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Presenting a Comprehensive Model of Factors Affecting Research Anxiety with Meta-synthesis Approach

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Abstract

Background & Objective: Research is one of the most important factors for the advancement of society. Given the necessity of researching scientific communities and associated mental pressures, researchers experience research anxiety. Therefore, the present study aimed to identify the factors affecting research anxiety.

Materials & Methods: This is a qualitative research performed with a meta-synthesis method. The statistical population includes all data related to research anxiety published during 2005-2020. In total, 463 references were found, 214 of which are chosen based on their abstracts. Afterwards, 82 references are selected based on content, and a total of 24 references are evaluated by the theme analysis approach as the related resources. Notably, the articles are found from databases of libraries, schools, and websites such as Academic Center for Education, Culture and Research, Noormags, Magiran, scientific articles of national conferences, national journals database, Iran Doc, Civilica, elmnet and valid foreign databases including Science Direct, Google Scholar, Scopus, Springer, and IEEE using the keywords of anxiety, research anxiety, and research barriers. The selected articles are analyzed in MAXQDA 2020 software.

Results: In this study, 103 codes and 13 concepts are extracted into two general components. According to the results, the two general components of internal and external factors affect research anxiety. In this regard, internal factors include methodological skills, research skills, information literacy, emotional, emotional, and management factors. On the other hand, external factors are rules and policies in the field of research, factors related to research centers, organizational attitudes and culture, organizational support, organizational decisions and planning, the research community, and research guide features and characteristics of research demographics.

Conclusion: In order to control research anxiety, researchers can consider appropriate programs and solutions to reduce anxiety by identifying the mentioned factors. In addition, our findings could contribute to the recognition and reduction of research anxiety in researchers.

Introduction

Education and research are undoubtedly some of the most important tools for creating organizational change, surviving, and achieving the desired goals and missions in today's competitive world (1). The role of research in the growth and development communities is known to all, and prosperity in society becomes possible with research. In fact, advanced communities are indebted to the expansion and improvement of research more than anything else (2). In general, research leads to advancement and development in any country and is associated with autonomy and self-efficacy. In addition, research is one of the most important necessities for comprehensive development and the most important competitive advantage and survival condition in today's fast-paced world (3). In fact, modern society needs people who can develop independent and creative thinking, explore issues and solve them creatively, which is not possible without the education of research skills. Therefore, one of the most important policies of developed and developing countries is to invest in the research infrastructures of the country so that researchers could generate knowledge and take steps toward meeting the knowledge needs of the country with ease and comfort and maximum effectiveness and return (4).

Most of the time, students and experienced and inexperienced researchers experience different levels of anxiety when asked to perform research and scientific activities. In fact, anxiety is one of the most common psychological problems in societies and one of the most important symptoms of psychological disorders (5). In general, anxiety is an unpleasant and often ambiguous feeling, which is associated with symptoms of the autonomic nervous system, such as shortness of breath, palpitations, perspiration, headache, slight stomach upset, and restlessness when sitting or standing (3). Anxiety is recognized as an adaptive response to environmental stimuli. Nevertheless, some anxieties can be normal (e.g., anxiety that has a positive effect on the process of human growth and development and causes motivation) and some of them can be abnormal (which have negative impacts on the process of human growth and development and cause non-compliance, poor performance, and failure) (6). Nevertheless, research anxiety can be considered abnormal due to its negative consequences. Research anxiety is a specific type of anxiety that is determined by physical, psychological, and behavioral signs, which can be turned into a problem when they endanger one's ability to deal with unpleasant events (7).

