GMC) were reviewed to highlight the students research related issues. Relevant national and international studies were identified from searches of Pubmed & EBSCO databases. Eligible studies varied from cross-sectional studies examining methods used nationally and internationally to enhance medical students' participation in medical research. All data were extracted independently by one person and cross-checked and revised by two.

RESULTS AND DISCUSSION

A lot of international experiences in medical students' research while and very few national experiences were reviewed. The results of these revisions were sorted in three main domains; studies that represented student's participation in research, approaches to enhance such participation and obstacles facing students' involvement in research. In addition, some, not all, benchmarked medical education standards that perceive students participation in research as a requirement.

Students research as a requirement in medical education

It was stated by the LCME that medical schools should make sufficient opportunities available for medical students to contribute in research and encourage and support student participation [12]. On the national level, The NCAAA stated that postgraduate research students could benefit from the opportunities of participating in joint research projects [13]. In the GMC document *Tomorrow's Doctors*, the attribute of research skills was emphasized. It was stated that the medical school graduates should be able to use research skills to develop better understanding and to affect their practice [14]. Jacobs and Cross [3] and Houlden *et al.* [7] reported that research might help fulfill this requirement of new doctors. When it came to the international medical school, it was found that the medical students in Germany are required to submit a research thesis to acquire the title of medical doctor As a result; about 90% of practicing German physicians had started a research [4, 15]. Students' motivation towards scientific research was stated as an essential element of modern undergraduate medical education curricula [16].

Medical students' participation in research

As a result of motivating the students at the Stanford University faculty of Medicine to participate in research, 75% published a paper and 52% participated in a national conference [3]. About 66% of medical students obtain a publication before graduation, in Germany, [4]. In a study conducted at the University of Helsinki to assess medical student research practice, about 31% of the participants reported having been involved with extracurricular research work [5].

The UK students in the college of Medicine showed an increasing attention in research and publication. The 2007 MTAS form rewards credit to graduates for a first author paper in a peer-reviewed journal [11]. A number of UK institutions offer interposed degree courses with a strong research component in which students interrupt their training to undertake a second degree. These courses attract about one third of UK medical students each year [6, 17]. Improving their career predictions as well as founding a broad knowledge base was among the common reasons for medical students choosing these courses while the other two thirds who have not undertaken an interposed degree may graduate without undergoing research. It was found that the most common reasons of the hesitancy of medical students to interpose were financial limitations, lack of interest, and prolong medical training [17]. In Charite' University Medical Centre Berlin, Germany, Students from the problem-based medical curriculum showed greater participation in research production and felt more confident in their scientific competencies than other students [18].

Although Saudi studies on medical students' researches were scarce, a study conducted amongst the interns at King Abdulaziz University hospital to assess their participation in research during the undergraduate studies was reviewed. This study showed that, only 6.4% of the interns had their research papers published, accepted for publication or being under revision, while about 12% discontinued their research. The majority (about 72%) of students' involvement in research started at the internship year which is considered to be a late start [19]. Little is known about the perception of medical students about the undergraduate research [8, 18] but recently a Saudi study found that all female medical students' demonstrated positive attitudes towards research conducted during the undergraduate study [20].

Obstacles facing medical students while conducting research

Overall, medical students claim to have inadequate opportunities to conduct research, whilst some do not know how to make the initial steps [21]. Unfortunately, many medical students can be challenged while pursuing research due to some factors, such as disruption of the progress of students through the core medical curriculum [11], difficulty in selecting the appropriate mentor, based on the field of interest and experience, and financial burdens [21]. In addition, disruption of faculty members from their own clinical and research commitments due to supervision requirements might hinder participating students in their own research [11]. The final-year medical students graduating from the Medical School, University of Nottingham, in the United Kingdom cited time constraints (74%) and a perceived lack of interest from potential supervisors (63%) as obstacles decreasing their involvement in research. This study highlighted

students interest to participate in extracurricular research, although the motivation for doing so appears to be largely CV driven [22].

The Interns at the KAU stated the lack of training in research methodology (67.5%), scientific paper writing and publication activity (63.1%), lack of dedicated research time (73.5%) and lack of available research projects for student participation (51.4%) are the main obstacles preventing students from research conduction. They suggested dedicating slots in the medical school curriculum for conduction of research [19].

