

Original Research

Scientific Social Networks in the Mirror of Iranian Academic Research: A Systematic Review Using the Kitchenham & Charters Model

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Received: 30 April 2022

Accepted: 28 September 2022

Abstract

With the spread of Web 2, social networks became more popular. Social networks are used in various fields and scientific fields due to their capabilities and facilities. This study aims to analyze published Persian research on scientific social networks systematically. The present study is applied research with a systematic review approach using the Kitchenham and Charters model, which consists of 7 steps: question design, database identification, benchmarking, search process, selection, extraction, analysis, and data quality evaluation. The statistical population comprises 83 studies indexed in Persian databases (Elmnet, Irandoc, Magiran, Noormags, SID, Civilica, ISC) published in scientific and social networks. Findings showed that the study of scientific, social networks has been started since 2012, and about 84 studies have been published in this field. Among different years, in 2018, the most works were published. About 215 authors were involved in writing these works, of which 51.6% were women and 48.4% were men, 48.8 were faculty members and 50.2 were non-faculty members. The specialty of most writers was knowledge and information science. Thematically, the study of indicators and capabilities of scientific social networks with 23 studies is in the first place, presence and use of scientific social networks with 20 titles in the second, review of various aspects of social networks with 15 titles in the third, cooperation networks with 12 titles in the fourth and general scientific social networks and construction of research profiles in them with four titles placed in the fifth rank. In conclusion, researchers try to study the activities of the universities of the Ministry of Science and the activities of medical universities. Most of the published research was in the form of articles published in scientific journals or at scientific conferences. Also, most were published in collaboration with three or four authors.

Keywords: Scientific Social Networks, ResearchGate, Academia, LinkedIn, Mendeley, Systematic Review, Kitchenham and Charters Model, Iranian Academic Research.

Introduction

The increasing development of information and communication technology has challenged all aspects of culture and social life. Cyberspace has created a new kind of social relations, and although it is a recent phenomenon, it has affected all human lives (Thelwall & Kousha, 2013). The concept of "social network" was first employed by J. A. Barnes to identify patterns and to explain common concepts used by public and social science (Memar, Adlipoor & Khaksar, 2013).

Along with the institutionalization of the use of public social networks, scientific social networks or in other words, scientific social networks were created. Creating scientific social networks (research-based) is one of the most important means of communication for researchers worldwide. There are more than a dozen scientific social networks, such as ResearchGate, Orcid, Google Scholar, Pablons, LinkedIn, etc. Authors can publish their research information, such as books, articles, slides, etc. to help other researchers become familiar with their research and receive more citations by studying their research (Thelwall & Kousha, 2013). Every person who registers in scientific social networks, a research profile is created for him/her, and this action increases the visibility of their works, reputation (Asadi, Naghshineh & Nazary, 2015), and citation of scientific (Sotodeh & Saadat, 2016)

In short, scientific social networks have some goals such as promoting scientific reputation (Sarrafzadeh & Sheikh, 2019), recognizing young and novice researchers, having an online resume for researchers, awareness of job opportunities, up-to-dateness and accompanying the research field related to the author (Gökkurt & Demirtel, 2017), awareness research, research activities, scientific questions and answers (Ebrahimi, Salimi, Anbaraki & Zare, 2020), providing more information to researchers in a thematic field (Sharif Moghadam, Miri & Salami, 2018) uploading a variety of scientific products even unpublished research, (Asadi, Naqshineh & Nazari, 2015). Today, presence in scientific social networks can be considered one of the main scientific needs of researchers.

The present work is a systematic review of the content analysis approach. The systematic review is a structured review that focuses on a question and tries to provide an answer by analyzing all available valid evidence (Kitchenham & Charters, 2007). This method adapts all the empirical evidence to the predetermined eligible criteria to answer a specific research question (Esfidani, Khajehian, Mohammadian & Rahmanian, 2021). This type of review is done using resource search, predetermined criteria, critically evaluating evidence, and extracting and producing data from and produced evidence (Sohrabi, 2013).

Materials and Methods

The present study is applied research done with a systematic review approach based on the model of Kitchenham and Charters (2007). The reasons for conducting systematic research from the researchers' point of view include: summarizing the scattered evidence and documents for better conclusions, identifying research gaps in the specific research field and proposing future research, and developing theoretical frameworks for new research (Esfidani, Khajehian, Mohammadian & Rahmanian, 2020). The steps for conducting a review research are shown in Figure 1.

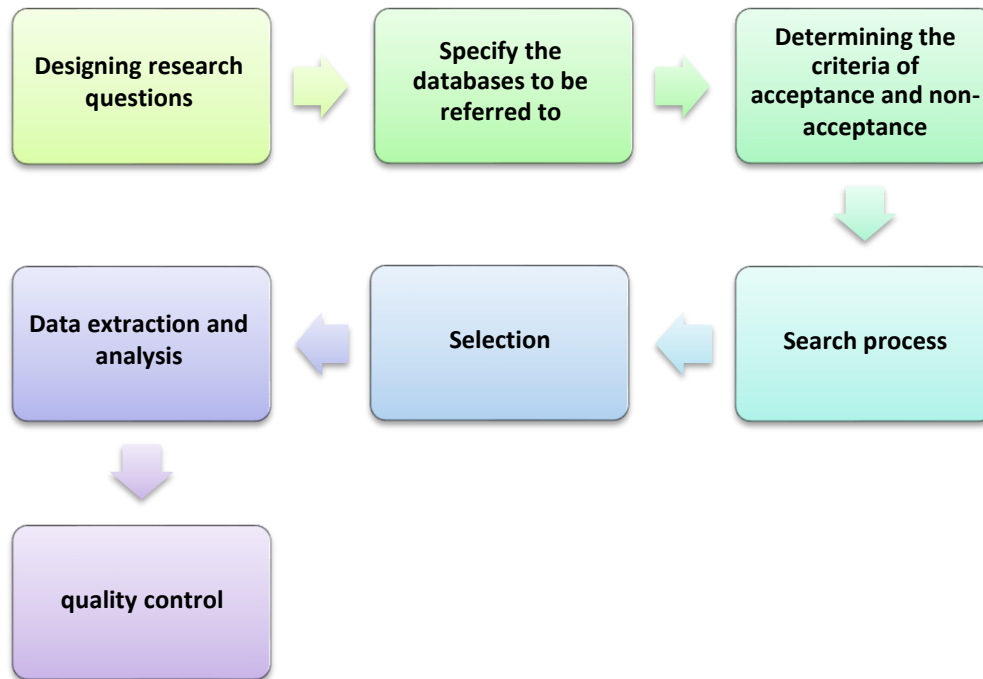


Figure 1: Systematic Review Research Process based on Kitchenham and Charters model