Research anxiety is one of the most common types of anxiety in higher education experienced by researchers. This type of anxiety is often occasional, meaning that it is formed in a specific situation and is not a permanent characteristic that could be related to a person's mind. Therefore, anxiety-induced problems can be solved favorably by providing the necessary education, increasing the level of scientific and skill capacity, decreasing the pressure of environmental factors, and improving their quality (8). In other words, research anxiety involves any feeling of fear or discomfort that is created during the science production process, from choosing a topic to publishing it in scientific societies and even after receiving feedback from the scientific communities (8). In the past few years, the phenomenon of research anxiety has attracted much attention due to its prevalence among researchers and impact on the performance of these individuals (9). Research anxiety is a multi-dimensional phenomenon that includes library anxiety and statistics and the research process (10). In addition, research anxiety is considered a part of research attitude that can affect the physical and psychological health of researchers (11). According to Konokman et al., research anxiety included three situational (previous knowledge and experience), purposeful (low self-esteem in dealing with mathematics, statistics, and research), and environmental (learning style, age, gender, and ethnicity) factors (12). Studies show that about half of people lack sufficient knowledge of research performance, which increases their anxiety. Some of the factors affecting research anxiety include lack of knowledge in the field of research, lack of digital literacy, limited knowledge of statistics and research methodology, lack of library information skills, limited English proficiency, lack of time management, especially during Master's degree, improper work conditions, more focus on finishing the course and getting good grades, and lack of research skills (13). Alpturk reported a lack of self-confidence, worrying during research, getting agitated, and having no desire to perform a research as behaviors caused by research anxiety (14). Research anxiety of higher education students is a basic problem since this feeling disrupts the dynamic mechanism in predicting the success of students. In addition, students doubt their abilities and become anxious when faced with the research process. Therefore, they should prepare themselves for research-related tasks by reducing their research anxiety (15). On the other hand, students' confidence in their abilities and their perception of research skills are among the factors affecting research since anxiety in research can disrupt learning, education, willingness to perform research, and scientific participation of students, thereby impairing their performance, causing a

delay in the search for necessary information, a decrease in research quantity and quality, mental confusion, reduction of interest and self-confidence, and adopting inappropriate research behaviors and the possibility of leaving the research before the obtaining the result (16). Therefore, considering the mentioned issues, focusing on research anxiety is not just a current problem and will also be a future issue. As such, more attention should be paid to this area. Numerous studies have been performed on anxiety in the past few years, which have mostly focused on direct and indirect aspects of the issue in various areas and its relationship with other variables. The dispersion of studies in this field on the one hand and the prevalence of various approaches on the other hand have caused a lack of a coherent perspective and image of scientific data and findings in the field of research anxiety. Therefore, the need for holistic and texturalization can be observed from the research findings since this issue has been addressed from different angles and each researcher has analyzed the research anxiety from their own point of view. On the other hand, the meta-synthesis method is used as a tool to achieve the principle of integration in various sciences based on the findings of other researchers.This method seeks to redefine and organize the findings by relying on the characteristics of the accumulation of sciences. Accordingly, the goal is to follow the principles of the meta-synthesis method by reorganizing the research findings in this field in a new way. Given the fact that the current study was qualitative and exploratory, there was no research hypothesis, and the study attempted to identify the factors affecting research anxiety. With this background in mind, attempts were made in the present study to answer this question: what are the factors affecting research anxiety?

Materials and Methods

In this study, we apply a qualitative meta-synthesis approach, which, similar to meta-analysis, is used for the integration of several studies and creating comprehensive and interpretive results. However, this method focuses on qualitative studies, which is in contrast to the quantitative meta-analysis approach and relies on the quantitative data of the literature and statistical approaches. In general, meta-synthesis is a type of qualitative study that uses the information and results extracted from other studies with similar and related topics (17). The statistical population includes all Farsi and English scientific documents (scientific articles, theses, and books) published on research anxiety during 2005-2020. Articles are found by searching the databases of libraries, research institutes, and websites such as Academic Center for Education, Culture and Research, Noormags, Magiran, scientific articles of national conferences, national journals database, Iran Doc, Civilica, elmnet and valid foreign databases including Science Direct, Google Scholar, Scopus, Springer, and IEEE using the keywords of anxiety, research anxiety, exam anxiety, library anxiety, computer anxiety, Internet anxiety, and research barriers. In addition, different parameters such as title, abstract, content, access, and quality of research method are used for assessing and choosing papers. The selected articles are evaluated in terms of content quality, for which we apply the critical appraisal method. During the process, a 10-item checklist is used to evaluate the accuracy, credibility, and importance of articles. In general, the items focus on the assessment of research objectives, the logic of the method, research design, sampling method, data collection, reflexivity or the relationship between the researcher and participants, ethical considerations, data analysis precision, clear expression of results, and research value. The articles are studied using the research tools and each paper is scored in a range of one-five based on the mentioned characteristics. According to the 50-point CASP (critical appraisal skills program), articles are classified based on their quality determined by a scoring system of very good

