

Extracurricular research activities among senior medical students in Kuwait: experiences, attitudes, and barriers

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Background: Research is the foundation of scientific advancement and improvement in quality of health care, which ensures the good health of the community. The aim of this study is to explore experiences, attitudes, and barriers of medical students in Kuwait University (KU) in regards to extracurricular research.

Methods: A questionnaire about extracurricular research activities (ie, any research activity that is not part of the required undergraduate curriculum, such as publishing a paper, research elective, etc) was distributed to 175 senior medical students (years 6 and 7). Descriptive and chi-square analyses were used to analyze the responses, considering a *P*-value of <0.05 as the cut-off level for significance. The main outcome was defined as taking part in any of the extracurricular research activities.

Results: Of the 150 participants (response rate = 85.7%), 26 (17.3%), 68 (45.3%), 52 (34.7%), and 17 (11.3%) had published their required medical school research, presented abstracts in conferences, conducted extracurricular research, and completed a research elective/course, respectively; 99 (66.0%) took part in any of these activities. Participants who read medical journals regularly (81; 54%) reported higher participation in extracurricular research activities than those who did not read journals (*P*=0.003). Improving the availability of mentors for students' extracurricular research was ranked by the participants as the most important factor to improve their participation in extracurricular research (4.05/5.00).

Conclusion: Despite the lack of adequate support, extracurricular research activities among medical students of KU were comparable to students from other countries. Barriers for these activities should be addressed by KU medical educators in order to enhance research activities among the students.

Keywords: research, publication, undergraduate, medical education, medical students

Introduction

Research is imperative in the advancement and improvement of the quality of health care. As such, medical students are required to develop research skills. It has been shown that involvement in research activities allows medical students to gain skills in search methodology, critical appraisal, statistics, time management, and teamwork, thus improving patients' care.¹⁻⁵ Moreover, getting involved in research and publishing scientific papers while attending a medical school increases the chances of students getting accepted in highly competitive residency training programs.^{4,6-8}

A large number of medical students have reported that conducting research is challenging; however, interest in a specific field and career advancement were the strongest motivators.^{9,10} Lack of time and availability of supervisors, a perception that the student

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would not receive appropriate acknowledgement for effort spent in research activities, and the perception that researchers are isolated from clinical practice were common reasons for not conducting research among medical students.^{3,10}

The Kuwait University (KU) medical curriculum is a 7-year program divided into a 4-year basic and a 3-year clinical sciences program. Evidence-based medicine (EBM) and research skills courses are part of both the basic sciences and clinical phases of the medical curriculum. Medical students start learning the basics of EBM, biostatistics, and epidemiology throughout the basic sciences phase, while they conduct a community medicine (CM) research project during an 8-week period of the clinical phase, with no obligation to publish their research projects. Students form small groups of 4 to 5 students to conduct their research, and the department of Community Medicine and Behavioural Sciences assigns research mentors and assistants to guide the groups throughout the steps of their project. This CM module is the course which exposes the students to research and basic concepts of public health and community medicine.

KU is focusing on the evaluation and improvement of the bedside teaching of their medical students; however, evaluating research and EBM education has not been done before.¹¹⁻¹⁴ In this study, any research experience that was not part of the curriculum in medical school is defined as an extracurricular research activity that includes presenting research abstracts, publishing scientific papers or participating in research electives. Knowledge about the involvement of KU medical students in extracurricular research activities is lacking. Therefore, we aimed to explore the experiences of extracurricular research activities, study the attitude of the senior medical students towards research and publication, and investigate the barriers to acquiring competence in research practices among medical students in KU. The deficiency of research infrastructure that integrates undergraduate medical students in Kuwait suggests that there should be little student participation in extracurricular research activities. This presents an opportunity in comparing such students to their international peers in terms of these activities, aiming to understand if the lack of a support system for students' research would result in a lower participation in research activities.

Methods

This cross-sectional study conducted during November 2012 included medical students from KU who had completed their research projects (ie, sixth and seventh year medical students). During the academic year 2012/2013, 91 and 95 students were

enrolled in the sixth and seventh years of study respectively (a total of 186).