According to Kitchenham and Charters' model, determining the research questions is the first step. The research questions of this study are as follows:

1. What has been the evolution of research on scientific social networks over the years?
2. In what formats has the most published research been presented?
3. What is the level of authors who participated in the publication of scientific social media research in terms of gender, level of education, and scientific rankings, and who are the core authors in this field?
4. What aspects of scientific social networks have the most published research focused on?
5. Which social networks were the focus of the published research?

The second step in conducting this study is "selecting the databases to be studied". To identify the published research, the authors searched the keywords related to scientific social networks, including "scientific social networks", "specialized social networks", "ResearchGate", "Academia", "Google Scholar", "Mendeley", Elmnet, IranDoc, Magiran, Noormags, SID, Civilica, and ISC.

The third step in conducting a systematic review according to the Kitchenham & Charters model is determining inclusion & exclusion criteria. In this regard, the authors identified four formats of books, proposals, dissertations, and articles for research on scientific social networks.

During the search, all published works on social networks (including ResearchGate, Academia, Google Scholar, and Mendeley) and research related to social networks were collected regardless of their relevance to the subject. But when identifying the research, the authors were confronted with research that was not relevant to the topics identified in the research; therefore, they were excluded from the scope of the research.

The fourth step in the Kitchenham & Charters model is to identify the search process in a systematic review. Authors searched keywords such as "Scientific Social Networks", "Research-Based Social Networks", "Specialized Social Networks", "ResearchGate", "Linkedin", "Mendeley", "Academia" and "Google Scholar" in the title, keywords, and abstracts of published works. These keywords are searched in "titles" and "keywords" of articles. In addition, during the research, if we observed related research, we would add them to the research community. Finally, 87 research topics on scientific social networks were identified. To analyze the data, the bibliographic information of each of the identified researches including document type, title, author name (s), authors' gender (s), authors' organizational affiliation, year of publication, journal title, and subject were collected in Excel file format and then analyzed.

Data selection, extraction, and analysis are this model's fifth and sixth stages. In these steps, researchers select, extract and analyze the identified data. In this study, in addition to identifying the recovered records, the researchers studied the identified research in detail. First of all titles, abstracts, and keywords of the articles were examined. Then, if they matched the topic, they were entered into a checklist and studied. At this stage, the researchers were confronted with some studies that had great semantic similarities with the subject of scientific social networks. These samples studied items such as co-author, co-citation, etc., which removed them from the search scope. finally, after applying the refining stage, 83 titles remained that were evaluated.

Quality Assessment is the seventh step. After selecting and reviewing the data, they will be analyzed. Research resources were collected according to the research questions, and the evaluation results were retrieved from charts and graphs.

Results

The first research question is dedicated to the study of the publication of research related to scientific social networks during different years. The distribution of the works during other years is shown in Figure 2.

