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RESEARCH ARTICLE

Investigation the barriers and factors influencing the scientific productions of graduate students in Hamadan University of Medical Sciences

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ABSTRACT

Background: The current study was conducted to investigate the research barriers and challenges faced by graduate students in Hamadan University of Medical Sciences. **Aims and Objectives:** This study is among the applied studies in terms of objective and descriptive survey in terms of method of study. **Materials and Methods:** Population of the study included 72 graduate students, selected using stratified sampling method among 227 people. The tool of the study included a researcher-developed questionnaire, which contained seven parts including demographic characteristics, personal barriers, organizational barriers, job factors, structural and communicative factors, and normative and ethical factors, and three open questions. The questions related to barriers and the questions related to factors were developed based on the 5-point Likert scale. **Results:** One of the most important structural and communicative factors influencing the scientific production of graduate students is solving the academic errors of student by professor, stimulating and encouraging the student by professor, stimulating the thought or brainstorming of the student by professor, and student and professor discussion, and exchange of views on the subject. Findings of multiple regressions revealed that job and organizational factors predict 22% scientific productions. Structural and communicative factors and normative and ethical factors predict 31% and 14% of variations invariance, respectively. **Conclusion:** The priorities influencing the scientific production of graduate students of Hamadan University of Medical Sciences included job and organizational factors, normative and ethical factors, and structural and communicative factors.

KEY WORDS: Barriers; Factors; Student; Academic Studies; Hamadan University of Medical Sciences

INTRODUCTION

Universities are the largest institutions playing an important role in the development of the society and graduate students play a key role in different cultural, social, political, technological, and educational areas,[1] so that development of universities is reflected in scientific productions.[2] The role and status of science production in the world is known to anyone. Science production is an important factor in economic, social, cultural, health, and political development of every country. Scientific production means the production of information in the form of books (including translation and compilation at national and international level), research projects, and papers published in valid journals, or papers presented at national and international scientific conferences.[3] Iran, like other developed countries, has experienced considerable growth in attracting graduate students and figures indicate that 46,00,000 students are studying at 2600 state and non-state universities. Out of these, about 5,00,000 students are graduate students who will

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be able to bring top ranks for Iran, in science, technology and, economic areas in Southwest Asia in 1404. This will be realized through the interaction between professors and graduate students. The most important superiority indicator of universities is the number of graduate students, and research activities (book, paper, and other types of scientific activities) of students are another important index for determining the educational level of the university, and their quantitative rank along with qualitative content is a strong base to attend in the area development and science geopolitics in the region.[4] Research is one of the strongest tools for developing potential talent that university planners need to consider.[5] Student research leads students to retrieve texts so that their viewpoints find new and innovative subjects about lessons and Fields.[6] Thus, in light of conducting the studies, barriers decreasing the academic productions among the students as well as factors encouraging graduate students to produce scientific products can be identified. There are some studies which have been conducted in this area, and some barriers have been evaluated and identified by researchers as following. Soleymani and Shokohi[7] conducted a study entitled "Factors influencing the scientific productions of Islamic Azad University (District 8)" using a questionnaire distributed among 420 full-time faculty members in District 8 of Islamic Azad University. They concluded that all individual factors have influenced the scientific production of respondents, and among the organizational factors, only information skills and scientific communication have been effective at the level of scientific productions. In addition, enhancing the knowledge and promoting the scientific rank were the most important motivation of respondents in performing the research activities. Somatipla (2004) in a study entitled "Medical students' attitude on importance of research in medical science" distributed questionnaire among 200 medical students in Delhi using descriptive survey method. He found that students' research is limited to the presentation of theses, and students are not considered as research work in until they have not published manuscripts, and this is considered as a weakness in the educational management. Hemsley-Brown and Oplatka,[8] conducted a study entitled "examining the facilities to conduct the research" to identify the factors affecting the scientific productions using a quantitative method and questionnaire. They concluded that government and managers' policies should be directed so that welfare and educational facilities to be provided for conducting the research so that students to be motivated to conduct the research. Zarei and Familrouhani[9] conducted a research entitled "investigating the research status of faculty members of Islamic Universities of District 5 and identifying their problems in the production of scientific information" using the descriptive method and using a questionnaire distributed among 250 full-time faculty members. They concluded that the problems of faculty members in science production included the problems of approving papers in specialized journals, the problems of approving of research works lack of specialized books needed, lack adequate opportunity for studying at university, administrative cumbersome rules, lack of bibliographies in the library, lack of specialized journals, lack of adequate facilities for studying at the university, lack of specialized Latin journals, and barriers in the research regulations. Karimian *et al*. in their study entitled, "Evaluation of the barriers and challenges of scientific research and science production of medical universities" came to the conclusion that most of the barriers are due to the lack of human relationships and attitudes. Hence, removing research barriers at the university is mostly affected by empowerment in education and science, culture, and attitudes reforms.[10] Although these above studies recognized some barriers and factors which could influence on the scientific productions, there is still an empty space for recognizing the structural, job, organizational, normative, and ethical factors, and individual and organizational barriers in this regard. Hence, this study carried out to investigate the barriers and factors influencing on the scientific productions of graduate students in Hamadan University of Medical Sciences.

