Original Article

Barriers to Student Research from the Perspectives of Nursing, Health, and Medical Sciences Students: A Cross-Sectional Study

Razieh Mokhtari, Mohsen Adib-Hajbaghery[1], Malihe Yazdani-Darki[2]

Student Research Committee, Kashan University of Medical Sciences, [1]Trauma Nursing Research Center, Nursing and Midwifery Faculty, Kashan University of Medical Sciences, [2]Department of Medical Surgical Nursing, Nursing and Midwifery Faculty, Kashan University of Medical Sciences, Kashan, Iran

ORCID:

Adib-Hajbaghery M: https://orcid.org/0000-0002-9518-4329

Mokhtari R: https://orcid.org/0000-0002-0095-6067

Yazdani Darki M: https://orcid.org/0000-0001-8276-1396

ABSTRACT

Background: Research is a key prerequisite for professional development in medical sciences. There is limited authoritative information about the barriers to student research. **Objective:** The objective of this study was done to identify barriers to student research from the perspectives of nursing and medical science students. **Methods:** This cross-sectional study was done in 2017, on 250 students randomly selected among nursing, medicine, and paramedic and health sciences students. A researcher-made, barriers to student research questionnaire was used for data collection. The questionnaire contained 32 items on personal, organizational, educational, environmental, technical, and quality- and result-related barriers to student research. The possible total score of the questionnaire and its subscales was 1–5. Data were analyzed using descriptive statistics, analysis of variance, and the independent-samples t-test. **Results:** There were barriers in all domains; however, respectively, the most important barriers to student research were environmental (3.70 ± 0.72), technical (3.59 ± 0.6), quality- and result-related (3.29 ± 0.67) barriers. More educational barriers to research were reported by nursing students and those with less previous experience in research activities ($P < 0.05$). **Conclusion:** In order of importance, the barriers to student research are environmental, technical, quality- and result-related barriers. The findings of this study highlighted the importance of providing students with necessary facilities and counseling in the area of research.

KEYWORDS: *Barriers, Health, Medical, Nursing, Research, Students*

INTRODUCTION

Research is the cornerstone of the growth and development of countries.[1] It facilitates changes in different areas such as healthcare systems.[2] Research is also essential to professional development in medical sciences and improvement of the care quality.[3-5]

The first steps in establishing an efficient research system are to motivate students and faculty members for research, determine the strengths and weaknesses of previous research works, identify the existing research-related facilities and equipment, and thereby, identify and remove barriers to research.[5-7] Students can significantly contribute to the conduction and promotion of research.[8,9] Therefore, identifying their research-related needs and concerns as well as the barriers to conducting research by them are

the key prerequisites to improve their motivation for research.[6,10] Nonetheless, university authorities value students' educational tasks more than their research-related activities.[11] According to a study in Iran, 70% of medical students are not interested in doing research because of the obstacles and challenges in the research.[12] Therefore, identifying research barriers helps authorities and policy-makers make intelligent decisions, employ effective strategies to remove them, promote the efficiency of research-related activities, and create a supportive

Address for correspondence: Dr. Mohsen Adib-Hajbaghery, Trauma Nursing Research Center, Nursing and Midwifery Faculty, Kashan University of Medical Sciences, Kashan, Iran. E-mail: adib1344@yahoo.com

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environment to encourage students' thinking, creativity, and innovation.[10,13]

Previous studies reported that the most important barriers to student research are lack of funding, the shortage of experienced research assistants, their limited knowledge about statistical methods,[11] students' incompetence in using electronic resources, lack of time,[6] and faculty members' inability to motivate them for doing research.[14] However, there is limited authoritative information about the rates of barriers to student research. This study was designed to narrow this gap.

Objective

The objective of this study was to identify barriers to student research from the perspectives of medical sciences students.

METHODS

Study design

As a cross-sectional study, this study was done during the year 2017 on 250 students of Kashan University of Medical Sciences. Eligibility criteria were affiliation to our university and completion of at least six college terms. The population of eligible students was around one thousand. The Cochrane sample size calculation formula for a finite population showed that with a standard deviation of 8, a *d* of 1,[15] and a confidence level of 0.95, 246 students were needed for the study. However, we recruited 300 students to compensate the possible attritions. There were no exclusion criteria other than unreturning the questionnaire. The 300 students were randomly selected from different schools through the stratified sampling method.

