



Review article

Women's financial literacy: A bibliometric study on current research and future directions

Sheela Sundarasan^{a,*}, Usha Rajagopalan^a, Malathi Kanapathy^b,
Kamilah Kamaludin^a

^a Department of Accounting, Prince Sultan University, P.O.Box No. 66833 Rafha Street, Riyadh, 11586, Saudi Arabia

^b School of Business and Management, Quest International University, No.227, Jalan Raja Permaisuri Bainun, 30250, Ipoh, Perak, Malaysia

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ABSTRACT

This study undertakes a bibliometric and content analysis on women's financial literacy. The purpose of a bibliometric research on financial literacy and women is to carefully evaluate and quantify the body of literature on this subject. It attempts to identify trends, research gaps, significant authors, and essential ideas, offering a thorough overview that might direct future research and policy activities to increase women's financial literacy and well-being. The data extraction commenced in January 2023 with a thorough criteria search for articles, which includes inclusion and exclusion criteria using Web of Science Core database, resulting in 312 articles, published between 1998 and 2022. Biblioshiny application as well as the VOSviewer software for network visualization of keywords and bibliographic coupling is used. Based on the outcomes of the scientific bibliographic coupling, dominant themes were identified – “Global Financial Literacy: Addressing Disparities and Enhancing Education”, “Addressing gender gap in financial inclusion and personal finance behaviour”, “Empowerment through Financial Literacy: Overcoming the Manacles of Domestic Violence” and “Women's retirement planning and preparedness”. Future research in this area could examine global gender differences in financial literacy, implement targeted financial education interventions, incorporate financial literacy and economic empowerment into domestic violence policies, investigate factors influencing women's retirement planning, and advance gender equality and financial well-being globally. The outcome from the future research is anticipated to assist regulatory bodies, government agencies and non-profit organization in enhancing existing regulations (specifically for women) and provide the platform for a sustainable wealth management and well-being program for women.

1. Introduction

Financial literacy refers to the diverse knowledge and skills on financial matters, such as managing money, setting budgets, and investing [1,2]. However, due to socioeconomic issues, cultural standards, and gender-based expectations, women face mounting challenges in financial literacy, money management and retirement planning. According to a recent study by Ref. [3]; women and girls are more likely to be financially literate in nations where there was more gender equality. This highlights the urgent need to provide

* Corresponding author.

E-mail addresses: ssundarasan@psu.edu.sa (S. Sundarasan), urajagopalan@psu.edu.sa (U. Rajagopalan), malathi.kanapathy@qiu.edu.my (M. Kanapathy), kkamaludin@psu.edu.sa (K. Kamaludin).

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women worldwide with opportunities to enhance their financial education and knowledge, which can have a significant impact on their financial planning, inclusion, and empowerment [4–6]. [6,7] also documented that women exhibit a relatively lower level of debt literacy and financial management ability. Thus, knowledge on financial literacy and money management should aid women in overcoming challenges in retirement planning [8–10], in addition to enhancing their quality of life and feeling of financial security and independence [11]. In that regard, the purpose of this study is to examine and shed further light on the academic discourse around women's financial literacy and well-being. This research intends to highlight the socioeconomic realities, cultural norms, and gender-related presumptions that make financial management, retirement planning, and economic literacy challenging for women. Subsequently, the study will identify knowledge gaps through thematic analysis, thereby providing a roadmap for future research that could potentially enhance the financial welfare of women.

This study is critical because women encounter numerous gender-based inequalities in terms of economic prospects, including restricted access to economic resources, lower wages, and biased practices [12]. Thus, advocating financial literacy among women [13] is instrumental in imparting knowledge and comprehension of intricate financial concepts and practices, such as cashflows, saving, investing, and debt management [14–16]. Holistic financial planning could lead to the establishment of prudent financial goals, formulation of meticulous budgets, and development of strategies to accomplish those goals [17]. These goals could be achieved through financial education, financial inclusion [18,19] and financial capability [20,21]. Additionally, encouraging ongoing interdisciplinary research on women's retirement policies will aid in refining educational programs through robust financial literacy initiatives and technological integration. Thus, it is the responsibility of policymakers, financial institutions, NGOs, employers, and other stakeholders to work alongside effectively and execute holistic and comprehensive intervention strategies [22] to accelerate the creation of a more equitable society.

