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Research on women's entrepreneurship in Saudi Arabia: a bibliometric analysis and research outlook

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Abstract: This paper offers a concise review of prior research on women's entrepreneurship in the unique cultural context of Saudi Arabia. A bibliometric analysis was performed on 154 publications obtained from the Scopus database to provide a holistic understanding of the theme of women's entrepreneurship, particularly in light of the Saudi Vision 2030 which is transforming the country into a diversified knowledge-based economy. This bibliometric evaluation reveals that scholarly focus on this topic hastened after 2016. Moreover, it captures the major dimensions of women's entrepreneurship as well as the indicators underlying it, including highly relevant but underdeveloped themes. The results will be valuable to practitioners, scholars and policymakers working on women's economic empowerment in Saudi Arabia. Among other implications, the findings demonstrate the need for further capacity development and training among women, particularly in the areas of governance, leadership and the application of digital technology in business.

Keywords women entrepreneurship; sustainable development goals; bibliometric analysis; Saudi Vision 2030; Saudi Arabia; national transformation; female entrepreneurs.

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1 Introduction

A woman entrepreneur is a dynamic woman who achieves economic independence and manages her personal life while starting and running her own business (Ambeipiya, 2016; Gulgira et al., 2024). She pursues a self-made business due to the limited opportunities available to her in the business sector, the need for flexibility in employment and a desire to shape her own role within her family and society at large. She is influenced by a wide range of individual, cultural and societal variables reflecting women's unique experiences across different contexts (Hattab, 2012). Moreover, her relationships with surrounding communities play a critical role in shaping her entrepreneurial identity. Thus, women entrepreneurs warrant a distinct category of entrepreneurship; this distinction facilitates an exploration of how women entrepreneurs' successful experiences differ from those of non-women entrepreneurs through the lens of prevailing entrepreneurial theories. Of course, this distinction also merits an examination of how existing research mirrors the intricacy of women's entrepreneurship (WE) and the factors that comprise successful business development for women in a patriarchal society like the Kingdom of Saudi Arabia (KSA).

Research on WE has grown significantly over the last two decades (Deng et al., 2025; Kumari and Kumar 2024). This growth aligns with the broader rising interest in WE globally, especially in emerging economies such as KSA (Abou-Moghli 2019; Al Boinin 2023; Aljarodi 2020). Saudi Vision 2030 provides a framework through which to promote entrepreneurship among women as an element of broader efforts to enhance gender equality and empower women economically. Saudi Vision 2030 recognises the importance of contextual institutionalised influences on WE, highlighting how ongoing social, economic and political transformations in KSA create both opportunities and challenges for women entrepreneurs (Alsahli and Al-Dajan, 2021). Despite this, findings generally suggest that ongoing efforts are required to address pressing challenges and enhance the supportive structures necessary for women to thrive in entrepreneurial ecosystems (Al-Dahash and Ahmed, 2024; Alessa et al., 2022).

Numerous systematic literature studies on WE are available from various perspectives (Deng et al., 2025; Kumari and Kumar, 2023; Manerkar, 2015; Tambunan, 2017).

Nevertheless, bibliometric studies on Arab WE are scarce, especially among Saudi women specifically. Thus, this study aims to address this research gap by examining contributions made by previous scholars on the topic of Saudi women's entrepreneurship (SWE) and conducting an in-depth, comprehensive bibliometric analysis utilising Scopus metadata. It seeks to identify research gaps in the existing literature and outline prospective research agendas that could initiate new pathways in WE research. Moreover, it hopes to open the door for academic exposition, benefitting practitioners, researchers and policymakers alike.

This study takes a unique angle on WE research, answering the following four research questions through extensive and transparent visuals as well as collaboration network analyses:

- RQ1 What are the prevailing trends in published research on SWE in 2002–2024?
- RQ2 What or who has provided the greatest contributions in the area of SWE in terms of journals, authors, countries and institutions?
- RQ3 Which themes are most commonly explored in research on SWE, and what are the corresponding evolving trends in this research?
- RQ4 What are the established and emerging themes – as well as the prevailing conceptual framework – in research on SWE?

The remainder of this paper is structured as follows. Section 2 provides an overview of the literature on WE. Section 3 depicts the research methodology and protocol used to perform bibliometric analysis. Section 4 presents the bibliometric mapping of 154 major scientific journals. Section 5 discusses the findings of the analysis and outlines potential future research agendas. Finally, Section 6 details the research agenda and offers some concluding thoughts.

2 Literature review

2.1 Women's entrepreneurship

The concept of WE is multifaceted, encompassing numerous considerations that are indicative of the unique experiences and environments of women entrepreneurs. It is shaped by the intersection of cultural and societal factors that reflect the complexity of women's involvement in entrepreneurship across different contexts (Hattab, 2012; Tahir, 2014). A woman entrepreneur is typically regarded as an intelligent, confident and dynamic woman who achieves economic independence, generates employment opportunities, and manages her family and personal life all while starting and running a business (Tabares et al., 2022). Theaker (2024) argues that women entrepreneurs' pursuits can constitute a wholly unique form of entrepreneurship, meaning that they differ from those covered by prevailing entrepreneurial theories. Evidently, it's currently a matter of some debate whether research can effectively capture the nuances of WE and the distinctive meanings that women entrepreneurs attribute to their success. Stossier (2023) emphasises societal and cultural aspects in their definition of WE, indicating that women primarily start their own businesses due to a lack of opportunities in the business sector, the need for flexibility in employment, a desire to shape her own role within her

family and society at large, and a general sense of independence within the community (Chhabra et al., 2022; Picciaia, 2017; Ramadani et al., 2013). Notably, the embeddedness of women entrepreneurs in their local communities significantly shapes their entrepreneurial identity. The literature indicates that WE networks can challenge dominant gender structures, giving way to a reconceptualisation of what it means to be a woman entrepreneur (Abdelzaher et al., 2021). This entails conformity with and resistance against dominant masculine discourses in entrepreneurship – the dynamic interaction between gender and entrepreneurship (Roos 2021).

2.2 *Bibliometric overview of research on women's entrepreneurship*

Bibliometric literature reviews on WE have seen some significant trends and themes in recent years (Al-Attari et al., 2025; Bedaduri and Mamilla, 2024; Cardella et al., 2020; Deng et al., 2021; Jiang et al., 2024). A review by Kumari and Kuma (2024) of 329 articles from 2012 to 2022 identified a significant uptick in scholarly interest post-2018, with significant topic areas including gender, growth and the association between women and work. Their review also uncovered poorly developed themes of mediating and moderating roles, leadership and performance, pointing to potential future research streams. Another bibliometric analysis of WE among family businesses by Marín-Palacios (2023) identified principal research areas and trends. The study employed literature review and bibliometric techniques to gauge the impact of various authors, journals and countries, thereby facilitating collaboration and knowledge sharing in the subject area. Further information was uncovered in a bibliometric analysis by Topimin et al. (2024) that contrasted 314 WE articles, revealing a substantial increase in publications and citations over the last decade. The research identified five broad themes in the literature and contributed to a stronger understanding of how the WE landscape was evolving. Ghosh (2024) conducted a bibliometric analysis of 2,098 documents to explore intellectual trends in gender discourses surrounding entrepreneurship. The research uncovered a few dominant themes, including access to finance, gendered inequalities, societal perceptions and policy responses, tracking the evolution of these themes over time. Fauzi et al. (2023) studied women and WE in emerging economies and highlighted the prevailing knowledge framework based on 208 publications. It drew themes pertaining to gender disparities in entrepreneurship, women's struggles and women entrepreneurs' empowerment, highlighting several potential avenues for future research.

Several studies have explored different issues surrounding SWE specifically; however, they have failed to offer any bibliometric analysis with a quantitative or visually illustrative component. Zamberi Ahmad (2011) examined the traits, motivators and challenges associated with women entrepreneurs in KSA, highlighting the unique challenges that Saudi women encounter. He emphasised the importance of understanding these factors to enhance the success of women entrepreneurs in the workplace. Similarly, Danish and Smith (2012) discussed the prospects and challenges for women entrepreneurs in KSA, demonstrating that despite the persistence of significant societal and institutional barriers, there is a rising trend of women establishing and operating small and medium-sized enterprises. Alreshoodi et al. (2022) detailed the complexities of Saudi women's entrepreneurial experiences, including difficulties in achieving a work-life balance as well as barriers to accessing resources. Kemppainen (2019) pointed out that Saudi entrepreneurs' experiences are contextually distinct from those of Western

entrepreneurs; while the general success factors may share similarities, contextual factors unique to Saudi culture and gender dynamics must be considered.

2.3 Women's entrepreneurship and Saudi Vision 2030

Saudi Vision 2030 plays a critical role in shaping the landscape of WE, fostering empowerment while also highlighting the ongoing challenges that must be tackled to achieve sustainable growth. The Saudi government's strategic plan aims to diversify the economy and foster societal inclusivity. Of course, this plan is bound to have profound implications for women's engagement in entrepreneurship. One of this plan's most notable elements is its effort to boost the economic role of small and medium-sized enterprises (SMEs) through the encouragement of women entrepreneurs. Saudi Vision 2030 aims to raise the proportion of women entrepreneurs from 20% to 35% by 2030, underscoring the push to support women's employment and empowerment (Alsulami and Abutaha, 2018). Various programmes and initiatives have been established by the Saudi government in collaboration with the private sector to encourage young Saudis – and especially young women – to establish their own businesses through various forms of support, such as access to capital and the provision of knowledge regarding existing support programmes (Alsulami and Abutaha, 2018). Notably, recent legal reforms have also played a critical role in empowering women economically (Al-Mamary and Abubakar, 2023). Changes in civil and labour laws have bolstered the rights of women in terms of work, travel and finance, making the environment broadly more favourable for women to venture into entrepreneurship (Rizvi and Hussain, 2022). The beneficial impact of these reforms is reflected in the increased female employment rate and the increase in the number of businesses owned by women, which contribute to economic development (Abobaker, 2024). Saudi Vision 2030 programmes have also established a culture in which women feel supported to seek new careers and leadership roles, thereby elevating their degree of economic contributions (Iqbal and Ahmad, 2024; Rizvi and Hussain, 2022). This integration of facilitating policies, legal reforms and dedicated programmes is part of a concerted effort to empower women entrepreneurs and integrate them into the national economy.

