ORIGINAL ARTICLE

Evaluation of Medical Sciences Students' Perception, Barriers, and Attitude toward Scientific Research: A Cross-sectional Study in Makkah Region, Saudi Arabia

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Abstract

Aim: Medical research skills at the undergraduate level is increasingly discussed as having a potential role in developing certain skills in students including decision making, problem-solving, and critical thinking. Therefore, this study aimed to evaluate the perception, barriers, and attitude of medical sciences students toward scientific research in Makkah region of Saudi Arabia. **Methods:** The data collected between August and September 2019 using an electronic questionnaire that was distributed to medical sciences students at Makkah region including (4th, 5th, 6th years, and interns). **Results:** Total number of participants who answered the questionnaire was 411 health-care students. Most of the students were females (70.6%), only 29.4% of them were male students. Most of them (72.8%) agreed that scientific research is essential for undergraduate students and about 73.2% of them said that they will participate in any available research opportunity. About 70.3% of the respondents reported that they do not know whom to contact if they want to conduct research and about 61.6% of the respondents reported there were few opportunities to do research in their college. **Conclusion:** Although students have good attitude and good perception toward research, there are some barriers that should be overcome to encourage student participation in research activities in Makkah region's universities of Saudi Arabia.

Key words: Scientific research, Perception, Barriers, Attitude, Saudi Arabia.

INTRODUCTION

Medical research has been identified as a critical element of modern medical education.[1] Nowadays it is extensively recognized that research at the undergraduate level is increasingly discussed as having a potential role in developing certain skills for students such as decision making, problem-solving and critical thinking.[2] These skills would help them to provide high-quality health-care services after graduation.[3] Furthermore, there is an accumulating evidence that undergraduate students' participation in research projects in their undergraduate studies can be a crucial factor for their participation in medical research in future.[4]

In Saudi Arabia, there is an increasing interest and focused investments in the higher education sector. Many universities and colleges took several steps over the last couple of years to enhance their research activities since this is one of the main objectives of international academic institutions.[5]

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A body of research documented many key barriers which play an important role in reducing student's involvement in research.[6] Some of the documented barriers of starting and conducting research include a lack knowledge about basic research skills,[7] and lack of research funding support and motivation from universities.[8]

Understanding barriers obstructing participation of undergraduate students in research activities is a prerequisite for implementing adaptive and corrective measures and devising methods for the research-oriented atmosphere in Saudi Arabia. A search of the medical literature revealed that several studies undertaken in Saudi Arabia for such purpose.[9-15] However, their results were limited only to a local university, region, or specific medical sciences college and its not possible to generalize their findings to other regions, such as Mecca region. There is a lack of research about medical sciences students' perception, barriers, and attitude toward scientific research in Mecca. Therefore, the current study aimed to assess the perception, barriers, and attitude of medical sciences students toward conducting scientific research in Mecca region to help in gaining an actual insight for this important phenomenon.

METHODS

Study setting

This study was conducted in the Mecca region, one of the central regions in the Kingdom of Saudi Arabia, which is located in the west of the Kingdom and contains 17 provinces belonging to it. Mecca region contains around nine governmental and private Universities. The years of study in private or governmental medical professions are limited to 5–7 years, including the year of internship.

Study design

A cross-sectional survey was designed to determine the perception, barriers, and attitude of students enrolled in medical sciences colleges toward scientific research. It is conducted using an electronic questionnaire distributed to students who met the inclusion criteria in the Mecca region of Saudi Arabia between August and September 2019.

Inclusion and exclusion criteria

The inclusion criteria included (i) all students who completed the first 3 years in one of medical sciences colleges (i.e., Medicine, Dentistry, Pharmacy, Applied Health Sciences, or Nursing); (ii) residing in Mecca region; and (iii) consenting to participate in the study. Hence, the students who did not completed the first 3 years in one of medical sciences colleges, the students in other regions, and the students who refused to fill the survey were excluded. To obtain a high response rate, the survey was distributed to students' leaders for each batch. Students were invited to contribute in the designed survey after explaining the study purpose to them.

