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# Health science students' perception about research training programs offered in Saudi universities

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## Abstract

**Purpose** – The purpose of this paper was to examine the perceptions of students of health sciences on research training programs offered at Saudi universities.

**Design/methodology/approach** – A cross-sectional survey design was adopted to capture the perceptions of health science students about research training programs offered at selected Saudi universities. A criterion-based sampling technique was adopted, and accordingly, 630 students were selected to participate in the study. A pre-tested questionnaire tool titled, “Students Attitude towards Research (SAR) questionnaire”, was used to capture student responses on a five-point Likert scale with respect to three dimensions, namely, extent of research activities offered in their college, involvement of faculty in research and the infrastructural facilities offered by the college for research. The students' attitudes with respect to various components of research training programs were analyzed using mean and cumulative percentage of students satisfied with the training. Multivariate analysis of variance (MANOVA) was used to study whether there is any significant difference in attitudes among the students belonging to four health science programs of the seven selected universities.

**Findings** – The results of this study demonstrate that only less than 50 per cent of the students from the selected health science colleges are satisfied with the existing research training programs. There are significant differences in the students' attitude toward research training programs offered in seven selected Saudi universities.

**Originality/value** – This is the first Saudi Arabia-based study that provides an alarming signal to educational-policy planners on students' perceptions and attitudes toward research training programs offered in Saudi higher education institutions.

**Keywords** Saudi Arabia, Health science colleges, Research training programs, Students' perception

**Paper type** Research paper

## Introduction

The past decade has witnessed the transformation of undergraduate research experiences from a traditional “Cottage Industry” into a strong “movement” (Blanton, 2008). Medical training all over the world is becoming more student-centered, with an emphasis on active learning rather than on passive attainment of knowledge (Jones *et al.*, 2001). Encouraging

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medical students to undertake research projects is certainly one of the ways of emphasizing active learning, but problems arise when students are ignorant of the necessary processes required to register their research, in particular obtaining ethical approval (Tagal, 2007). In addition to this, students at the undergraduate university level typically tend to view research-related courses with negative attitudes and feelings (Papanastasiou, 2005). Students reported to have lack of time, neglect of routine duties and deterioration of clinical skills, due to more time being spent on research activities and inadequate project-management (Diez *et al.*, 2000). In spite of that, undergraduate research is important and popular for the following reasons:

- to integrate young scholars into the community of learning;
- to motivate undergraduates to become independent thinkers;
- to ensure that research experience is felt to be a necessity (Schwartz, 2003); and
- to prepare students for graduate program (Adamsen *et al.*, 2003).

It is interesting to note that undergraduate students who participated in research, rate the experience highly, for significantly greater enhancement in cognitive and personal skills and an increased likelihood of continuing into postgraduate education (Lopatto, 2003).

Even though the undergraduate students recognize the benefits of research experience, they then need a realistic understanding of the research process and require training to recognize the skills required for research and enhanced transparency in potential project outcomes (Deborah *et al.*, 2010). Other studies have also indicated that there are significant differences in attitudes toward mandatory research as a component of critical inquiry and scholarship in the undergraduate curriculum at medical schools (Siemens *et al.*, 2010). Further, there are a number of barriers to scientific training during undergraduate studies that include lack of institutional motivation, defective infrastructure and limited amount of time for professors to mentor undergraduate students (Neilton *et al.*, 2011).

In spite of this, there has been a significant movement toward providing medical students with early research experience within the medical school curriculum (Lloyd *et al.*, 2004; Frishman, 2001; Bickel and Morgan, 1980). With this increasing emphasis being placed on evidence-based medicine and the application of scientific research to clinical practice, it is paramount for medical professionals to possess sound understanding of scientific principles and methods, and to be skillful in the acquisition and critical appraisal of new information (Hren *et al.*, 2004; Byrne, 2004; Bickel and Morgon, 1980). Despite the many benefits of research to the medical students, the principles of scientific research are rarely taught at medical schools in a comprehensive way (Parkes *et al.*, 2001), and there has been a documented decline in the number of physician-scientists in medical practice (Solomon *et al.*, 2003). Also, it is surprising to note that the research activity is not a mandatory component of medical education in many countries, including Saudi Arabia.

To ensure and plan better utilization of the research training programs provided in the health science colleges in Saudi Arabia, it appears pivotal to inquire into the research experience of present undergraduate students. The motivational theory can be applied in the present study: when students have a positive attitude toward research methods and statistics (e.g. the subject is meaningful and relevant to their academic studies and

future career), they are likely to put more effort into studying the subject (Li, 2012). On the contrary, when students develop a negative attitude toward research methods and statistics (e.g. the subject is meaningless and irrelevant to their academic studies and future career), they are less likely to take extra effort in studying the subject. Further, it is essential to inculcate critical thinking and reasoning skills and to develop a positive attitude among students toward scientific research even from the beginning of their medical career (Aslam *et al.*, 2005).