The literature on SWE highlights the significant transformations currently occurring in KSA against the backdrop of Saudi Vision 2030. Alsahli and Al-Dajani (2021) detailed the institutionalised contextual factors that promote or hinder WE activity, particularly those that impact the integration of women into the Shura Council and the broader Saudi Vision 2030 reform agenda. Empirical evidence indicates that women's empowerment plays a pivotal role in encouraging entrepreneurship in KSA (Al-Mamary and Abubakar, 2023). Empirical work on the impact of women's empowerment indicates that social and economic forms of empowerment are crucial for nurturing entrepreneurial capabilities in women. Earlier entrepreneurial actions among women were limited to household capabilities, but Vision 2030 programmes have brought about a remarkable shift towards more diversified business activities (Al-Dahash and Ahmed, 2024). Critically, a survey by Alessa et al. (2022) on 903 women indicates that attitudes towards the economic empowerment of women have been broadly positive alongside Vision 2030. Their study demands greater sensitisation of gender equity in remuneration and the economic contributions of women (Alessa et al., 2022).

The exploration of the determinants that influence women entrepreneurs reveals that education, experience and social capital exert strong impacts on their entrepreneurial

intentions (Chakraborty et al., 2019; Kumar et al., 2020). Miralam et al. (2025) emphasised the need to situate WE within the evolving context of KSA and confirmed that women can contribute significantly to unleashing sustainable economic development, as per the United Nations' sustainable development goal (SDG) 5 concerning gender equality (Bilal et al., 2023). Consequently, women's empowerment is essential to economic growth in KSA. Still, Jamilah and Isnarti (2024) pointed out that challenges like gender discrimination and cultural norms continue to restrict access to leadership posts for women in KSA. The assessment of government-led initiatives reveals that, while reforms have facilitated greater participation of women across various areas, more must be done to effectively tackle these barriers (Jamilah and Isnarti, 2024).

3 Methodology

This literature review on SWE was conducted in early February 2025 by selecting suitable search keywords, examining the discovered published works and performing the analysis (Saunders et al., 2009). Rowley and Slack (2004) proposed a research protocol for identifying and screening relevant documents. Adopting a similar approach, this paper employed a four-step process to identify the most significant works, emerging trends and potential pathways for future research.

3.1 *Defining the appropriate keywords for research*

This study used Elsevier's Scopus database to retrieve journals because it is an extensive database featuring the largest indexed peer-reviewed journals. A comprehensive search string consisting of the most possible keywords was used to gather all publications belonging to the theme of SWE. The search string includes ('female*' OR '*women*' OR 'Femin*' OR '*woman*') AND ('entrepreneur*' OR 'leader*' OR 'manager' OR 'Startup' OR 'self-employ*' OR 'business own*' OR 'business creator*' OR 'business founder*' OR 'mumpreneur*' OR 'freelancer' OR 'SDG' OR 'sustainable development*' OR 'SDG*5' OR 'SDG*8' OR 'SDG*10' OR 'decent work' OR 'economic growth' OR '*Equalit*' OR 'empower*') AND ('KSA' OR 'Saudi' OR 'national transformation' OR 'vision 2030' OR 'Saudi Vision' OR 'Saudization'). The symbol '*' was incorporated in the search to facilitate a fuzzy search and capture variations of the words.

3.2 *Initial search results*

The search query applied in the Scopus database covered the title/abstract/keywords of the journals to ensure that the results precisely capture the desired themes. Two research categories on SWE were chosen in the Scopus database:

- 1 business, management and accounting
- 2 economics, econometrics and finance.

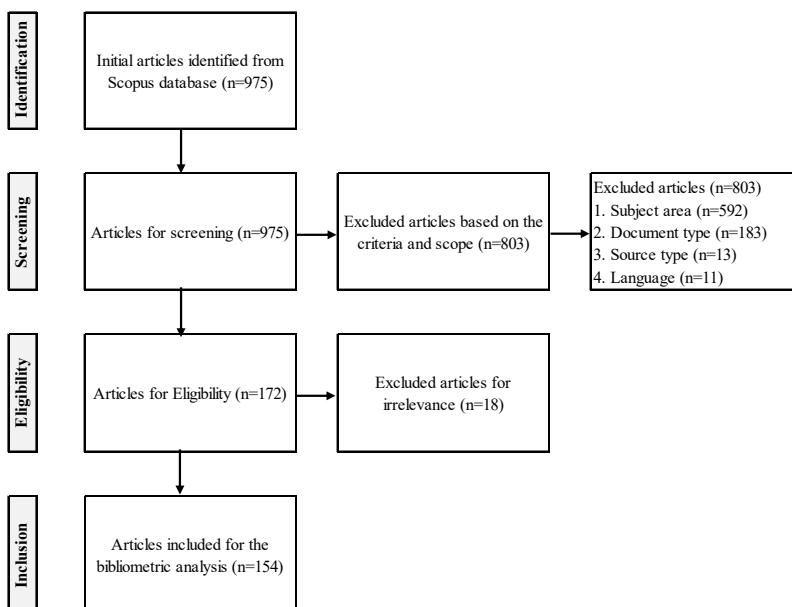
The included document types included English-language research articles and English-language book chapters. The preceding 23 years (2002–2024) were used in the year-search category. Initial search attempts resulted in a total of 172 documents, which

were cross-checked with known major studies. The search results were exported into CSV (comma-separated values) format to include all essential bibliographic information for each document, including title, author(s) and affiliations, year of publication, keywords, journal name, references, and other relevant information recorded in the Scopus database. Table 1 depicts the study's research protocol.

Table 1 Research protocol

Type	Criteria
Research database	Scopus
Search fields	Title, abstract and keywords
Search string	TITLE-ABS-KEY ((('female*' OR '*women*' OR 'Femin*' OR '*woman*') AND ('entrepreneur*' OR 'leader*' OR 'manager' OR 'Startup' OR 'self-employ*' OR 'business own*' OR 'business creator*' OR 'business founder*' OR 'mumpreneur*' OR 'freelancer' OR 'SDG*' OR 'sustainable development*' OR 'SDG*5' OR 'SDG*8' OR 'SDG*10' OR 'decent work' OR 'economic growth' OR '*Equalit*' OR 'Empower*') AND ('KSA' OR 'Saudi' OR 'national transformation' OR 'Vision 2030' OR 'Saudi Vision' OR 'Saudisation')))
Date range	2002–2024
Subject area	Business, management and accounting, and economics, econometrics and finance
Document type	Article and book chapter
Publication type	Peer-reviewed journals
Language	English
Search date	February 28, 2025

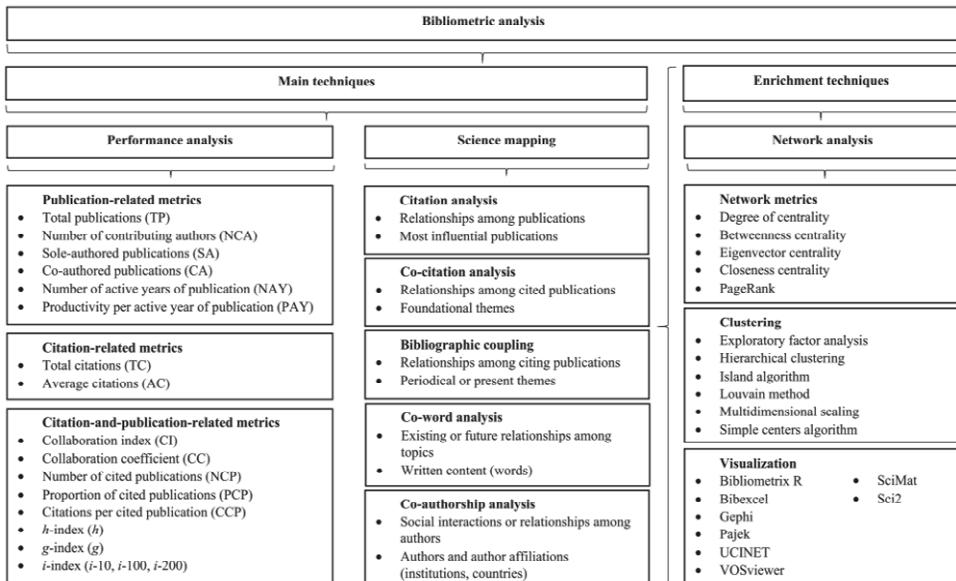
Figure 1 PRISMA method procedure for identifying and selecting documents



3.3 Refining the search results

The sample of 172 primary documents could have included articles unrelated to the relevant literature. After screening the abstracts (and the full papers when necessary), 18 of the retrieved documents were found to be irrelevant to WE, as they focused on an intersectional analysis of ethnicity, religion and gender inequality among Saudi women. Ultimately, 154 documents published in journals across various disciplines were selected for the bibliometric analysis. To create the corresponding modification in the CSV file, the records of these 18 articles were deleted in Excel, and the resulting CSV file was used to prepare the input data for a detailed bibliometric analysis. Figure 1 presents the pattern followed for this particular study. The cleansing and inclusion of documents were carried out using the PRISMA (preferred reporting items for systematic reviews and meta-analysis) method along a four-phase flow diagram (Liberati et al., 2009).

Figure 2 The bibliometric analysis toolbox



Source: Donthu et al. (2021)

3.4 Data analysis and synthesis

The two core techniques of bibliometric analysis are:

- 1 performance analysis
- 2 science mapping (Donthu et al., 2021).

A performance analysis was conducted to evaluate the productivity and impact of included authors, institutions and journals. Key metrics considered included journals' citation and publication counts, collaboration index and productivity per year. Science mapping was carried out to visualise the relationships between different publications, authors and institutions. Network analysis was applied to enrich the outcomes of the core

techniques via network metrics, clustering and visualisation. Biblioshiny and VOSviewer were selected as this study's software instruments. The R 'bibliometrix package' Biblioshiny software was used for source analysis, citation analysis, country analysis, institution analysis, three-fields plotting, thematic mapping, evolution trend analysis and word-map factorial analysis, while VOSviewer was used for co-authorship analysis, hotspot analysis, bibliographic coupling analysis and co-citation analysis (Van Eck and Waltman, 2007). The next section illustrates the two core and enrichment techniques, which are shown in Figure 2.

4 Bibliometric analysis

Bibliometric analysis is a quantitative method used to synthesise research findings by describing, evaluating and monitoring published works on a common theme. Such analysis is based on the bibliographic data recorded in the considered primary and secondary documents. An article is considered a primary document and used as a unit of analysis, whereas its cited references are considered secondary documents. The data on secondary documents includes name of the first author, year of publication, source type (e.g., journal article, book chapter), volume and DOI number.