(41-50), good (31-40), moderate (21-30), weak (11-20) and very weak (<11). In total, 24 articles are accepted based on the mentioned scoring process and were enrolled in the study. The meta-synthesis approach is applied in accordance with Sandelowski and Barroso's Meta-Synthesis Method, and a summary of stages is presented in Figure 1.

Figure 1: Metasynthesis steps based on the seven-step Sandlowski and Barros method

First Step: Research Question Design

Various factors are used to ask the research question such as the study population, what, when, and how the method is used. In this study, the explored question is: What are the factors affecting research anxiety?

Second Step: Systematic Review of the Literature

Preliminary data of published articles are used to collect research data. These documents include all studies on research anxiety. In meta-synthesis, the text of past studies is data. In total, 24 studies related to our topic are selected according to Figure 2.

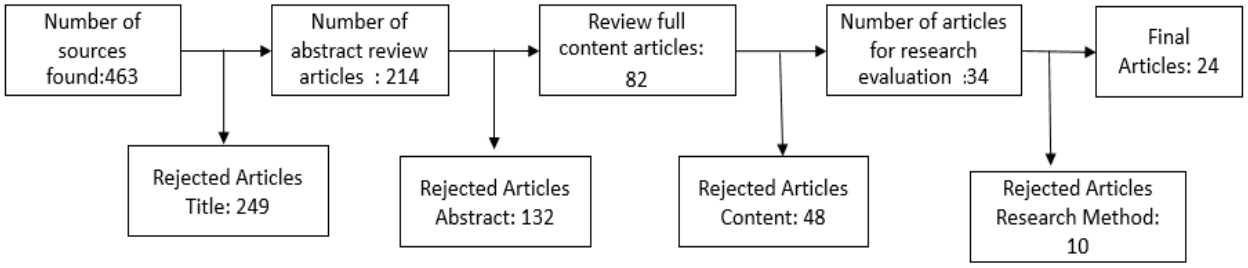

Figure 2: A simple overview of the search process and selection of final articles related to the topic

Third Step: Search and Selection of Appropriate Texts

At the beginning of the search process, it is necessary to determine whether the received articles are proportional to the research question or not. To this end, primary articles are extracted by searching and collecting articles by two members of the group. Afterwards, the extracted articles are assessed and reviewed several times based on the consensus of researchers. At this stage, 439 articles are rejected due to the lack of compatibility of their titles with the problem and variables of the current study. Another 249 papers are rejected based topic, and 132 articles are removed because of their abstract. Moreover, 48 articles are removed from the analysis processes based on content, and another 10 papers are rejected due to research methodology. Finally, 24 articles are used as the final selected article. The sources used to extract the identifiers are shown in Table 2.