The questionnaire

A self-administered questionnaire was utilized to gather data. To start designing the questionnaire, we referred to the literature in the database like PubMed, ScienceDirect and MEDLINE. We reviewed the previous studies to get the suitable design of the questionnaire.[16-21] The questionnaire was in English language, and the validity was performed by two experienced academics in research and survey writing. After receiving the feedback, the questionnaire was modified and adjusted to be more suitable for data collection.

The last version of the questionnaire had four sections: background characteristics of participants (i.e., gender, university, grade, specialty, number of research, and number of publication), participant's perception toward scientific research represented in eight statements; barriers facing participants to be involved in research represented in seven statements, and the participant's attitude toward scientific research represented in six statements. Responses were recorded using a 5-part Likert scale, ranging from "Strongly Disagree" to "Strongly Agree", to examine the participants' agreement or disagreement with several statements related to perception, barriers, and attitudes to research. For analysis purpose, perception, barriers, and attitude responses of strongly agree, agree, natural, disagree, and strongly disagree were converted to three responses "agree," "neutral," and "disagree."

Ethical approval

Human Research Ethics Committee of the College of Pharmacy in Umm Al-Qura University approved the study before the beginning of the study. The consent form was added to the questionnaire to explain the study purpose and the procedures to be undergone and to invite the students to participate in the research study. Names of the participants were not recorded, and data were kept safely in the investigator's locker and could be accessed only by the research team. Individual data were masked and only group data without identifying individual were presented.

Statistical analysis

The collected data were entered and analyzed using SPSS software version 22.0. The descriptive data such as (gender, grade, and specialty) were summarized by using frequencies and percentages. To find a significant association between the perceptions, barriers, attitude, and characteristics of participants' Chi-square test was used and $P < 0.05$ was considered statistically significant.

RESULTS

A total of 411 medical sciences students filled the questionnaires (Response rate: 75.0%). Most of them were females 70.6% and only 29.4% were males. The number of students per grade ranged from 56 to 125 (13.6–30.4%). More than half of the responses were received from students enrolled in the college of medicine (55.2%). The results showed about 35.3% of students have never participated in any research. The percentage of students who had no publication was 76.6%. Table 1 presents the background characteristics of the studied subjects in the current study.

The respondents' perception to research is presented in Table 2. The majority of students reported agreeing for all studied perception items (varied from 68.6% to 75.4%). Based on the results from Table 2, the grade has a significant correlation with the first, second, third, and fifth perception items while specialty has shown a significant relationship with the first, fourth, and sixth perception items.

Barriers facing medical sciences students and the association with their demographics are presented in Table 3. About 70.3% of the respondents reported that they do not know whom to contact if they want to conduct research. About 61.6% of the respondents reported that there were few opportunities to do research in their colleges. For other studied barriers items, the subjects agreeing percentages varied from 43.3% to 58.7% amongst the studied students. The results have shown a significant association between the students' grade and the 6th barrier named "There is no website consists of easy-to-find information about scientific research". Furthermore, there have been statistically associations between different specialties and the 1st and 5th barrier items.

Table 1: Background characteristics of the study population (*n*=411)

Variable	Category	Number (%)
Gender	Male	121 (29.4)
	Female	290 (70.6)
Grade	4th	124 (30.2)
	5th	125 (30.4)
	6th	56 (13.6)
	Intern	106 (25.8)
Specialty	Medicine	227 (55.2)
	Dentistry	30 (7.3)
	Pharmacy	78 (19.0)
	Nursing	23 (5.6)
	Applied medical science	35 (8.5)
	Public health	18 (4.4)
Number of researches participated in	0	145 (35.3)
	1	121 (29.4)
	2	68 (16.5)
	3 and more	77 (18.8)
Number of publications	0	315 (76.7)
	1	65 (15.8)
	2	17 (4.1)
	3 and more	14 (3.4)

Table 4 depicts the attitude of medical sciences students toward research. The results show that most of the students in the present study revealed positive attitudes toward conducting research (the percentage of subjects agreeing varied from 54.3% to 85.4%). With the exception of the attitude items "I used to read research articles in scientific journals" and "Treatment methods must be scientifically supported", there have been statistically significant differences between different grades concerning their reporting about all studied attitude items. Only the first and fifth attitude items were significantly associated with respondents' specialties.

