

## GOING BACK TO THE ROOTS: A BIBLIOMETRIC AND THEMATIC ANALYSIS OF WOMEN ENTREPRENEURSHIP

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### Abstract

*We used bibliometric methods to examine studies related to women entrepreneurship. Specifically, we focused on understanding the recent trends, the most influential publications and journals, topics on which women entrepreneurship studies are conducted, and deciphering the future direction of women entrepreneurship studies. We used the Scopus database to extract 1,554 documents published from 1982 to 2022 and analyzed the scientific publications per year, the most cited articles, sources of publications, keyword co-occurrence, thematic structure (topic modeling), and bibliographic coupling. We found that the scientific publications related to women entrepreneurship are increasing significantly each year, and the most consistent keyword is "gender." Citation analysis identified Ahl (2006) as the most cited article, which demonstrates Ahl's notable influence, as well as the success of the gender turn influenced by feminist theory. Co-word analysis found seven clusters showing the thematic structure of women entrepreneurship research. Bibliographic coupling analysis found four clusters, encompassing various aspects associated with women entrepreneurship. The clusters are "Role of gender in an entrepreneur's performance," "Challenges and upcoming issues faced by women entrepreneurs," "Impact of geographic location on women entrepreneurship," and "Financial struggles of women entrepreneurs." Topic modeling using the latent Dirchlet allocation algorithm (LDA) identified seven areas of interest in the women entrepreneurship literature. We conclude with implications and suggestions for future research.*

**Keywords:** *women entrepreneurship, female entrepreneurship, bibliometric analysis, bibliographic coupling, co-word analysis, topic modeling*

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## 1 INTRODUCTION

Increased scholarly and political attention has been invested in women entrepreneurship in recent years (Henry, Foss, & Ahl, 2016; Jennings & Brush, 2013). Globally, there are an estimated 274 million women involved in business startups. This does not include 139 million women owners/managers of established businesses and 144 million women who are informal investors (GEM, 2020–21, p.14). It is now well accepted that women contribute significantly to entrepreneurial activity (Noguera, Álvarez, & Urbano, 2013) and economic development (Kelley et al., 2017, Hechevarría, Bullough, Brush, & Edleman, 2019) by creating new jobs and thus leading to an increase in the gross domestic product (GDP) (Bahmani-Oskooee, Kutan, & Xi, 2013; Ayogu & Agu, 2015). This has had a cascading effect on reducing poverty and social exclusion (Langowitz & Minniti, 2007; Rae, 2015).

The number of studies and the attention being paid to the realm of women entrepreneurship has increased strongly in recent years. This includes several reviews of women's entrepreneurship which furnish an understanding of the field. Brush (1992) reviewed 57 studies of women entrepreneurship published during the period 1975–1991 and proposed a new “integrated perspective for future research.” After reviewing 81 research articles published during 1982–2000 in leading entrepreneurship and management journals, Ahl (2006) criticized a few shortcomings of women entrepreneurship research, revealed a trend of recreating the idea of women as being subordinate to men, and suggested new research directions. In addition to these studies, the contributions of studies of women entrepreneurship to general entrepreneurship theories over the last 30 years was evaluated by Jennings & Brush (2013). More recently, the developmental trajectory of women entrepreneurship research, detecting new research horizons, and developing trends in the literature was studied by Deng, Liang, Li, and Wang (2020). A comprehensive literature review and bibliometric analysis by Aggarwal and Johal (2021) attempted to identify a link between rural women and entrepreneurship.

However, the significant growth of women entrepreneurship globally calls for a more thorough and comprehensive review and analysis of studies on the topic. Existing reviews, with the exception of

that by Deng et al. (2020), focused on a small number of studies published in management and business journals. Hence, a major shortcoming that exists today is the lack of a more comprehensive understanding of the development trajectory and recent and future trends in the domain of women entrepreneurship.

Taking these shortcomings into consideration, this study answers the following questions:

1. What are the most influential studies and outlets for women entrepreneurship?
2. What is the thematic structure of women entrepreneurship literature?
3. What is the intellectual structure of studies on women entrepreneurship?
4. What are the recent trends in the field of women entrepreneurship research?
5. How will the existing research shape the future direction of women entrepreneurship studies?

We bring clarity to the cumulative knowledge of women entrepreneurship through a bibliometric analysis using bibliographic coupling, citation analysis, co-word analysis, and topic modeling. By answering the research questions, this bibliometric review makes the following contributions. First, this paper provides a comprehensive, systematic, and objective review of women entrepreneurship. Our study further complements existing reviews by conducting a co-word analysis, topic modeling, and bibliographic coupling, and visualizing them comprehensively. Second, we identify the areas of women entrepreneurship which demand increasing attention, including an increasing focus on work–life balance and the significance and imperative of networking to business. Thirdly, our study highlights a burgeoning interest in women entrepreneurs from developing countries

Future research needs to focus on the women entrepreneurship ecosystem to study the institutional environment embedded within it and work on improving it, because it is important to increase the percentage of women in entrepreneurship because of the possible economic benefits that could be derived from this.

## 2 LITERATURE REVIEW

Entrepreneurship as a topic of research gained significance in the 1930s (Yadav & Unni, 2016). It took almost 50 years for the sub-domain of “women entrepreneurship” to emerge as a topic of research (Jennings & Brush, 2013). According to Schwartz (1976), Yadav and Unni’s (2016) review study of “female entrepreneurship” was the first “academic research paper,” Hisrich and O’Brien (1981) was the first “academic conference presentation,” and Goffee and Scase (1985) was the first book on the topic. According to Jennings and Brush (2013), the late 1990s and early 2000s were pivotal years in the study of women entrepreneurs, during which two conferences paved the way for women entrepreneurship as a research area. The first was a “policy-oriented Organization for Economic Cooperation and Development (OECD) Conference on women entrepreneurs in small and medium-sized enterprises” in 1998, and the second occurred in 2003 when Diana International hosted an academic conference.