The involvement of medical students in research and the barriers they face in accessing research training and engaging in research activities have not been adequately addressed in Saudi Arabia. Thus, the primary objective of this study is to document the undergraduate students' perceptions on the availability of research training programs offered in selected health science colleges in Saudi Arabia, the degree of involvement of students in these programs and the main barriers faced by the students in carrying out research activities. The research also attempts to study whether there is any significant difference in students' perceptions on and attitude toward research training opportunities available in seven different Saudi universities. In this study, the term "Perception" means how the students perceive the existing research training programs (i.e. how they see it), and the term "Attitude" means how they react to the existing research training opportunities. There may not appear to be much difference between the terms "perceptions" and "attitude" and both develop as a result of experience (Scott, 1969). Moreover, perception affects attitude and vice versa (Schiff, 1970). The present study addresses both the perceptions and attitudes of the health science students toward the research training programs offered at selected Saudi universities. The students' responses are stratified and ranked and appropriate recommendations are made which will help the policy planners to review the effectiveness of the existing research training programs offered at health science colleges in Saudi Arabia.

## Materials and methods

### *Study design*

A cross-sectional study design was adopted to capture the perceptions of the health science students about the research training programs offered at selected universities located within Saudi Arabia.

### *Study population*

All the students belonging to the health science colleges cluster of seven government universities located at four different geographical zones in Saudi Arabia were the focus of this study. A set of criteria were adopted by the researcher while choosing the samples, which include:

- only four colleges belonging to the health cluster were considered, i.e. medicine, dentistry, pharmacology and applied medical science programs;
- only governmental universities offering such programs were considered; and
- only those universities located in four major geographical zones of Saudi Arabia were considered for this study.

Based on the aforementioned criteria, 21 colleges belonging to seven governmental universities were chosen. From those 21 colleges, 630 final-year/internship students

were selected at random to participate in this study based on the homogeneity of students with respect to their level of exposure to research training.

### *Methods*

All the final-year and the internship students in each college were given a random number. Before distributing the questionnaire, a sampling lot was finalized by the researcher by picking 30 samples from each college. Then, the researcher distributed the questionnaires to all the selected participants ( $N = 630$ ), and the respondents were requested to kindly complete the questionnaire and return the same to the researcher. The respondents were given sufficient time to respond without inducing pressure. In all, 564 completed questionnaires were returned, which include colleges of medicine ( $N = 207$ ), dentistry ( $N = 119$ ), applied medical sciences ( $N = 150$ ); and pharmacy ( $N = 88$ ).

The response rate was measured as 90 per cent. Throughout the study, care was taken to protect the anonymity of the respondents. Respondent-identification of responses was not recorded, apart from global attributes, like the college where they were based.

### *Instrumentation*

A questionnaire tool (Students attitude toward Research Training – SAR questionnaire) was prepared in the form of statements related to various aspects of the research training program with five response options (Appendix). They are: (1) strongly disagree, (2) disagree, (3) not sure, (4) agree and (5) strongly agree. The questionnaire consists of 16 items structured in such a way as to address three attributes, viz., research activities offered in the college (seven items), students' opinion on faculty involvement in research (five items), and infrastructural facilities offered by the college for research (three items) as well as the overall satisfaction (one item). The reliability and validity of this questionnaire tool had already been established, which indicated that there is a high level of internal consistency (Cronbach's alpha = 0.77) for this scale with these specific sample items ( $N = 16$ ) (Al-Kuwaiti, 2014).

### **Analytical methods**

The students' perceptions and attitudes about various attributes of the research training programs were analyzed using mean agreement score and the cumulative percentage data of students who opted for both "Agree" and "Strongly agree" in the five-point Likert scale.

As a measure to find out whether there are any significant differences among the students' attitudes toward research training program offered in seven Saudi universities, one-way multivariate analysis of variance (MANOVA) was used. Further exploration was carried out using univariate ANOVA technique to find out whether there is any significant difference among the students with respect to three attributes of research training offered in their respective universities. A  $p$  value less than 0.05 was considered "significant". All the analyses were done by using SPSS 19.0 version.