Table 2: Documents reviewed to extract the factors affecting research anxiety

Row	Author or authors	Year	Article name	Journal
1	Darya poor & et al (18)	2020	Factors affecting the development of research culture in elementary school with a phenomenological approach	School Psychology
2	Gholampour, Rostami Nejad (19)	2020	Identifying the extent and causes of research anxiety in students: a mixed approach	Two Quarterly Journal of Higher Education Curriculum Studies
3	Maryam Khosravi, Roya Pour Naghi (20)	2019	Dimensions of research effectiveness - systematic review study	Two scientific quarterly journals of Shahed University
4	Imani, Masoumi, Amiri (21)	2019	Research Anxiety and Related Factors in Graduate Students of Hamadan University of Medical Sciences	Research in medical education
5	Dehghani, Azizian Kohan, Behtaj (22)	2019	The Relationship between Research Capabilities and Information Literacy with Predicting Research Anxiety among Physical Education Students	A new approach in sports management
6	Razavipour et al. (23)	2019	Investigating the motivation, barriers and problems of research in clinical professors of Mazandaran University of Medical Sciences in 2019	Journal of Mazandaran University of Medical Sciences
7	Ahmadi et al. (24)	2019	Evaluation of research anxiety and identification of related factors in PhD students of Iran University of Medical Sciences	Journal of Modern Medical Information
8	Shirbegs, Nemati, Saedi (25)	2019	Understanding the concept of research from the perspective of faculty members	Culture strategy
9	Zahed Babalan et al. (26)	2018	The relationship between information literacy and time management with research anxiety	Teacher Professional Development Quarterly
10	Abedi (27)	2017	The relationship between research anxiety and student self-efficacy	Thesis
11	Gholami, Mehram, Karshki (13)	2017	Build and validate a research anxiety scale for students	Iranian Journal of Ron Medicine and Clinical Psychology
12	Ramzpour, theoretical, Makundi (28)	2017	Determining the factors related to research anxiety of faculty members of the Department of Information Science and Knowledge of Iranian universities	Caspian Journal of Scientometrics
13	Safdari et al. (29(	2016	Barriers to research in medical sciences from the perspective of faculty members of the University of Medical Sciences	Journal of Rafsanjan University of Medical Sciences
14	Fazlullah, Nowruz, Maleki (30)	2012	Investigating the Inhibitory Factors Affecting Cultural Researchers	Research in curriculum planning

Continue of Table 2: Documents reviewed to extract the factors affecting research anxiet

15	Mohammad Amin Erfan Manesh (8)	2008	Research anxiety and the reasons for its occurrence in researchers and faculty members of universities - a review of texts	Quarterly Journal of National Library and Information Studies
16	Sarah Jarrin & David Finn (31)	2019	Optogenetics and its application in pain and anxiety research	Neuroscience and Biobehavioral Reviews
17	England, Brigati, Schussler & Chen(15)	2019	Student Anxiety and Perception of Difficulty Impact Performance and Persistence in Introductory Biology Courses.	CBE—Life Sciences Education
18	Cooper, Downing& Brownell (9)	2018	The influence of active learning practices on student anxiety in large-enrollment college science classrooms.	International Journal of STEM Education
19	Merç (10)	2016	Research Anxiety among Turkish Graduate ELT Students.	Current Issues in Education
20	Alpturk Akcoltekin(14)	2015	High school students' time management skills in relation to research anxiety	Educational Research and Reviews
21	Konokman,Yelken & Yokuş (12)	2015	Preschool Teacher Candidates' Research Qualifications and Anxiety Level towards Research	Eurasian Journal of Educational Research
22	Brinkman SN, Hartsell-Gundy(32)	2012	Buildingtrust to relieve graduate student research anxiety.	Public Services Quarterly
23	Prima Vitasari (33)	2010	A Research for Identifying Study Anxiety Sources among University Students	International Education Studies
24	Higgins & Kotrlik(34)	2006	Factors Associated with Research Anxiety of University Human Resource Education Faculty	Career and Technical Education Research

Fourth Step: Research Data Extraction

At this stage, the content of the selected articles is assessed by the researchers, and some codes related to the keywords are selected, according to which the concepts and categories of the study are formed. In total, 289 codes are extracted. However, duplicates are removed and 103 codes are used in the end. The final classification of the extracted codes is carried out following careful examination and study of researchers and due to the similarities and commonalities of some of these categories with each other. In the end, the concepts are classified into 13 categories and two main components.