MATERIALS AND METHODS

This cross-sectional study was conducted using descriptive method in 2015. The population of the study included 613 postgraduate students (master, research and educational specialized PhD, and medical and dental assistants). As master students have less experience in writing research projects or presenting academic papers, the students in the 1st semester in 2015 were excluded, and the master students in the 1st semester of 2014 and/or working on their thesis were selected as subjects of the study. Hence, 101 subjects were selected as sample size based on Morgan and Jersey table separately in terms of the level of education using stratified random sampling. Finally, 72 students completed the study tools [Table 1]. Tool of the study included a researcher-developed questionnaire, which contained seven parts including demographic characteristics (age, gender, education level, educational department, faculty, and experience of participation in workshops), personal barriers, organizational barriers, job factors, structural and communicative factors, normative, and ethical factors, and three open questions. The questions related to barriers and the questions related to factors were developed based on the 5-point Likert scale. In this scale, questions' answers were valued from 1 to 5, so that the option of strongly

Table 1: Graduate Students' status in terms of level of education

level of education	*n* (%)
Master	30 (41.6)
PhD	18 (25)
Medical assistant	2 (2.7)
Dental assistant	22 (30.5)
Total	72 (100)

agree received value 1 and the option of strongly disagree received the value 5.

RESULTS

In this study, out of 72 students studied, 40.2% (29 people) were male and 59.8% (43 people) were female, which their age range was 24–42 years with mean ± standard deviation of 28.7 ± 3.9. Based on the table above, master students (41.6%) had the highest frequency, and medical assistants (2.7%) had the lowest frequency among the population. In terms of the university of students, faculty of dentistry had the highest frequency, followed by faculties of Health, Nursing, and Midwifery, Medicine and Paramedics, respectively. The most important barriers influencing the scientific production are the lack of interest in research, the fear of being failed, inadequate knowledge in the methodology of research, and the lack of knowledge on the process of writing the paper [Table 2]. The most important organizational barriers influencing the scientific productions are the ethical restrictions in conducting research, higher importance of more clinical services to research services, non-cooperation of relevant professors, the lack of research privileges for promotion, the lack of research in curriculum, and the scientific stagnation due to time spending on research [Table 3]. Results indicated students are not supported and guided by supervisors or advisors in university in writing their thesis and similar courses, based on statistical data on the history of scientific production. It was also found that supervises do not spend much time for students and this is a problem that higher education system of the country had been faced with it during recent years due to lack of interaction between professor and student. In addition, increasing number of students does not allow faculty member of the university to provide research support for students outside of the curriculum. In general, individual, organizational, job, ethical, and structural factors are regarded as the barriers influencing the scientific production of graduate students. In addition, lack of motivation, lack of interest and lack of knowledge in English language, and lack of knowledge on paper writing skills, and most importantly, time limitation, and lack of knowledge on research process affect the scientific production of graduate students in Hamadan University of Medical Sciences.

DISCUSSION

Based on the findings of the study, the most important individual barriers affecting the scientific productions of students were lack of interest in research, fear of being failed, lack of adequate knowledge in the methodology of research, and lack of knowledge on the process of writing the paper, respectively. Therefore, it is essential to hold educational workshops on paper writing and providing the appropriate conditions to reduce the barriers of students. Holding research and statistics counseling centers are useful to guide students in the process of conducting the research. Considering the importance of search and information retrieval skill in conducting the research, making the students familiarized with library, databases, and so on can be effective in enhancing the motivation of students to conduct research and reducing its barriers. Based on the findings of the study, one of the most important organizational barriers influencing the scientific production of students is the higher importance of clinical services compared to research services. Thus, assigning more scores for research activities and reducing working hours seem to be essential. Based on the findings, another important barrier in the area of organizational barriers influencing the scientific production of graduate students included non-cooperation of relevant professors. As students require support and guidance of professors in conducting their research, some strategies should be adopted to enhance this cooperation. Considering special privileges for group research compared to individual research can be helpful in this regard. As holding conference and meetings, as well as relation with other scientific organizations, are two important job and organizational factors influencing the scientific