### *Results*

Table I shows the number of students who responded to this study from each of the seven Saudi universities. In the total sample size of 564, King Abdul Aziz, King Faisal, Taibah and Dammam University constituted 15 per cent each, whereas King Khalid

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University constituted 11 per cent of the total samples. King Saudi University constituted 21 per cent and 5 per cent of the students belonged to Al Qassim University, justifying a wider representation of the samples in this study.

Table II shows the number of students who responded to this study with respect to each of the four specializations (i.e. programs) offered under the health science colleges domain. In the total sample size of 564, students from medical colleges constitute 36.7 per cent ( $N = 207$ ), students from dentistry program constitute 21.1 per cent (119), students from applied medical sciences constitute 26.6 per cent (150) and students belonging to the clinical pharmacy program constitute 15.6 per cent ( $N = 88$ ) of the total sample.

Table III shows the results of the analysis carried out for each of the three attributes of research training programs using the mean score and the cumulative percentage of students who opted for either "Agree" or "Strongly agree" on various statements in the questionnaire.

#### *Research activities offered in the college*

On analyzing the agreement scores of students about research activities offered in their respective colleges, it is seen that 44 per cent of the students "agreed" that their college has adequate infrastructure facilities to organize research programs.

Over 45 per cent of the students agreed that the degree of involvement of the faculty in research is good, and they have adequate skills to handle research methodology. However, a considerable proportion of students (45 per cent) felt that the faculty does not have sufficient time to mentor undergraduates in research. Even though the majority of students (51 per cent) agreed that their college was giving priority to include undergraduates in research, there was a concern among the students about their exposure to basic and advanced statistical tools needed for the preparation of research report. Only 43 per cent of them agreed that they have been exposed to such skills during

**Table I.**  
Number of students  
participated in the  
study

No.	Name of the university	No. of students responded $N$ (%)
1	King Abdulaziz University	88 (15.60)
2	King Faisal University	89 (15.78)
3	King Khalid University	59 (10.46)
4	King Saud University	120 (21.28)
5	Taibah University	90 (15.96)
6	University of Dammam	89 (15.78)
7	Al Qassim University	29 (5.14)
Total		564 (100.00)

**Table II.**  
Number of students  
participated in the  
study with respect to  
the four health  
sciences programs

No.	Specialization	No. of students responded $n$ (%)
1	Medicine	207 (36.7)
2	Dentistry	119 (21.1)
3	Applied medical sciences	150 (26.6)
4	Clinical pharmacy	88 (15.6)
Total		564 (100.00)

Sr No	Items in the questionnaire	Mean (SD)	Agreement scores (% of Students opt either "Agree" or "Strongly agree")
<i>I. Research activities offered in the college</i>			
1	I am much interested in participating in research activities at the undergraduates	3.24 (1.27)	45.8
2	My college organizes and gives priority to include undergraduates in research activities	3.26 (1.33)	50.7
3	Faculty members have adequate skills to handle research methodology	3.23 (1.27)	45.1
4	Faculty does not have sufficient time to mentor undergraduate students in research	3.11 (1.32)	44.7
5	The degree of involvement of the faculty in research program is good	3.11 (1.38)	45.6
6	Our college has adequate infrastructure to organize research programs	3.06 (1.40)	44
7	I had been exposed to basic and advanced statistical tools needed for preparation of research report	3.04 (1.42)	42.6
Cumulative percentage of all the Items (Item 1 to 7)			45.5
<i>II. Students opinion of faculty's involvement in research</i>			
8	Faculty members place great emphasis on research	2.99 (1.45)	43.8
9	Faculty members discuss their own research interests in class	3.00 (1.39)	42.4
10	Faculty members use research findings as a part of their teaching material	3.01 (1.36)	40.8
11	Research is important for identifying and investing problems in a subject matter	3.12 (1.42)	37.1
12	I am always getting the chance to discuss about the scientific/academic research in my class	3.16 (1.41)	47
Cumulative percentage of all the items (Item 8 to 12)			42.2
<i>III. Infrastructural facilities offered by my college for Research</i>			
13	Our college provides a good infrastructural facilities (i.e. Laboratory) needed to conduct research at the undergraduate level	3.10 (1.28)	43.1
14	The library facilities available in my college is sufficient for us to conduct research activities	3.18 (1.33)	45.9
15	Sufficient funding is offered by the university for conducting research at the undergraduate level	3.13 (1.33)	43.6
Cumulative percentage of all the items (Item 13 to 15)			44.2
<i>IV. Overall satisfaction</i>			
16	Overall I am satisfied with the research training program offered at the undergraduate level	3.04 (1.26)	41.5

**Table III.**  
Comparison of the agreement scores on students' attitude toward various attributes of the research training program offered in selected universities in Saudi Arabia

the training program. It is also seen that 46 per cent of the students are interested to participate in research activities offered at the undergraduate level.