A self-administered questionnaire composed of three main sections was developed based on a comprehensive literature review and was pre-tested on 20 randomly selected students to ensure clarity of questions.^{2,3,9,10} Section I included 13 multiple choice, closed-ended questions about the socio-demographic characteristics and background information about the student's research and publication practice. Sections II and III consisted of questions about the student's attitude towards research and barriers against research practice, containing 11 and 13 questions, respectively. The students had to choose between yes or no for sentences about the attitude toward research, and were asked to rate possible barriers to their participation in extracurricular research activities using a scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Written informed consent was obtained from each participant after proper explanation of the objectives of the study. Participants were assured of the confidentiality of the collected information. They were also assured that there would not be any harm if they declined to participate in the study. The study protocol and data collection instrument were ethically approved by Kuwait Institute for Medical Specialization, and permission to collect data from the students was obtained from the administration of the Faculty of Medicine of KU.

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS, version 17.0; PASW, SPSS Inc, Chicago, IL, USA). Frequencies and percentages were obtained for all variables to generate descriptive tables and figures. Chi-square analysis was performed to assess the association between students' participation in extracurricular research activities and their sociodemographic and academic characteristics, to understand if students with different academic performance or personal backgrounds would have different interests in research. A *P*-value of <0.05 was considered as the cut-off level for statistical significance.

Results

Of 175 students who were approached, 150 (87.5%) agreed to participate in the study while the remaining 25 (14.3%) did not offer any reason for declining. The sociodemographic and academic characteristics of the study sample are given in Table 1. Of the 150 participants, 88 (58.7%) were female, 83 (55.3%) aged 23 years or less, and 117 (78.0%) were unmarried. With regard to their academic features, 87 (58.0%) students were in their final year of study,

Table 1 Sociodemographic and academic characteristics of medical students in Kuwait University during the academic year 2012/2013

Characteristic	N	(%)
Sex		
Male	62	(41.3)
Female	88	(58.7)
Age (years)		
≤23	83	(55.3)
>23	67	(44.7)
Marital status		
Married	33	(22.0)
Not married	117	(78.0)
Year of study		
Sixth year	63	(42.0)
Seventh year	87	(58.0)
Grade point average (out of 4)		
≤2.99	123	(82.0)
≥3.00	27	(18.0)
Grade in community medicine module		
≥80%	28	(18.7)
<80%	122	(81.3)
Decided a future career specialty		
Not yet	79	(52.7)
Yes	71	(47.3)
Preferred future specialty*		
Surgical	21	(29.6)
Medical	29	(40.8)
Other	21	(29.6)
Preferred place of residency*		
Kuwait	18	(25.4)
Outside Kuwait	53	(74.6)
Regularly read journal articles		
No	81	(54.0)
Yes	69	(46.0)

Note: *Out of 71 (47.3%) participants who have made their decision on specialty.

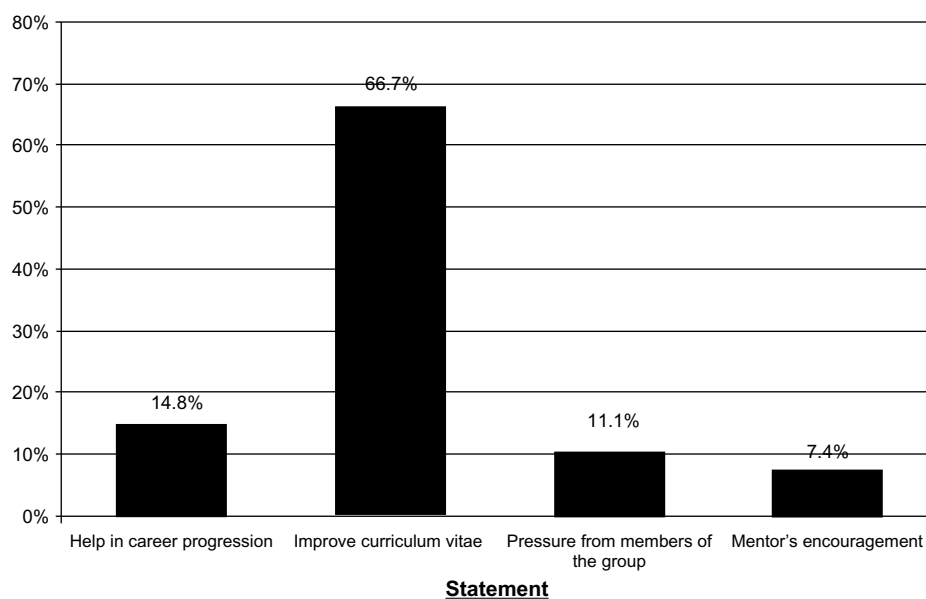
Table 2 Extracurricular research activities of medical students in Kuwait University during the academic year 2012/2013