The results of this research may have important ramifications for practice and policy, eventually boosting women's financial security and advancing the overarching objective of gender equality. It could further assist regulatory bodies, government agencies and non-profit organization in enhancing existing regulations (specifically for women) and provide the needs and platform for a sustainable wealth management and well-being program for women. Immediate actions are pivotal to solving these problems and providing women with the tools they need to handle difficult financial situations. In essence, this research holds the potential for substantial contributions across societal, academic, governmental, and industrial dimensions, thereby enhancing women's financial well-being and retirement preparedness.

The rest of the paper is organized as follows. Section 2 develops the methodology and discusses the software integrated for the data analysis. Section 3 discusses the bibliometric findings, a critical analysis of the themes based on bibliographic coupling and content analysis, identifies the gaps and meticulously articulates future research. Section 4 concludes.

2. Literature review

According to the Organization for Economic Co-operation and Development (OECD), 2020, the comprehensive notion of financial literacy encompasses a convergence of awareness, knowledge, skills, attitude, and behavior. The factors mentioned above, when considered collectively, assume a crucial role in enabling the ability to develop insightful and judicious financial assessments, ultimately leading to the achievement of financial success. In light of the unique barriers that women face in the realm of financial planning and security, it is imperative to recognize and understand the consequential implications that these challenges impose upon women. Numerous scholarly inquiries have been undertaken to delve into the gender disparities in financial literacy, resulting in a consistent body of evidence indicating that women tend to demonstrate a relatively lower level of financial literacy in comparison to their male counterparts [23]; Grigion Potrich et al., 2018; [24,25]. Moreover, it has been noted that within the demographic of elderly households in both the United States and China, with a particular emphasis on women, there exists a distinct disposition towards insufficiently allocating resources for their post-employment years [26–28]. This phenomenon can be attributed, in part, to their comparatively weak levels of acumen in matters pertaining to financial knowledge and understanding (Mitchell, O. S., & Lusardi, A., 2008). Numerous studies have also explored gender disparities and the importance of women's financial literacy for retirement planning and preparedness [27,29–31]; Mitchell, O. S., & Lusardi, A., 2008). These research findings underscore the importance of recognizing and addressing gender-specific obstacles within the realm of financial literacy.

In terms of enhancing financial inclusion and empowerment among women, studies indicate that it is crucial to implement focused interventions and educational initiatives. Sarah [32,33] underscored the significance of initiatives promoting financial inclusion to enhance women's economic empowerment and address the disparity in financial literacy between genders. In fact, new prospects for financial inclusion are provided by the development of digital financial services, but women's digital financial literacy is still a problem (Opoku Asuming et al., 2019). Thus, women's access to formal financial services can be facilitated by addressing the digital gender gap and offering digital financial literacy training [34]. Additionally, socioeconomic circumstances also play an important role in women's financial literacy; Kamer [35] observed that women in the middle-income countries exhibit lower levels of financial literacy. This finding suggests that education plays a crucial role in enhancing financial literacy. By effectively addressing these challenges, society has the potential to cultivate a greater degree of fairness and sustainability in economic opportunities for women, thereby augmenting their overall financial welfare. Within the realms of socioeconomic issues, women are also victims of economic abuse. Economic abuse has a remarkable impact on the economic self-sufficiency of women who had experienced abuse [36,37]. This finding implies that curricula aimed at enhancing financial literacy should prioritize the empowerment of individuals who have survived intimate partner violence (IPV). The level of confidence an individual holds in their capability to efficiently handle their money is a significant factor in shaping their financial decision-making and actions. Lisa [23,38] concluded that women revealed a stronger tendency to own investment and savings products when their ability to manage money increases. Thus, developing effective policies to increase