#### *Faculty's involvement in research activities*

Over 43 per cent of the students felt that the faculty placed great emphasis on research and discussed their own research findings in the class, 41 per cent agreed that the faculty used the research findings as part of their teaching material, 47 per cent felt that they were exposed to research-related discussions in the class and 37 per cent agreed that research is important for identifying and investigating problems in their subject matter.

#### *Infrastructural facilities offered by the college for research*

With regard to the funding offered by the university for research, only 44 per cent of the students felt that it was sufficient for them to conduct research at the undergraduate level. Similarly, 46 per cent of the students agreed that the library facilities were sufficient for them to execute research work. Likewise, 43 per cent of the students registered their opinion that the laboratory facilities are sufficient to carry out research activities.

Table IV shows the results of MANOVA reflecting students' attitude toward research training programs offered by the universities and the four related health sciences programs, chosen to the study. From the results, it was inferred that there is a statistically significant difference in the students' attitude toward research training offered at different Saudi universities ( $p < 0.05$ ). A further attempt was made to study whether there is any significant difference in students' attitudes toward research training program with respect to different specializations (i.e. programs). It was found that a statistically significant difference exists among the students with respect to four different specializations of the health sciences studied ( $p < 0.05$ ).

Further exploration was carried out to study whether the students' attitude toward each of the three attributes of the research training programs differs with respect to the seven universities and the four health science programs chosen. A statistically significant difference was noted in the attitudes among the students toward the research activities offered at the university as well as the program level ( $p < 0.05$ ). There is no significant difference among the universities with respect to students' attitude about faculty involvement in research ( $p = 0.759$ ) and the infrastructural facilities offered for research activities ( $p = 0.556$ ). Similarly, there is no statistically significant difference among the four health science programs with respect to the students' opinion about the faculty involvement in research ( $p = 0.166$ ) and the infrastructural facilities offered for research activities ( $p = 0.122$ ).

For multiple comparisons, a Tukey's HSD post "hoc" test was carried out with the significant factors identified by ANOVA. A significant mean difference was observed between "King Abdul-Aziz" and "King Khalid" Universities ( $p = 0.00$ ), "King Abdul-Aziz" and "King Saud" Universities ( $p = 0.00$ ), "King Faisal" and "King Khalid" Universities ( $p = 0.00$ ), "King Faisal" and "King Saud" Universities ( $p = 0.00$ ), "King Khalid" and "Taibah" Universities ( $p = 0.003$ ), "King Khalid" and "University of Dammam" ( $p = 0.013$ ), "King Saud" and "Taibah" ( $p = 0.00$ ) Universities, "King Saud" and "University of Dammam" ( $p = 0.00$ ) and King Saud and Al Qassim Universities ( $p = 0.047$ ). While analyzing the difference in the mean agreement scores of the students of these four specializations, a statistically significant mean difference ( $p < 0.05$ ) was

University	Research activities offered	Students opinion of faculty's	Infrastructural facilities offered	F-value	
	in the college Mean (SD)	involvement in research Mean (SD)	by my college for research Mean (SD)		
King Abdul Aziz	20.49 (3.23)	14.97 (3.12)	9.16 (2.50)	$F_{(18, 1,536)} = 6.118^*$	
King Faisal	20.43 (3.26)	14.94 (3.11)	9.10 (2.54)		
King Khalid	23.49 (4.52)	16.12 (4.31)	10.20 (2.69)		
King Saud	24.68 (4.27)	15.30 (3.16)	9.19 (2.34)		
Taibah	21.20 (3.73)	15.68 (3.43)	9.61 (2.23)		
Dammam University	21.46 (3.95)	15.17 (3.85)	9.45 (2.64)		
Al Qassim	22.48 (3.70)	14.59 (5.50)	9.76 (3.29)		
<i>Program-specific specializations</i>					
Medicine	21.93 (4.15)	14.96 (4.06)	9.56 (2.68)		$F_{(9, 1,321)} = 5.207^*$
Dentistry	23.74 (4.10)	16.07 (3.71)	9.69 (2.62)		
Applied medical sciences	21.95 (4.27)	15.35 (3.02)	9.47 (2.41)		
Clinical pharmacy	20.24 (3.01)	14.86 (2.96)	8.61 (2.09)		

**Note:** \*Statistically significant at the 0.05 level

**Table IV.**  
MANOVA of  
students' attitude  
toward research  
training program  
with respect to seven  
universities and four  
health science  
programs

observed among all specializations, except between “Medicine” and “Applied Medical Sciences”. Specifically, medical and dentistry students of King Saud University were more satisfied with the research activities offered in their college when compared with those from the other six universities. Besides that, students from all the seven universities were equally satisfied with the faculty’s involvement and infrastructural facilities offered by their college for research.