First, a list of students studying in each school of the university was prepared. Afterward, the number of samples needed of each school was calculated based on the number of students in each school. Finally, using an electronic random number table, the needed samples were selected randomly using the list of students in each school.

The first researcher referred to the different schools, found the selected students and invited them to participate in the study. If any of the selected students did not agree to participate, another one was replaced randomly. When students agreed to take part in the study, the study instrument was given them, and they were asked to respond it carefully in a calm and private environment. Students were asked to put the completed questionnaire in a box that had been placed in the main lobby of each school. Questionnaires were collected from this box after 48 h.

Data collection instrument

The study instrument was a two-part researcher-made questionnaire. The first part included questions on the students' age, gender, field of study, marital status, employment status, participation in research-related workshops, and previous experiences in doing research. The second part of the questionnaire, i.e., the barriers to student research questionnaire contained 32 items on personal, organizational, educational, environmental, technical, and quality- and result-related barriers to student research. Item scoring was done on a five-point Likert-type scale on which 1 and 5 stood for "completely disagree" and "completely agree," respectively. The total score of the questionnaire was calculated through summing the scores of all items and dividing the sum by the total number of items, i.e., 32. Moreover, the score of each subscale was calculated through summing the scores of its items and dividing the result by the number of its items. Accordingly, the total scores of the questionnaire and its subscales ranged from 1 to 5. On the other hand, to calculate the frequency of students who disagreed or agreed with a given item, the sum of "completely agree" and "agree" responses to that item was considered as the number of students who agreed with that item. Similarly, the sum of "completely disagree" and "disagree" responses to that item was considered as the number of students who disagreed with that item. The content validity of the questionnaire was confirmed by 10 nursing, midwifery, and health faculty members (content validity index ranged from 0.85 to 0.94 and content validity ratio = 0.86). Its reliability was also evaluated through the test-retest method on ten students with a 2-week interval, which resulted in a test-retest correlation coefficient of 0.86.

Ethical considerations

This study obtained the approvals of the Institutional Review Board and the Ethics Committee of our university (with the approval codes of 9613 and IR.KAUMS.REC.1396.13, respectively). The questionnaire was anonymous, and participants were assured about the confidential management of their data and voluntariness of their participation in the study. The aim of this study was also explained to the students. All participants signed a written informed consent that was attached to the questionnaire.

Data analysis

Analysis of the data was done through the SPSS software v. 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics measures (such as mean, standard deviation, and absolute and relative frequencies) were used to describe the study sample. Moreover, the independent-samples *t*-test was used to compare the

mean scores of barriers regarding the students' previous experience in research. One-way analysis of variance was also done to compare the mean scores of barriers regarding the students' academic degree and field of study.

RESULTS

From 300 recruited students, 250 (83.33%) responded and returned the study questionnaires. The mean of the students' age was 23.23 ± 4.10 years. Respectively, 22.4%, 31.6%, 13.2%, and 14.4% of the students were from the nursing and midwifery, medicine, health, and paramedic schools. Table 1 shows their demographic characteristics.

There were barriers in all the assessed domains. The most important barriers to student research were environmental (3.70 ± 0.72), technical (3.59 ± 0.60), and quality- and result-related (3.29 ± 0.67) barriers. Moreover, the most important environmental, technical, quality- and result-related, organizational, educational, and personal domains were respectively high costs of research-related affairs and services (such as typing, printing, and transportation services), large amount of time needed for research, poor interpretation and understandability of statistical data, inadequate payment

for research, lack of necessary educations to clearly understand the research results, and lake of adequate knowledge to conduct research [Table 2].

The results of statistical analyses showed significant differences between students in different fields of study, students with or without previous experience in doing research, and among students of different academic degrees, respecting the mean score of the educational barriers to student research [$P < 0.05$; Table 3]. Tukey *post hoc* test showed that the mean score of educational barriers was significantly different between nursing and medical students ($P < 0.001$). Moreover, using the Tukey *post hoc* test, a significant difference was found between master students and undergraduate ones.

DISCUSSION

This study aimed to identify barriers to student research from the perspectives of medical science students. Barriers to student research were existed in all assessed domains; however, the most important barriers were in environmental, technical, and quality- and result-related domains. This ordering of the barriers to student research is inconsistent with the orderings reported in a previous study.[6] The difference in the results might be attributed to the differences in the settings and samples of the studies.