Students’ research fostering approaches

There are several ways applied in different Universities to encourage undergraduate medical students to start their own researches. Research conduction was found to be mandatory in some medical schools and elective or extracurricular in others. An Office of Student Research Opportunities was established in Mount Sinai School of Medicine in 1995, to enhance students to participate in research. This office advised students, identified faculty who want to mentor students, organized an annual research day, helped fund summer and full-time research, and had created an award to provision student travel to national meetings [23].

In Queen's University, Faculty of Health Sciences, Canada, to motivate medical students to select research careers, a required eight week “Critical Enquiry” elective was included in the 2nd year of the curriculum. This elective is allowed each student a block of time, released from other academic commitments, to pursue a medically-related hypothesis of the student's choice. A complete literature search must be written and a final report submitted [7]. Marquette University School of Dentistry was one of the first dental schools to restructure its curriculum to incorporate a research emphasis [24]. A survival guide has been written by The Office of Student Research, Yale University [25]. It showed that from 1839 till now, the Yale University School of Medicine has carried on the practice of required medical student research. This guide suggested that students should look for mentors and seek advice in order to understand the research and forms of analysis best suited to their research [25].

In the report of FOM, KAU issued to LCME to attain an international recognition during the years 2010 -2011, the number of graduating students who participated in a research project with a faculty member was assess. Duplication in this percentage was observed during the year 2010-2011 compared to the previous years (Fig. 1) (unpublished data). This could be attributed to several initiatives that had been launched in FOM to promote students’ involvement in the research activity.

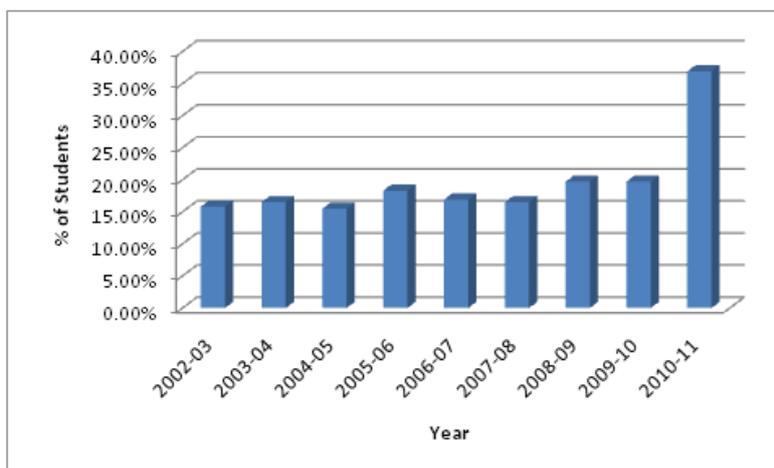


Fig. 1: King Abdulaziz University medical students’ participation in research during the period of 2002-2012 (unpublished data)

Establishment of Centers of Excellence and Scientific Chairs was one of these initiatives. These centers aim to provide a dynamic, productive and stimulating research environment for both faculty and students. It offers them biostatistics and research methodology training programs and workshops. They fund and supervise research projects proposed to them from students. Organizing research groups was another initiative that has been taken by the KAU. Integration of research skill study into the developed new curriculums of FOM at different levels starting from the second to

the fifth year was done at 2006-2007. Organizing conferences and research days at the FOM also has enhanced student participation in research.

Structured Seminars arranged by faculty members to give insights to their researches [23] and extracurricular research activities and hand on workshops on research skills could enhance student research [19]. In concordance with Mabvuure *et al.* [21], addressing educators on how to motivate medical students to get involved in research and

emphasizing research as a learning process and educating students on the advantages of conducting a research are advisable. Encouraging students to network with other researchers, to apply for summer research programs, to attend scientific conferences addressing research, to balance their academic and research interests were recommended by Mabvuure *et al.* [21].

CONCLUSION

Students' involvement in scientific research during their undergraduate studies is important and provides many benefits for students themselves, their institutions and communities. Efforts finance and time should be appropriately invested to promote and encourage early student involvement in research. Many studies have proved effectiveness of specific approaches for enhancing students' research. The important thing is to start thinking about this issue and to be incorporated in strategic planning of educational institutes and to be translated into specific projects and actions to be taken.

Author's recommendations to enhance students' research

- Integrating the research further into the curriculum, together with assigning scores for research conduction that affect students' grades or making research a requirement for graduation.
- Formulation of a Medical Student Research Unit to encourage research participation, answer questions and provide any aid and guidance necessary.
- Providence of protected time for both research faculty members and medical students to conduct researches.

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