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# Barriers to participation in medical research from the perspective of researchers

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## Abstract:

**BACKGROUND:** The first step toward organizing research activities is to obtain a correct perception of available capabilities. This study was conducted to investigate the researchers' views about barriers affecting research activities.

**METHODS:** This descriptive, cross-sectional study was conducted using the census method. The population consisted of the faculty members of Birjand University of Medical Sciences in 2014. The research tool was a questionnaire in six areas of financial, facility, professional, scientific, personal, and organizational–managerial barriers. The results were analyzed using descriptive statistics and Friedman test.

**RESULTS:** Faculty members confirmed that although all barriers affected research activities, organizational–managerial barriers ( $3.73 \pm 0.63$ ) had the greatest and scientific barriers ( $3.15 \pm 0.93$ ) had the lowest effect, respectively. The results of Friedman test showed that there is a significant difference between the mean values of factors related to various barriers affecting research activities from the viewpoint of the participants' answers.

**CONCLUSIONS:** Research activities are affected by numerous barriers. Strategies, such as empowering researchers, employing new technologies in the creation of research teams, and benefiting from research experts in various stages of research, may have a positive effect on the removal of the barriers.

## Keywords:

Medical research, obstacles, researchers

## Introduction

Universities are among the major pathways of producing science in every country.<sup>[1,2]</sup> Iran is among the countries with many medical universities and research centers as the main part of scientific products in the medical field. The quality and quantity of scientific products are the important index of scientific development in Iran.<sup>[3]</sup>

The first step toward organizing research activities is to obtain a correct perception of the available capabilities and facilities and to discover the strengths and weaknesses of

research plans. Identification of deficiencies and awareness of the quality and extent of the realization of research objectives are among essential tools for research decision-makers, planners, and policymakers through which necessary decisions are made to achieve objectives, improve methods, and increase efficiency.

Regulative pressure by journal publishers and the availability of data repositories have been found to be significantly related to health scientists' data sharing behaviors. Furthermore, perceived career benefit, career risk, and effort have a significant relationship with data sharing behavior.<sup>[4]</sup>

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One of the most prominent indicators of the growth and development of the societies is technological abilities and scientific research that some of the economic, social, and cultural barriers can affect the process. Hence, any action to clarify the status of the research and the barriers ahead is significant.

According to the results of previous studies, researchers in different societies have described different factors as barriers to research. Hence, it is essential to be aware of the barriers to research and to work to resolve them. Due to the differences in terms of conducting research activities, university facilities, number of research centers, access to databases, organizational culture, university credits, etc., the researchers' viewpoints about research barriers are different in different research environments.

In Iran, many universities with the aim of the increasing scientific production have studied the researchers' perspective on the barriers to research.

The present study was conducted to review the opinions of researchers of Birjand University of Medical Sciences about barriers to research activities to recognize these barriers and direct university research policies accordingly with the aim of research promotion.

## Methods

This descriptive cross-sectional study was conducted using the census method. As a type two Iranian university according to the ranking of the Ministry of Health and Medical Education, Birjand University of Medical Sciences was selected and all of its faculty members (in both basic and clinical fields) in 2014 constituted the study population. Hence, 119 questionnaires were distributed among all faculty members in medical school, dental school, the school of allied medical sciences, nursing school, and school of public health. The research tool was a researcher-made questionnaire with close-ended questions organized in two sections of basic characteristics of the respondents and the attitude of the study population. We made a comprehensive list of barriers to research after an extensive review of the literature published during the past 20 years. For a more coherent analysis, these barriers were grouped into six categories based on the nature of them. The attitude section included 8, 6, 9, 7, 9, and 12 items

on individual barriers, professional barriers, facility barriers, financial barriers, scientific barriers, and managerial-organizational barriers, respectively. The faculty members' attitude was collected in five-point Likert scale (from completely disagree to completely agree). The highest and lowest score was 5 and 1, respectively. The validity of the questionnaire was confirmed by four experts of Information Resources and Library Sciences as well as one questionnaire designing specialist. The reliability of the questionnaire, however, was calculated by the Cronbach's alpha ( $\alpha = 0.92$ ). The self-administrated questionnaire was distributed and collected by researchers. Of 119 distributed questionnaires, 102 were evaluated after the elimination of disturbed data. Chi-square ( $\alpha = 0.05$ ) were used to compare the mean value of the factors related to effective research activity barriers derived from the participants' answers and Friedman test ( $P < 0.001$ ) to assess the relationship between the mean rank of the factors.