Fifth Step: Analysis and Combination of Qualitative Results

During the analysis, the researcher seeks topics that have emerged in meta-synthesis among the existing studies, recognized as thematic review (18). In this regard, the researcher considers all factors extracted from studies as code and then classifies the codes in a similar category by considering the concept of each code, which leads to the formation of concepts (themes) of the research. Afterwards, similar concepts are classified into determining categories, and factors affecting research anxiety are identified in the form of the main components of the research using MAXQDA 2020 software. Ultimately, the network of factors affecting research anxiety is formed in the figure below.

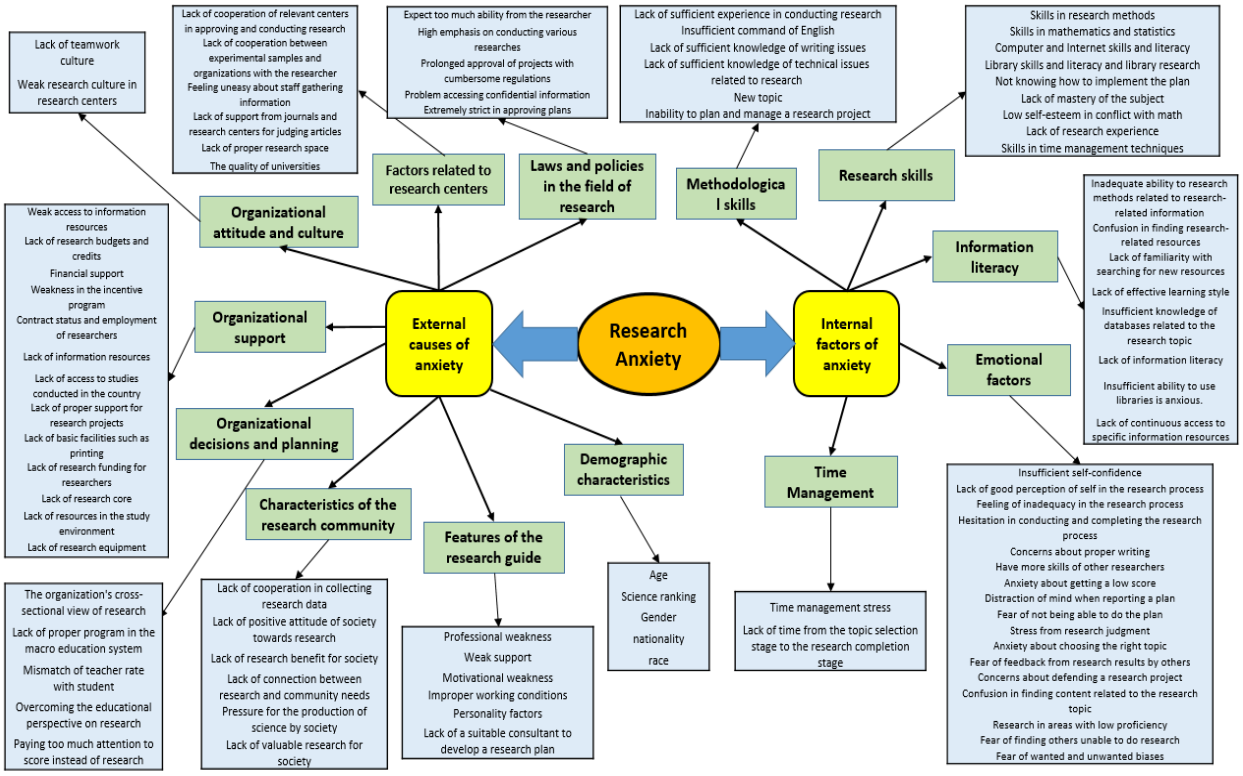

Figure 3: **The final model of the factors affecting research anxiety**

Sixth Step: Quality Control

At this stage, the selected articles and extracted codes are provided to eight specialists in the fields of educational sciences and psychology in order to receive their feedback on the quality of the extracted concepts. In the end, six specialists agreed on the extracted categories and confirmed the codes. Therefore, there are 6 agreements and 2 disagreements between experts and researchers. In this regard, the calculation of the reliability coefficient shows 75% agreement. Given a reliability coefficient above 0.6, the tools have appropriate reliability for code extraction. According to Sandelowski and Barroso (35), descriptive validity in qualitative meta-synthesis studies is defined as the identification of all research reports related to the topic and recognition and description of information of each report. In general, descriptive validity in qualitative meta-synthesis studies is related to the secondary researchers, who collect and write the reports existing in the study. Theoretical validity in meta-synthesis primarily refers to the validity of approaches used to integrate the results and deals with the integration of results or the researcher's interpretation of findings of previous researchers (18). In the present study, attempts are made to identify and collect the largest number of Persian and English domestic and foreign articles to have descriptive validity. Ultimately, in order to establish theoretical validity, it is aimed to use studies that have high scientific validity, especially in terms of reference of scientific articles.

Seventh Step: Presentation of Results

According to the systematic review, a total of 463 domestic and foreign articles were selected, 24 of which were evaluated in the end, which led to the extraction of 103 codes. The output of this process is to identify and classify the codes in the form of 13 secondary categories and place them in two main components of research anxiety. According to the results, there are two types of internal and external

research anxiety factors; internal factors are those emerging from the inside and are related to the person himself. On the other hand, external factors come from the surrounding environment and cannot be controlled by the person. In this study, the internal factors of research anxiety include components such as methodological skills, research skills, information literacy, emotional, emotional, and management factors. The external factors are rules and policies in the field of research, factors related to research centers, organizational attitudes and culture, organizational support, organizational decisions and planning, research community, and research guide features and characteristics of research demographics.