### Discussion of findings

Higher education in Saudi Arabia includes institutions of all educational levels which consist of:

- government universities ( $N = 21$ );
- primary teachers colleges for men ( $N = 18$ );
- primary teachers colleges for women ( $N = 80$ );
- colleges and institutes for health ( $N = 37$ );
- technical colleges ( $N = 12$ ); and
- private universities and colleges ( $N = 24$ ) (MOHE, 2014; Alamri, 2011).

This study was conducted to survey the health science students’ perceptions and attitude toward research training programs offered in their respective colleges. To be more precise, the present study focuses only on those health science colleges offering programs in medicine, dentistry, applied medical sciences and clinical pharmacy. These programs were selected based on three key parameters, viz.:

- (1) scope and basic course requirements with respect to research and development;
- (2) opportunity for clinical exposure and training; and
- (3) infrastructural requirements needed for the conduct of research.

To the best of our knowledge, this is the first Saudi Arabia-based study to document the students’ opinion on the research training programs offered at its higher education institutions. All care was taken to cover samples from universities located in the four major provinces of Saudi Arabia. To attain homogeneity in the selection of the institutions, only health science colleges of seven government universities were selected.

SAR questionnaire tool was utilized to capture the three major attributes of the research training program (Appendix). Students’ responses were recorded using a five-point scale, viz., (1) strongly disagree, (2) disagree, (3) not sure, (4) agree and (5) strongly agree. The reliability and validity of this questionnaire tool had been tested through pre-testing, which indicated that there is a high level of internal consistency (Cronbach’s  $\alpha = 0.77$ ) for this scale with the specific sample items ( $N = 16$ ) (Al-Kuwaiti, 2014).

In this study, the researcher attempted to study the students’ perception about the research training programs offered at seven different Saudi universities and found a significant difference among the universities as well as across the four health science programs (Table IV). It was established that the students differ in their opinions with respect to the research activities offered in their respective universities (Table V). Concurrent to this finding, a previous study also reported that students’ attitudes toward science and scientific research were significantly associated with the type of

university in which they enrolled (Amin *et al.*, 2012). Such differences might be due to the fact that health science programs offered at the selected universities are at varying levels of the developmental phase in terms of curricular and research requirements. Although all the universities explored in this study are run by the Ministry of Higher Education, Kingdom of Saudi Arabia, some differences in the infrastructural facilities (i.e. laboratory, library and teaching hospital) and intellectual capital (i.e. availability of faculty and skilled manpower for research guidance) are obvious with respect to the conduct of scientific enquiry in their chosen domain. Contrary to this assumption, the present study also revealed that there is no difference in perception among the students about the faculty involvement in research and the infrastructural facilities offered by their colleges for research. This could be due to the uniform regulations adopted by the Saudi universities with respect to research at the higher education level. Even though the curricular requirements (i.e. foundation courses, clinical training and mandatory research components) are common to all the chosen programs, there are some differences in the scope and basic requirements for conducting research while advancing in the vertical curricular platform. Also, the methodology adopted to impart training is an important factor that might influence the students' attitude toward health research (Khan *et al.*, 2006). Precisely, under the health science domain, the scope and opportunities available for the medical students to carry out research are different with respect to the requirements of dental and other allied health students. But, exploring the reasons for these differences is beyond the scope of this research and further research is warranted.

With respect to the overall satisfaction felt by health sciences students about the research training programs offered in their colleges, it is seen that only less than 50 per cent of the students in Saudi Arabia are satisfied with the existing research training programs offered at the university level. Over 45 per cent of the health sciences students were interested to participate in research activities offered at the undergraduate level. Contrary to this finding, a recent study indicated that over 55 per cent of the Saudi medical students participated in the research activities in their medical school (AlGhamodi *et al.*, 2013). Such differences in the participation rate might be due to the

Source of variance	Dependent variable	Sum of squares	Mean square	ANOVA result	
				F-value	P-value
University	Research activities offered in the college	1,362.417	227.069	$F_{(6, 545)} = 17.933$	0.00*
	Students opinion of faculty's involvement in research	43.575	7.263	$F_{(6, 545)} = 0.564$	0.759
	Infrastructural facilities offered by my college for research	31.055	5.176	$F_{(6, 545)} = 0.818$	0.556
Program-specific specializations	Research activities offered in the college	491.36	163.80	$F_{(3, 545)} = 12.94$	0.000*
	Students opinion of faculty's involvement in research	65.64	21.88	$F_{(3, 545)} = 1.70$	0.166
	Infrastructural facilities offered by my college for research	36.75	12.25	$F_{(3, 545)} = 1.94$	0.122