## Results

The demographic findings of the research indicate that the number of men was higher than the women; the highest frequency was for specialists and sub-specialists and the least frequent was for those with PhD degree. According to Academic Rank, the maximum number of participants was Assistant Professor and the lowest number was Associate Professor, also 41 of them had executive responsibility. Details are provided in Table 1.

Table 2 displays the effective barriers to research in six different categories including individual, professional, facility, financial, scientific, and managerial-organizational barriers along with mean rank.

### Individual barriers

Lack of mental relaxation due to extra-university activities and problems and the lack of interest in research were the most and the least influencing factors with a mean score of 5.15 and 3.60, respectively. According to Friedman test results, there was a significant difference between the mean scores given by researchers to the individual barriers affecting research activities ( $P < 0.001$ ).

### Professional barriers

The difficulty in establishing a close relationship with researchers and research centers outside the university

**Table 1: Frequently distribution of studied individuals according to variables**

Index	Variable									
	Gender		Education			Academic rank			Executive responsibility	
	Male	Female	Master and doctor of medicine	PhD	Specialists and sub-specialists	Instructor	Assistant professor	Associate professor	Yes	No
Frequency (%)	52 (51)	50 (49)	37 (36.3)	25 (24.5)	40 (39.2)	38 (37.3)	48 (47.1)	16 (15.7)	41 (40.2)	61 (59.8)

**Table 2: Mean value of items related to each group of research activity barriers in the studied university**

Items	Mean rank	SD
<b>Individual barriers</b>		
Individualistic temperament of faculty members and lack of interest in group research activities	3.75	1.04
Decreased scientific temperament of researchers and engagement in marginal issues	3.81	1.01
Researcher's disinterest and fading disposition toward problem finding and sensitivity to social issues	3.40	1.16
Lack of commitment of some researchers to observing research ethics and scientific trusteeship	3.27	1.20
Benchmarking idea, subject and methodology from foreign studies instead of concentrating on real problems of communities	3.80	1.07
Lack of internal motivations for research	3.75	0.95
Lack of spiritual and mental relaxation due to the tensions and problems outside the university	3.84	1.07
Lack of interest in research	3.04	1.23
$\chi^2$ , df, P	61.26, 7, <0.001	
<b>Professional barriers</b>		
Engagement in routine high volume executive/administrative duties of university	3.79	0.89
High engagement in health and treatment affairs and lack of enough time for research	3.64	0.97
Difficulty of establishing close scientific relationship with researchers and research centers outside the university	3.82	0.98
Livelihood problems of the faculty members causing them to have multiple jobs outside the university	3.22	1.11
Limited use of fellowships and difficulty of benefiting from it	3.64	0.99
Hurdles on participating in seminars and conferences held outside Iran	3.58	1.05
$\chi^2$ , df, P	35.01, 5, <0.001	
<b>Facility barriers</b>		
Difficult and time-consuming processes for providing necessary materials for research	3.89	1.03
Insufficient efficient research-assistant specialists and trained research assistants	4.02	1.03
Lack of databases and accurate Statistics in the university	3.40	1.22
Lack of active research cores in colleges	3.51	0.99
Insufficient hardware, software and laboratory facilities for research	3.24	1.10
Inadequate librarian and information specialists for guiding how to use references	2.98	1.09
Inefficiency of research consultant centers of universities in solving researchers problems and ambiguities	3.16	1.09
Inadequate scientific resources (professional library, scientific journals subscription, full text articles and so on)	2.57	0.92
Taking long time from presenting academic articles to publishing them	3.88	1.04
$\chi^2$ , df, P	206.88, 8, <0.001	
<b>Financial barriers</b>		
Lower income of research activities as compared to incomes outside university	3.86	1.07
The impact of the individuals' name and influence on distributing research budget	3.75	0.98
Insufficient budget for scientific-research activities in universities	3.34	0.99
Inappropriate mechanisms and rules for budgeting research plans	3.68	1.01
Lack of financial independency and relying only on state budget	3.63	0.99
Inappropriate and unfair distribution of budget and facilities in universities	3.60	0.94
Lack of allocation of some parts of annual research budget to the university due to inappropriate organizing of affairs	3.46	0.92
$\chi^2$ , df, P	46.40, 6, <0.001	
<b>Scientific barriers</b>		
Insufficient skill in research methods, statistical tests and questionnaire development	3.30	1.15
Weak skills in adopting computer-based software and hardware	3.19	1.10
Insufficient skill in principles of writing an article	3.01	1.13
Insufficient skill in writing articles and providing posters for publishing in journals and meetings	3.03	1.19
Insufficient skill in explaining, describing and analyzing research subject	3.20	1.14
Lack of knowledge about proper methods for searching articles from the Internet and etc.	2.96	1.12
Insufficient skill in foreign languages for using foreign resources in one's field of study	3.19	1.28
Lack of knowledge about terms and conditions of accepting and publishing articles in scientific journals	3.24	1.09
Inability in identifying research scopes	3.22	1.10
$\chi^2$ , df, P	26.28, 8, <0.001	
<b>Managerial-organizational barriers</b>		
Lack of employment of university research results for improving society conditions	4.11	0.78
Inappropriate assessment of research performance (lack of differentiation of deep research plans and repetitious sketchy ones)	4.01	0.81

Contd...