Discussion

Research anxiety can have negative effects on the performance of researchers from different angles. It might reduce the quality and quantity of scientific productions and can cause job burnout and occupational dissatisfaction. In addition, it can affect the personal life of researchers and even threaten their health. Anxiety occurs when a person worries about a future event excessively, which results in negative reactions such as fear and concern. The present study aimed to present a comprehensive model of factors affecting research anxiety using a meta-synthesis approach. This research is one of the first studies performed comprehensively to identify and determine the factors affecting research anxiety through combining previous studies. We provided new findings on the mental health of individuals that could affect the decision-making of higher education managers. According to the results of the present study, factors affecting research anxiety can be divided into two categories of internal and external factors, which are discussed below.

External factors: the external factors of research anxiety come from the surrounding environment and cannot be controlled by the person. The external factors are rules and policies in the field of research, factors related to research centers, organizational attitudes and culture, organizational support, organizational decisions and planning, research community, and research guide features and characteristics of research demographics.In this respect, our findings are in line with the results obtained by Kawakami (36), McLean (37), Ashley (38), Gholami, Mahram and Kareshki (13), Khosravi and Pournaghi (20), Imani, Masomi, and Amiri (21), Ahmadi et al. (24), Gholampour and Rostaminejad (19), Safdari et al. (29), Romezpoor, Nazari and Makvandi (28), and Erfanmanesh and Didegah (8). Rules and policies in the field of research can cause anxiety. In this regard, some of the factors include strict rules about approving the topics, time-consuming approval of research projects, and cumbersome regulations. Moreover, research anxiety is caused by a lack of cooperation of research centers with the researchers, such as lack of providing samples and a research setting to the researcher, or lack of necessary facilities and proper quality of instruments. Other external factors of research anxiety include a lack of necessary support (e.g., lack of financial support), lack of proper incentive programs, lack of basic facilities, lack of research core and lack of resources in the research environment, decisions, and planning of different organizational levels such as lack of proper planning in the macro educational system, the incompatibility of the teacher-student rate and the dominance of the educational view over research. The research community can also cause anxiety. A lack of cooperation of people with the researcher in collecting correct information, negative attitude of the community toward research, lack of connection between research and the needs of society, and lack of benefit of conducted research for members of society, which could have negative impacts on achieving correct information, thereby increasing anxiety in researchers. Moreover, demographic characteristics such as gender, scientific rank, age, ethnicity, and race affect anxiety. In fact, a researcher who is conducting research among