Our findings indicated that one of the main barriers to student research was the time-consuming process of doing a research. Moreover, many students cited the poor understandability of the research findings and statistical data as important barriers to research. Previous studies also reported the same findings.[15-17] University students, especially in medical sciences Universities, usually spend a large amount of their times in clinical settings to fulfill their apprenticeships. Then, the lack of time reduces their motives to participate in research activities[16] especially when students have no previous research experience. Moreover, students usually have difficulties in comprehending the statistical data and findings of previous studies. On the other hand, as previous studies reported, many nursing and medical sciences students are confronted with the research-practice gap when they enter the clinical setting. In this situation, research activities can be considered as futile.[17,18] Incomprehensibility of research findings along with the visible research-practice gap may consequently further decrease the students' motivation toward research.

The study findings revealed organizational barriers as the fourth most important barrier to student research. Some earlier studies also cited organizational barriers as the main and most important barriers to research[15,17] that even might be more important than personal and

Table 1: Students' demographic characteristics		
Characteristics	***n* (%)**	**Not responded**
Gender		
Male	48 (19.2)	11
Female	191 (76.4)	
Marital status		
Single	192 (76.8)	6
Married	52 (20.8)	
Employment status		
Employed	31 (12.4)	18
Unemployed	201 (80.4)	
Previous experience in research		
Yes	90 (36.0)	13
No	147 (58.8)	
Participation in research workshops		
Yes	118 (47.2)	12
No	120 (48.0)	
Academic degree		
Bachelor's	142 (56.8)	6
Master's	51 (20.4)	
MD	51 (20.4)	
School		
Nursing and midwifery	56 (22.4)	46
Medicine	79 (31.6)	
Health	33 (13.2)	
Paramedical sciences	36 (14.4)	

MD: Doctor of medicine

Table 2: The frequency and mean scores of the barriers to student research from the perspectives of medical sciences students

Barriers	Disagree, n (%)	No idea, n (%)	Agree, n (%)	Not responded, n (%)	Subscale score, mean ± SD
Organizational					
The staffs of the research administration in our university have inappropriate conducts	47 (18.8)	145 (58.0)	58 (23.2)	0	3.28 ± 0.50
Research administration experts in our university have no effective supervision on student research projects	43 (17.2)	150 (60.0)	56 (22.4)	1 (0.4)	
Hospital and university authorities do not collaborate with students in data collection	49 (19.6)	95 (38.0)	105 (42)	1 (0.4)	
Authorities do not trust students in research-related affairs	50 (20.0)	89 (35.6)	97 (42.8)	14 (1.6)	
Student evaluation does not value students' research-related activities	70 (28.0)	80 (32.0)	100 (40.0)	0	
Research-related activities have no effect on students' career prospect	93 (37.2)	71 (28.4)	86 (34.4)	0	
There are strict regulations on doing student research projects	28 (11.2)	85 (34.0)	137 (54.8)	0	
Authorities do not allow the use of research results in practice	29 (11.6)	122 (48.8)	99 (39.6)	0	
Payments for research-related activities are inadequate	17 (6.8)	86 (34.4)	147 (58.8)	0	
Environmental					
There is no proper scientific and research atmosphere in the university	51 (21.4)	57 (22.8)	141 (56.4)	1 (0.4)	3.70 ± 0.72
Research-related affairs and services (such as typing, printing, and transportation) are costly	30 (12.0)	50 (20.0)	168 (67.2)	2 (0.8)	
There are few competent researchers to help student in research	167 (66.8)	45 (18)	38 (15.2)	0	
Educational					
I do not have adequate knowledge for doing research	60 (24.0)	53 (21.2)	136 (54.4)	1 (0.4)	3.22 ± 0.64
I do not have adequate English knowledge	76 (37.4)	45 (18.0)	129 (51.6)	0	
I do not have adequate knowledge about statistics	53 (30.2)	44 (17.6)	153 (61.2)	1 (0.4)	
There are no scientific writing, research methodology, and biostatistics workshops for students in our university	154 (61.6)	46 (18.4)	50 (20.0)	0	
I do not have adequate skills in the areas of computer, Internet, and searching for documents	123 (49.2)	41 (16.4)	86 (34.4)	0	
Students do not receive adequate instruction for doing research	19 (7.6)	45 (18.0)	185 (74.0)	1 (0.4)	
Research quality and results					
Research results are not clear and understandable	71 (28.4)	98 (39.2)	80 (32)	1 (0.4)	3.29 ± 0.67
Actual practice is different from research results	34 (12.8)	100 (40.0)	116 (46.4)	0	
Understanding and interpreting statistical results are difficult	30 (12.0)	87 (34.8)	132 (52.8)	1 (0.4)	
Technical					
The process of doing research is complex	27 (10.8)	56 (22.4)	166 (66.4)	1 (0.4)	3.59 ± 0.60
Study results are not collected and presented in a certain place (such as a website)	40 (16.0)	109 (43.6)	100 (40.0)	1 (0.4)	
The steps in doing research are not clear	49 (19.6)	87 (34.8)	114 (45.6)	1 (0.4)	
There are inadequate facilities and equipment for doing research	38 (15.2)	77 (30.8)	135 (54.0)	0	
Research-related affairs are time-consuming	11 (4.4)	35 (14.0)	202 (80.8)	2 (0.8)	
Personal					
I do not have adequate time for doing research	55 (22.0)	55 (22.0)	140 (56.0)	0	2.91 ± 0.67
Household responsibilities prevent me from engaging in research	89 (35.6)	70 (28.0)	90 (36.0)	1 (0.4)	
I am not interested in research	143 (57.2)	47 (18.8)	59 (23.6)	1 (0.4)	
Social responsibilities and employment prevent me from engaging in research	96 (38.4)	80 (32.0)	74 (29.6)	0	
My educational tasks prevent me from engaging in research	68 (27.2)	50 (20.0)	132 (52.8)	0	
In my opinion, researches are useless	167 (66.8)	45 (18.0)	38 (15.2)	0	