A few studies have explored women entrepreneurship through qualitative and/or bibliometric analysis. Cardella, Hernández-Sánchez, & Sánchez-García (2020) examined 2,848 articles relating to women entrepreneurship and discovered that it was a relatively new area of investigation that has gained continual attention from scholars, with increasingly more articles published in the last 20 years. According to Cardella et al.’s (2020) study, women entrepreneurship as a research subject is shifting focus from the investigation of political and economic problems to the examination of beneficial factors that allow for the bridging of the gender gap. Deng et al. (2020) reported consistent observations, stating that the literature on women entrepreneurship has increased exponentially since 2014, with as many as of 150 articles annually, and certain clusters have received enhanced attention. These clusters include “entrepreneurial intention,” “initiating force,” and “social network.” Bastian, Sidani, & El Amine, (2018) highlighted the significance of developing a theoretical framework that can aid in gaining a comprehensive understanding of women entrepreneurship. The framework can aid in assessing the uniqueness of the geographical area as well as some of the motivators or hurdles in women en-

trepreneurship. A comprehensive view of women entrepreneurs is necessary to identify new research directions (Paoloni, Secundo, Ndou, & Modaffari, 2018). Paoloni et al. (2018) highlights digital women entrepreneurship. They emphasize that a pertinent socioeconomic and technological phenomenon can reshape existing businesses and create opportunities for developing innovative solutions for society. Adom & Anambane (2019) examined the involvement of culture and gender stereotypes in the entrepreneurial journey of women. They further highlight that culture, which encapsulates gender stereotypes, helps drive women’s entrepreneurial behavior. This is because of a desire to escape these stereotypes, as well as gender inequality, which has hampered women’s living standards.

An increasing number of studies pertaining to women entrepreneurship are being published. However, a qualitative review can include only a limited number of studies. This paper fills this gap by presenting a large-scale systemic analysis of trends in women entrepreneurship studies, co-authorship networks, recent topics of women entrepreneurship studies, and what the future holds for studies in women entrepreneurship.

## 3 METHODOLOGY

We performed a bibliometric analysis to gain a better understanding of the most important influences on women’s entrepreneurship and how the available literature on women’s entrepreneurship is structured. We employed the Scopus database, which is well-known in the research community and contains over 27 million abstracts, making it the largest database (Burnham, 2006). The search criteria for articles included keywords such as “women entrepreneurship,” “female entrepreneurship,” “women entrepreneurs” or “female entrepreneurs.” The bibliographic search returned 3,228 results for the period 1982–2022. The article selection thereafter was refined using four criteria. First, the article had to be written in English (Cardella et al., 2020); second, it had to be a scientific paper published in a peer-reviewed journal, because these are considered to be reliable sources of information (Podsakoff, MacKenzie, Bachrach, and Podsakoff, 2005), Third, the article had to be related to “business, management, and accounting.” Finally, the

research article must not have been published in a book as a chapter or in a conference proceeding.

The criteria further narrowed the selection to 1,584 articles. This approach is based on the PRISMA method guidelines (Liberati et al., 2009) used by Cardella et al. (2020). The present study analyses the temporal evolution of research publications, the most prominent authors on the topic, the most productive journals in terms of total quantity of published articles, and the nations with the maximum number of research contributions using a series of bibliometric indicators.

At the final stage of filtration, all 1,584 articles were read by the researchers to shortlist the articles that were not related directly to women entrepreneurship. Such articles ( $n = 29$ ) were removed from the data set. For example, if an article had a keyword “women entrepreneurship” but did not discuss entrepreneurship per se, the article was eliminated. A consensus among the researchers was reached after this step, and the final number of articles used in the analysis was 1,554.

VOS viewer software version 1.6.10 was used for the analysis. Because it uses a bibliometric technique, it enables graphic illustration, identification, and classification of groups in a strategic matrix predicated on commonalities and contrasts. The graphic creation of maps leads to deeper examination of the relationships between variables, which aids in a better understanding of the nature of a research area and makes it an indisputable analysis instrument (Val-laster, Kraus, Merigo Lindahl, and Nielsen, 2019).

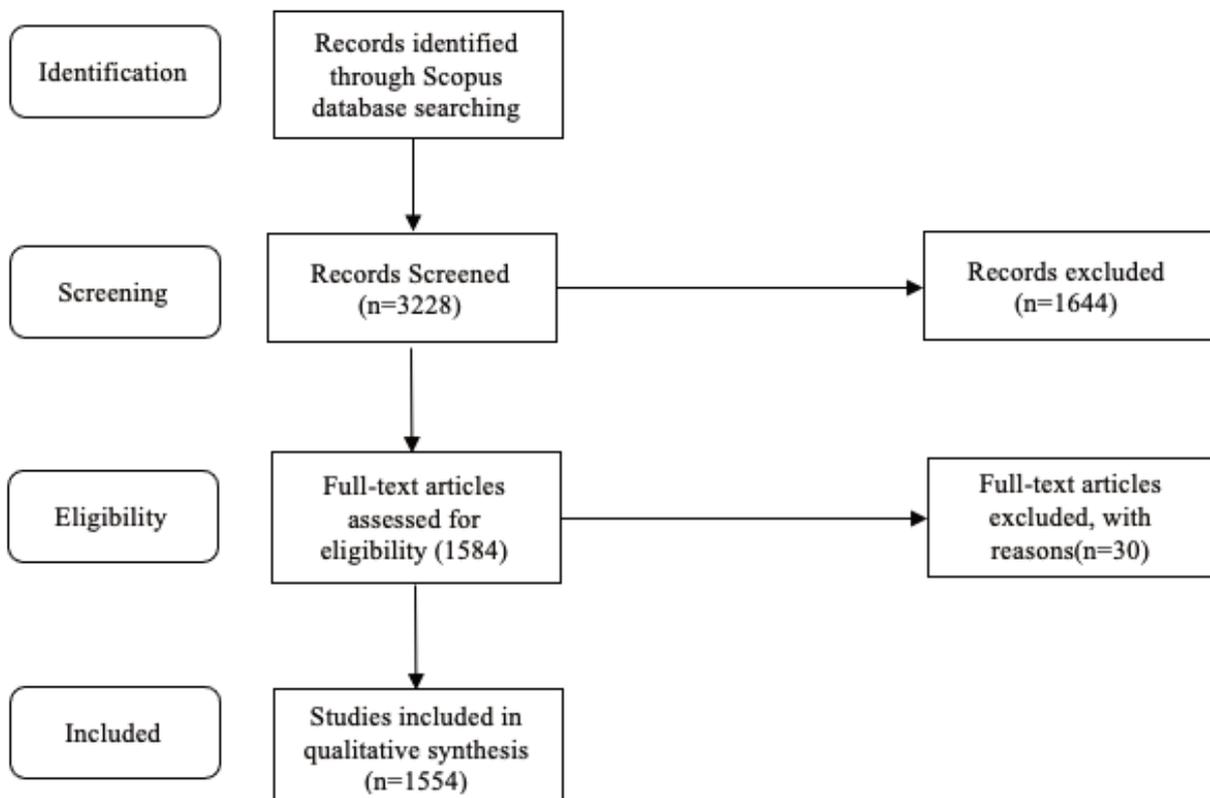
## 4 RESULTS

### 4.1 Scientific Publications per Year<sup>1</sup>

Women are among the fastest-growing groups of entrepreneurs, contributing significantly to global advancement, employment generation, and eco-

<sup>1</sup> Publications in 2022 were not taken into account for this analysis because the data were available for only 4 months.