**Note:** \*Statistically significant at the 0.05 level

**Table V.**  
ANOVA of students' attitude toward the three attributes of the research training program offered at seven Saudi universities and four related health sciences programs

fact that the earlier study focused only on medical students alone, whereas the present one captures the perceptions of the health sciences students as a whole. Moreover, a previous study pointed out that most of the Brazilian medical students are interested to participate in scientific research during their schooling (Neilton *et al.*, 2011). This difference in perception may be due to the racial and ethnic differences among the students, which might contribute to differences in their perceptions about research (National Science Foundation, 2008).

In the present study, only a few of the students (37 per cent) agreed that research training is important for identifying and investigating problems in the subject domain. On the contrary, a recent Saudi Arabia-based study indicates that 97 per cent of medical students felt that research is important in the medical field (AlGhamdi *et al.*, 2014). Few other studies have also indicated that over 80 per cent of the medical students felt that research helped them to understand medicine better and develop core clinical skills, especially in areas like diagnostic reasoning, communication and physical examination (Conn *et al.*, 2012; Nikkar-Esfahani *et al.*, 2012; Forester and McWhorter, 2005). The majority of students agreed that the other main reason for participation in research during undergraduate medical studies was to facilitate their admission to the postgraduate programs of their choice (Ismail *et al.*, 2014; Siemens *et al.*, 2010).

Amin *et al.* (2012) addressed several barriers related to the participation of students in research during medical school and these include:

- lack of time with overburdened educational activities;
- lack of proper mentoring to encourage/guide the students in the field of scientific research; and
- lack of a rewarding and motivating system.

It had been reported that lack of institutional incentive is the most significant barrier to students' participation in research activities (Jimmy *et al.*, 2013; Neilton *et al.*, 2011). Conforming to findings of the previous studies, the present study also indicates that a considerable proportion of students (45 per cent) feel that their faculty does not have sufficient time to mentor undergraduate health science students in research. Further, only less than 45 per cent of the students reported that their college provided good infrastructural facilities and sufficient funding to conduct research at the undergraduate level. Furthermore, only less than 43 per cent of the students in this study agreed that they were exposed to the basic and advanced statistical skills training program through their respective colleges. The present study also indicates that only 44 per cent of students feel that their college has adequate infrastructure to organize such research programs. In contrast, a recent study conducted in India showed that 74 per cent of the students felt that the institution was conducive to research (Jimmy, 2013). Such differences in perception might be due to the heterogeneity of the students targeted in the studies. The previous study by Jimmy *et al.* focused only on medical students, but the present study focuses on health science students in four specializations. From the aforementioned results, it is evident that the health science students belonging to the selected universities in Saudi Arabia are facing certain barriers in research.

There are several limitations to this study that need to be addressed. First, the results are derived from a self-report survey on the participation in and attitudes toward research in health science colleges and independent verification of data was not possible.

The whole study was conducted to capture the perceptions and attitudes of the health science students on research training programs and their perceptions cannot be generalized to students of other disciplines.

### Conclusion

From the findings of this study, it is evident that only less than 50 per cent of the health science students agree that they are satisfied with the research training programs offered by their respective colleges in Saudi Arabia. There is a significant difference in the students' attitudes toward research training with respect to the four health science programs offered at seven Saudi universities. Specifically, the medical and dental students of King Saud University were more satisfied with the research activities offered in their college than those from the other six universities. Besides that, the students from all the seven universities were equally satisfied with the faculty's involvement and infrastructural facilities offered by their college for research.

The common barriers identified include:

- lack of institutional motivation;
- inadequate infrastructural facilities;
- lack of faculty involvement;
- insufficient faculty time allocated for research activities; and
- ignorance on the part of students about the utility of research to understand their subject matter.

This study provides an alarming signal to educational policy-planners that the research-oriented activities need to be strengthened at higher education institutions in Saudi Arabia. Future work should include a wider survey of the pertinent questions regarding the role of research in other disciplines. Furthermore, a similar survey of other stakeholders in health science education, including faculty members in the undergraduate and postgraduate programs, would be highly informative, especially regarding the role of and perceived barriers to research in the health science programs offered at Saudi universities.