DISCUSSION

The essential role of medical research in the advancement and improvement of healthcare is necessary and clear.[12,22] The current study makes a valuable contribution to the limited body of available knowledge investigating the perception, barriers, and attitude of medical science students toward scientific research. Such study is needed in Saudi Arabia that is witnessing rapid development in health-care profession and health education, especially with the new requirements of Saudi Commission for health program of residency and graduate's that includes research publication.[23]

Although the research importance is well recognized in all medical sciences colleges, according to the present findings, only small numbers of students had participated in research activities. This finding is in line with previous reports.[16,24,25] Unfortunately, this may raise concerns about the quality of undergraduate education in medical sciences schools in the region.

When investigating the perceived importance of research on a 5-point Likert scale, the students reported their positive perception about conducting research. The improved understanding of the importance of participating in research activities that was found in this study confirms the results of previous studies.[11,26] This is a good sign as it was emphasized that understanding student' perceptions are crucial to enhance research practices among future researchers.[27] Furthermore, significant differences were noted in the perception based on student grade and this is not surprising because seniors know more than others about the importance of research.

Table 2: Perception of medical sciences students toward research

Item	Agree *n* (%)	Neutral *n* (%)	Disagree *n* (%)	Grade *P* value	Specialty *P* value
Research is essential to undergraduate medical science students	299 (72.8)	58 (14.1)	54 (13.1)	*P*<0.0001*	*P*<0.0001*
Research must be a required component of medical science education	282 (68.6)	83 (20.2)	46 (11.2)	0.002*	0.065
Research skills and knowledge are relevant in clinical practice	300 (73.0)	83 (20.2)	28 (6.8)	0.001*	0.146
I will be involved in research to ease the admission to residency/fellowship programs	310 (75.4)	50 (12.2)	51 (12.4)	0.876	0.005*
I will participate in any available research opportunity	301 (73.2)	86 (20.9)	24 (5.9)	0.029*	0.054
I am interested in scientific research	262 (63.7)	82 (20.0)	67 (16.3)	0.058	0.006*

**P*<0.05 it is considered significant result

Table 3: Barriers facing medical sciences students and the association with the grade and specialty

Item	Agree *n* (%)	Neutral *n* (%)	Disagree *n* (%)	Grade *P* value	Specialty *P* value
There are few opportunities to do research in my college	253 (61.6)	95 (23.1)	63 (15.3)	0.647	0.042*
There is NO time to conduct research	211 (51.3)	113 (27.5)	87 (21.2)	0.613	0.147
There is NO funding to do research project	241 (58.7)	107 (26.0)	63 (15.3)	0.165	0.844
If I want to conduct research, I don't know whom to contact	289 (70.3)	58 (14.1)	64 (15.6)	0.526	0.083
There is no conferences encourage me to do research in my college	227 (55.2)	91 (22.2)	93 (22.6)	0.284	0.018*
There is no website contains easy-to-find information about scientific research	178 (43.3)	122 (29.7)	111 (27.0)	0.032*	0.846
If I do research, there is no proper appreciation and acknowledgment	181 (44.0)	154 (37.5)	76 (18.5)	0.727	0.219

**P*<0.05 it is considered significant result

Table 4: The attitude of medical sciences students and the association with their demographics