Table 2: Contd...

Items	Mean rank	SD
Lack of extra-department cooperation between medical science field and other fields in research activities	4	0.77
Repetition of similar studies in university due to lack of organization and inappropriate notification	3.78	1.04
Spending research budget of university for studies with no beneficial outcomes for the society	3.88	0.94
Imposing personal taste and opinion during the evaluation and approval of presented plans and articles	3.62	0.99
Unknown and diverse decision making authorities for approving and assessing research activities	3.29	0.99
Inadequate notification of research resources, capabilities and administration rules to faculty members	3.34	1.04
Inappropriate system of motivation, encouraging and supporting research activities conducted by top managers of universities	3.73	0.90
Receiving insufficient support from managers for performing research activities	3.53	1.06
Low patent of each article in the promotion of faculty members	3.52	0.91
Lack of a proper cooperation between clinical and basic sciences members in conducting joint research activities	3.95	0.79
$\chi^2$ , df, P	135.89, 11, <0.001	

SD=Standard deviation

and the livelihood problems of faculty members forcing them to have multiple jobs outside the university had the highest and lowest influence with a mean score of 3.93 and 2.80, respectively. According to Friedman test results, there was a significant difference between the mean score given by researchers to the professional barriers affecting research activities ( $P < 0.001$ ).

### Facility barriers

Inadequate efficient research aids and trained research assistants and insufficient scientific resources had the highest and lowest influence on research activities with a mean score of 6.56 and 2.93, respectively. According to Friedman test, there was a significant difference between the mean score given by researchers to facility barriers affecting research activities ( $P < 0.001$ ).

### Financial barriers

Lower income of research activities, as compared to income of extra university (private) activities, and insufficient budget allocated to scientific research activities in universities had the highest and lowest influence with a mean score of 4.71 and 3.28, respectively. Friedman test results showed a significant difference in the mean score of financial barriers affecting research activities from the faculty members' perspective among participants ( $P < 0.001$ ).

### Scientific barriers

Insufficient skill in research methods and statistical tests, and questionnaire development, and insufficient skill in writing a manuscript and poster preparation had the highest and lowest effect on research activities with a mean score of 5.45 and 4.54, respectively. The Friedman test results showed a significant difference in the mean score of scientific barriers affecting research activities from the faculty members' perspective among participants ( $P < 0.001$ ).

### Managerial–organizational barriers

Nonimplementation of research results in improving society problems and vagueness and multiplicity of

decision-making authorities regarding the assessment and approval of research activities had the highest and lowest effect with a mean score of 7.97 and 4.96, respectively. According to the Friedman test, there was a significant difference between the mean scores given by researchers to the managerial–organizational barriers affecting research activities ( $P < 0.001$ ).

As shown in Table 3, the comparison of the researchers' viewpoints on the barriers of research activities revealed that.

Managerial–organizational and scientific barriers have the highest and lowest impact on research activities with a mean score of  $3.73 \pm 0.63$  and  $3.15 \pm 0.93$ , respectively. The results of ANOVA showed a significant difference in the factors affecting research activities ( $P < 0.001$ ).

According to *post hoc* results, the mean point of researchers' viewpoint to individual, professional and financial barriers was significantly higher and lower than that of scientific barriers and managerial–organizational barriers, respectively ( $P < 0.05$ ).

The mean point of researchers' viewpoint to scientific barriers was significantly lower than that of other effective barriers. The mean point of researchers' viewpoint to facility barriers was significantly lower than that of individual, professional, financial, and managerial–organizational barriers ( $P < 0.05$ ).

## Discussion

The review of the opinions of researchers on research activity barriers showed that the trend of research activities is influenced by different barriers and problems which can be studied from different viewpoints.

### Individual barriers

The score of different individual factors in this study showed the faculty members' interest in research activities and participation in team research. However,



**Table 3: Comparison of the researcher's viewpoint mean on the barriers affecting research activities**

Barriers	Mean±SD
Individual barriers	3.58±0.71
Professional barriers	3.61±0.62
Facility barriers	3.41±0.74
Financial barriers	3.62±0.72
Scientific barriers	3.15±0.93
Managerial-organizational barriers	3.73±0.63
F, df, P	10.75, 97.5, 0.001

SD=Standard deviation

tensions and problems outside the university have a negative effect on their role in research activities.