Table 2 Descriptive overview of selected publications on women entrepreneurship in KSA

<i>Description</i>	<i>Criteria</i>	<i>Results</i>
Main information about data	Timespan	2002 – Feb. 28, 2025
	Sources (Journals)	104
	Documents	154
	Total citations	2,833
	Average citation per document	18.4
	References	9,068
Document contents	Keywords plus (ID)	102
	Authors keywords	486
Authors	Authors	324
	Authors of single-authored documents	38
Authors collaboration	Single authored documents	42
	Co-authors per document	2.43
	International co-authorships %	34.42

Source: Biblioshiny

4.1 Descriptive overview of publications

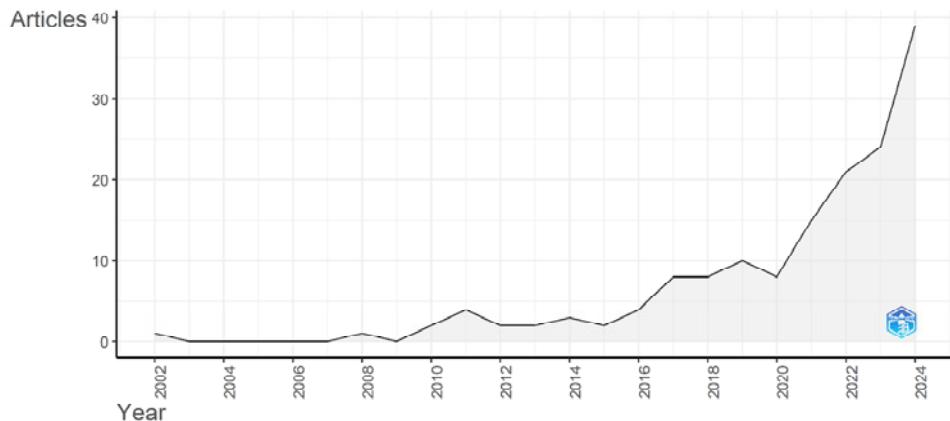
Table 2 presents a descriptive summary of gathered publications on the topic of SWE. It shows that 975 publications were retrieved from the Scopus database between 2002 and 2024, but just 154 were selected for this study, including 141 (91%) research articles and 13 (9%) book chapters. The total number of considered authors is 324, while the total number of publishing journals is 104. The total number of citations is 2,833 alongside

102 total KeyWord pluses (words that appear repeatedly in the titles of an article's references).

4.2 Source analysis

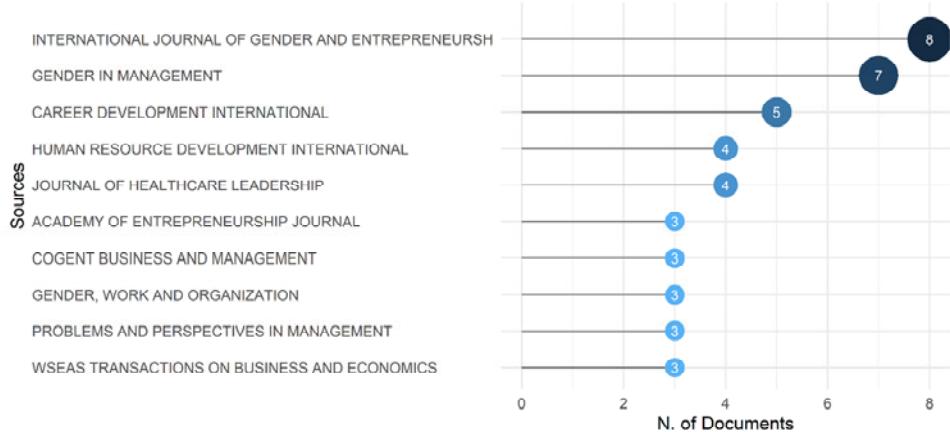
Figure 3 illustrates the distribution of published documents on SWE throughout the considered 23-year period as evidenced by Scopus metadata. It reveals a pattern of approximately exponential growth. Notably, WE literature has grown dramatically since 2016, suggesting a sharp uptick in interest among scholars following the launch of Saudi Vision 2030, with peak article production in 2024 (39 publications).

Figure 3 Annual production of articles (see online version for colours)



Source: Biblioshiny

Figure 4 Top 10 productive journals (see online version for colours)



Source: Biblioshiny

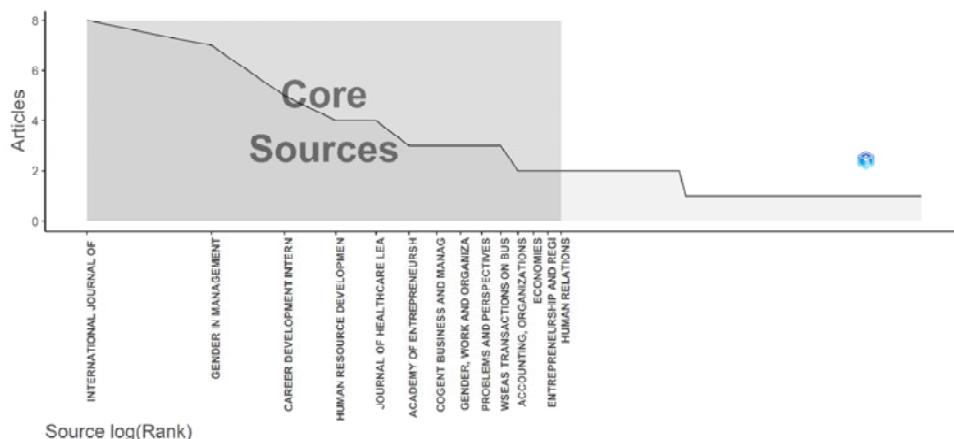
4.2.1 High-productivity journals

Figure 4 displays the ten most productive journals with regard to the topic of this review. *The International Journal of Gender and Entrepreneurship* ranked highest with eight publications, followed by *Gender in Management* with seven and *Career Development International* with five. Other notable sources included the *Human Resource Development International* and the *Journal of Healthcare Leadership*. This analysis offered insightful information into reputable journals within the field of SWE.

4.2.2 Bradford law-based evaluation of articles

Bradford's law describes how articles on a particular subject are scattered throughout the mass of periodicals (Lawani, 1981). Under Bradford's law, the total number of articles has been divided into three zones, each consisting of one-third of all articles, as depicted in Figure 5. Zone 1 (i.e., core journals) consists of journals like the *International Journal of Gender and Entrepreneurship*, *Gender in Management* and *Career Development International*. Journals like *Human Resources Development International* and *The Journal of Healthcare Leadership* fall under Zone 2. Journals like the *Academy of Entrepreneurship Journal* and *Cogent Business and Management* fall under Zone 3 (i.e., secondary journals).

Figure 5 Bradford law-based evaluation of the sources (see online version for colours)



Source: Biblioshiny

4.3 Citation analysis

Citation analysis is carried out by calculating the frequency with which articles are cited by other authors to measure the relative importance or impact of their authors. It offers an approximate indication of an article's credibility, and that credibility holds when the article's citation patterns are known. The ten most cited articles among the 154 considered documents are presented in Table 3. 'Entrepreneurial ecosystem, entrepreneurial self-efficacy, and entrepreneurial intention in higher education: evidence from Saudi Arabia' in *The International Journal of Management Education* by Elnadi led the pack with 192 citations, followed by 'evidence of the characteristics of women

entrepreneurs in the KSA: an empirical investigation' in *International Journal of Gender and Entrepreneurship* by Zamberi Ahmad with 162.

Table 3 Most cited articles

S. no.	Title	Authors	Journal	Total citations	TC per year	Year
1	Entrepreneurial ecosystem, entrepreneurial self-efficacy, and entrepreneurial intention in higher education: evidence from Saudi Arabia	Elnadi M	<i>The International Journal of Management Education</i>	192	38.4	2021
2	Evidence of the characteristics of women entrepreneurs in the KSA: An empirical INVESTIGATION	Zamberi Ahmad S	<i>International Journal of Gender and Entrepreneurship</i>	162	10.8	2011
3	'And now i'm free': women's empowerment and emancipation through entrepreneurship in Saudi Arabia and Sweden	Alkhalef S	<i>Entrepreneurship and Regional Development: An International Journal</i>	125	15.63	2018
4	Female entrepreneurship in Saudi Arabia: opportunities and challenges	Yousuf Danish A	<i>International Journal of Gender and Entrepreneurship</i>	118	8.43	2012
5	Digital girl: cyberfeminism and the emancipatory potential of digital entrepreneurship in emerging economies	Mcadam M	<i>Small Business Economics</i>	111	18.5	2020
6	Women, empowerment and development in Arab Gulf States: a critical appraisal of governance, culture and national human resource development (HRD) frameworks	Metcalfe BD	<i>Human Resource Development International</i>	103	6.87	2011
7	Challenges facing women leaders in Saudi Arabia	Al-Ahmadi H	<i>Human Resource Development International</i>	102	6.8	2011

Note: TC: total citation

Source: Biblioshiny

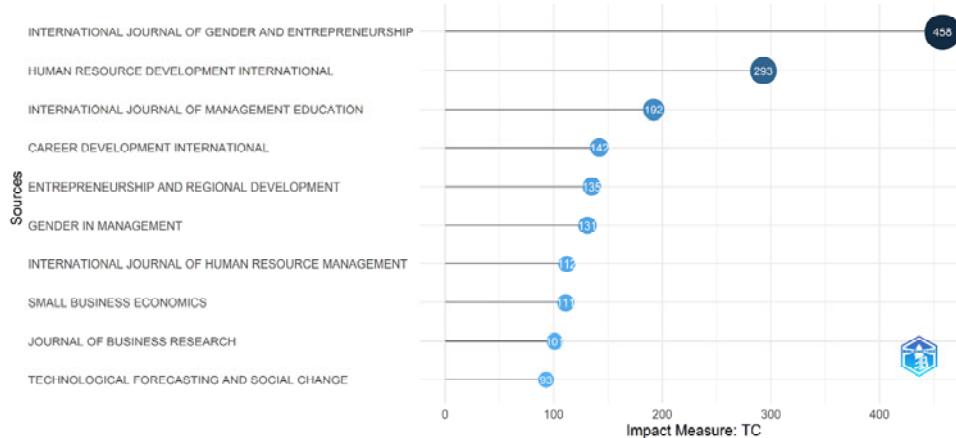
Table 3 Most cited articles (continued)

S. no.	Title	Authors	Journal	Total citations	TC per year	Year
8	Saudi women entrepreneurs: a growing economic segment	Welsh DHB	<i>Journal of Business Research</i>	101	8.42	2014
9	'To boldly go where no [man] has gone before' – institutional voids and the development of women's digital entrepreneurship	Mcadam M	<i>Technological Forecasting and Social Change</i>	93	13.29	2019
10	Exploring Arab Middle Eastern women's perceptions of barriers to, and facilitators of, international management opportunities	Hutchings K	<i>The International Journal of Human Resource Management</i>	87	5.44	2010

Note: TC: total citation

Source: Biblioshiny

The citation tallies may be aggregated to gauge the impact of individual journals on the broader research area. A higher citation count signals greater relevance. Figure 6 reveals that the *International Journal of Gender and Entrepreneurship* has the highest number of citations at 458.