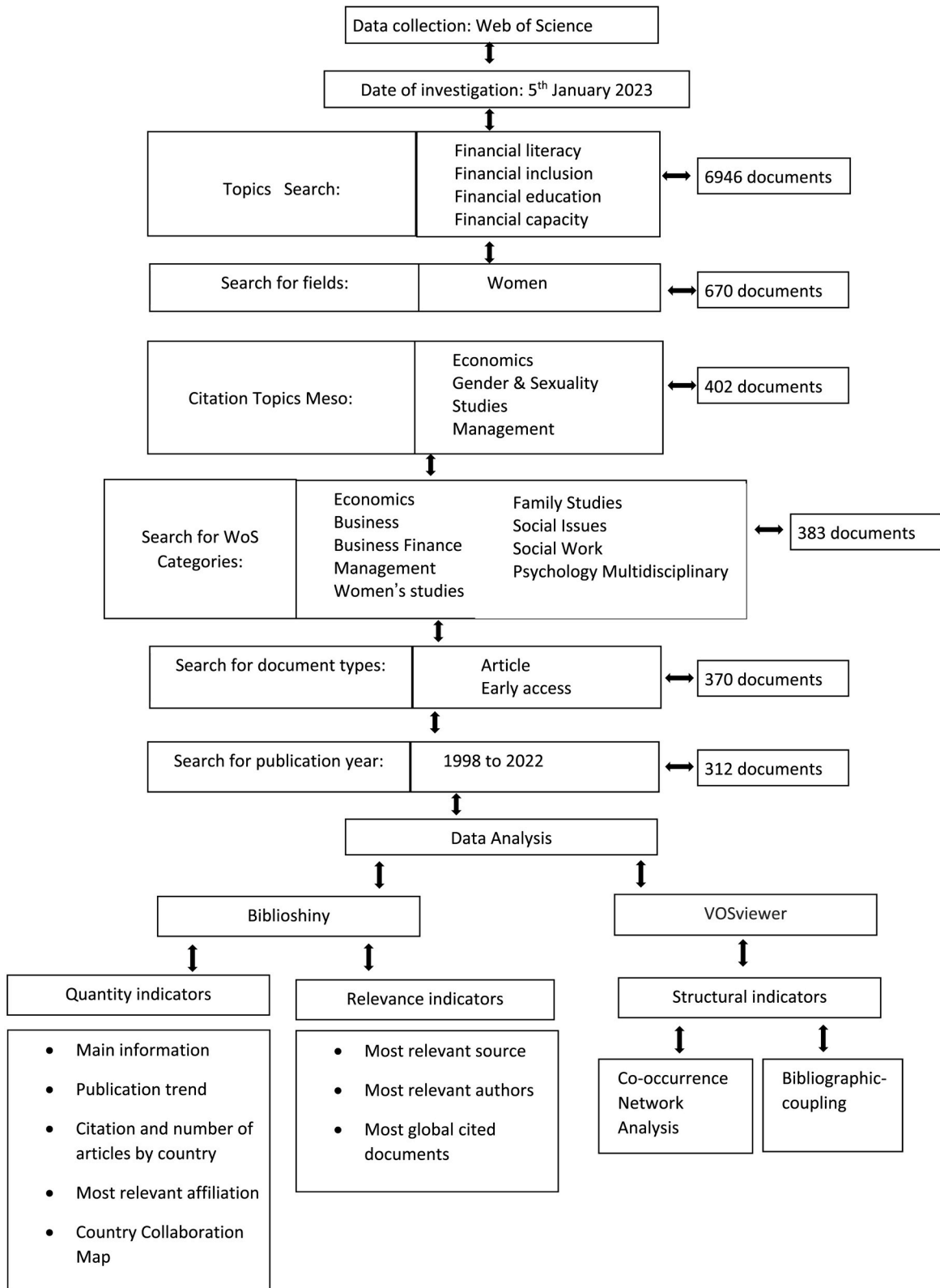


Fig. 1. Dataset search and analysis criteria.

self-efficacy in handling money can give positive outcomes for women's financial literacy.