The spirit of individualism and lack of interest in group and inter-disciplinary activities is the main individual barrier to research activities in other studies.<sup>[5]</sup> Another important factor requiring more attention is to address community problems rather than modeling external research. Various studies have confirmed the effect of internal motivation on research activities.<sup>[6,7]</sup>

### Professional barriers

Problems associated with communicating with researchers outside the university were the most important professional barriers. Furthermore, according to this research, engagement in time-consuming executive and administrative activities wastes the time of faculty member, which can be spent on research and science production and results in their interest in administrative and routine activities. These results have reported in many studies.<sup>[8-10]</sup>

### Facility barriers

Shortage of research specialists was the main facility barrier. The time-consuming process of providing necessary materials for research was another important barrier that should receive more attention due to the existence of clinical fields and operational researches of medical sciences and the necessity of supplying laboratory materials, medical equipment and so on.<sup>[8,11,12]</sup> Thus, in some cases, despite the interest of the researcher, the selection of a research subject is based on available capabilities rather than interest and innovation.<sup>[8,13]</sup> Furthermore, the time-consuming process of publishing scientific articles is an important barrier to research activities.

### Financial barriers

The lower income of research activities compared with the income of private activities was the most important financial barrier. Considering the pragmatic nature of medical sciences and since faculty members can work in private centers and earn more money, most specialists prefer to select more profitable treatment activities

instead of being involved in low-paid, difficult, and high-risk research activities.

### Scientific barriers

Insufficient skill in study methods, statistical tests, and questionnaire development were the most important scientific barriers in this study. Other studies have also reported the same results.<sup>[8,14]</sup> Up-to-date scientific workshops with the presence of renowned and skilled professors can be considered an efficient solution for overcoming this barrier.

Similar to other studies,<sup>[15]</sup> we found that insufficient foreign language skills is an important barrier. Inability to identify trending research areas is another important barrier demanding more attention. New roles to be played by librarian, especially in the field of extracting scientific drawings in different researchers, can pave the ground for identifying research cores and research scopes.

### Managerial-organizational barriers

Disregarding research results in the society was an important managerial-organizational barrier followed by inappropriate assessment. According to other studies, taking appropriate actions including administrative and financial processes and approval of research projects by the university and research deputy is the most important expectation of faculty members followed by prioritizing research need. Identifying the problem is the first step in conducting a research. Therefore, prioritizing research plans is a sensitive mission that should be undertaken by the human force of scientific groups involved in special fields.

In summary, all of the above barriers affect research activities, with financial, managerial-organizational, and professional barriers being the most important ones to research activities.

Many studies have evaluated common barriers and incentives in medical sciences for creating a research potential and culture<sup>[16-18]</sup> the barriers include inadequate time for research due to increased clinical activities, and insufficient research skills and incentives such as personal inclination toward improving skills, job satisfaction, and occupational achievements.<sup>[19,20]</sup>

Studies carried out in other countries have shown other barriers including workplace and demographic characteristics,<sup>[10]</sup> lack of access to information resources,<sup>[10]</sup> and a positive correlation with education and a negative correlation with executive positions.<sup>[21]</sup> Moreover, budget deficiency, lack of financial incentives, and lack of motivating factors are expressed as individual and organizational factors in a study in Iran.<sup>[8]</sup>

Lack of critical thinking, poor research culture, nonencouragement of research activities, and inadequate imparting of research skills in education are the most significant barriers to producing high-quality research in developing countries.<sup>[22]</sup>

Moreover, the high volume of treatment activities has been regarded as an important reason for lack of adequate time for research or even thinking about its applications. The mismatch between research activities and the real needs of the society is one of the most important reasons that the outcomes of medical research are not implemented in Asian countries.<sup>[23]</sup>

Strategies like formation of research and management teams and accurate supervision of their activities, benefiting from the research specialists' knowledge in different research phases, implementing modern remote training methods aimed at empowering researchers in required fields, adopting new technologies for participating in national and international projects, facilitating the process of approving research plans and fair budget allocation, prioritizing research needs, and creating infrastructures for designing applied research and implementing their results can mitigate the effect of many existing barriers and play a remarkable role in the promotion of research.

## Conclusions

The results of this study showed that researchers are motivated and interested in research. Therefore, examining their attitude toward different research barriers can help to identify and overcome the problems. Many barriers should be addressed by authorities. Elimination of these obstacles requires a change in research policies. Some barriers also depend on the people's perspective, and their resolution requires a change in the culture of research and researchers.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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