Figure 1: PRISMA method—process of sample selection



conomic systems (Brush, 2006). As shown in Figure 2, the number of scientific publications on the subject is increasing each year. Scientific publications on topics related to women entrepreneurship have been available for quite some time; the first published article dates back to 1950 (Cardella et al., 2020). Figure 2 highlights the increasing trend in publications on the topic during the period 1982–2022. The earliest publication on women entrepreneurship in our data set extracted from Scopus was from 1982. The progress in the chosen field of study remained low until 1997, when 10 publications were reported. However, the number of publications decreased again until 2005, after which scientific publications increased and remained in double digits (e.g., 11 in 2005, 24 in 2006, 25 in 2007, and 30 in 2008). Apart from 2010 and 2015, all other years exhibited a significantly positive increase in the number of publications related to women entrepreneurship. The maximum number of publications was reported in 2021, 242 publications.

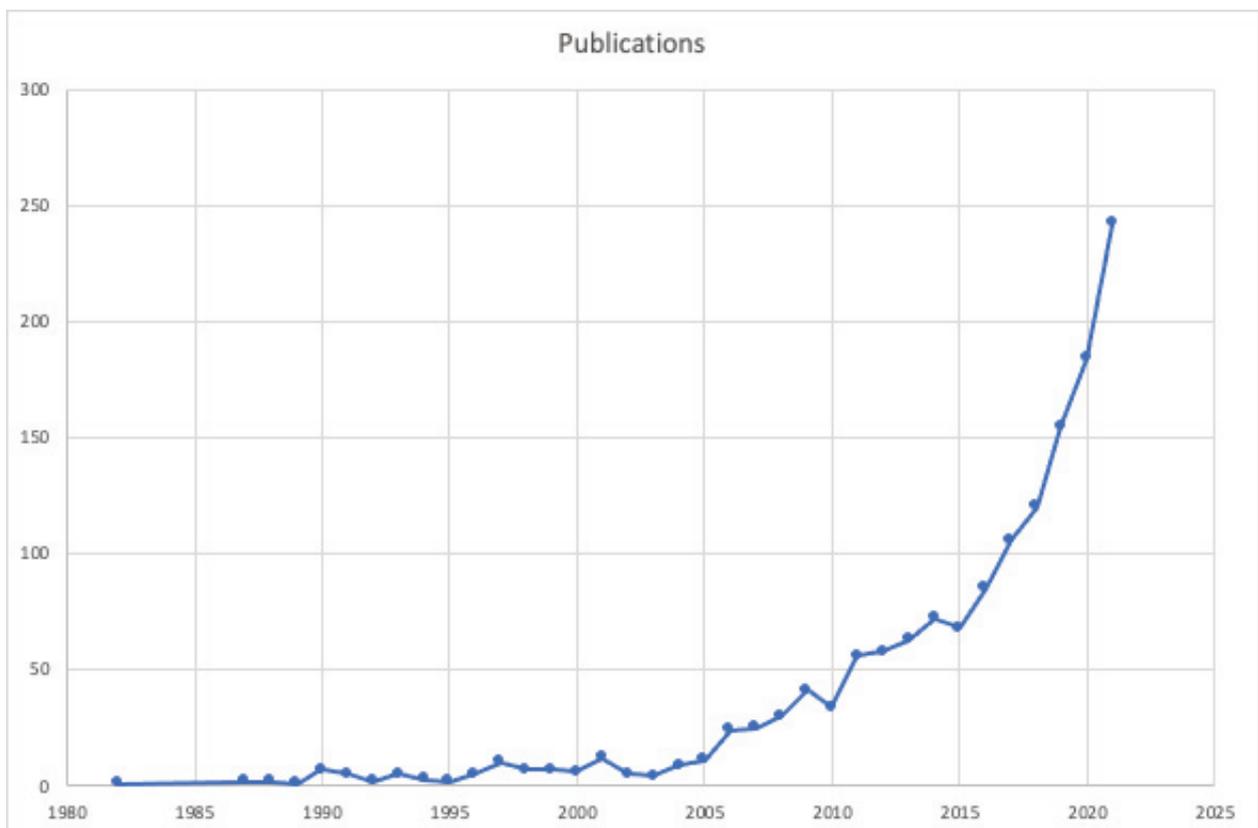
#### 4.2 Article Citations

Table 1 lists the 20 most cited articles. The articles were sorted on the basis of citations received and link strength, extracted through VOS viewer. Ahl’s (2006) research paper “Why Research on Women Entrepreneurs Needs New Directions” is the most cited ( $n = 966$ ). The link strength of Ahl’s article is 307, which indicates its significance. Fischer, Reuber, and Dyke’s (1993) research article is the second most cited article in the study’s database, with 528 citations. Despite being significantly new compared with other publications, Ahl (2006) is still the most cited paper. The list of other publications is presented in Table 1.

#### 4.3 Source of Publications

A list of journals which publish articles pertaining to women entrepreneurship was prepared using VOS viewer. The threshold used for shortlisting the sources was five published articles. Of a total of 336