### References

- Adamsen, L., Larsen, K., Bjerrgaard, L. and Madsen, J.K. (2003), "Moving forward in a role as a researcher", *Journal of Clinical Nursing*, Vol. 12 No. 3, pp. 442-450.
- AlGhamdi, K.M., Moussa, N.A., AlEsa, D.S., AlOthimeen, N. and Al-Saud, A.S. (2014), "Perceptions, attitudes and practices toward research among senior medical students", *Saudi Pharmaceutical Journal*, Vol. 22 No. 2, pp. 113-117.
- Al-Kuwaiti, A. (2014), "Health science students' attitude towards research training programs in the Kingdom of Saudi Arabia: reliability and validity of the questionnaire instrument", *Journal of Family Community Medicine*, Vol. 21 No. 2, pp. 134-138.
- Alamri, M. (2011), "Higher Education in Saudi Arabia", *Journal of Higher Education Theory and Practice*, Vol. 11 No. 4, pp. 88-91.
- Amin, T., Kaliyadan, F., Al Qattan, E., Al Majed, M., Al Khanjaf, H. and Mirza, M. (2012), "Knowledge, attitudes and barriers related to participation of medical students in research in three Arab Universities", *Education in Medicine Journal*, Vol. 4 No. 1, pp. e43-e56.

- Aslam, F., Shakir, M. and Qayyum, M.A. (2005), "Why medical students are crucial to the future of research in South Asia", *PLoS Med*, Vol. 2 No. 11, p. e322.
- Bickel, J. and Morgan, T.E. (1980), "Research opportunities for medical students: an approach to the physician-investigator shortage", *Journal of Medical Education*, Vol. 55 No. 7, pp. 567-573.
- Blanton, R.L. (2008), "A brief history of undergraduate research, with consideration of its alternative futures", in Taraban, R. and Blanton, R.L. (Eds), *Creating Effective Undergraduate Research Programs in Science: The Transformation from Student to Scientist*, Teachers College Press, New York, NY, pp. 233-246.
- Byrne, E. (2004), "The physician scientist: an endangered breed?", *Internal Medicine Journal*, Vol. 34 No. 3, p. 75.
- Conn, J.J., Lake, F.R., McColl, G.J., Bilszta, J.L. and Woodward-Kron, R. (2012), "Clinical teaching and learning: from theory and research to application", *Medical Journal of Australia*, Vol. 196 No. 8, p. 527.
- Deborah, M.E., Drewer, S., Elton, S., Emmerson, C., Marshall, M., Smith, J.A., Stark, P. and Whittle, S. (2010), "What do medical students understand by research and research skills? Identifying research opportunities within undergraduate projects", *Medical Teacher*, Vol. 32 No. 3, pp. e152-e160.
- Diez, C., Arkenau, C. and Meyer-Wentrup, F. (2000), "The german medical dissertation – time to change?", *Academic Medicine*, Vol. 75 No. 8, pp. 861-863.
- Forester, J.P. and McWhorter, D.L. (2005), "Medical students' perceptions of medical education research and their roles as participants", *Academic Medicine*, Vol. 80 No. 8, pp. 780-785.
- Frishman, W.H. (2001), "Student research projects and theses: should they be a requirement for medical school graduation?", *Heart Disease*, Vol. 3 No. 3, pp. 140-144.
- Hren, D., Lukic, I.K., Marusic, A., Vodopivec, I., Vujaklija, A., Hrabak, M. and Marusic, M. (2004), "Teaching research methodology in medical schools: students' attitudes towards and knowledge about science", *Medical Education*, Vol. 38 No. 1, pp. 81-86.
- Ismail, M., Bazli, M.Y. and O'Flynn, S. (2014), "Study on medical student's attitude towards research activities between University College Cork and Universiti Sains Malaysia", *Procedia - Social and Behavioral Sciences*, Vol. 116, pp. 2645-2649.
- Jimmy, R., Platty, P.L., D'Silva, P., Baliga, M.S. and Singh, A. (2013), "Are medical students inclined to do research?", *Journal of Clinical Research*, Vol. 7 No. 12, pp. 2892-2895.
- Jones, R., Higgs, R., de Angelis, C. and Prideaux, D. (2001), "Changing face of medical curricula", *Lancet*, Vol. 357 No. 9257, pp. 699-703.
- Khan, H., Khawaja, M.R., Waheed, A., Rauf, M.A. and Fatmi, Z. (2006), "Knowledge and attitudes about health research amongst a group of Pakistani medical students", *BMC Medical Education*, Vol. 6 No. 54.
- Li, L.K.Y. (2012), "A study of the attitude, self-efficacy, effort and academic achievement of CityU students towards research methods and statistics", *Discovery – SS Student E-Journal*, Vol. 12, pp. 154-183.
- Lloyd, T., Phillips, B.R. and Aber, R.C. (2004), "Factors that influence doctors' participation in clinical research", *Medical Education*, Vol. 38 No. 8, pp. 848-851.
- Lopatto, D. (2003), "The essential features of undergraduate research", *Council on Undergraduate Research Quarterly*, Vol. 24, pp. 139-142.
- Ministry of Higher Education (MOHE) (2014), available at: [www.mohe.gov.sa/en](http://www.mohe.gov.sa/en) (accessed 20 September 2014).