In summary, this research explores how women's financial literacy, gender variations in financial literacy, and socioeconomic factors affect women economically. Future studies should focus on enhancing targeted financial education programs, comprehending how financial literacy affects financial behavior, and researching the long-term effects of increased financial literacy on women's financial stability. To close the gender gap in financial inclusion and promote better retirement planning outcomes, governments and policymakers should prioritize financial education and initiatives that accommodate the special needs of women, particularly those in vulnerable groups. Section 4.9 further elaborates on the scholarly discussion of women's financial literacy from a thematic angle.

3. Methodology

This study employs bibliometric analysis to examine the existing scholarly literature and discourse pertaining to women's financial literacy. In line with other studies [39,40], this study uses both numerical and graphical methodologies. Web of Science (WoS) is used for this research, though other databases including Scopus, Google Scholar, SSRN, and EconLit are all viable options for bibliometric analysis. The selection of WoS is based on its extensive coverage of reputable journals and the exclusion of non-scientific sources, which aligns with the study's objective to ensure rigor and quality [41]; Huang et al., 2019). Bibliometrix and VOSviewer are employed in this investigation, while Latent Dirichlet Allocation (LDA) is acknowledged as an alternative statistical method for topic modeling, uncovering latent themes within a text corpus through the analysis of word co-occurrence patterns. By utilizing Bibliometrix, descriptive analysis, publication trend exploration, author and source identification, collaboration pattern analysis, quantitative insights, and statistical summaries can be conducted (RQ1 and RQ2). Additionally, VOSviewer provides valuable network visualization and bibliographic coupling analysis capabilities (RQ3 and RQ4). Its strengths lie in robust network visualizations, clustering analysis, collaboration analysis, and comprehensive summary functionalities, all of which contribute to understanding relationships and thematic clusters. Thus, the combined use of Bibliometrix and VOSviewer is implemented as methodological tools to achieve the study's stated objectives.

The following research questions (RQs) will be addressed in this study.

RQ1. What are the publications trends, most prominent sources, documents, and authors on women's financial literacy?

RQ2. Which are the major contributing institutions and countries yielding research related to women's financial literacy?

RQ3. What are the major themes on women's financial literacy?

RQ4. What are the potential future areas of research on women's financial literacy?

The proceeding section delineates data extraction and analysis.

3.1. Data extraction, inclusion and exclusion criteria

As stated in the previous section, to ensure the highest level of rigor and quality, we sourced our data exclusively from the Web of Science (WoS) database [41]; Huang et al., 2019). The data extraction commenced in January 2023 with a thorough criteria search for articles, using Web of Science Core database in the title, abstract, or in the keyword list; "financial literacy" OR "financial inclusion" OR "financial education" OR "financial capacity" which turned up 6946 scholarly works. These results were further filtered to only include the field "Women", which resulted in 670 scholarly works. Strict inclusion and exclusion criteria were applied; a citation topic search was carried out with the use of the keywords "Economics," "Gender & Sexuality Studies," and "Management," which narrowed the results to 402 scholarly works. Thereafter, limiting our scope to articles published in the English language from the domains of Economics, Business, Business Finance, Management, Women's Studies, Family studies, Social issues, Social work, and Psychology multidisciplinary, a total of 383 scholarly works were identified. The search results were further filtered by selecting the document types "Article" or "Early access," published between 1998 and 2022, thus resulting in the final corpus of 312 articles. These articles serve as the foundation for this bibliometric study.

3.2. Data analysis

To analyze the data, we employed the Bibliometrix R-package (Biblioshiny) application [42] for descriptive analysis [43], as well as the VOSviewer software [44] for network visualization of keywords and bibliographic coupling [39,40,45]. In the bibliometric section, we examined the summary of main information, publication trend, most relevant authors, sources, affiliation, document and country collaboration analysis. VOSviewer was used for clustering of the network – 'keyword analysis' and 'bibliographic coupling' [44]. Based on the bibliographic coupling, this study performed a Content Analysis, and identified the themes and future research for financial literacy and women. Fig. 1 delineates the search criteria (keywords, inclusion, and exclusion) and the subsequent analysis.