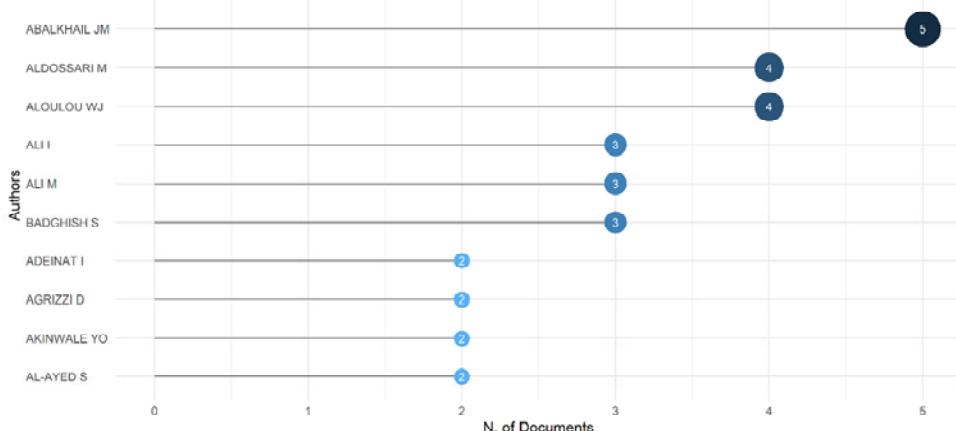
Figure 6 Journal impact (see online version for colours)

Source: Biblioshiny

4.4 Author analysis

The top ten authors by number of published documents are shown in Figure 7. The top of the list is Abalkhail with five publications, followed by Aldossari and Aloulou, each with four. Other notable contributors include Ali and Badghish with three publications. Al-Ayed is ranked tenth, having published just two articles on SWE. These findings provide valuable insights and highlight the prolific contributions of various authors towards the scholarly landscape surrounding women entrepreneurs in KSA.

Figure 7 Top document published authors (see online version for colours)



Source: Biblioshiny

4.4.1 Authorship impact

Table 4 shows the top ten authors' local impact, concluding that Abalkhail ranks first in the list with an *h_index* of five, followed by Aldossari and Aloulou with one of three.

Table 4 Top 10 author's local impact

Author	<i>h_index</i>	TC	NP	PY_start
Abalkhail JM	5	181	5	2015
Aldossari M	3	30	4	2022
Aloulou WJ	3	71	4	2017
Adeinat I	2	17	2	2022
Agrizzi D	2	48	2	2020
Akinwale YO	2	8	2	2018
Al-Dajani H	2	7	2	2021
Ali AJ	2	4	2	2024
Ali M	2	87	3	2019
Alkhaled S	2	159	2	2018

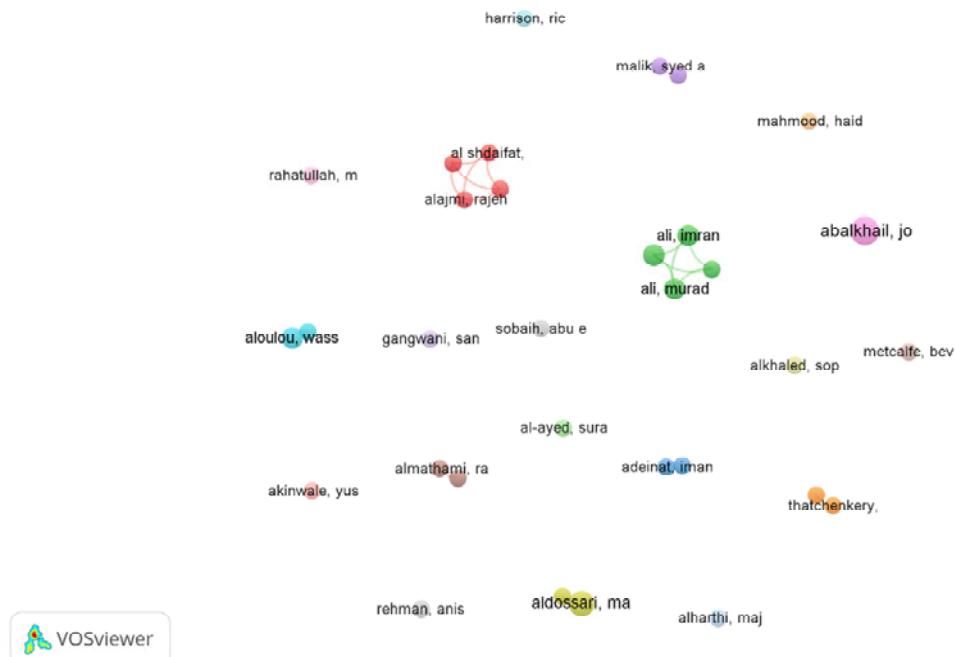
Note: NP: number of publications, TC: total citation, PY_Start: publishing year

Source: Biblioshiny

4.4.2 Author collaborations

Clustering is the 'process of identifying natural groupings or clusters within multidimensional databased on some similarity measure' [Omran et al., (2007), p.583]. Data that shares similar traits belongs to the same cluster. This study used VOSviewer software in conjunction with the collected dataset to create collaborational clusters between authors. The resultant collaboration network is depicted in Figure 8. The author name and node size reveal the number of articles published by an author as well as the strength of their collaborations. The authors were clustered into 36 clusters, with just 17 co-authored relationships discovered among the 32 authors. The majority of the research was carried out independently, with little or no cooperation among the involved researchers. The author with the most co-authored publications among these clusters is Ali with three papers. Among all the authors who made major contributions, four authors – Al Shdaifat, Alajmi, Gorondutse and Hilman – established a large network of connections through their research on government support for women. Notably, however, some of the other authors also formed strong bonds through their collaborations.

Figure 8 Co-authorship impact analysis (see online version for colours)



Source: VOSviewer

4.4.3 Lotka's law-based evaluation of authors

Lotka's law describes the connection between authors and their published work, predicting the contribution of an author to a document (Lawani, 1981). Figure 9 depicts the productivity of an author as determined through the application of Lotka's law. The X

axis represents the number of documents written on SWE while the Y axis displays the percentage of the author's contribution.

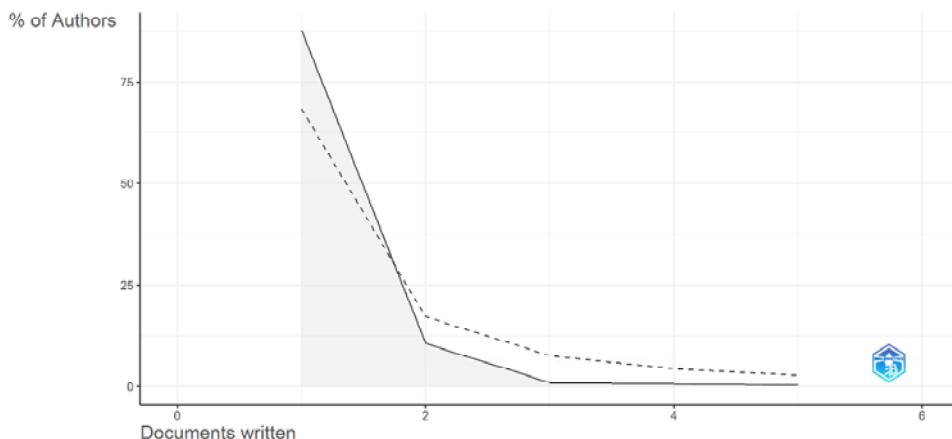
Table 5 Analysis of author's productivity through Lotka's law

<i>Written documents</i>	<i>Number of authors</i>	<i>Proportion of authors</i>
1	284	0.877
2	34	0.105
3	3	0.009
4	2	0.006
5	1	0.003

Source: Biblioshiny

Table 5 presents a thorough analysis of Lotka's law, demonstrating that 284 of the authors wrote just one of the considered documents. There are only two written documents produced by 34 authors, three by three authors. Just one author wrote five documents.

Figure 9 Author productivity through Lotka's law (see online version for colours)



Source: Biblioshiny

4.5 Country analysis

The analysis revealed the top ten countries in terms of contributions to the research field of SWE, as shown in Table 6. KSA ranked number one in publications with 187 papers, followed by the UK ($n = 36$), the USA ($n = 23$) and Egypt ($n = 16$). Other notable contributors included Malaysia, Australia and Spain, each with 15, 11, and 8 publications, respectively. These findings shed light on how research on SWE is distributed internationally despite the research scope being limited to KSA. Unsurprisingly, KSA tops the list of cited countries with a total of 843 citations, followed by the UK with 456.

Figure 10 depicts the collaboration network of the top ten countries, as also summarised in Table 7. The social network among the countries and authors in similar

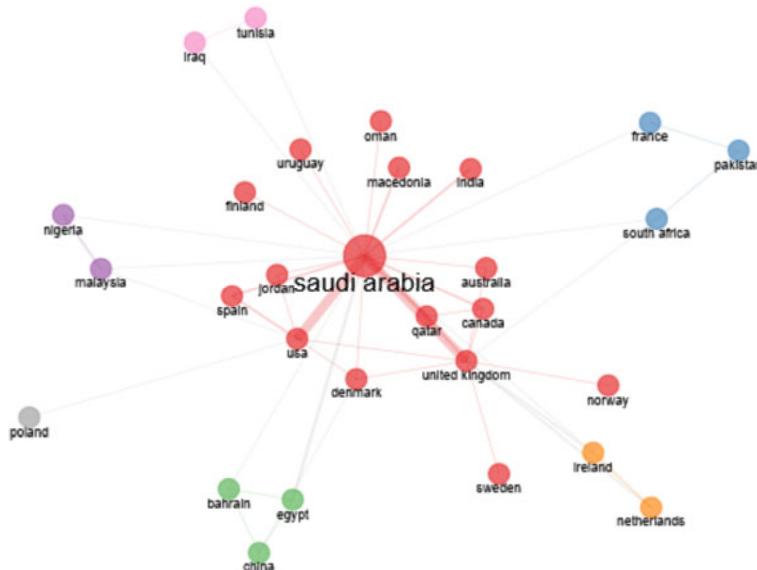
fields are analysed below. A connecting line between two nodes (countries) represents a collaboration; the countries with the highest numbers of connections are the nodes with the largest sizes. The results show that KSA and the US/UK have the greatest collaborations ($n = 10$). KSA and Qatar are tied for second place with four collaborations, followed by KSA and Egypt ($n = 3$).