- National Science Foundation (2008), "Research experiences for undergraduates (reu) in the directorate for engineering (eng): 2003-2006 participant survey", available at: [www.nsf.gov/eng/eec/EEC\\_Public/REU.pdf](http://www.nsf.gov/eng/eec/EEC_Public/REU.pdf) (accessed 13 April 2014).
- Neilton, A.O., Luz, M.R., Saraiva, R.M. and Alves, L.A. (2011), "Student views of research training programmes in medical schools", *Medical Education*, Vol. 45 No. 7, pp. 748-755.
- Nikkar-Esfahani, A., Jamjoom, A.A. and Fitzgerald, J.E. (2012), "Extracurricular participation in research and audit by medical students: opportunities, obstacles, motivation and outcomes", *Medical Teacher*, Vol. 34 No. 5, pp. e317-324.
- Papanastasiou, E.C. (2005), "Factor structure of attitude towards research scale", *Statistics Education Research Journal*, Vol. 4 No. 1, pp. 16-26.
- Parkes, J., Hyde, C., Deeks, J. and Milne, R. (2001), "Teaching critical appraisal skills in health care setting", *Cochrane Database of Systematic Reviews*, No. 3, DOI: 10.1002/14651858.CD001270.
- Schiff, M.R. (1970), "Some theoretical aspects of attitudes and perception", Working paper No. 15, Natural hazard research, University of Toronto, available at: [www.colorado.edu/hazards/publications/wp/wp15.pdf](http://www.colorado.edu/hazards/publications/wp/wp15.pdf) (accessed 24 September 2014).
- Schwartz, M. (2003), "The role of advising in undergraduate research", *The Mentor: An Academic Advising Journal*, available at: <http://dus.psu.edu/mentor/old/articles/030916ms.htm> (accessed 10 March 2014).
- Scott, W.A. (1969), "Attitude measurement", in Lindzey, G. and Aronson II, E. (Eds), *Handbook of Social Psychology*, 2nd edn., Addison-Wesley Publishing Company, Reading, MA, pp. 206-208.
- Siemens, R.D., Punnen, S., Wong, S. and Kanji, N. (2010), "Survey on the attitudes towards research in medical school", *BMC Medical Education*, Vol. 10, No. 4.
- Solomon, S.S., Tom, S.C., Pichert, J., Wasserman, D. and Powers, A.C. (2003), "Impact of medical student research in the development of Physician-Scientists", *Journal of Investigating Medicine*, Vol. 51 No. 3, pp. 149-156.
- Tagal, J. (2007), "Difficulties in undergraduate medical research", *The Clinical Teacher*, Vol. 4 No. 1, pp. 2-5.

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## Appendix. Students' attitude toward research questionnaire items

### *Research activities offered in the college*

- (1) I am much interested in participating in research activities at the undergraduate level.
- (2) My college organizes and gives priority to include undergraduates in research activities.
- (3) Faculty members have adequate skills to handle research methodology.
- (4) Faculty do not have sufficient time to mentor undergraduate students in research.
- (5) The degree of involvement of the faculty in the research program is good.
- (6) Our college has adequate infrastructure to organize research programs.
- (7) I had been exposed to basic and advanced statistical tools needed for the preparation of a research report.

### *Students' opinion of faculty's involvement in research*

- (8) Faculty members place great emphasis on research.
- (9) Faculty members discuss their own research interests in class.
- (10) Faculty members use research findings as a part of their teaching material.
- (11) Research is important for identifying and investigating problems in a subject matter.
- (12) I am always getting the chance to discuss about the scientific/academic research in my class.

### *Infrastructural facilities offered by my college for research*

- (13) Our college provides good infrastructural facilities (i.e. laboratory) needed to conduct research at the undergraduate level.
- (14) The library facilities available in my college are sufficient for us to conduct research activities.
- (15) Sufficient funding is offered by the university for conducting research at the undergraduate level.

### *Overall satisfaction*

- (16) Overall, I am satisfied with the research training program offered at the undergraduate level.