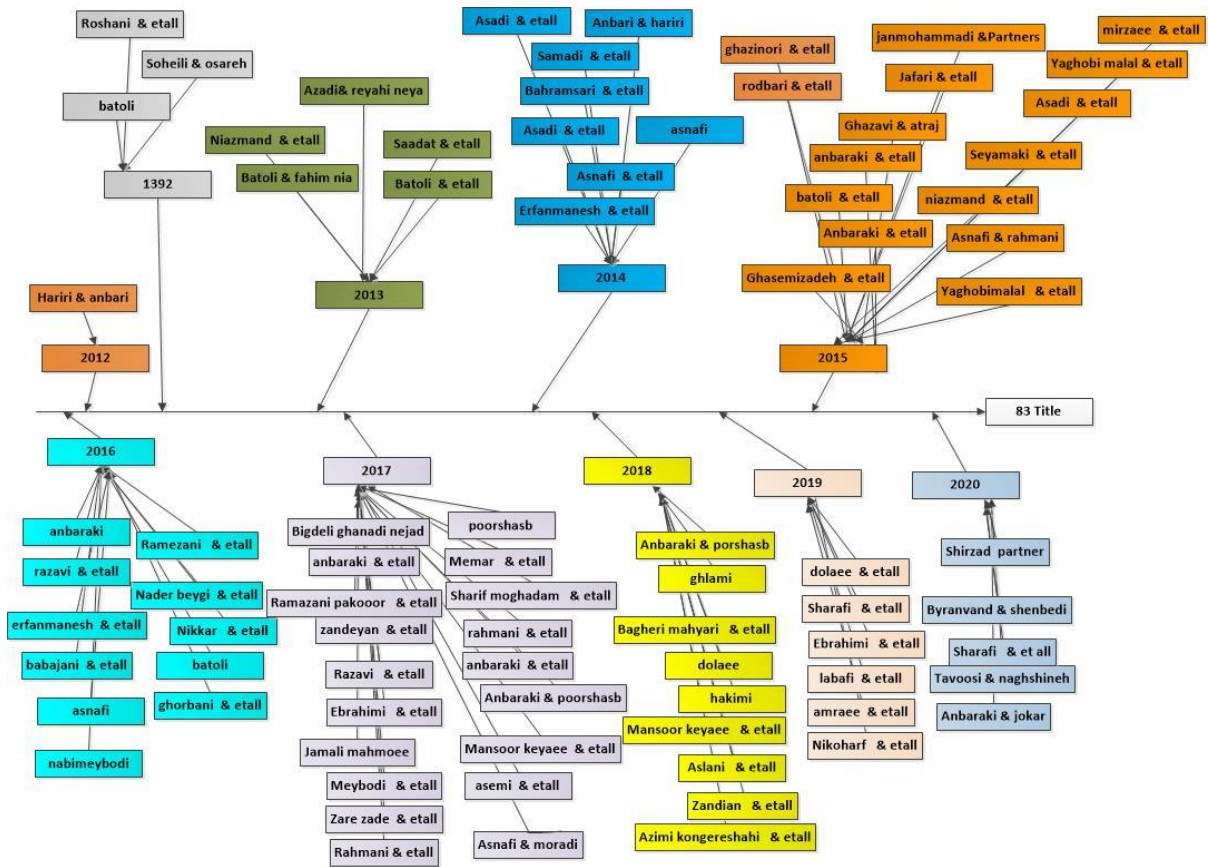


Figure 2. Frequency Distribution of Published Works between 2013 and 2021

According to Figure (2), the publication of research on scientific social networks started with Hariri and Anbari's (2012) research "Assessing the capabilities of Persian specialized social networks and providing appropriate solutions". But over the next few years, we have seen more research on scientific social networks. The data show that in 2013 three works, in 2014, five, in 2015, seven, in 2016, sixteen, in 2017 eleven, in 2018 nineteen, in 2019 nine, in 2020 six and in 2021 five works were published. 2018 with 18 works, was in the first place, and 2016 with 16 works, was in the second place.

The second research question is dedicated to determining the formats of published works (figure 3).

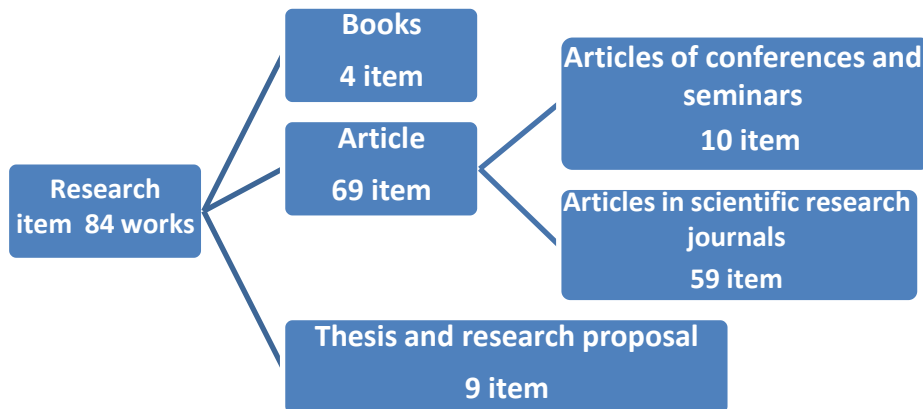


Figure 3: Frequency Distribution of Published Works

Figure 3 shows that the authors' research products include four books, 69 articles (59 journal articles and ten conference articles), nine theses, and research proposals. The third question of the research was dedicated to the study of the status of authors, including gender, level of education, and scientific rank. Table 1 shows its statistical data.

Table 1

Frequent Distribution of Authors by Gender, Level Of Education, and Academic Rankings

Components		Frequency	%	
Gender	woman	111	51.6	
	man	104	48.4	
	Total	215	100	
Job position	Faculty member	Tutor	5	4.7
		Assistant Professor	50	47.6
		Associate Professor	41	39
		Professor	9	8.7
	Total		105	
	Non- faculty member	Masters	2	1.8
		Student	48	43.6
		Masters	14	12.7
		Ph.D. student	27	24.5
		Doctorate	11	10
		Unknown	8	7.4
Total		110	100	

According to Table 1, 215 authors were involved in the publication of these works, of which 111 (51.6%) were women and 104 (48.4%) were men. Regarding job positions, 105 (48.8%) were faculty members, and 110 (51.2%) were non-faculty members. Among the faculty members, there were 50 assistant professors and 41 associate professors; among the non-faculty members, there were 48 graduated students and 27 Ph.D. students. Also, eight writers did not specify their job status. Among the authors is Saeedeh Ebrahimi, with 11 works. Sahar Anbaraki, with nine works and Jokar, Salami and Asnafi, with eight works, were in the second and third ranks and introduced themselves as the core writers of this field. Authors such as Nazari, Batooli, and Niazmand are also among the authors who have published more than three works in scientific social networks. The study of the specialized subject field of the authors showed: 158 participants were in the field of knowledge and information science, 8 participants were in information technology, 7 participants were in media management, and 34 participants were in other areas. Also, 8 participants did not specify their specialized field.

The fourth question of this research was dedicated to the study of thematic aspects in published research. To find out, what parts of scientific social networks have the published research focused on? Data in Figure 4 will answer this question.