Figure 2: Publications from 1982 to 2022



*Table 1: Most cited articles*

No.	First author	Title	Year	Citations	DOI
1	Ahl, H.	Why Research on Women Entrepreneurs Needs New Directions	2006	966	<a href="https://doi.org/10.1111/j.1540-6520.2006.00138.x">https://doi.org/10.1111/j.1540-6520.2006.00138.x</a>
2	Fischer, E. M.	A theoretical overview and extension of research on sex, gender, and entrepreneurship	1993	528	<a href="https://doi.org/10.1016/0883-9026(93)90017-Y">https://doi.org/10.1016/0883-9026(93)90017-Y</a>
3	Cliff, J. E.	Does one size fit all? exploring the relationship between attitudes towards growth, gender, and business size	1998	486	<a href="https://doi.org/10.1016/S0883-9026(97)00071-2">https://doi.org/10.1016/S0883-9026(97)00071-2</a>
4	Parasuraman, S.	Work and Family Variables, Entrepreneurial Career Success, and Psychological Well-Being	1996	482	<a href="https://doi.org/10.1006/jvbe.1996.0025">https://doi.org/10.1006/jvbe.1996.0025</a>
5	Brush, C. G.	A gender-aware framework for women's entrepreneurship	2009	468	<a href="https://doi.org/10.1108/17566260910942318">https://doi.org/10.1108/17566260910942318</a>
6	Du Rietz, A.	Testing the Female Underperformance Hypothesis	2000	362	<a href="https://doi.org/10.1023/A:1008106215480">https://doi.org/10.1023/A:1008106215480</a>
7	Verheul, I.	Start-Up Capital: "Does Gender Matter?"	2001	361	<a href="https://doi.org/10.1023/A:101178629240">https://doi.org/10.1023/A:101178629240</a>
8	Baughn, C. C.	The Normative Context for Women's Participation in Entrepreneurship: A Multicounty Study	2006	333	<a href="https://doi.org/10.1111/j.1540-6520.2006.00142.x">https://doi.org/10.1111/j.1540-6520.2006.00142.x</a>
9	Fairlie, R. W.	Gender differences in business performance: evidence from the Characteristics of Business Owners survey	2009	333	<a href="https://doi.org/10.1007/s11187-009-9207-5">https://doi.org/10.1007/s11187-009-9207-5</a>
10	Boden, Jr., R. J.	On the survival prospects of men's and women's new business ventures	2000	317	<a href="https://doi.org/10.1016/S0883-9026(98)00004-4">https://doi.org/10.1016/S0883-9026(98)00004-4</a>
11	Mirchandani, K.	Feminist insight on gendered work: New directions in research on women and entrepreneurship	1999	312	<a href="https://doi.org/10.1111/1468-0432.00085">https://doi.org/10.1111/1468-0432.00085</a>
12	Verheul, I.	Explaining female and male entrepreneurship at the country level	2006	305	<a href="https://doi.org/10.1080/08985620500532053">https://doi.org/10.1080/08985620500532053</a>
13	Gundry, L. K.	The ambitious entrepreneur: High growth strategies of women-owned enterprises	2001	294	<a href="https://doi.org/10.1016/S0883-9026(99)00059-2">https://doi.org/10.1016/S0883-9026(99)00059-2</a>
14	Sexton, D. L.	Female and male entrepreneurs: Psychological characteristics and their role in gender-related discrimination	1990	293	<a href="https://doi.org/10.1016/0883-9026(90)90024-N">https://doi.org/10.1016/0883-9026(90)90024-N</a>
15	Minniti, M.	Being in Someone Else's Shoes: the Role of Gender in Nascent Entrepreneurship	2007	289	<a href="https://doi.org/10.1007/s11187-006-9017-y">https://doi.org/10.1007/s11187-006-9017-y</a>
16	Anna, A. L.	Women business owners in traditional and non-traditional industries	2000	282	<a href="https://doi.org/10.1016/S0883-9026(98)00012-3">https://doi.org/10.1016/S0883-9026(98)00012-3</a>
17	Orhan, M.	Why women enter into entrepreneurship: an explanatory model	2001	278	<a href="https://doi.org/10.1108/09649420110395719">https://doi.org/10.1108/09649420110395719</a>
18	Demartino, R.	Differences between women and men MBA entrepreneurs: exploring family flexibility and wealth creation as career motivators	2003	273	<a href="https://doi.org/10.1016/S0883-9026(03)00003-X">https://doi.org/10.1016/S0883-9026(03)00003-X</a>
19	Lewis, P.	The quest for invisibility: Female entrepreneurs and the masculine norm of entrepreneurship	2006	272	<a href="https://doi.org/10.1111/j.1468-0432.2006.00317.x">https://doi.org/10.1111/j.1468-0432.2006.00317.x</a>
20	Hughes, K. D.	Extending Women's Entrepreneurship Research in New Directions	2012	266	<a href="https://doi.org/10.1111/j.1540-6520.2012.00504.x">https://doi.org/10.1111/j.1540-6520.2012.00504.x</a>

sources, 60 met the designated criteria. Table 2 indicates the top 10 sources or journals publishing articles related to the topic of research. Women entrepreneurship articles are published most frequently in the *International Journal of Gender and Entrepreneurship*. The total number of articles published in this journal was 143. The second journal is the *International Journal of Entrepreneurship and Small Business*. The difference in the number of articles published in the first and second journals is in itself significant, and shows the dominance of the former journal in this field of study. However, during the analysis, we found that the *International Journal of Gender and Entrepreneurship* is not the most cited. The most cited is the *Journal of Business Venturing*, which is ninth on the list of sources, with a total of citations of 4,819. Thus the *Journal of Business Venturing* is the most influential source in women entrepreneurship literature.

#### 4.4 Co-Occurrence (Keywords)

Based on 1,555 studies of women entrepreneurs, we applied VOS viewer to create a network of keyword co-occurrence. This network was effective in gaining insight into the articles' linked content. "Author keywords show the core of the study and the focal point of an investigation that are carefully selected by the authors," according to Oraee, Hosseini, Papadonikolaki, Palliyaguru, and Arashpour (2017). The type and strength of the relationship between various fields of

knowledge is highlighted by keyword co-occurrence analysis. Only 220 keywords of a total of 3,337 passed the threshold. With a total link strength of 796, the keyword "gender" occurred most often (290 times), followed by "entrepreneurship," which occurred 297 times and had a link strength of 757. "Women" (occurrence = 213, link strength = 631), "women entrepreneurs" (occurrence = 244, link strength = 469), "entrepreneur" (occurrence = 89, link strength = 374), and "female entrepreneurship" (occurrence = 140, link strength = 278) also were among the top keywords. Figure 3 presents the keywords graphically.

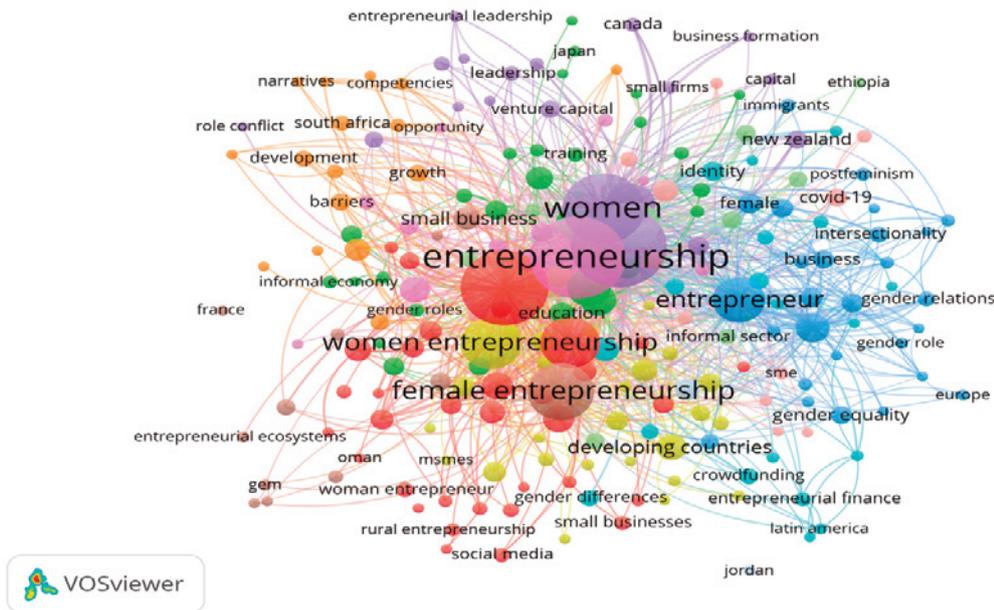
A further analysis of keyword co-occurrence in VOS viewer indicated seven clusters comprising 96 items, after filtering for a minimum of 10 occurrences of a keyword. Cluster 1 and Cluster 2 are the largest, with 22 and 19 items, respectively, in each cluster. The most common keyword ( $n = 297$ ) in Cluster 1 is "entrepreneurship," and "female entrepreneurs" ( $n = 117$ ) is the most common in Cluster 2. Prima facie, Cluster 1 highlights aspects pertaining to the entrepreneurial side of women's enterprises, focusing on entrepreneurial intentions, entrepreneurial orientation, entrepreneurship, and entrepreneurship education. In addition, the cluster contains keywords focusing on women empowerment, gender gap, and opportunity recognition.