Table 6 Distribution of articles published by country

Country	Number of publications	Total citations
KSA	187	843
UK	36	456
USA	23	187
Egypt	16	192
Malaysia	15	13
Australia	11	119
Spain	8	13
Denmark	5	0
South Africa	5	1
Canada	4	0

Source: Biblioshiny

Figure 10 Collaboration network of countries (see online version for colours)



Source: Biblioshiny

4.6 Institution analysis

Figure 11 represents the names of the top ten institutions according to the number of documents published on SWE from 2002 to 2024. These institutions collectively

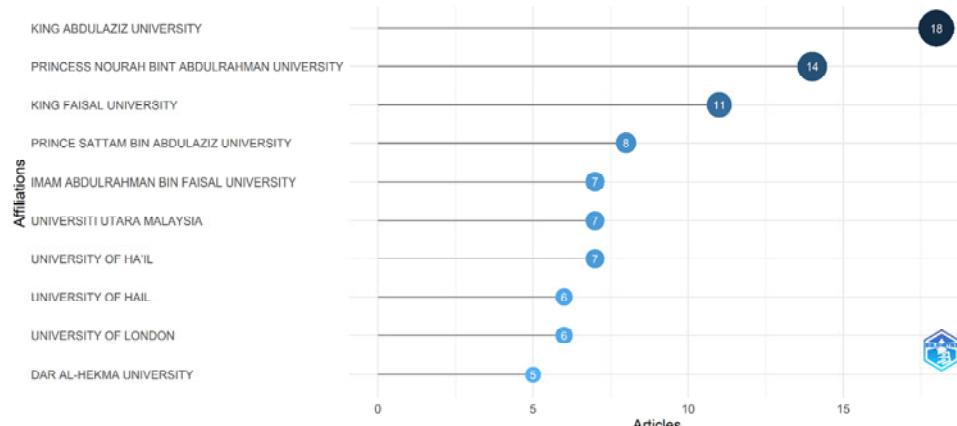
published 89 documents, the majority of them in KSA. King Abdulaziz University led with 18 publications, followed by Princess Nourah Bint Abdulrahman University (n = 14) and King Faisal University (n = 11). Distinguished contributors outside KSA include the Universiti Utara Malaysia and the University of London with 7 and 6 publications, respectively. This finding highlights the diverse sources of funding supporting research on SWE.

Table 7 Analysis of countries' collaboration

From	To	Frequency
KSA	UK	10
KSA	USA	10
KSA	Qatar	4
KSA	Egypt	3
Ireland	Netherlands	2
Malaysia	Nigeria	2
KSA	Canada	2
KSA	India	2
KSA	Macedonia	2
KSA	Spain	2

Source: Biblioshiny

Figure 11 Top funding-sponsored institutions (see online version for colours)



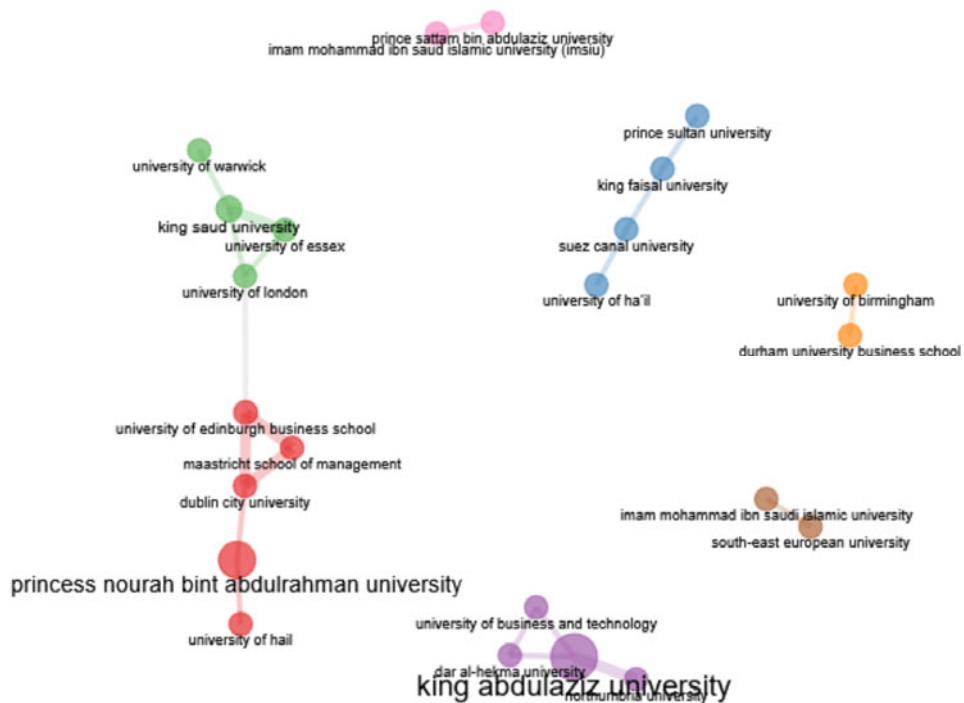
Source: Biblioshiny

Figure 12 depicts various institutions that have worked with one another to support work on SWE. Universities in Cluster 1 include King Abdulaziz University, the University of Business and Technology, Northumbria University and Dar Al-Hekma University, while those in Cluster 2 include Princess Nourah Bint Abdulrahman University, the University of Hail and the University of Edinburgh.

4.7 Keyword analysis

Keyword analysis was used in this study to investigate trending topics in the field of WE. The ten most frequent author keywords in the considered publications are presented in Figure 13. These keywords include 'Saudi Arabia' with 66 documents mentioning it, 'gender' with 18, 'women' with 13, 'leadership' with 12, 'entrepreneurship' with ten and 'vision 2030' with nine. Other notable keywords include 'women entrepreneurship', 'entrepreneurial intention,' 'female entrepreneurs,' and 'female entrepreneurship'. These keywords revealed the subject areas and themes common in research on WE and Saudi Vision 2030.

Figure 12 Collaboration network of institutions (see online version for colours)

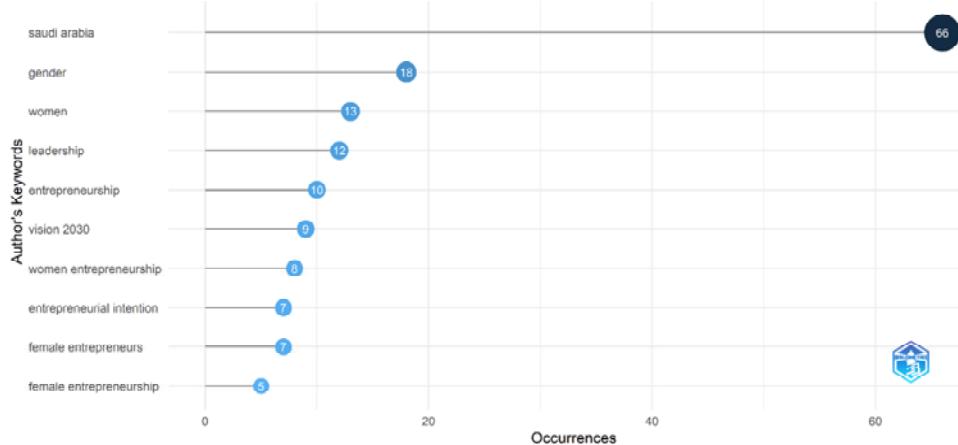


Source: Biblioshiny

4.7.1 Word cloud and word dynamics

A word cloud is a type of data-visualisation chart in which the size of a given word corresponds to its frequency or importance (Kadam et al., 2021). Figure 14 presents a word cloud based on the considered publications' KeyWords plus. The word 'Saudi Arabia' evidently appears most frequently ($n = 15$), followed by female ($n = 6$) and entrepreneur ($n = 5$).

Figure 13 Top 10 author's keywords of research-documented publications (see online version for colours)



Source: Biblioshiny

Figure 14 Word cloud (see online version for colours)



Source: Biblioshiny

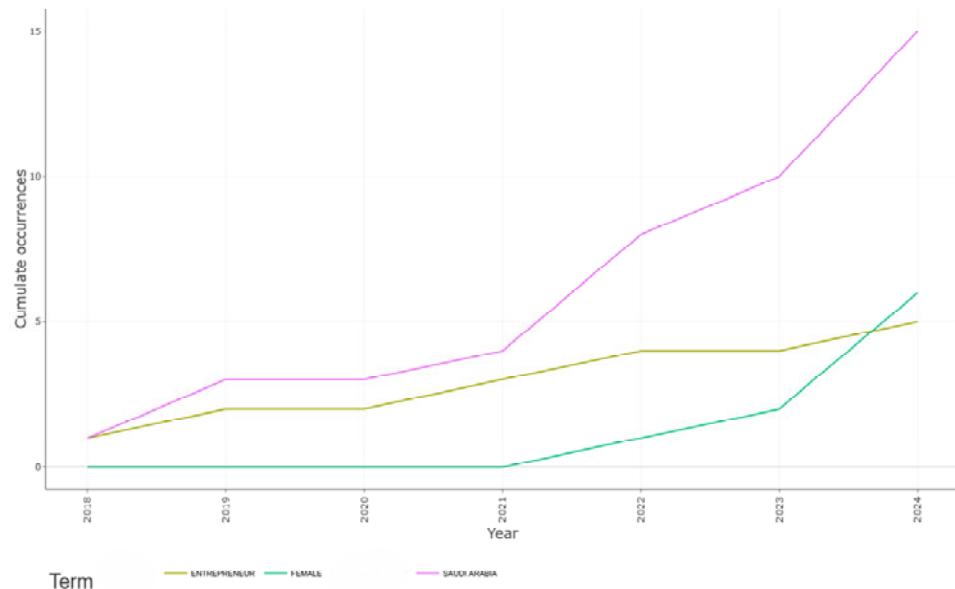
Word dynamics refer to changes in the frequency of keywords over time. Figure 15 illustrates the trajectory of the cumulative occurrences of the three most frequent keywords. Notably, SWE literature has grown dramatically since 2021, pointing to a significant uptick in interest following the introduction of Saudi Vision 2030 and its economic, social and cultural themes.