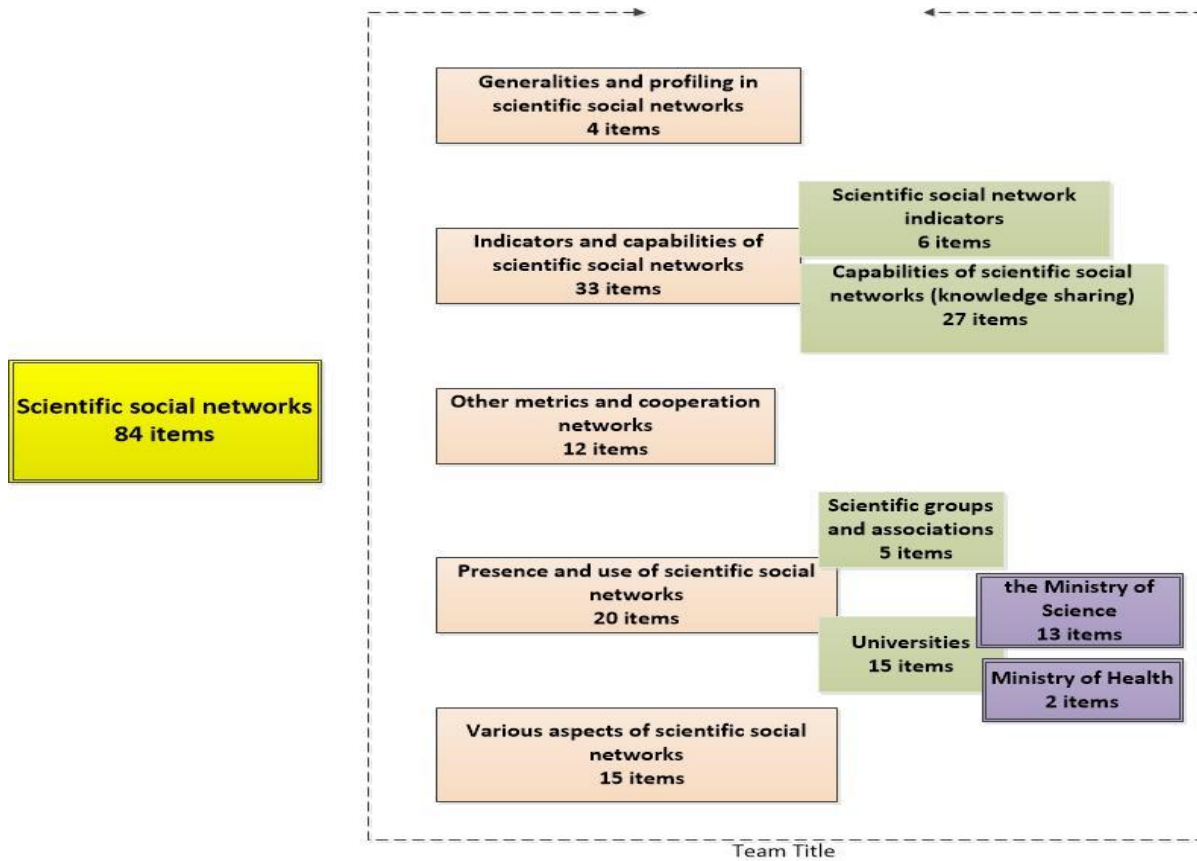


Figure 4: Frequency Distribution of Topics Discussed in Articles Published in the Field of Scientific Social Networks

As Figure 4 shows, all thematic works are classified into five thematic categories:

1. Generalities of Scientific Social Networks and Profiling in Networks,
2. Indicators and Capabilities of Scientific Social Networks
3. Other Criteria and Collaborative Networks and Altmetrix
4. Presence and use of scientific social networks
5. Different aspects of social networks.

About 84 research titles in scientific social networks have been published from 2012 to 2021. According to Figure 4, four titles are dedicated to the generalities of social networks and profiling guide, 33 titles to the indicators and capabilities of social networks, 12 titles to other metrics and cooperation networks, and 20 titles to the reflection of research activities, and 15 other topics have dealt with various aspects of social networks. The results show that six titles of research sources dealt with the subject of social network indicators (Figure 5)