Characteristic	N	(%)
Published the research project of the CM module	26	(17.3)
Presented an abstract in a conference	68	(45.3)
Participated in research other than CM project (currently or in the past)	52	(34.7)
Joined extracurricular research courses/electives	17	(11.3)
Took part in any of the above research related activities (overall)	99	(66.0)

Abbreviation: CM, community medicine.

123 (82.0%) had a grade point average (GPA) of <3.00, 122 (81.3%) scored <80.0% in their CM module, and 79 (52.7%) had not decided a future career specialty, while 71 (47.3%) had made such a decision. Of the 71, 29 (40.8%) preferred a medical future specialty and 53 (74.6%) were planning to complete their postgraduate education/residency outside of Kuwait. Of the 150 participants, 81 (54.0%) students read medical journals regularly (ie, following at least one journal's issues and updates).

Overall, 99 (66.0%) of the students had participated in extracurricular research activities (Table 2). Specifically, 26 (17.3%), 68 (45.3%), 52 (34.7%), and 17 (11.3%) students published their undergraduate research project in a medical journal, presented an abstract in a conference, participated in extracurricular research projects, and received extracurricular research education/training, respectively. The most important reasons reported by the students for publishing their CM research projects (Figure 1) were to improve their curriculum vitae (18; 66.7%), to help in career progression

**Figure 1** Reasons for publishing the community medicine research project reported by medical students in Kuwait University during the academic year 2012/2013.

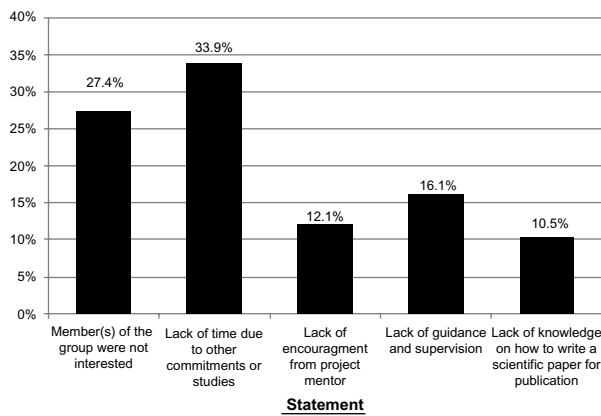


Figure 2 Reasons for not publishing the community medicine research project reported by medical students in Kuwait during the academic year 2012/2013.

Table 3 The association between Kuwait University medical students' sociodemographic and academic characteristics with the participation in extracurricular research activities during the academic year 2012/2013

Characteristic	Took part in any extracurricular research activity		
	N	(%)	P-value
Sex			0.307 ^s
Male	38	(61.3)	
Female	61	(69.3)	
Age (years)			0.190 ^s
≤23	51	(61.4)	
>23	48	(71.6)	
Marital status			0.927 ^s
Married	22	(66.7)	
Not married	77	(65.8)	
Year of study			0.110 ^s
Sixth year	37	(58.7)	
Seventh year	62	(71.3)	
Grade point average (out of 4)			0.936 ^s
≤2.99	81	(65.9)	
≥3.00	18	(66.7)	
Grade in community medicine module			0.265 ^s
≥80%	21	(75.0)	
<80%	78	(63.9)	
Decided a future career specialty			0.076 ^s
Not yet	47	(59.5)	
Yes	52	(73.2)	
Preferred future specialty [‡]			0.729 [‡]
Surgical	15	(71.4)	
Medical	21	(72.4)	
Other	16	(76.2)	
Preferred place of residency [*]			0.179 ^s
Kuwait	11	(61.1)	
Outside Kuwait	41	(77.4)	
Regularly read journal articles			0.003 ^s
No	45	(55.6)	
Yes	54	(78.3)	

Notes: ^{*}Out of 71 (47.3%) participants who have made their decision on specialty; ^sPearson chi-square; [‡]linear-by-linear association.