4. Findings and discussion

5.1. Main information

Table 1 provides a summary of the scholarly work included in this study, which consists of, predominantly "articles" (285), and

“early access” (27), published between 1998 and 2022. The analysis of authors’ keywords (808) reveals a noticeable clustering of co-occurring keywords and strong links between concepts and terms within this extensive bibliographic dataset. This will be discussed in further detail in the proceeding section. In terms of citation, the average number of citations per document is 16.04, suggesting moderately significant impact on the research. The existence of 755 authors in this dataset is a good indication that the research area is of significant interest to a sizable number of researchers and is an active area of investigation. This may be due to the potential practical applications of the research as it addresses women’s financial literacy. It is also worth noting that most of the documents (699) are authored by multiple authors. Collaborative authorship is encouraged in academic work as it enhances creativity, brings diverse ideas together, and fosters shared responsibility, leading to improved outcomes and innovation.

5.2. Publication trend

The trajectory of articles published within this dataset indicates an upward trend, with a remarkable surge in the number of scholarly contributions in recent years (Fig. 2). In the emerging years of this collection, spanning from 1998 to 2009, only a handful of articles were published. However, the year 2011 marked an important turning point, with six papers, signifying a significant leap in scholarly output. In the years that ensued, the publication of scholarly articles on financial literacy and women experienced a consistent and exponential increase, exhibiting a peak in 2022, with a staggering fifty-five articles. The progressive increase in scholarly articles on women’s financial literacy between 2011 and 2022 can be attributed to several factors. First, the surge in publication reflects the rising recognition of the critical role that financial literacy plays in the contemporary world. Additionally, as cultural paradigms change and awareness is increased about the persisting disadvantages encountered by women in different fields, including finance, it reflects the focus on gender equality and women’s equality. Furthermore, this publication trend could be driven by policies and educational initiatives aimed at enhancing financial literacy, as policymakers and institutions recognize its vital significance in fostering economic well-being and resilience among individuals and communities. Additionally, the evolving landscape of research and academia has been a driving force, with scholars and researchers investigating the complex nuances of women’s financial literacy research through robust empirical investigations, innovative methodologies, and interdisciplinary collaborations. In sum, the upward trajectory of articles published in this collection over the years is a testament to the growing recognition of the significance of financial literacy and gender equality, underpinned by a several factors such as awareness, policy initiatives, research advancements, and demand for evidence-based solutions.

5.3. Most relevant source and source dynamics

Table 2 shows the most relevant sources for articles on women’s financial literacy, while Fig. 3 shows the trajectory of publication in the relevant sources. Top sources include Journal of Family and Economic Issues, Journal of Pension Economics & Finance, Journal of Consumer Affairs, Journal of Women & Ageing, and Journal of Behavioural and Experimental Finance. All sources indicate a significant increase in their publications over the years (Fig. 3), with the Journal of Pension Economics & Finance and the Journal of Family and Economic Issues having a total of 9 publications over the said period. These are prominent scholarly periodicals, with a proliferation of articles focused on pensions and retirement savings, and family economic issues. This may be attributed to the increasing significance of these topics within the fields of economics and finance. Additionally, scholars, policymakers, and practitioners are also showing increased interest in the intersection of women and ageing.

The Journal of Women & Ageing is among the prominent academic publications that focus on women’s health and ageing. It is undeniable that financial literacy plays a critical role in promoting the health and wellbeing of women in the context of ageing and

Table 1

Summary of main information related to the 312 articles downloaded from Web of Science, based on the inclusion and exclusion criteria mentioned.

Description	Results
Documents	312
Keywords Plus (ID)	494
Author’s Keywords (DE)	808
Period	1998–2022
Average citations per documents	16.04
Authors	755
Author Appearances	818
Authors of single-authored documents	56
Authors of multi-authored documents	699
Single-authored documents	56
Documents per Author	0.413
Authors per Document	2.42
Co-Authors per Documents	2.62
Collaboration Index	2.73
Document types	
Article	285
Article, early access	27

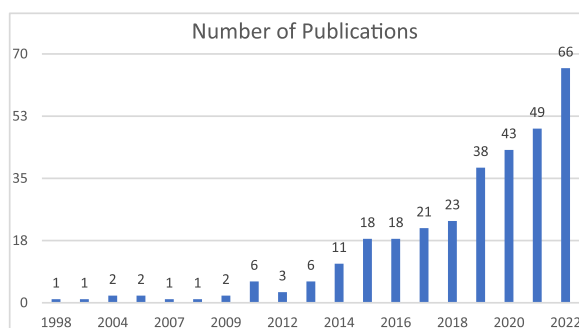


Fig. 2. Publication trend for the 312 articles from Web of Science from 1998 to 2022.