4.7.2 Hotspot analysis

Article keywords summarise a study's most important findings. Hence, by studying keywords and their co-occurrence, a researcher can predict future developments and identify research hotspots and frontiers (Chen et al., 2016). This study employed network analysis to investigate the co-occurrence of keywords using VOSviewer software. An aggregate of 561 keywords was found, of which 17 exhibit at least five occurrences – the threshold criterion. 'Saudi Arabia' is the most commonly used term from 2002 to 2024, and it exhibits a close relationship with other keywords, such as Vision 2030, female entrepreneurship and women's empowerment. Figure 16 and Table 8 illustrate the

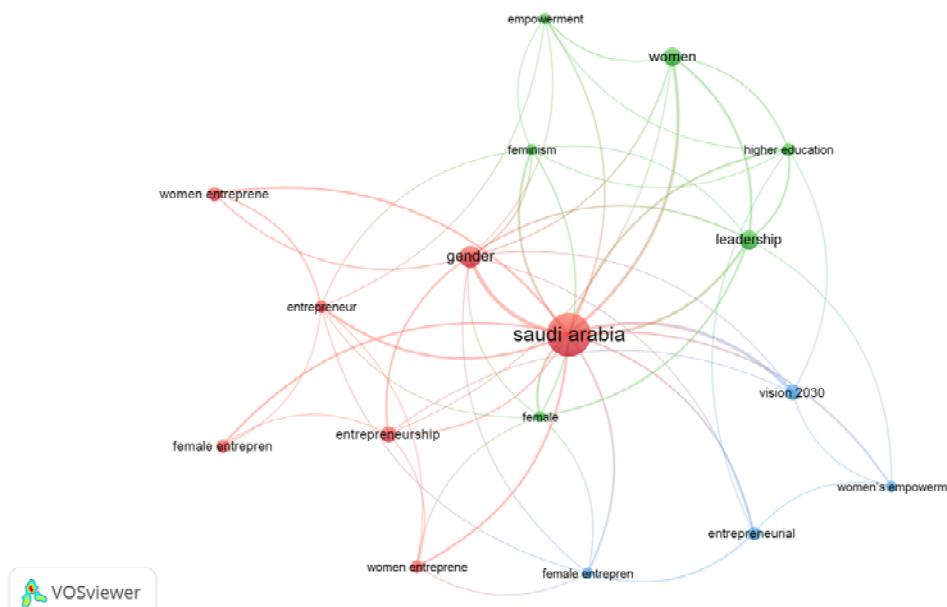
network analysis, showcasing three main clusters identified by this review of the literature.

Figure 15 Word dynamics (see online version for colours)



Source: Biblioshiny

Figure 16 Keyword clustering from 2002 to 2024 (see online version for colours)



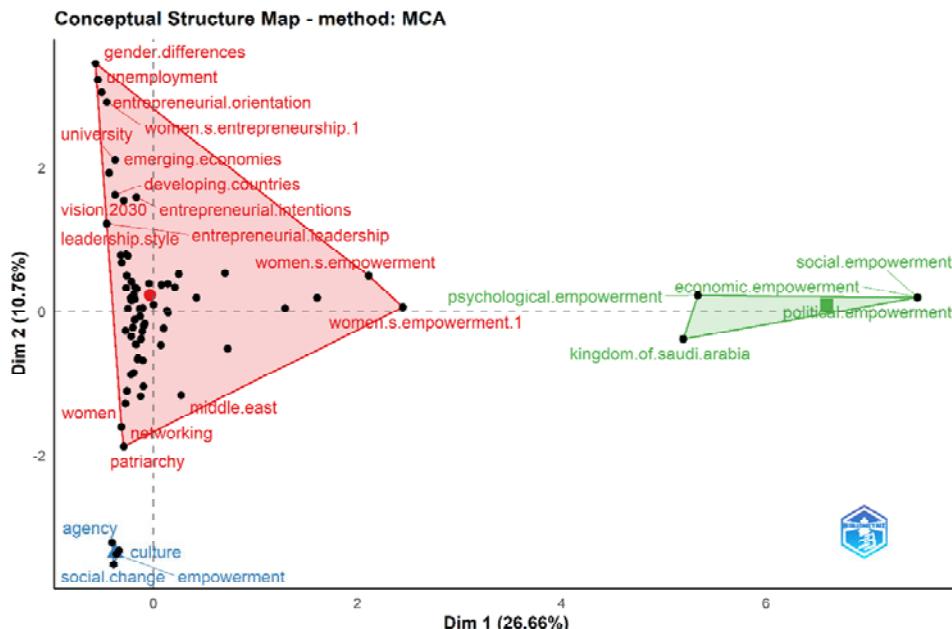
Source: VOSviewer

Table 8 Three clusters made based on author's keywords

Co-citation cluster	Keywords (occurrence)
Cluster 1 (Red): Saudi women entrepreneurship in Saudi Arabia	Saudi Arabia (73), women entrepreneurship (21), gender (19), entrepreneurship (16),
Cluster 2 (Green): gender, empowerment and leadership	Leadership (14), women (13), higher education (6), female (5), empowerment (5), feminism (5)
Cluster 3 (Blue): Vision 2030 influence on saudi women	Vision 2030 (9), entrepreneurship intention (7), female entrepreneurship (5), women's empowerment (5)

Source: Source: Biblioshiny

These three clusters cover multiple topics relevant to WE, including Vision 2030, entrepreneurial intentions, empowerment, education, employment and gender. Understanding the relationships within and between these clusters can greatly benefit practitioners, academics and policymakers in the development of plans to support and promote Saudi women entrepreneurs.

Figure 17 Conceptual structure map (see online version for colours)

Source: Biblioshiny

4.7.3 Word-map factorial analysis

A word map consists of elements represented in the shape of a group of dots projected in a 3D space. The dots are laid out on a map so that the most strongly associated elements are closed on the map (Aria and Cuccurullo, 2017). This review employed multiple correspondence analysis to scrutinise the co-occurrence of keywords via biblioshiny. Figure 17 depicts a word-map factorial analysis, showcasing the three major thematic clusters identified by this review. The largest cluster, Cluster 1 (red) features keywords

like WE, leadership style, Vision 2030 and entrepreneurial intentions. Cluster 2 (blue) includes KSA as well as economic, political and social empowerment. Cluster 3 (green) encompasses culture, empowerment and social change. The results match the outcomes of the hotspot analysis (Figure 17).

Table 9 Top 3 documents for co-citation clusters

Co-citation cluster	Author (year)	Source	Secondary document title	Co-citation strength
Cluster 1 (Blue): inequalities and challenges facing Saudi women	Al-Ahmadi (2011)	<i>Human Resource Development International</i>	Challenges facing women leaders in Saudi Arabia	15
	Metcalfe (2008)	<i>Journal of Business Ethics</i>	Women, management and globalisation in the middle east	9
	Metcalfe (2007)	<i>International Journal of Human Resource Management</i>	Gender and human resource management in the middle east	5
Cluster 2 (Green): education and career development of Saudi women	Hamdan (2005)	<i>International Education Journal</i>	Women and education in Saudi Arabia: challenges and achievements	16
	Syed et al. (2018)	<i>Career Development International</i>	Gender equality in employment in Saudi Arabia: A relational perspective	10
	Elamin and Omair (2018)	<i>Personnel Review</i>	Males' attitudes towards working females in Saudi Arabia	7
Cluster 3 (Red): Saudi women in entrepreneurship	Danish and Smith (2012)	<i>International Journal of Gender and Entrepreneurship</i>	Female entrepreneurship in Saudi Arabia	10
	Zamberi Ahmad (2011)	<i>International Journal of Gender and Entrepreneurship</i>	Evidence of the characteristics of women entrepreneurs in the KSA	9
	Sadi and Al-Ghazali (2010)	<i>African Journal of Business Management</i>	Doing business with impudence: A focus on women entrepreneurship in Saudi Arabia	7

Source: Biblioshiny

4.8 Co-citation analysis

This review's co-citation analysis focused on secondary documents, tracking pairs of cited references mentioned within the same primary documents to expose networked

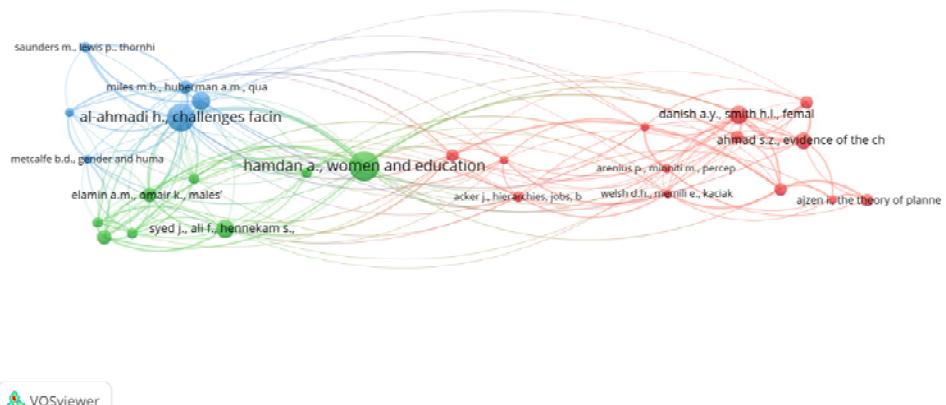
clusters (Lima and Carlos Filho, 2019). Analysing co-citation patterns can capture the intellectual foundation of a subject area as well as the interactions between scholars in academic exploration (Small, 1973; Vogel, 2012; Vogel et al., 2021). Figure 18 is built on secondary documents that are particularly focused on current SWE research. It visualises three clustered relationships, with the minimum number of citations set to five. Cluster 1 (blue): inequalities and challenges facing Saudi Arabian women; Cluster 2 (green): education and career development among Saudi Arabian women; Cluster 3 (red): Saudi Arabian women in entrepreneurship.

Table 9 lists the 3 leading secondary documents for each co-citation cluster.

4.9 Bibliographic coupling analysis

Inverse to co-citation analysis, bibliographic coupling analysis examines how many primary documents share the same cited references (Donthu et al., 2021; Vogel et al., 2021). The results of co-citation analysis tend to be robust, as the degree of similarity in the references of published primary documents remains intact over time, unlike other contextual analyses (Batisticić and van der Laken, 2019; Caputo et al., 2021). Due to the focus on primary documents, the analysis generates results that represent the current intellectual structure of the field as a whole, capturing dominant research trends (Vogel et al., 2021).