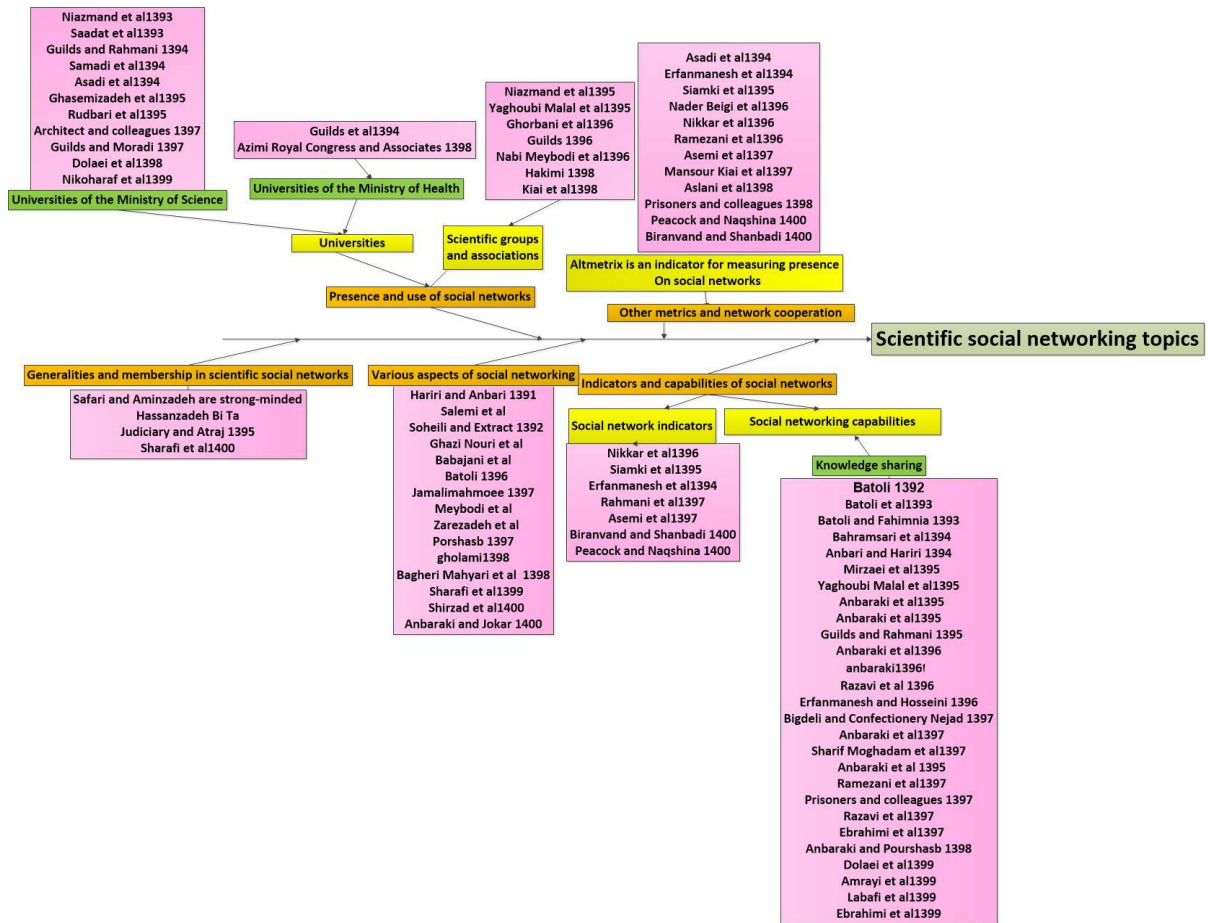


Figure 5: Research Conducted In Each of the Thematic Categories

As mentioned, 20 published research titles were dedicated to studying the presence of researchers in different universities and scientific groups and the reflection of their works in the scientific networks (Figure 6).

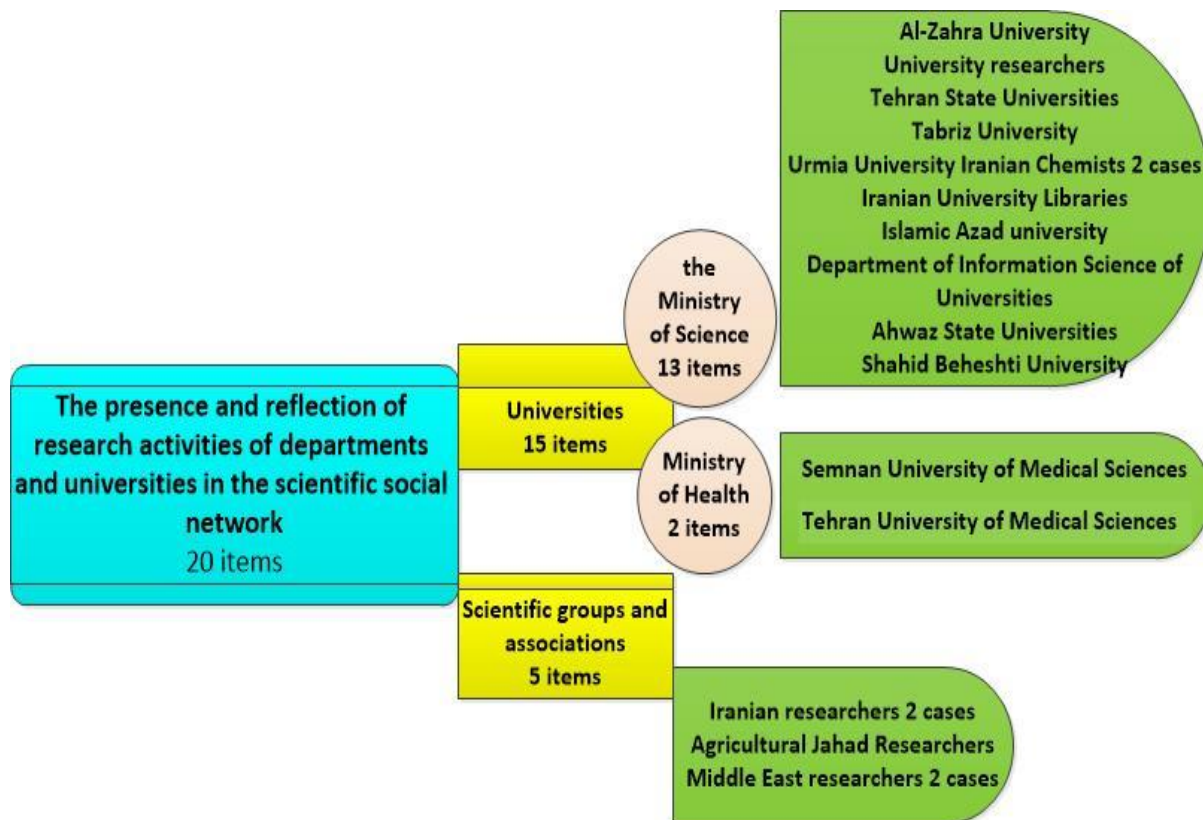


Figure 6: Frequency Distribution of Published Research on the Presence of Researchers from Different Universities and Groups in Scientific Social Networks

In this research, studies on the presence of faculty members of universities and various scientific groups in scientific social networks are divided into two categories: Universities and scientific groups and associations. In the company of faculty members of universities in scientific social networks, 15 kinds of research have been published, of which 13 titles are related to the universities of the Ministry of Science and 2 cases are related to the universities of the Ministry of Health. This research shows that students do not use scientific social; (Ghorbani, Momeni, Ghorbani & Babalhavaeji, 2017). and they are unfamiliar with social networks (Asnafi & Moradi, 2019).

Also, the research results show a deficient presence of Iranian researchers compared to researchers in other Middle Eastern countries (Niazmand, Ebrahimi & Jowkar, 2016). The results also show an increase in self-archiving (Saadat, 2014) and the creation of inadequacies such as lack of up-to-dateness, multilingualism, illegibility, false and invalid, duplication, and lack of information in social networks, incorrect information (Bahramsari, Ahmadizadeh & Niazmand, 2014). These studies examined the presence of researchers in the social networks of ResearchGate, Mendeley, Academia, etc., and concluded that many faculty members still do not have information about them (Nabi-Meybodi, Alidosti & Nazari, 2018).

Another topic that has been studied more than others is the indicators and capabilities of scientific social networks. The results show that 27 studies have been conducted in this field.