Table 2

Most relevant source (based on number of articles published).

Sources	Number Of Articles	ABDC	ABS	SJR	Publisher
Journal of Family and Economic Issues	9	B	2	Q2	Springer
Journal of Pension Economics & Finance	9	B	1	Q2	Cambridge University Press
Journal of Consumer Affairs	7	A	2	Q1	Wiley-Blackwell
Journal of Women & Aging	6	–	–	Q2	Routledge
Journal of Behavioral and Experimental Finance	5	A	1	Q1	Elsevier
Pacific Business Review International	5	–	–	–	Pacific Academy of Higher Education & Research University
African Development Review-Revue African Development	4	C	–	Q2	Wiley-Blackwell Publishing Ltd
Development In Practice	4	–	–	Q2	Routledge
Economics & Sociology	4	–	1	Q2	Centre Of Sociological Research
Frontiers in Psychology	4	–	1	Q1	Frontiers
Journal of International Development	4	B	1	Q2	John Wiley And Sons Ltd
Review of Behavioral Finance	4	B	1	Q3	Emerald Group Publishing Ltd.
Sustainability	4	–	–	Q2	MDPI
World Development	4	A	3	Q1	Elsevier
Economics Letters	3	A	3	Q2	Elsevier
Economics of Education Review	3	A	2	Q1	Elsevier
Educational Gerontology	3	–	–	Q3	Routledge
Feminist Economics	3	A	3	Q1	Routledge
Finance Research Letters	3	A	2	Q1	Elsevier BV
Gender Technology & Development	3	–	–	Q2	Routledge

retirement. Thus, it is reasonable for scholars to examine the impact of financial literacy on the health and overall welfare of women, particularly with respect to the ageing process and retirement. Further scrutiny of the other journals indicates that the topics covered in these sources include family and financial issues, finance, consumer affairs, gender and aging, behavioral and experimental finance. The recent trend in this area of research on women's financial literacy, as evident from the journal publications, demonstrates an increasing focus on the relationship between gender and finance. It signifies the recognition of the significance of addressing women's specific financial concerns and their distinct encounters in domains like family, pensions, consumer affairs, and aging.

These journals are published by prestigious publishers including Springer, Cambridge University Press, Wiley-Blackwell, Routledge, and Elsevier, which are renowned for their rigorous peer-review processes and superior publishing standards. This reflects the quality, impact, and relevance of the published articles in the realms of women's financial literacy. To assess the scholarly impact, visibility, and influence of these journals, the ABDC, ABS and SJR rankings are used, and the ranks are as displayed in Table 2.

5.4. Most relevant authors

Table 3 lists the most prolific women's financial literacy authors, hailing from prominent institutions around the world. With nine articles, Lusardi Annamaria demonstrates her exceptional knowledge in the realm of financial literacy. Her expertise spans across various domains and complexities of financial literacy, financial decision making, retirement planning and its influence on financial outcomes. Olivia S. Mitchell is another authority in financial literacy; has five publications in this collection, and her research expertise has led to in-depth investigations on financial literacy, education, and pensions, further solidifying her position as a leader in the industry. Adding to the list of esteemed authors, Kumar S has contributed four articles, demonstrating firm dedication to research in the domain of financial literacy. The author has examined various facets of financial literacy, inclusion, and decision-making. His research has shown the complex relationship between financial literacy, financial behaviour, and economic consequences,