Figure 18 Co-citation analysis (see online version for colours)



Source: VOSviewer

Figure 19 displays the coupling network with three unique research clusters generated by VOSviewer based on the top 50 primary documents. These documents exhibited a mean coupling strength of 73.92 and a standard deviation of 22.91.

Table 10 Top 3 documents for coupling clusters

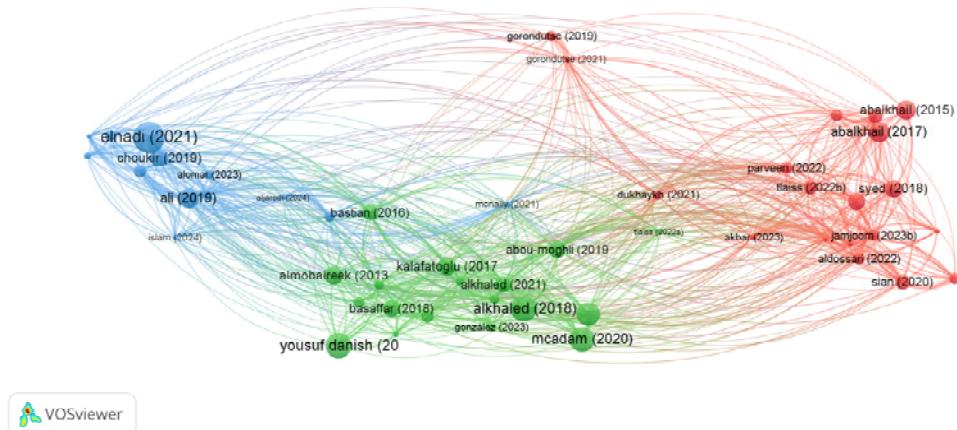
Co-citation cluster	Author (year)	Source	Secondary document title	Co-citation strength
Cluster 1 (Blue): entrepreneurial ecosystem and institutional influences	Elnadi and Gheith (2021)	<i>International Journal of Management Education</i>	Entrepreneurial ecosystem, entrepreneurial self-efficacy, and entrepreneurial intention in higher education: Evidence from Saudi Arabia	84
	Ali et al. (2019)	<i>International Journal of Gender and Entrepreneurship</i>	Symmetric and asymmetric modelling of entrepreneurial ecosystem in developing entrepreneurial intentions among female university students in Saudi Arabia	97
	Choukir et al. (2019)	<i>International Journal of Gender and Entrepreneurship</i>	Influences of role models and gender on Saudi Arabian freshman students' entrepreneurial intention	79
Cluster 2 (Green): cultural, gender, and empowerment influence on Saudi women	Alkhaled and Berglund (2018)	<i>Entrepreneurship and Regional Development</i>	'And now I'm free': Women's empowerment and emancipation through entrepreneurship in Saudi Arabia and Sweden	88
	Yousuf et al. (2024)	<i>Journal of Entrepreneurship in Emerging Economies</i>	Entrepreneurial orientation across gender in Saudi Arabia: evidence from the adult population survey (APS) of global entrepreneurship monitor (GEM)	46
	McAdam et al. (2020)	<i>Small Business Economics</i>	Digital girl: cyberfeminism and the emancipatory potential of digital entrepreneurship in emerging economies	65

Source: VOSviewer

Table 10 Top 3 documents for coupling clusters (continued)

Co-citation cluster	Author (year)	Source	Secondary document title	Co-citation strength
Cluster 3 (Red): work career and development of Saudi women	Abalkhail (2017)	Career Development International	Women and leadership: challenges and opportunities in Saudi higher education	62
	Abalkhail and Allan (2015)	<i>Human Resource Development International</i>	Women's career advancement: mentoring and networking in Saudi Arabia and the UK	45
	Syed et al. (2018)	<i>Career Development International</i>	Gender equality in employment in Saudi Arabia: a relational perspective	60

Source: VOSviewer

Figure 19 Bibliographic coupling network of top 50 primary documents (see online version for colours)

Source: VOSviewer

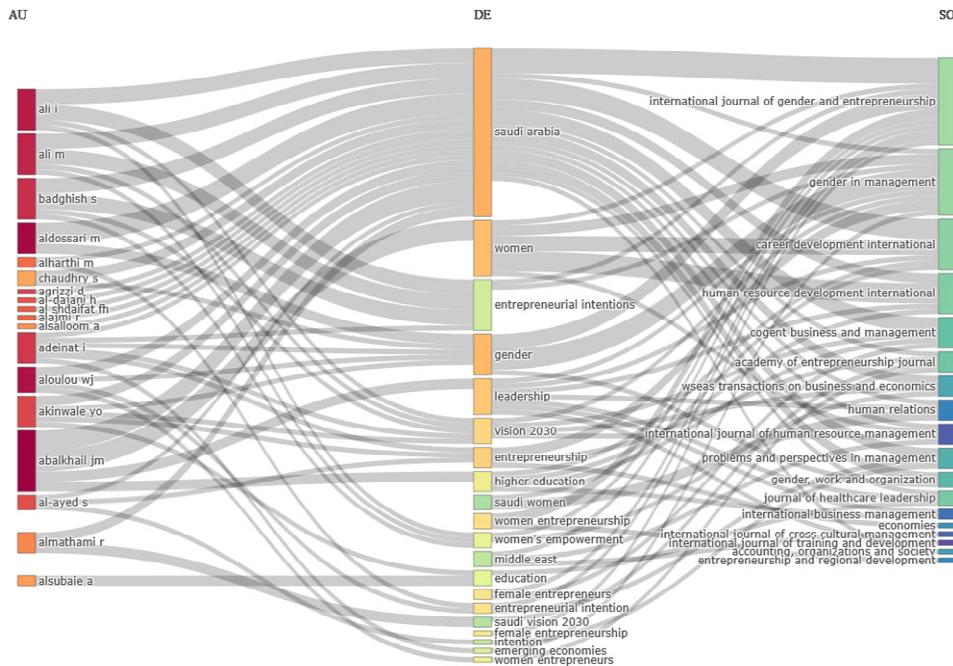
The top three primary documents for coupling clusters are listed in Table 10.

4.10 Three-fields plot

The three-fields plot (Sankey diagram) is a visual mapping tool that facilitates the summarisation of an entire bibliometric study within a single figure as well as the visualisation of content proportionality (Riehmann et al., 2005). The three-fields plot, as shown in Figure 20 with authors' names (left side), keywords (middle) and sources (right side), shows how researchers are deeply involved in this topic and are far from the finish line. The size of each node corresponds to the number of documents published by each journal. The thickness of the overlapping lines reveals a significant relationship between the two subjects. Since Ali analysed keywords like Saudi Vision 2030, entrepreneurship

intention and education, it is clear that he did not focus on topics like gender, leadership or education, since other authors rely on them as a majority of their output. This is important, as it reduces the risk of keyword collusion in the future. This figure indicates that the *International Journal of Gender and Entrepreneurship* is the top contributor in this arena. In the middle field, there are five different types of groups of existing literature: Saudi Arabia, women, intention, gender and leadership.

Figure 20 Three-fields plot (see online version for colours)



Source: Biblioshiny

4.11 Thematic evolution analysis

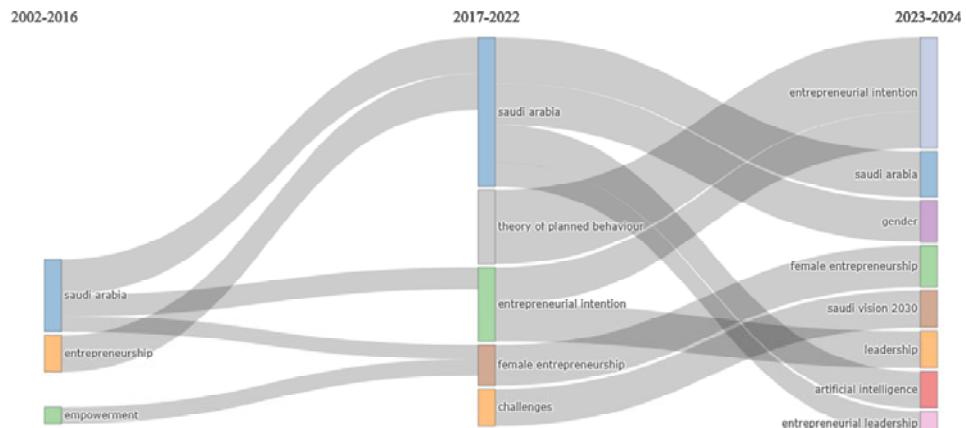
Thematic evolution occurs when a group of themes advances throughout an entire period (Cobo et al., 2011). Figure 21 depicts that Saudi Arabia has progressed along three emerging concepts: Saudi Vision 2030, institutional barriers and entrepreneurial ecosystems.

4.12 Evolution trend analysis

The analysis of trend topics focuses on the evolution of keywords starting from their first appearance through to their last appearance. Figure 22 presents the trending topics in the WE literature between 2011 and 2024. The following topics were identified by examining the authors' keywords and ensuring that each article contained a minimum of five-word phrases at least four times: entrepreneurship, empowerment, gender equality, Saudi women and Vision 2030. Numerous studies have examined gender, education and discrimination factors alongside entrepreneurship in the Saudi context. In fact, Saudi

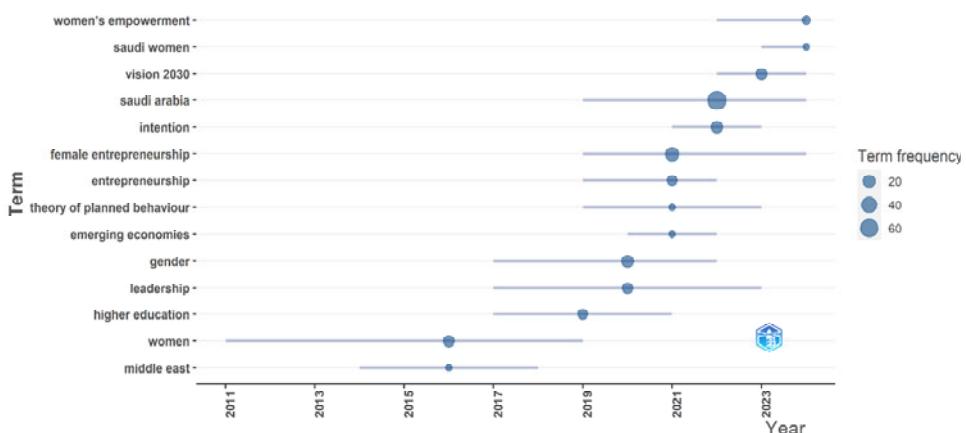
Vision 2030, Saudi women's empowerment and entrepreneurial intentions were examined alongside one another very recently. As illustrated in Figure 22, the research has primarily focused on WE. The literature is significantly lacking when it comes to the impacts of empowering Saudi women on entrepreneurship against the backdrop of Saudi Vision 2030.