Hariri and Anbari (2012) conducted the first research in this field. One of the most important findings of this group of studies is the direct relationship between information literacy and the use of scientific social networks, the role of social networks in introducing,

communicating, and cooperation between researchers, increasing productivity as a result of growing information exchange (Mirzaei, Rahimi & Moradi, 2016); The role of scientific social networks in promoting the level of research in universities, increasing citations as a result of easy and convenient access to the works uploaded in scientific social networks (Batooli, Nazari & Fahimnia, 2015). Also, the use of scientific social networks can increase information literacy skills in researchers (Batooli, 2014), facilitate the exchange of global knowledge and university education (Razavi, Refahi Kamsari & Asnafi, 2016), "common vision", "interaction" and "confidence". In addition, by creating scientific social networks, the presence of researchers in the same field and the exchange of specialized knowledge (Anbaraki, Jowkar & Ebrahimi, 2022) can inspire faculty members and have a positive impact on their final performance (Sharif Moghaddam, Miri & Salami, 2018).

Social media indicators were another topic addressed in published research. The important findings of these researches are as follows: authors' self-archiving, Bahramsari, Ahmadzade and Niazmand (2014) believe that this issue is one of the essential factors for the absence of researchers in the scientific social network, While in the researches of Fahimnia and Montazeri (2013), lack of time and interest have been introduced as factors of the absence of researchers in scientific social networks ; increasing citations and its effect on RG indicators in ResearchGate (Batooli, Nazari & Fahimnia, 2015); introducing Facebook, MySpace and Club as the public social networks and three specialized networks such as Good Reeds, HR and LinkedIn as top networks in measuring the capabilities of social networks (Roshani, Rezaeenik, & Shojaei, 2013), using the indicators of scientific social networks in creating scientific collaborations among experts, using these databases to find the desired specialists (Azadi Ahmadabadi & Riahinia, 2015); using scientific social networks to improve thinking and business practices (Jafari, Karimi & Abarghou, 2016); using the indicators of scientific social networks in creating scientific collaborations with other experts, using these databases to find the desired specialists (Azadi Ahmadabadi & Riahinia, 2015); using scientific social networks to improve thinking and business practices (Jafari, Karimi & Abarghou, 2016); using the RG indicators as a complementary indicator to evaluate the scientific activities of researchers (Rahmani, Nowruzi Chakoli & Asnafi, 2018); using the RG indicators in the Times University Rankings (Tavosi & Naghshineh, 2021).

The next topic is Altmetric. Altmetrics is a tool for measuring web-based research interactions with specific parameters. These kinds of studies were also divided into two categories. First were the studies that examined the collaboration network and Altmetrics in medical sciences, and the second category was the studies that examined it in the universities of the Ministry of Science. Figure 7 shows the thematic areas of Altmetric studies.

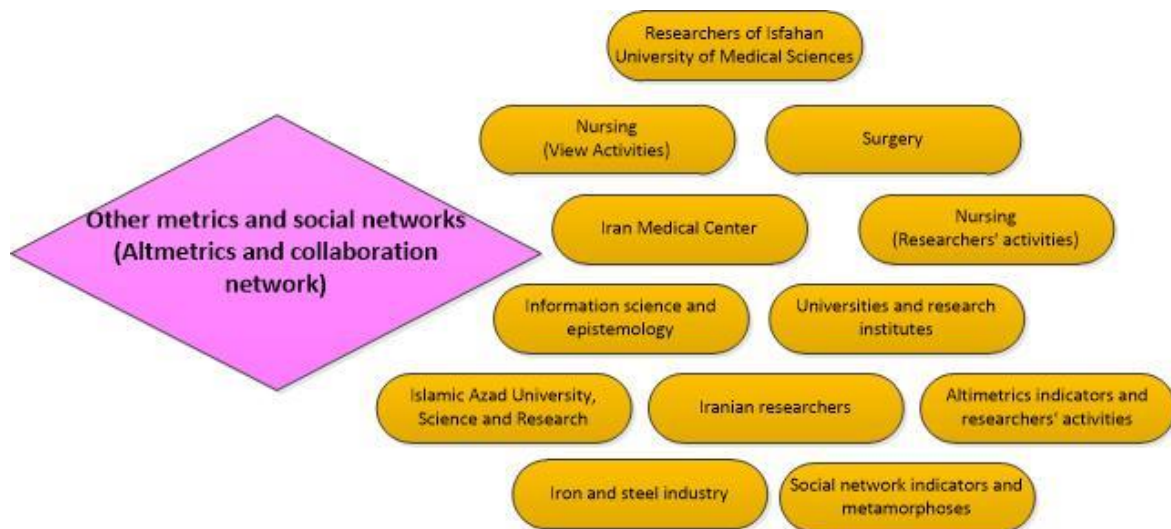


Figure 7 : The Presence of Academic Researchers and Scientific Groups Using Altmetric Methods

As Figure 7 shows, 12 studies examined the presence of researchers in various scientific courses in scientific social networks, of which only 5 studied the presence of faculty members of medical universities, and 5 studied the scientific groups and associations. The results are as follows: low RG indicators of nurses in ResearchGate (Siamaki, Geraei & Zare-Farashbandi, 2016); RG score of culturalization to increase the presence and activity of researchers in ResearchGate to increase the visibility of writings and increase the number of citations (Jan Mohammadi, Rahmani & Rotten, 2017); promoting scientific position of Iran in the world with the extensive activity of Iranian researchers in scientific social networks, such as ResearchGate (Asemi, Ebrahimi Darcheh & Nojavan, 2019); demonstrating better performance of Tehran University of Medical Sciences, University of Tehran, Tarbiat Modares University, Amirkabir University, Islamic Azad University, Shiraz University of Medical Sciences and Sharif University in the ResearchGate (Erfanmanesh, Asnafi & Arshadi, 2015); determining the significant relationship between the amount of citations received in Google Scholar, Scopus, and Web of science with the presence of scientific social networks (Biranvand & Shenbedi, 2022); the effect of presence in the ResearchGate to increase the citation rate of Iranian research at the global level (Nikkar, Alijani & Ghazizadeh Khalifa Mahaleh, 2018); providing a suitable presence and optimal use of the capabilities of such environments for Iranian researchers, scientists and students (Naderbeigi, Isfandyari-Moghaddam & Soheili, 2017); using Mendelian tools as an alternative or complementary tool for evaluating scientists (Asadi, Nagshineh & Nazary, 2015); initiation of executive activities by universities to increase the presence of faculty members in scientific social networks and uploading works published in these scientific networks (Ramezani, Ghazimirsaeed, Papi, YektaKooshali & Ramezani Pakpour Langroudi, 2017).