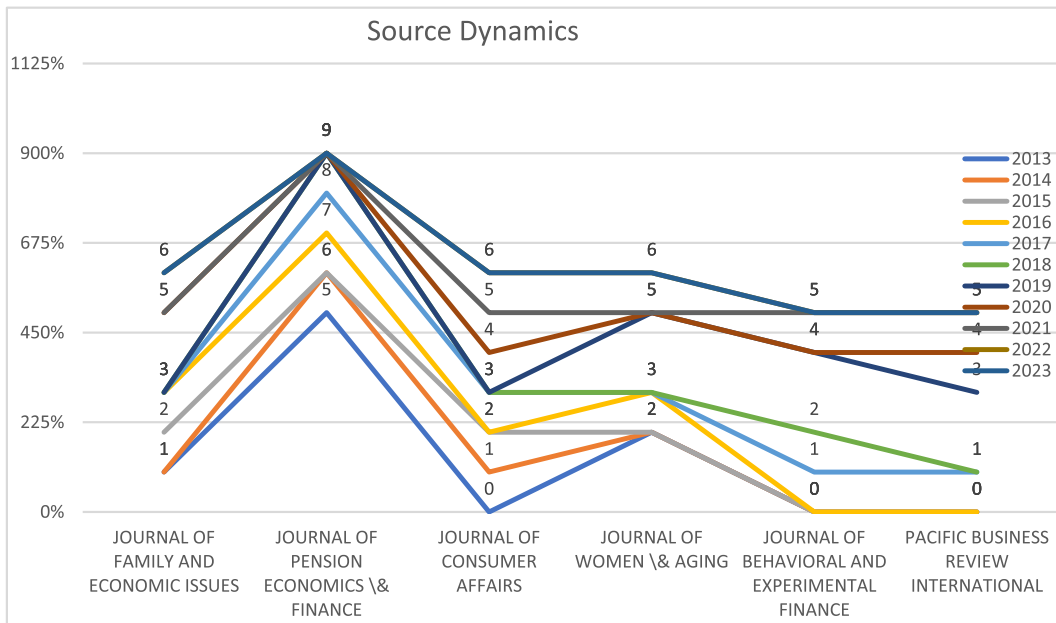


Fig. 3. Source document.

Table 3
Most relevant authors (Based on their number of publications).

Authors	Authors' Affiliation	# of Articles	Country	h-index
Annamaria Lusardi	The George Washington University	9	USA	79
Olivia S. Mitchell	University of Pennsylvania	5	USA	84
Satish Kumar	Indian Institute of Management Nagpur	4	India	46
Ali Ahmed	Linköping University	2	UK	33
Arvind Ashta	Université de Bourgogne-Franche Comté,	2	France	26
Ahmad Raza Bilal	Sohar University Oman	2	Pakistan	19
Saibal Ghosh	Reserve Bank of India, Mumbai	3	India	15
Johan Almenberg	Ministry of Finance, Sweden	2	Sweden	14
H. Kent Baker	American University, Washington	2	USA	NA*
Christina E. Banner	Gutenberg University Mainz, Germany	2	Germany	NA*

NA* - not available.

Table 4
Most relevant affiliation (based on number of articles published).

Affiliations	Country	# of Articles
University of Turin	Italy	10
George Washington University	United States of America	9
Linköping University	Sweden	8
Rutgers, The State University of New Jersey	United States of America	8
University of Massachusetts	United States of America	7
Boise State University	United States of America	6
Makerere University	Uganda	6
Ohio State University	United States of America	6
RMIT University	Australia	6
University of Agder	Norway	6
University of Ghana	Ghana	6
University of North Carolina at Chapel Hill	United States of America	6
University of Pennsylvania	United States of America	6
College Carlo Alberto	Italy	5
Malaviya National Institute of Technology	India	5
University of California, San Diego	United States of America	5
University of Giessen	Germany	5
University of Sheffield	UK	5
Washington University	United States of America	5

emphasising the role of financial literacy in enabling underprivileged communities to improve their financial situations. In conclusion, these prominent writers' intellectual contributions in financial literacy are outstanding, demonstrating their strong dedication to developing this essential topic.