Cluster 2 contains keywords focusing on business development, growth, and performance. This cluster essentially focuses on developing or emerg-

Table 2: Journals publishing articles related to women entrepreneurship

No.	Journal	Publications	Citations
1	<i>International Journal of Gender and Entrepreneurship</i>	143	2,835
2	<i>International Journal of Entrepreneurship and Small Business</i>	92	1,003
3	<i>Small Business Economics</i>	51	2,847
4	<i>Gender in Management</i>	51	727
5	<i>Journal of Developmental Entrepreneurship</i>	45	487
6	<i>International Journal of Entrepreneurial Behaviour and Research</i>	43	1,279
7	<i>Journal of Small Business and Entrepreneurship</i>	41	453
8	<i>International Entrepreneurship and Management Journal</i>	33	1,046
9	<i>Journal of Business Venturing</i>	32	4,819
10	<i>Journal of Small Business Management</i>	31	744

Figure 3: Keyword co-occurrence



ing nations such as India and Nigeria, among others. Cluster 3 contains 17 items and highlights gender issues, equality, and relations, particularly in the face of the global pandemic. A significant keyword in Cluster 3 is “*covid-19.*” Cluster 4 contains 12 items, and this cluster essentially highlights theories such as the gender theory, feminist theory, and institutional theory. Gender differences and gender stereotypes appear in Cluster 5. Cluster 6, with eight items, highlights the challenges and barriers encountered by women entrepreneurs. Cluster 7 deals with aspects pertaining to work–life balance and venture capital, in addition to gender and leadership.

#### 4.5 Topic Modeling

We further analyzed the abstracts of our documents using the latent Dirichlet allocation (Blei, Ng, & Jordan, 2003) algorithm (LDA). Our analysis found twelve topics summarized in Table 4.

The identified topics helped in narrowing the trends and/or patterns being followed in the area of interest. Upon analyzing the topics, it was found that few of these topics are similar; e.g., Topics 1 and 11. Whereas the former concerns the general perspective of women entrepreneurship, the latter concerns the gender disparity in raising funds and capital for

Table 3: Co-word clusters

Cluster	Cluster title	Items	Keywords
1	Entrepreneurial aspect	22	Entrepreneurship, entrepreneurial intentions, entrepreneurial orientation
2	Commercial aspect	19	Business development, business growth, business performance
3	Gender-based aspect	17	Covid-19, economic development, gender equality, gender issue, gender relations
4	Theoretical aspect	12	Feminist theory, gender theory, institutional theory
5	Gender-differences aspect	10	Gender differences, gender stereotype, UAE, Middle East
6	Challenges and barriers	08	Barriers, challenges, Malaysia, South Africa
7	Managing finances and work–life balance	08	Work–life balance, venture capital

business. Topics 5 and 6 also are similar. Whereas Topic 6 contains articles pertaining to how to manage the business owned by women or how female entrepreneurs are managing them, Topic 5 contains articles highlighting the significance of networking and socializing. Topics 7 and 10 include articles in which significance is accorded to soft-skill enhancement and management. Training, development, and motivation are crucial for the success of any business, irrespective of the gender of the owner.

From a theoretical perspective, Topic 3 includes terms and articles considered important for theoretical advancement and understanding of various techniques and methodologies for conducting research on women entrepreneurship. There is increasing focus on women entrepreneurs and work–life balance, in addition to substantial interest in women entrepreneurs from developing countries. An area attracting significant attention is the significance of socialization and networking for women entrepreneurs.

*Table 4: Topic modeling analysis*

Topic	Description	Top terms
1	A gender-based perspective of entrepreneurship	Gender, entrepreneurship, women, entrepreneurial, context, social, gendered, experiences, identity, institutional, cultural, practices, contexts, culture, values, norms, theory, explores, change, feminist
2	Women entrepreneurs and work-life balance	Family, entrepreneurs, business, women, work, role, support, life, personal, experience, career, roles, influence, balance, entrepreneur, related, members, conflict, present, job
3	Theoretical approach to entrepreneurship	Purpose, limited, entrepreneurship, literature, originality, design methodology approach, practical, studies, understanding, group, future, framework, limitations, implications, approach, qualitative, review, aims, context, insights
4	Entrepreneurship in a global context	Entrepreneurship, countries, female, economic, activity, springer, nature, global, international, policy, chapter, part, developing, region, institutions, economies, country, emerging, cultural, level
5	Significance of socialization and networking for women entrepreneurs	Social, case, networks, process, media, venture, network, learning, creation, networking, entrepreneur, opportunities, entrepreneurs, community, woman, opportunity, area, immigrant, digital, business
6	Management of business venture by a women entrepreneur	Development, women, management, innovation, leadership, studies, developed, model, focus, enterprise, role, companies, organizations, order, aim, innovative, sustainable, dimensions, start-ups, tourism
7	Skill enhancement through training and development	Business, entrepreneurs, women, support, training, government, skills, level, programs, questionnaire, identify, survey, start, lack, develop, education, group, groups, collected, respondents
8	Women entrepreneurial scenario at a global level	Business, businesses, growth, performance, capital, small, financial, firms, entrepreneurs, enterprises, access, owners, firm, women owned, impact, human, SMEs, micro, significant, survey
9	Women entrepreneurs of developing markets	Employment, sector, economy, informal, market, knowledge, activities, participation, marketing, number, industry, income, increase, working, employed, sources, general, due, formal, people
10	Motivational factors for entrepreneurship	Entrepreneurial, factors, success, relationship, influence, education, significant, positive, model, motivation, factor, intention, perceived, orientation, variables, role, university, intentions, students, structural
11	Gender disparity in raising capital for a venture	Female, entrepreneurs, gender, male, men, differences, ventures, gap, compared, risk, start, characteristics, venture, females, financing, interest, higher, examine, greater, funding
12	Challenges and prospects faced by women entrepreneurs	Women, entrepreneurs, challenges, interviews, rural, barriers, economic, empowerment, enterprises, India, face, potential, society, faced, activities, conducted, motivations, developing, depth, country