Item	Agree *n* (%)	Neutral *n* (%)	Disagree *n* (%)	Grade *P* value	Specialty *P* value
I used to read research articles in scientific journals	223 (54.3)	100 (24.3)	88 (21.4)	0.326	0.002*
Applicable outcomes obtained from scientific researches	254 (61.8)	142 (34.6)	15 (3.6)	0.024*	0.791
Treatment methods must be scientifically supported	351 (85.4)	55 (13.4)	5 (1.2)	0.162	0.807
Teaching research methods are relevant to medical science education	318 (77.4)	74 (18.0)	19 (4.6)	0.014*	0.924
Researches should not be rated for acceptance in residency program	237 (57.7)	111 (27.0)	63 (15.3)	0.003*	0.002*
Students should be encouraged to research project	333 (81.0)	67 (16.3)	11 (2.7)	0.004*	0.197

Studied subjects in the current study highlighted the main barriers to participating in research, including that they do not know whom to contact and the lack of opportunities to do research in college. The solution for this would be attempting to effortlessly integrate scientific thinking and research methodology into the undergraduate curriculum, confirming that it is not an optional subject.[3,28] Furthermore, there is a lack of scientific conferences in college followed by inadequate financial support for students to do a research project which seems to be the same finding in other studies in different countries.[29,30]

Offering monetary support may be necessary to enhance students to participate in researches and enables them to participate in scientific conferences, which is an important learning experience in itself. In addition, a lack of time and proper appreciation and acknowledgment, which are common barriers for medical students as they were reported in several studies in different countries around the world.[16,23,25,31,32] The present study also showed that there was a significant association between the grade and specialty of the participant and the availability of

conferences encourage them to conduct research in the college.

On the basis of our results with respect to students' attitudes, one can conclude that students had a positive attitude towards scientific research. The positive outcome of this study finding could be attributed to the efforts of universities to implement an intensive research environment as part of their mission and strategic plan. Similar findings were reported previously.[3,13,24] Furthermore, similar to a previous report,[9] the students agreed that the acknowledged treatment methods must be scientifically supported.

The results also revealed that the attitude to research, considering the grade and specialty of the student had a significant difference in some attitude items. For example, the findings of Al-Hilali *et al*. showed that clinical students were more likely to develop a positive attitude towards scientific research compared to preclinical students, in addition, about half of the students in the 5th-year were found to have a positive attitude as compared to less than a third of the students in the 1st-year.[9] Vujaklija *et al*. found that the undergraduate students' attitude toward research increased with each year of education.[33]A possible explanation of this difference is the variations in the field of study or the individual situation in each country.[14]

Since scientific knowledge is a vital prerequisite in reporting and solving problems encountered during medical practice, it is obligatory that research is increasingly endorsed by health care organizations across the world.[34] Thus, the assessment process should be incorporated to assess the research activities among students in different medical science disciplines. In the bases of this result, to improve the medical science student's perception and attitude toward the scientific researches, medical science facilities should incorporate research focused contents in each course throughout the education process.

The study of Park *et al*. showed that 90% of students, who had completed an introductory research degree during their medical undergraduate study, had been engaged in scientific research after graduation.[22] Involving students in a funded research study, improving training in research methodology, training on how to present a paper at a scientific gathering, writing up and submitting a paper for publication providing the students with adequate time and student-centered teaching and learning strategies would encourage them to get involved in research activities.[15,35]

Limitations

There is some limitation faced this study. Since this study evaluates perception, barriers, and attitude toward scientific research of medical science students in the Makkah region only and each university in other regions of Saudi Arabia may follow traditional/mixed curriculums and might have significant differences in students' perception, barriers, and attitude. Another limitation was that the questionnaire might suffer from insufficient accuracy. Furthermore, not presenting the questionnaire face to face may lead to a different interpretation and a different understanding of the questions. To overcome this problem, we tried to validate the questionnaire by expert academics.

CONCLUSION

The majority of students in the study reported that research activities are important but, at the same time, a small percentage of the medical science students in Mecca were involved in research activities and smaller percentage had published at least one article. Thus, barriers reported in this study need to be addressed to encourage those students to be involved in high-quality research in the study area. It is important also to provide suitable programs and conferences for students to ease their participation in research activities.

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