people of the opposite gender and different ages and who has different ethnicities and races, compared to the research community, experiences more anxiety. The higher the level of guidance and support provided for the researcher, the higher the necessary motivation of the researcher, the more appropriate the counseling provided for developing a research design by the researcher, and the higher the scientific rank of advisors and supervisors, the lower the research anxiety of researchers.

Internal factors:Internal factors are those that emerged from the person's inside and are related to the person himself. The internal factors of research anxiety include components of methodological skills, research skills, information literacy, emotional, emotional, and management factors. In this respect, our findings are congruent with the results obtained by McLean (37), McLean (38), Abedi (27), Dehghani, Azizian and Behtaj (22), Gholami, Maram and Kareshki (13), Pournaghi and Khosravi (20), Imani, Masomi and Amiri (21), Gholampour and Rostaminejad (19), Safdari et al. (29), Romezpoor, Nazari, and Makvandi (28), and Erfanmanesh and Didegah. Regarding the effect of internal factors on research anxiety, it could be expressed that the higher the level of literacy, research skills, and time management, the better the ability of researchers to manage their research problems. This reduces their anxiety since research anxiety decreases work efficiency and causes psychological disorders. Therefore, researchers should be provided with a variety of research-related knowledge and skills and be prepared to take on real-life roles and responsibilities. Regarding methodological skills, it could be expressed that the more experienced the researcher is in conducting research and the more knowledge and mastery they have about research topics, the higher their skills will be, which will reduce their research anxiety. In addition, research skills such as the inability to use a computer, internet literacy and skills, library literacy and skills, and lack of project management and planning could play a role in increased anxiety. The emotional factors of researchers play an important role in their level of anxiety. Inadequate self-confidence and a sense of inadequacy in research performance lead to the researcher's concerns about unwanted biases and lack of proper perception of themselves during the research process, which increases their anxiety. Time management is another internal factor affecting anxiety among researchers. During the research, the researcher deals with insufficient time from the beginning to the end of the work, which affects the quality of the research and causes anxiety. While attempts were made to have a better perception of research anxiety, our findings may not lead to accurate identification of different levels of research anxiety due to the specific and personal characteristics of individuals. Therefore, it is recommended that more studies be conducted to identify various factors affecting anxiety at various levels and in different locations while taking all personal characteristics of individuals into account. In addition, in order to reduce research anxiety, it is suggested that more attention be paid to students and attempts be made to prevent scattered work and anxiety in these individuals.

Conclusion

According to the results of the present study, anxiety could have negative impacts on researchers' productivity and lead to a lack of progress of researchers. Obviously, the ability of scientific production in the educational system becomes stagnant with the continuation of such conditions and lack of attention to the causes of anxiety, whichprevents people from performing their functions (e.g., research) in society properly. In brief, there were different levels of anxiety among the researchers. In addition, research anxiety could be affected by various internal and external factors, and a decrease or increase in each of these factors could have a direct or indirect effect on results. Some of the effective factors, especially internal factors that are related to the individual, can be

controlled to some extent by training and identifying the source of research anxiety. Therefore, it is possible to reduce or eliminate research anxiety in order to improve the quantity and quality of researchers' scientific products by training and retraining research skills, training in anxiety management skills, as well as financial and organizational support.

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Conflicts of Interest:

The authors declare that there are no conflicts of interest.

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