#### 4.6 Bibliographic Coupling

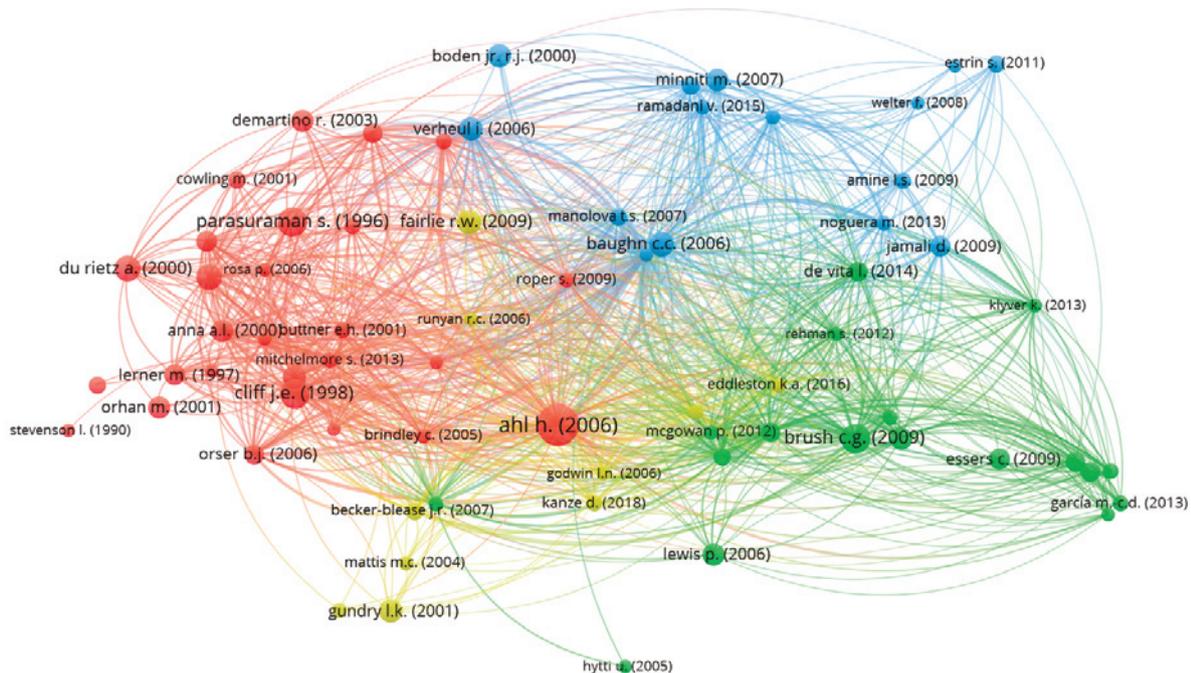
Bibliographic coupling employs citation analysis to ascertain a similarity relationship between publications. This happens when two works refer to the same third work in their respective bibliographies. The “coupling strength” of two documents increases as the number of shared citations of other publications increases (Martyn, 1964). Collating the connections between all the publications in a field of research aids in the creation of a map of the research field and the identification of sub-groups (clusters) of research using quantitative network analysis methods (Zupic & Čater, 2015).

The bibliographic coupling technique was applied to the entire data set of 1,554 documents, using a minimum of 100 citations per document, a resolution size of 1.25, and a minimum cluster size of 5. This gave us a visual representation of 70 documents fulfilling the aforementioned filters from five clusters. A graphic representation is provided in Figure 4.

#### Cluster 1 (Red): Role of Gender in an Entrepreneur’s Performance

The first cluster is the largest, containing 27 documents. It contains some of the most cited articles, e.g., Ahl (2006), which is cited 966 times, and Cliff (1998), which is cited 486 times. This cluster’s most dominant sub-theme is “gender-based studies.” This topic is covered in 11 articles. For example, Roper and Scott (2009) discussed the difficulties that women entrepreneurs face in obtaining funds for their start-ups. Following Roper and Scott (2009), Fairlie and Robb (2009) investigated the role of prior work experience to explain why women’s enterprises have relatively low survival rates, revenues, employment, and profits. However, in contrast, Orser, Riding, and Manley (2006) reported that women and men entrepreneurs are equally likely to seek external financing. However, women entrepreneurs refrain from seeking equity funding, because they primarily own small and medium enterprises. Similar work by authors such as Cromie (1987), Cowling and Taylor

Figure 4: Bibliographic coupling map with four clusters of the top 100 articles



(2001), Demartino and Barbato (2003), and Ahl (2006) appears in the cluster.

The other sub-theme on which authors are focusing is how performance of a venture run by women entrepreneurs is measured or impacted. Mitchelmore and Rowley (2013) developed a “Female Entrepreneur Competence” framework which provides a basis for an agenda focusing on education and overall development of women entrepreneurs. For years, authors have focused on how the performance of women’s entrepreneurial ventures can be enhanced (Parasuraman, 1996; Orhan & Scott, 2001; Brindley, 2005; Mitchelmore, 2013). Cluster 1 highlights the importance of collating gender-based studies with performance-based studies (in relation to women entrepreneurs).

### **Cluster 2 (Green): Challenges and Upcoming Issues Faced by Women Entrepreneurs**

This is the second largest cluster, with 18 items. This cluster contains publications which focus on issues that women entrepreneurs might encounter, not just in developing countries but also in developed nations such as the USA and Sweden. From a practical point of view, this cluster is significant. Publications in this cluster bring attention to certain issues that are universal, e.g., work–life balance and managing the domestic role. The most cited ( $n = 100$ ) article in this cluster, Ahl and Nelson (2015), explains that even in countries with “family-friendly” welfare policies such as Sweden, women entrepreneurs face challenges in taking their venture to the next level. Interestingly, this cluster also contains certain articles which focus on gender awareness (Brush, 2009), gender identities (Garcia & Welter, 2013), and gender and technology-dependent ventures (Marlow & McAdam, 2012).

In addition, this cluster includes publications which associate religious identities with women entrepreneurs. Essers and Benschop (2009) explained how Moroccan and Turkish women entrepreneurs in the Netherlands craft their ethno-cultural identities in relation to their Muslim identity. A similar religious group was studied by Rehman and Roomi (2012), but in a different geographical location (Pakistan). According to the research, major hurdles women face in achieving balance in a patriarchal Is-

lamic society are socio-cultural norms, meeting family commitments, and ensuring a healthy work-life balance (Kirkwood & Tootell, 2008; Eddleston & Powell, 2012), as well as masculinity (Lewis, 2006), which leads to hiding their gendered identity associated with the business.