Figure 21 Thematic evolution (see online version for colours)



Source: Biblioshiny

Figure 22 Trend topics (see online version for colours)



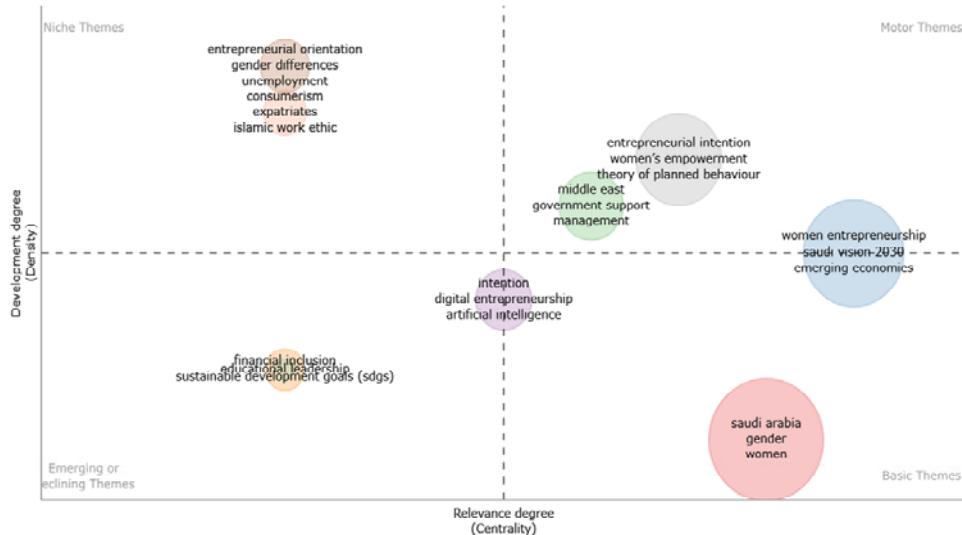
Source: Biblioshiny

4.13 Thematic map analysis

A thematic map is a simple visual representation of the co-word analysis of authors' keywords that permits researchers to position key study themes into one of four quadrants based on their centrality and density – in other words, their degree of relevance and their degree of development (Duan, 2024). Figure 23 presents a thematic map of 2002–2024

WE studies to gain insights into WE's scope for additional exploration. The minimum word-count frequency and word-label size are set to five, and the number of words is set to 100. Quadrant 1 (motor theme) features well-explored research topics. Quadrant 2 (niche theme) features advanced and isolated concepts. Quadrant 3 (peripheral theme) features emerging and declining themes. Quadrant 4 (transversal or basic themes) features central concepts or universal problems that intersect with other subjects. Table 11 details the words across all four quadrants.

Figure 23 Thematic map (see online version for colours)



Source: Biblioshiny

Table 11 Thematic map quadrant-wise analysis

Quadrant 1	Quadrant 2	Quadrant 3	Quadrant 4
Entrepreneurial intention	Entrepreneurial orientation	Financial inclusion	Women entrepreneurship
Women's empowerment	Gender difference	Educational leadership	Saudi Vision 2030
Theory of planned behaviour	Unemployment	Sustainable development goals	Emerging economies
Entrepreneurship ecosystem	Consumerism	Digital entrepreneurship	Saudi Arabia
Economic development	Expatriates	Artificial intelligence	Gender
Government support	Islamic work ethic	Innovation	Women

Source: Biblioshiny

This analysis provides researchers and stakeholders with insights into relevant worth exploring. Quadrant 3 in particular reveals the emerging fields of digital entrepreneurship, artificial intelligence, innovation and the SDGs, while Quadrant 4 captures transversal concepts like Saudi Vision 2030 and WE.

5 Discussion

This study offered an extensive bibliometric analysis of SWE. Based on an examination of 154 documents from the Scopus database, it showcased patterns of authorship, publication, citation and collaboration, providing practitioners, academics and policymakers with valuable insights. It highlighted the evolution of key trends in academic research, especially against the framework of socio-economic reforms effected by Saudi Vision 2030. Since 2016, there has been a considerable uptick in the volume of research on SWE, reflecting the broader development in this sector. The *International Journal of Gender and Entrepreneurship* emerged as the most prominent journal in this research area, and Abalkhail ranked as the most productive author. Furthermore, the thematic clustering findings revealed that KSA is progressing across various emerging concepts, including digital entrepreneurship, entrepreneurial ecosystems and the SDGs.

Notably, however, this paper also identified significant scarcities through its systematic literature review, specifically when it comes to bibliometric studies on Saudi women's entrepreneurial experiences. Thematic and evolution analyses identified themes in need of additional exploration by splitting relevant research into four quadrants, indicating well-researched themes (e.g., entrepreneurial intention) and emerging concerns (e.g., digital entrepreneurship). The analysis indicated that, although some themes are central to the discussion, others are niche and in need of further scholarly attention. On the other hand, the collaborative analysis indicated a relatively weak level of cooperation between researchers and institutions, implying that there is a need for stronger collaborations to bolster the influence and development of the discipline at large. Through such revelations, this bibliometric study not only presented an in-depth literature review on SWE but also highlighted areas in need of further study and development, contributing to the development and empowerment of women entrepreneurs in KSA.

Especially prior to 2016, one of the major challenges faced by women in KSA consisted of deeply rooted societal and institutional barriers. Women entrepreneurs tend to face difficulties in the regulatory environment, such as gender-based restrictions that constrain their access to formal capital and funding avenues. This is often coupled with a greater demand for the application of contemporary marketing and technological mechanisms (Zamberi Ahmad, 2011). Moreover, cultural obstacles with foundations in Arab traditions persist in limiting the roles of women in the business space. For example, the male guardianship requirement and the prohibition on foreign travel without male accompaniment present substantial obstacles for women interested in establishing and managing enterprises (Alhabidi, 2013). These cultural norms can give rise to diminished trust levels and assumptions of dishonesty, exacerbating the difficulties associated with women's entrepreneurial activities (Alhabidi, 2013). Moreover, women entrepreneurs often struggle to achieve a healthy work-life balance, have less reliable access to networking opportunities and possess insufficient knowledge about various business activities and functions. These factors collectively foster an environment that deters women from growing their businesses (Alreshoodi, 2022). Furthermore, inadequate education and finance represent a serious problem, as most women find it difficult to obtain the support necessary to establish and operate their businesses (Alhabidi, 2013).

Since 2016, Saudi Vision 2030 has offered Saudi women better opportunities but, at the same time, has introduced new challenges. Recent studies have explored the challenges associated with female empowerment and WE. Women's entrepreneurial undertakings have yet to constitute a mass movement of business growth, meaning that

they have not been accompanied by a broad wave of social acceptance and legitimacy – and this wave will not come unless the obstacles identified by the reviewed studies are acknowledged and overcome. Saudi Vision 2030's strategic goals make progress towards the advancement of women's economic and social empowerment, fostering greater involvement of women in various activities undertaken by most businesses. The social and economic changes associated with KSA's national transformational vision contribute to more women choosing steady careers over business start-ups, as many of its accompanying initiatives focus on empowering women through the provision of job opportunities. These aspects are driving women to be independent but are not very influential when it comes to encouraging entrepreneurship. Hence, further research on the effectiveness of current policies and recommendations when it comes to supporting WE is required. Vision 2030 is undoubtedly shifting women's perceptions of entrepreneurship. The associated transformation is not just empowering women but also offering them material business and investment opportunities. However, systemic constraints persist, meaning that there is a clear need for continued research on the contextual factors that influence WE.

6 Research agenda and conclusions

The vast majority of the reviewed research suggests that, while Saudi Vision 2030 provides a framework for advancing WE, ongoing efforts to address underlying challenges and enhance supportive structures are necessary to enable women to thrive in the entrepreneurial ecosystem. The Saudi government has already established various programmes in support of women, but there is a persistent shortfall in their utilisation. Policymakers should encourage more women to take advantage of available resources and support systems in order to foster a robust entrepreneurial ecosystem that motivates women to pursue entrepreneurial endeavours by promoting business-related capabilities and addressing restrictive cultural norms (Basaffar et al., 2018). Future research is necessary to identify which programmes and targeted policies can best facilitate their entrepreneurial success.

Empowering women is a central theme of Saudi Vision 2030, with studies showing that it has already begun to positively influence women's entrepreneurial intentions. However, social empowerment has also had a negative impact in the form of women feeling that their communities do not adequately support them or their entrepreneurial aspirations (Hassan et al., 2022). Evidently, while structural changes are occurring, there is still a need for corresponding social shifts if these changes are to give way to an environment that is conducive for women entrepreneurs. Such shifts would require a concerted effort from various stakeholders to create supportive frameworks that empower women. By addressing existing barriers and promoting a culture of entrepreneurship, the potential for women to contribute to economic growth may be realised, aligning with the broader objectives of Saudi Vision 2030. Therefore, the impact of empowering women on entrepreneurship is a vital area of study.

The role of training and mentoring in enhancing women's entrepreneurial participation is crucial. There is a clear and significant need for capacity development, particularly in the areas of governance, leadership and technology use in daily business operations, as the majority of women entrepreneurs in KSA are unable to provide appropriate services to their communities. Such capacity-development programmes

significantly increase the likelihood of women starting their own businesses and persisting in their entrepreneurial journeys (Miralam et al., 2025). Moreover, women entrepreneurs encounter significant unique barriers, including gender-based regulatory issues and financing constraints. Thus, government agencies and non-governmental organisations must formulate effective policies that provide women entrepreneurs with support while also simplifying the administrative procedures that currently require male representation. Furthermore, establishing more non-governmental organisations focused on supporting women entrepreneurs could provide them with essential networking opportunities and resources. Future research should pursue a greater understanding of which development programmes best fit women's entrepreneurial requirements and challenges, including those pertaining to work-life balance, networking opportunities and access to financial resources.

Finally, the theoretical frameworks surrounding SWE warrant further exploration. KSA's unique socio-cultural context necessitates a tailored approach to understanding the factors that influence female innovators and entrepreneurs, as traditional Western theories may not fully align (Kempainen, 2019). A research agenda focused specifically on SWE should encompass institutional influences, empowerment strategies, barriers to success and the contextual relevance of theoretical frameworks – all aligned with the objectives of Saudi Vision 2030.

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Declarations

All authors declare that they have no conflicts of interest.

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