Table 2: Information related to individual barriers

Items	Individual barriers (%)					Mean±SD
	Strongest agree	Agree	No idea	Strongest disagree	Disagree	
Fear of lack of success	15.3	22.2	15.3	25	22.2	3.17±1.40
Inadequate knowledge in research methodology	4.2	38.9	26.4	16.7	13.9	2.97±1.13
Time shortage	23.6	44.4	22.2	5.6	4.2	2.22±1.01
Lack of knowledge on statistical principles	11.1	33.3	23.6	18.1	13.9	2.90±1.23
Lack of knowledge on the process of writing the paper	8.3	38.9	18.1	16.7	18.1	2.97±1.27
Lack interest in research	4.2	20.1	15.3	31.9	27.8	3.54±1.22
Social responsibility	8.3	37.5	26.4	16.7	11.1	2.85±1.14
Lack of knowledge on researchable subjects	8.3	41.7	16.7	19.4	13.9	2.88±1.22
Family responsibilities	11.1	37.5	16.7	18.1	16.7	2.91±1.29

SD: Standard deviation

Table 3: Information related to items of organizational barriers

Items	Individual barriers (%)					Mean±SD
	Strongest agree	Agree	No idea	Strongest disagree	Disagree	
Lack of access to information source	30.6	25	18.1	12.5	13.9	2.54±1.40
Non-availability of counseling forces	30.6	34.7	16.7	5.4	12.5	2.35±1.31
Weakness of counseling forces	25.0	36.1	16.7	11.1	11.1	2.47±1.28
Lack of equipment and facilities needed for research	23.6	34.7	16.7	13.9	11.1	2.54±1.29
Time limitations for conducting research	31.9	37.5	9.7	9.7	11.1	2.31±1.31
Inadequate research privileges for promotion	19.4	30.6	26.4	9.7	13.9	2.68±1.28
Lack of creating motivation by authorities and professors	25	37.5	18.1	9.7	9.7	2.42±1.24
Force to use particular framework	23.6	38.9	18.1	6.9	12.5	2.46±1.27
Non-cooperation of relevant professors	18.1	30.6	25.0	13.9	12.5	2.72±1.27
Administrative cumbersome rules	27.8	40.3	13.9	11.1	6.9	2.29±1.92
Ethical limitations in conducting research	11.1	34.7	22.2	13.9	18.1	2.93±1.29
Lack of using research findings	26.4	34.7	12.5	12.5	13.9	2.53±1.37
Inadequate revenue resulting from research	31.9	33.3	15.3	9.7	9.7	2.32±1.28
Performing proper advertising to conduct student research	20.8	38.9	15.3	15.3	9.7	2.54±1.25
lack of research in the curriculum	20.8	34.7	19.4	12.5	12.5	2.61±1.29
The scientific stagnation due to the time spent on research	19.4	36.1	23.6	8.3	12.5	2.58±1.25
Higher importance of clinical services compared to research services	26.4	36.1	13.9	9.7	12.5	2.88±3.83

SD: Standard deviation

production of graduate students in the University of Medical Sciences, it seems that taking measures such as holding and attending in domestic and foreign scientific conferences to be essential in providing the conditions for cooperation among universities and access to the scientific production of other organizations and universities. Based on the findings of the study, the most important normative and ethical factors influencing the scientific production of graduate students of the medical sciences university included professor's view on student, credibility and reward given to student by professor, professor's specialization in scientific subjects, and accepting the academic subjects proposed by student, which all of these factors suggest key role of professors in conducting the student research. Hence, employing experienced and moral professors are essential.

CONCLUSION

The results of the study showed that individual barriers were more effective than institutional obstacles in hindering the scientific production of postgraduate students. Furthermore, effective priorities on scientific production of postgraduate students were, respectively, occupational and organizational factors, normative and ethical factors, and structural and communicational factors. Therefore, necessary, the relevant authorities, by identifying, rooting, and prioritizing the factors and barriers to the production of science by students, to overcome these barriers, promote the process of the scientific production of the university.

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