Interestingly, a few studies have discussed the future of women entrepreneurship. Hughes, Jennings, Brush, Carter, and Welter (2012) argued that several studies focusing on women entrepreneurs highlight the problems faced by such entrepreneurs but do not indicate what the future holds for them. According to Hughes et al. (2012), describing precisely the new spheres for authors to investigate will not only address the arguments raised thus far, but will also result in a broader and deeper comprehension of women’s entrepreneurship.

### **Cluster 3 (Blue): Impact of Geographic Location on Women Entrepreneurship**

This cluster has 15 documents, in which the scientific publications shed light on how different geographical locations impact the performance of ventures owned by women. The study by Baughn, Chua, and Neupert (2006) encompasses a number of countries ( $n = 38$ ) to investigate the impact of specific norms facilitating women’s entrepreneurship and the relative rates of women to men involved in entrepreneurship in various countries. Another example is Jamali’s (2009) study, which brought attention to the constraints faced and opportunities available to women entrepreneurs in developing nations.

The cluster also contains publications pertaining to specific nations. Cetindamar, Gupta, Karadeniz, and Egrican (2012) explored the impact of “human, family and financial capital” on women entrepreneurs in Turkey. Coad and Tamvada (2012) accentuated the barriers faced by women entrepreneurs in India, and Manolova, Carter, Manev, and Gyoshev (2007) called to attention the impact of the “human capital” of Bulgaria’s women entrepreneurs. Ramadani (2013, 2015) indicated the work done by women entrepreneurs in developing nations such as Macedonia, Albania, and Kosovo. This cluster includes authors that have focused on developing nations only. This gives a posi-

tive outlook for nations such as India. Because actual women entrepreneurship is growing in India (IBEF, 2022), so should the academic research, and this cluster is proof that this is the case.

#### **Cluster 4 (Yellow): Financial Struggles of Women Entrepreneurs**

The final cluster is the smallest, including just 10 scientific publications. The major theme in this cluster is related to financing a business owned by women. Becker-Blease and Sohl (2007) discovered that although women entrepreneurs in the United States are more likely to receive angel investment for their ventures, they seek it at significantly lower rates than do men. In contrast, Eddleston, Ladge, Mitteness, and Balachandra (2016) found no difference in access to finance between women and men entrepreneurs. Eddleston et al. did not take into account any other source of finance other than bank loans, which could be the reason for this result. Woman-led ventures are less impactful than male-owned enterprises in terms of start-up financing, because women have less start-up capital, human resources, and prior work experience (Fairlie & Robb, 2009). Other studies in this cluster discussed the strategies to be applied in a woman-led business to make it successful (Gundry & Welsch, 2001), and women embarking upon an entrepreneurial journey after breaking the glass ceiling (Mattis, 2004).

## **5 DISCUSSION AND CONCLUSION**

This research used bibliometric analysis to understand the trend in academic research related to women entrepreneurship. According to this study, the scientific publications related to women entrepreneurship are increasing significantly each year. Our study takes into account research papers published through 2021. This is significant because a large number of articles on women entrepreneurship were published after 2020. There were 242 publications in 2021. Our study extracted four clusters giving a broad picture of different areas of concern pertaining to women entrepreneurship.

Among the four major clusters, the most significant theme preferred by researchers across the globe is the role of gender in a venture's perfor-

mance. The study used co-citation analysis to examine the philosophical underpinnings of the most cited publications, and used bibliographic coupling to explore the similarity relationship of research articles. We distilled the insight of the academic scholars who articulated their viewpoints with citations using bibliometric methods. The most consistent keyword among the data set is "gender," which is in agreement with the largest cluster extracted from bibliographic coupling. This finding is consistent with that of the study by Deng et al. (2020).

The study also gives an overview of the trajectory of research articles written over the years. The number of publications grew significantly after 2005, and the maximum number of publications was reported in 2021. Publications prior to 2000 focused primarily on gender (Fischer, 1993; Cliff, 1998) and work and family balance (Parasuraman, 1996). The base set in the earlier years of research could be the reason for the similar themes in the later years as well. In the recent past there have been publications on similar themes or topics (Sarfaraz, Faghih, & Majd, 2014; Adom & Anambane, 2019). A major shift in studies related to women entrepreneurship occurred after 2010, with authors focusing more on challenges faced by (Deborah, Wilhelmina, Oyelana, & Ibrahim, 2015; Panda, 2018) and prospects available to (Garg & Agarwal, 2017) women entrepreneurs. This shift is visible because of women breaking the glass ceiling and the stereotype that women do not belong in the corporate world (Lathabhavan & Balasubramanian, 2017). The articles related to women entrepreneurship published in recent times (2021 onward) take a divergent route by focusing on specific industries (Ribeiro et al., 2021), developing nations (Ogundana, Simba, Dana, & Liguora, 2021), and sustainable development (Mahajan & Bandyopadhyay, 2021), to name a few.

The trends observed in the area of women's entrepreneurship were made more specific through the use of topic modeling. This analysis summarizes the topics under 12 headings, which contain content related to "a gender-based perspective of entrepreneurship," "skill enhancement through training and development," and "challenges and prospects faced by women entrepreneurs", to name a few.

This research resonates with the findings of Moreira, Marques, Braga, and Ratten (2019) to a certain extent; one cluster (role of gender) overlaps that of Moreira et al.'s "Epistemological position and gender." However, the present research also differs from Moreira et al. regarding the most cited article. The results of this study found Ahl (2006) to be the most cited article, whereas in Moreira et al. (2019), Ahl (2006) was not even among the six most cited articles. This demonstrates Ahl's (2006) notable influence, as well as the success of the gender turn influenced by feminist theory in recent times. Furthermore, because co-citation analyses evolve over time as additional studies are published with new citation patterns, it is logical to generate a co-citation analysis of the field on a regular basis. In addition to knowing which article is cited the most, it is equally important to know which source or journal is publishing the most articles on women entrepreneurship. The *International Journal of Gender and Entrepreneurship* is the most prominent journal among the list available in terms of publishing articles on women entrepreneurship. The publication count was 143, with 2,835 citations. Because the analysis found that "gender" is the most common keyword, the result for the source of publication is justifiable.

The bibliographic coupling analysis revealed four clusters encompassing various aspects of women entrepreneurship. Cluster 1 is the largest cluster, and clearly indicates that for a long period the role of gender in entrepreneurship has remained a topic of interest for various authors. The trend of gender-based studies is being associated with performance measurement (of ventures owned by women) studies, which is opening up new avenues for gender studies in general and women entrepreneurship in specific. Cluster 2 is the most promising cluster. Articles in this cluster are not only discussing challenges in financial terms (Panda, 2018), but also highlighting more-contemporary issues such as gender awareness and identities, gender and technology, and religious identities (Brush et al., 2009; Garcia & Welter, 2013; Marlow & McAdam, 2012; Essers and Benschop, 2009). The trend in this cluster is that authors are aligning "gender" with other variables to give a more holistic outlook of women entrepreneurship.