The next category of published research was devoted to examining the theoretical and practical aspects of scientific social networks. In this study, researchers examined different aspects such as relevance in scientific social networks, information storage and retrieval in scientific social networks, copyright and self-archiving rights, and the challenges and perspectives of scientific social networks. The results obtained are as follows, determining centrality and density in scientific social networks (Soheili & Ossareh, 2013); determining how authors use the publisher's final file for self-archiving as the main problems in ResearchGate,

copyright infringement by two-fifths of articles uploaded in ResearchGate (Jamali Mahmoudi, 2018); determining the factor of "interaction with other elites and achieving a coherent knowledge base" as the most important reasons for membership in scientific social networks, determining the cultural weakness in relationship with dialogue, critique and analysis; weakness in information technology infrastructure (Roshani, Rezaeenik & Shojaei, 2013); guiding students to use these networks in order to establish more scientific interaction (Babajani, 2017); introducing Telegram, Instagram, LinkedIn and ResearchGate softwares as the best social media for official use in the National Library (Zarezadeh, Sharifmoghadam, Khosravi & Salami, 2018), respectively, identifying the subject areas that have had the most and the least discredited articles (Poroushasb, 2018); introducing ResearchGate as a powerful tool in increasing the visibility of scientific works and also introducing ResearchGate as a tool of "self-archiving" and "information search" (Batooli, 2017). Norouzi, Khavidaki and Sadrabady (2021) also reminded us that the above parameters are effective in scientific social networks and can affect each other. Also, the findings of Shirzad, Mousavi Chelak, Ziaei, Soheili and Salami (2021) showed that the Research Gate network is vital in meeting users' information needs.

Profiling and getting acquainted with social networks are the last category. Four books have been published in this field. Due to the importance of these networks, it is necessary to prepare several manuscripts to acquaint students and professors with such scientific networks. Responding to the fifth research question, "Which social networks did the most published research focus on?" The data have been prepared in Figure 8.

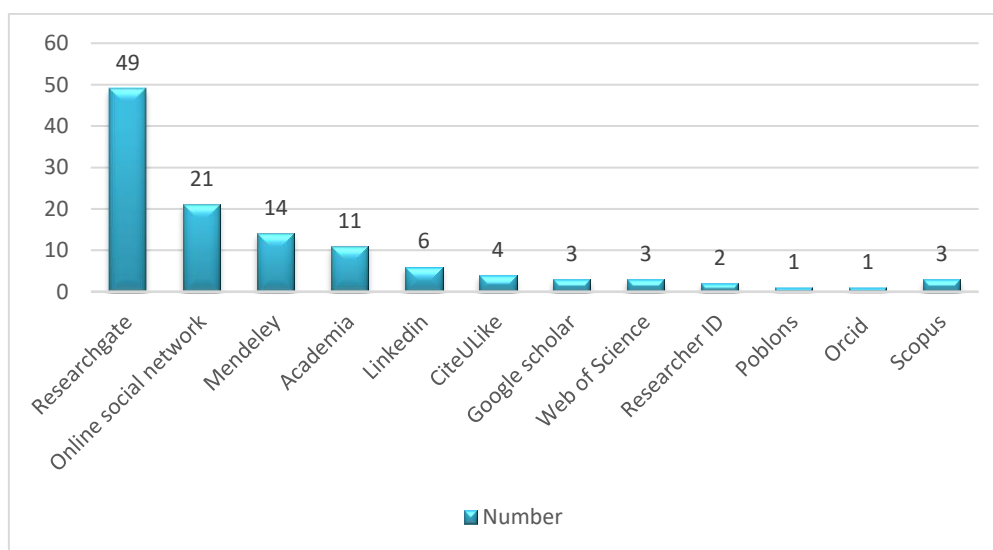


Figure 8. The Emphasis of Research on Scientific Social Networks

Among scientific social networks, ResearchGate is in first place with 49 cases, followed by Mendeley with 14 titles, and Academia with 11 titles in the second and third places. 21 studies also examined all scientific social networks. Among them, the scientific social networks Pablons, Research ID, and Google Scholar were less considered (Figure 8).

Discussion

A systematic review is a resource review that focuses on a question and tries to provide an answer by analyzing all available valid evidence. This method is done by using resource search,

using predefined entry and exit criteria, critically evaluating evidence, and extracting and producing data from evidence (Sohrabi, 2013), which has been expanded meta-analytically (Ghaedi & Golshani, 2016). Considering the extensive research that has been done in the field of scientific social networks, there has been no systematic or systematic review in this field in Iran, it seems necessary to conduct a systematic review study to determine the thematic course used in these years and to determine the research gaps in this field. Perhaps the reason for paying attention to this issue is the growth of research in this field and the interest of researchers in publishing new research in it.

Studies show that research in this field began with Anbari and Hariri's research (2014), and over time the number of publications in this field increased. This trend grew significantly in 2017. In 2018, about 19 works were published in this field. Perhaps one of the reasons for the growth of this research is related to the establishment of a Master of Science in Scientometrics at the Science and Technology Information Center (2013) and Shahed University.