(4; 14.8%), pressure from members of the research project group (3; 11.1%), and the encouragement of their research mentors (2; 7.4%). On the other hand, the most important reasons/barriers for not publishing the CM projects reported by the students (Figure 2) were lack of time due to other commitments or studies (42; 33.9%), lack of interest either by the participant or other members of his/her project group (34; 27.4%), lack of guidance and supervision (20; 16.1%), lack of encouragement from the project's mentor (15; 12.1%), and lack of knowledge on how to write a scientific article for publication (13; 10.5%).

The chi-square analysis of the association between participation in extracurricular research activities and sociodemographic and academic characteristics of the students is shown in Table 3. Students who read medical journals regularly were found to have a statistically significant higher participation in extracurricular research activities (P -value 0.003). No other factors were found to be significantly associated with students' participation in these activities.

The students' attitude towards research activities is given in Figure 3. Sixty-three (42.0%) students believed that research is important during undergraduate education, while 116 (77.3%) believed that it will become important during their future career. In addition, 132 (88.0%) reported interest in clinical-based research, while 104 (69.3%) students reported interest in laboratory-based research. On the other hand, 18 (12.0%) students reported no interest in research while 5 (3.3%) students believed that research was not relevant to undergraduate medical education. Of the students surveyed, 120 (80.0%) were interested in additional education and training about the process of writing a scientific paper.

Barriers against students' participation in extracurricular research activities are shown in Figure 4. The most important barriers reported by the students that need to be improved so that they can participate more in extracurricular research activities were availability of mentors (score 4.05/5.00), acknowledgement for students' participation in research (score 3.98/5.00), and availability of financial support or grants for students' research (score 3.98/5.00).

Discussion

Although the overall participation in extracurricular research activities was high, the findings that the majority of KU medical students did not publish their required undergraduate research project or participate in other extracurricular research activities are similar to some previous studies.^{15–18}

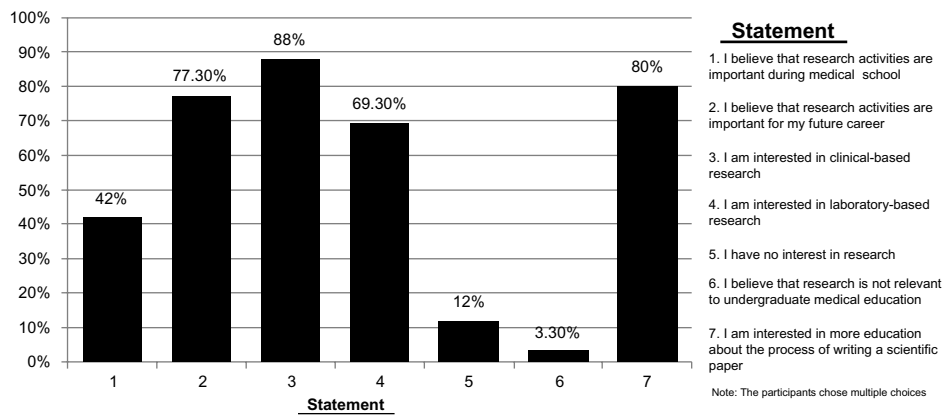


Figure 3 Attitude of medical students in Kuwait University toward research practices and activities during the academic year 2012/2013.

For example, the publication rate of students' scientific papers was low in Germany and the UK, ranging from 14% to 28%.^{15,16} Nevertheless, a higher rate of publication (range: 41% to 75%) was noted among students from the USA.^{17,18} This difference in the rate of publication of students' research is most probably due to the disparity in the research methodology between the studies; some authors used a questionnaire covering most of the students, while others did a literature search resulting in lower rates of extracurricular research activity.¹⁵⁻¹⁷ Also, the medical schools' curricular differences might contribute to this difference. For example, Stanford University's School of Medicine provided a good example of successful undergraduate research activities where students were encouraged by funding and teaching staff to conduct research.¹⁸ This encouragement resulted in 90% of their students performing research, publications among 75%, and presentations at national meetings among 52%.