Bibliometric coupling also shows that much research on women entrepreneurship is being concentrated in developing nations (Baughn et al., 2006; Cetindamar et al., 2012) because it often is reported that women in these areas are forced into running a venture either because of financial problems (Baughn et al., 2006) or simply because they need to survive (Jamali, 2009). The pre-existing conditions of such entrepreneurs are poor, and the pressure of earning a living to support their family puts them in a worse situation. The final cluster of this research, although the smallest, still holds significance. This cluster predominantly concerns the problems faced by women entrepreneurs in raising financing for their ventures. Women entrepreneurs are not easily trusted by funding agencies, because they are perceived as lacking in experience (Fairlie & Robb, 2009; Wellalage & Locke, 2017) in managing a business. However, the cluster also incorporates articles which show that women are climbing the corporate ladder (Salahuddin et al., 2021), thus showcasing the latent potential of women.

## 5.1 Implications and Future Research

Female entrepreneurs highlight their contributions as a key tool for future economic, social, and sustainable growth (Sajjad, Kaleem, Chani, & Ahmed, 2020). In the future, businesswomen around the world will look up to successful female entrepreneurs as role models (Al Mamun, Fazal, & Muniady, 2019).

The present research establishes a base for academicians planning to conduct studies in a similar domain. Using bibliometric analysis, the research brings to attention certain visible areas which have potential for more research, including gender-based studies (Panda, 2018). The findings of this study suggest that authors should include performance measurement tools in gender-based studies. Mitchelmore and Rowley's (2013) "Female Entrepreneur Competence" framework provides a base for an action plan concentrating on education and overall development of women entrepreneurs. Although this framework has been used in recent studies (e.g., Iskanto, Ghazali, & Afthanorhan, 2020), there exists scope for more application.

This research summarizes approximately 1,500 articles in four clusters. This could help authors in conducting qualitative studies focusing on a specific cluster. Publications in Cluster 2 highlight the challenges faced by women entrepreneurs. The significance of this cluster is justified by number of recent publications (Isaga, 2018; Al-Kwafi, Tien Khoa, Ongsakul, & Ahmed, 2020). However, authors can narrow their focus to the challenges and issues faced by women in conflicted zones (political or economic) such as Kashmir in India, Iran, or Ukraine. A qualitative study conducted using in-depth interviews can bring to attention the harsh realities faced by women entrepreneurs in such politically unstable and war-torn areas.

The study concludes with articles focusing particularly on the troubles faced by women in securing additional funds or even seeking seed funding for their ventures. This is a point of concern at present, because businesses in general are facing financial difficulty (McLaughlin, 2022). The condition of women entrepreneurs is bound to worsen. The findings of this study can serve as a foundation for quantitative or qualitative studies focusing on what can be done to improve the financial condition of women entrepreneurs not just in developing nations, but also in developed nations. Studies focusing on the role of microfinance in entrepreneurship can benefit from the findings of Cluster 4.

The results of this study also provide some insights for policy makers and bureaucrats. Countries may establish policies that support women entrepreneurs in terms of financial assistance (subsidies and rebates). This research can help governments to understand the problems that are faced by women entrepreneurs, and the solutions they can provide to such entrepreneurs. Policy makers need to educate not only the women entrepreneurs, but their family members as well, in order to break the shackles. Using digital media or social media platforms, brands and governments can create a single platform for women entrepreneurs which can help them get in touch with other prospective entrepreneurs and impart to them necessary skills and knowledge.

## 5.2 Limitations and Conclusions

The sample for the study was restricted to peer-reviewed publications in English-language journals. As a result, a specific knowledge base was not taken into account. During the filtration process, 96 articles could not be taken into consideration because of this criterion. Future studies can be conducted in collaboration with authors comfortable in languages other than English. This can add depth future studies. By broadening the language horizon not only can more studies be included in future research, but authors also can explore the cross-cultural aspect of entrepreneurship.

The study is dependent on the data extracted from the Scopus database only. This is a limitation. Future studies can make use of other available databases such as the Web of Science for a more comprehensive study. In addition, citation analysis assigns a weight to a paper's citations, and these weights are biased toward older articles, because those articles have a significantly greater number of citations than do recent publications. As a result, the bibliographic analyses may be biased in favor of older articles. In future research, authors can limit the search result to the number of citations (preferably less than 10). This automatically will highlight the more recent articles.

Our results also demonstrate that there has been limited scrutiny of the role of social network or networking theories (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998) to investigate the success of entrepreneurial firms. Future research could focus on how different types of networks play significant roles in different entrepreneurial behaviors.

## EXTENDED SUMMARY/IZVLEČEK

Z bibliometričnimi metodami smo preučevali študije, povezane z ženskim podjetništvom. Posebej smo se osredotočili na razumevanje nedavnih trendov, najvplivnejših objav in revij, tematik, povezanih z raziskovanjem podjetništva žensk, ter dešifriranja prihodnjih usmeritev raziskovanja podjetništva žensk. S pomočjo baze podatkov Scopus smo pridobili 1554 dokumentov, objavljenih od leta 1982 do 2022, in analizirali znanstvene objave na leto, največkrat citirane članke, vire objav, sopojavljanje ključnih besed, tematsko strukturo (modeliranje teme) in bibliografsko sklopljenost (parčenje). Ugotovili smo, da se število znanstvenih publikacij, povezanih z ženskim podjetništvom, vsako leto znatno povečuje, najbolj dosledna ključna beseda pa je »spol«. Analiza citatov je Ahl (2006) prepoznala kot najbolj citiran članek, kar dokazuje opazen vpliv te objave, pa tudi uspešnost spolnega obrata pod vplivom feministične teorije. Analiza sosklicevanja je odkrila sedem skupin, ki prikazujejo tematsko strukturo raziskav ženskega podjetništva. Bibliografska analiza sklopljenosti je odkrila štiri skupine, ki zajemajo različne vidike, povezane z ženskim podjetništvom. Identificirani grozdi so »Vloga spola pri podjetniški uspešnosti«, »Izzivi in prihajajoče težave, s katerimi se srečujejo podjetnice«, »Vpliv geografske lokacije na podjetništvo žensk« in »Finančne težave podjetnic«. Modeliranje tem z uporabo latentnega Dirchletovega algoritma za dodeljevanje (angl. Dirchlet allocation algorithm; LDA) je prepoznalo sedem področij zanimanja v literaturi o ženskem podjetništvu. Na koncu članek poda tudi implikacije in predloge za nadaljnje raziskave.

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