Shayan Majd (2012) has also emphasized and believed that the growth of scientometrics in Iran began in 2010, and today many articles are being published. During these years, research has been written by 215 authors. About 11 studies with one author, 15 kinds of research with two authors, 47 types of research with three authors, eight works with four authors, and two works with more than four authors have been published. The increase in the number of authors is because these works are mainly extracted from student dissertations with the participation of the supervisor and the advisor. The survey of authors showed that 111 (51.7%) are women and 104 (48.3%) are men. In this part of the findings, there is a discrepancy between the present study's findings and Saadat's research (2014), because she had reported a low level of women's participation in disseminating research in this area. Of these authors, 77 had a master's degree, and 139 had a doctorate. 108 (50.2%) are faculty members, and the rest are non-faculty. Of 109 non-faculty writers (49.8%), 65 were students (15 Ph.D. students and 49 postgraduate students). Among the researchers, Saeedeh Ebrahimi with 11 works, Sahar Anbaraki with 11 works, Jokar, Salami and Asnafi with 8 works have the most research works. Authors such as Nazari, Batooli, and Niazmand are researchers who have published more than three works in this field.

Regarding researcher collaboration, 163 authors were collaborators within the organization and collaborated with 34 authors from outside the organization. The study of the subject area showed that out of 215 participants, 158 (73.5%) were information science specialists, 8 were IT managers, 7 were media managers, and 34 were from other fields. Eight did not specify their area of expertise.

The most important part of this research was the classification of the subjects studied in this research. Researchers categorized the subject areas of this study into five categories. The most important part is the studies related to the presence of researchers and the reflection of their research works in these social networks, especially the ResearchGate network. Niazmand, Jokar and Ebrahimi (2014); Saadat (2014); Samadi (2015); Asnafi and Rahmani (2016); Asadi, Naghshineh and Nazary (2015); Ghasemizadeh (2015); Roodbari (2019); Yaghoubi Malal, Jamali Mahmoei and Mansourian (2016); Ghorbani, Momeni, Ghorbani and Babalhavaeji (2017); Nabi-Meybodi, Alidousti and Nazari (2018); Hakimi (2020); Azimi Kangarshahi, Ghazi Mirsaeid and Ganjipour (2019); Mansour Kiyaei, Babolhavaeji, Nooshinfard and Soheili (2018) and Nikoharf, Hosaini and Ghafari, (2021), have addressed this issue.

The most important part of this research was the classification of research topics. Researchers categorized the subject areas of the research into five categories. One of the

important parts of this research is related to the presence of researchers and the reflection of research works in social science networks, especially in the ResearchGate network. Among these, 12 studies examined the presence of researchers from different universities of the Ministry of Science, Research and Technology, and two reviewed the presence of researchers from medical universities. Also, five studies examined the presence and reflection of the research activities of specific groups, including nurses, librarians, chemists, and researchers in the Middle East.

With the increasing presence and reflection of more works in social science networks and their achievements, the discussion about using scientometric indicators, knowledge-sharing capabilities, and knowledge management of these networks arose. So that in 27 studies, the ability to share knowledge and in 11 studies, their altimetric aspects were studied.

Utilizing the capabilities of these networks in knowledge sharing among researchers is a case that Afrasiabi (2014) also emphasizes and states that social networks are a place to increase students' creativity and accelerate the flow of knowledge in society. He also considers the exchange of information, accelerating the process of knowledge production, strengthening scientific thinking, and knowledge management as its achievements.

The popularity of social science networks by researchers and academics has led experts in other fields, including digital librarians, to study these aspects of social media. So that in 14 studies, different parts of these networks were studied. The widespread acceptance of these networks led researchers in 4 studies to guide researchers on creating research profiles and reflecting on their research activities in these networks.

Perhaps these works were published due to the necessities emphasized in various research, such as Anari, Asemi and Riyahi nia (2013). The use of social networks and knowledge sharing among students was very low. They believed that the growth and development of scientific social networks in the academic community is one of the necessities. In summary, it can be said that the studies have focused on the presence of researchers and the benefits of their presence in scientific social networks. They also discussed more scientific relevance in scientific social networks and the benefits researchers receive from participating in them. In most of these studies, the capabilities of ResearchGate have been studied, and other networks and their capabilities have been less discussed. One of the points to be considered was using the ResearchGate social network in research studies. About 49 articles were posted on the ResearchGate social network. Perhaps the reason is the greater attention of universities, user-friendliness, and ease of use of this network among faculty members. This issue has also been emphasized by Razavi, Refahi Kamsari and Asnafi (2016). Evaluating the capacities of other scientific social networks and the relationship between new scientometric indicators and new indicators of scientific social networks is another topic that has been neglected. The excessive focus of research on the capabilities and capabilities of this network and the reason for focusing more on the ResearchGate can be considered in calculating the RG index and using other networks of this index in ranking and evaluating researchers and institutions. Rahmani, Nowruzi Chakoli and Asnafi (2018) have introduced the RG score as a complementary indicator to assess researchers' research activities. The fact that it is free to share and access uploaded works may be another reason to pay more attention to this network. This advantage is a case that has been emphasized. In addition, 21 studies have examined all scientific social networks in total.

Conclusion

The increase in virtual communication, especially in education, has led to the rise in scientific social networks and research. Research on scientific social networks has begun with what social networks are. Currently, more attention is paid to the functions and capabilities of scientific social networks. But the points that should be considered can be mentioned the following:

1. Due to less familiarity of humanities students and faculty members with such networks; It is suggested that most scientific organizations and associations hold workshops and conferences to introduce and expose such scientific social networks.

2. More attention is needed from scientific policymakers of universities and executive bodies to the capabilities of social networks and the particular encouragement of humanities faculty members to pay more attention to these networks.

3. Due to the removal of the RG indicators in the ResearchGate social network and more attention to the question-and-answer indicators, the authors should consider more comparative studies.

4. It necessitates familiarizing researchers with scientific social networks and their impact on receiving citations, increasing visibility, and shaping intra-organizational, extra-organizational, national, and international scientific collaborations.

5. Paying more attention to the criteria and indicators of scoring by scientific social networks to researchers and conducting qualitative research on them

6. The policymakers of research centers and universities familiarize researchers with these indicators and the capabilities of Altmetrics.

7. Investigate further research on the reflection and sharing of the works of medical universities in these scientific social networks.

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