SD: Standard deviation

environmental barriers.[6,14] It seems that insufficient supports from the research administration of the university and hospital authorities and lack of competent research experts to help students, along with insufficient

Table 3: The relationships of previous experience in research and academic degree with the perception of research barriers

Barriers/field of study	Mean±SD	P^a	Experience in research	Mean ± SD	P^b	Academic degree	Mean ± SD	P^a
Organizational								
Nursing and midwifery	3.33 ± 0.50	0.640	Yes	3.35 ± 0.54	0.110	Bachelor's	3.30 ± 0.49	0.470
Medicine	3.23 ± 0.47		No	3.25 ± 0.48		Master's	3.21 ± 0.57	
Health and hygiene	3.33 ± 0.52					MD	3.32 ± 0.45	
Paramedicine	3.30 ± 0.52							
Environmental								
Nursing and midwifery	3.57 ± 0.75	0.921	Yes	3.76 ± 0.67	0.290	Bachelor's	3.65 ± 0.72	0.241
Medicine	3.59 ± 0.74		No	3.66 ± 0.74		Master's	3.67 ± 0.66	
Health and hygiene	3.66 ± 0.70					MD	3.84 ± 0.72	
Paramedicine	3.63 ± 0.65							
Educational								
Nursing and midwifery	3.13 ± 0.61	0.001	Yes	3.04 ± 0.70	0.001	Bachelor's	3.27 ± 0.63	0.010
Medicine	2.71 ± 0.71		No	3.35 ± 0.58		Master's	2.99 ± 0.71	
Health and hygiene	2.97 ± 0.54					MD	3.34 ± 0.56	
Paramedicine	2.78 ± 0.58							
Quality and results of research								
Nursing and midwifery	3.42 ± 0.59	0.680	Yes	3.38 ± 0.72	0.070	Bachelor's	3.28 ± 0.63	0.590
Medicine	3.35 ± 0.66		No	3.22 ± 0.61		Master's	3.38 ± 0.65	
Health and hygiene	3.37 ± 0.57					MD	3.26 ± 0.78	
Paramedicine	3.50 ± 0.72							
Technical								
Nursing and midwifery	3.66 ± 0.60	0.411	Yes	3.60 ± 0.65	0.980	Bachelor's	3.54 ± 0.61	0.061
Medicine	3.74 ± 0.59		No	3.60 ± 0.56		Master's	3.61 ± 0.55	
Health and hygiene	3.55 ± 0.53					MD	3.77 ± 0.57	
Paramedicine	3.62 ± 0.64							
Personal								
Nursing and midwifery	3.08 ± 0.79	0.801	Yes	2.85 ± 0.66	0.380	Bachelor's	2.86 ± 0.68	0.311
Medicine	2.97 ± 0.79		No	2.93 ± 0.68		Master's	2.92 ± 0.65	
Health and hygiene	3.03 ± 0.63					MD	3.02 ± 0.64	
Paramedicine	3.10 ± 0.58							