The findings of this study that the motivating factors for publishing a paper were mainly to improve the student's personal curriculum vitae and help in career progression were also noted in a study of UK medical students, where 51% of the students submitted papers for publication to improve their curriculum vitae and 10% to improve their career progression and academia.¹⁵ In addition, another study done in the UK revealed that CV improvement was the main motivator for participation in research and audits among 51% of medical students.¹⁹ On the other hand, 65% of fourth year Canadian medical students reported that personal interest was their motivation to participate in research activities.¹⁰ It is important to point out that based on previous studies, although research and publications increase the chances of getting accepted in residency programs, they are not the most important factors used in selecting residents.⁶⁻⁸ Hence, students' participation

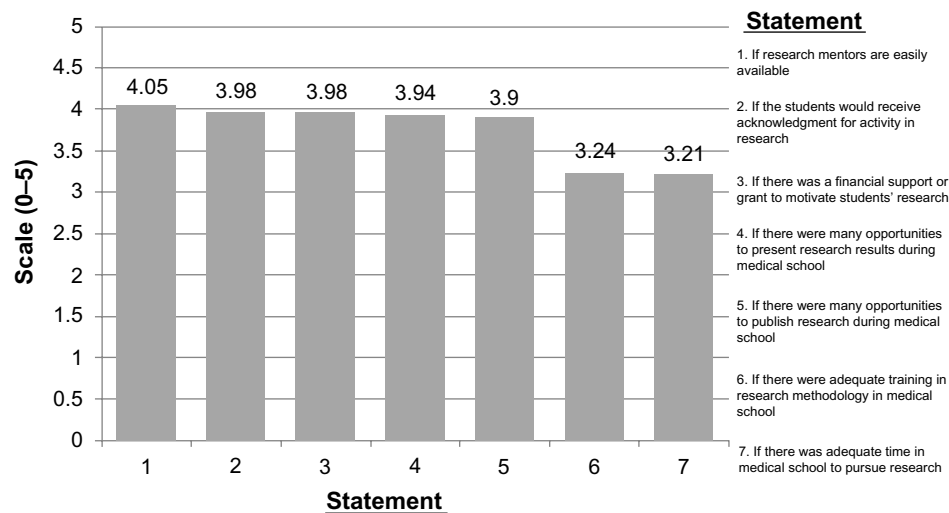


Figure 4 Importance level of factors that can improve undergraduate extracurricular research activities in Kuwait University as perceived by medical students during the academic year 2012/2013.

in research should not be motivated mainly by improving their CV.⁶⁻⁸

Challenges to participation in undergraduate medical research were addressed in previous studies.¹⁹⁻²¹ Availability of research mentors was considered the most important issue that needed to be addressed to improve students' research among our participants. Additionally, lack of time was the most important reason reported by our students for not publishing papers. This aspect also proved to be an important barrier against conducting research among Brazilian medical students.²⁰ Likewise, medical students in the UK reported time constraints (74%) as the most important obstacle against participation in research and audits, as previously reported.¹⁹ Such barriers could be resolved by establishing summer research electives, research interest groups, and providing sufficient time for research activities during the undergraduate medical curriculum.²²⁻²⁴ Research mentorship should also be encouraged among faculty staff, possibly by funding mentors, and the importance of extracurricular students' research to the publication output of the academic institute should be highlighted.¹⁶

In Portugal, male students were twice as likely to participate in extracurricular research activities than females, but this was not the case among our participants; the only sociodemographic or academic characteristic that was found to be associated with participation in extracurricular research activities was reading journal articles regularly.²⁵ The most probable explanation for this association is that students who read scientific papers have better skills in searching the literature, better understanding of the basic steps of writing a research article, and had more interest in academic careers. Nevertheless, being involved in more research activities can be a reason for reading more scientific journals.

Although less than 20% of medical students in KU reported that they are interested in a future specialty that offers more research opportunities, the majority of them reported that research activities were important for their future career.²⁶ Moreover, most of the participants were interested in more education about the process of writing scientific papers, and only 12% reported no interest in research. This interest should be utilized by medical educators and students' mentors in KU to improve the research activities and productivity of their students.

The major limitations of this study are that it is cross-sectional, questionnaire-based, and self-reported, which can result in recall and responder biases. Also, some of our participants completed their CM course a few months before

data collection; hence they might not have had sufficient time to publish their findings.

Conclusion

Despite the lack of adequate support, extracurricular research activities among medical students of KU were comparable to students from other countries. Barriers for these activities should be addressed by KU medical educators in order to enhance research activities among the students.

Disclosure

The authors have no conflicts of interest to declare.

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