[a]Analysis of variance, [b]*t*-test. MD: Doctor of medicine, SD: Standard deviation

financial supports for student research have reduced the students' motivation for engaging in research activities. Some earlier studies[8,10] also reported the inadequate payment for research as a major organizational barrier which reduces the motivation for engaging in research activities.[6]

Our findings also revealed the lack of necessary educations and instructions for research as the most important educational barrier to student research. Providing students with high-quality research-related educations might motivate them for getting engaged in research activities.[12,19] Another educational barrier to student research in the present study was inadequate English literacy skills. This is in line with the findings of previous studies.[3,14,15] Currently, most research results are published in English, and hence, audiences with limited English literacy have difficulties in using research results. This finding might be an alarm for the educational authorities to pay more attention to the quality of English language education in the universities. Moreover, it is suggested to publish the results of the researches in the local journals and magazines so that the native population can also become aware of the research findings.

The lowest-scored barrier to student research subscale was personal barriers. This finding implies students' personal readiness for engagement in research activities. The most important personal factors in this study were students' intense involvement in educational activities, and hence, lack of time and energy for research activities. Previous studies also reported that heavy educational tasks require students to assign lower priority to research activities.[11,12] Another most important personal barrier to student research was household responsibilities. This finding may be due to the fact that most participants were female students. According to Thibault, women are less successful in doing research because they have heavier household responsibilities.[20]

Study findings also showed that nursing and midwifery students perceived more educational barriers to research compared to medical students. Although two studies in Semnan[21] and Isfahan,[22] Iran, reported that the field of the study and the college in which the students were studying did not affect the students' attitude and function toward research, another study in Yasouj, Iran, reported that among students in different medical sciences majors, students in medicine perceived the highest level of personal barriers (i.e., the shortage of time) to participate in research activities.[23] A number of other studies have also cited to the density of students' curriculum and lacking of time as the two important barriers to student research.[22,24,25] This finding might be attributed to the fact that medical students are more engaged in their studying and have less time to invest in research activities. Therefore, they did not feel the educational barriers to research. On the other hand, nursing students seem to have more time to participate in research activities, and then they felt more barriers in this regard and attributed these barriers to their educations. Nonetheless, the content and methods of research education in nursing and medicine schools may be different. In a recent study in Arak medical university, Anbari *et al*.[6] have also reported that students in different schools expressed different barriers to research. However, in Anbari's study, medical students expressed more barriers to research than nursing students. Moreover, in the present study, students with greater experience in research obtained lower educational barrier scores compared with those without the experience. Clearly, students without such an experience feel less competent in doing research. The study findings also indicated that master's students felt less educational barriers to doing research compared with bachelor's and doctor of medicine students. Master's students need to take mandatory courses in research and do a thesis as partial fulfillment of the requirement for the master's degree. Perhaps these mandatory duties made them more skilled and knowledgeable in research compared with other students.

Although we calculated the sample size using an appropriate formula, however, the relatively small sample size and studying the students in one university might be considered as the limitations of the present study that can reduce the generalizability of the results. Therefore, conducting further multicenter studies with larger sample sizes are recommended. Moreover, the study was a cross-sectional one. In a cross-sectional study, we cannot assess a definite cause-and-effect relationship.

CONCLUSION

In order of importance, the barriers to student research are environmental, technical, quality- and result-related, organizational, educational, and personal barriers. Moreover, nursing and midwifery students perceived more educational barriers to research compared to medical students. University administrators and especially authorities in nursing school are recommended to facilitate students' engagement in research activities through holding research workshops and English learning courses for them, providing them with adequate research-related facilities, eliminating unnecessary bureaucracies, establishing research counseling offices, and supervising student research activities. Further studies are needed to determine the best strategies for facilitating student research.

Conflicts of interest

There are no conflicts of interest.

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