5.5. Most relevant affiliation

Table 4 shows the affiliation and publication counts in women's financial literacy research. The University of Turin leads the field with ten publications. George Washington University and Linkoping University, with nine and eight publications, respectively. Rutgers State University and the University of Massachusetts exhibit a commendable level with eight and seven publications. From a national standpoint, there exists a geographic disparity in research productivity, with a clustering of scholarly publications originating from universities located in the Western nations. These differences could be due to several factors, including governmental funding, research infrastructure, and academic culture. Countries with a stronger research-oriented culture and availability of research data may have higher publication rates. Moreover, cultural attitudes towards women and money may also impact publication rates. Patriarchal societies, for example, may exhibit lower financial literacy rates among women, which could translate into less interest in researching this domain. Conversely, countries with robust gender equality traditions may prioritize research in this field and allocate more resources towards studying the financial literacy of women. Despite these differences, greater collaboration is necessary to bridge the gap and promote the sharing of research findings from universities across Asia, Africa, and the Middle East in the domain of women's financial literacy.

5.6. Most global cited documents

Table 5 summarizes authors' intellectual output, focused on financial literacy, retirement planning, and gender-related aspects in various countries. Lusardi Annamaria and Mitchell are leading research authorities in financial literacy, with their article published in the *Journal of Pension Economics and Finance* – "Financial literacy around the world: an overview" (citation: 2375 as of 23rd May 2023). This honour instantaneously recognizes Lusardi Annamaria & Mitchell's pension economics and financial skills. The article provides evidence that there exists a disparity in financial literacy between genders, with women exhibiting lower levels of financial literacy compared to their male counterparts. Additionally, the research suggests that individuals who fall within the younger and older age brackets tend to exhibit lower levels of financial literacy compared to those in the middle-aged group. The findings also indicate that individuals with higher levels of education tend to be more financially literate. Most importantly, the articles reiterate that having financial literacy increases retirement planning and the fact that financial literacy's impact on retirement planning is underestimated by instrumental factors.

Lusardi Annamaria and Mitchell's scholarly contribution extends beyond the aforementioned work, with 1999 citations (as at 23rd May 2023) for their publication titled "Planning and Financial Literacy: How Do Women Fare?", published in the *American Economic Review*. The article discusses that one-size-fits-all programmes are unlikely to be effective in addressing saving deficiencies across different levels of population. Particularly, given the high prevalence of financial illiteracy among women, it seems unlikely that a single financial education session would have a significant impact on long-term planning and saving choices. The research instead

Table 5
Most global cited documents.

Author	Year	Title	Source	Total Citations (as of 31/05/2023)	TC per Year
Annamaria Lusardi and Olivia S. Mitchell	2011	Financial literacy around the world: an overview	<i>Journal of Pension Economics and Finance</i>	2375	43.31
Annamaria Lusardi and Olivia S. Mitchell	2008	Planning and Financial Literacy: How Do Women Fare?	<i>American Economic Review</i>	1999	31.44
Annamaria Lusardi and Olivia S. Mitchell	2011	Financial literacy and retirement planning in the United States	<i>Journal of Pension Economics and Finance</i>	1173	20.92
Annamaria Lusardi and Tabea Bucher-Koenen	2011	Financial literacy and retirement planning in Germany	<i>Journal of Pension Economics and Finance</i>	812	13.69
Judy L. Postmus, Sara-Beth Plummer, Sarah McMahon, Shaanta Murshid & Mi Sung Kim	2012	Understanding Economic Abuse in the Lives of Survivors	<i>Journal of Interpersonal Violence</i>	363	12.42
Johan Almenberg, Anna Dreber	2015	Gender, stock market participation and financial literacy	<i>Economics Letters</i>	484	16.00
Tabea Bucher-Koenen, Annamaria Lusardi, Rob Alessie, Maarten van Rooij	2017	How Financially Literate Are Women? An Overview and New Insights	<i>Journal of Consumer Affairs</i>	539	18.29
Lisa Farrell, Tim R.L. Fry, Leonora Risse	2016	The significance of financial self-efficacy in explaining women's personal finance behaviour	<i>Journal of Economic Psychology</i>	437	15.75
Vighneswara Swamy	2014	Financial Inclusion, Gender Dimension, and Economic Impact on Poor Households	<i>World Development</i>	414	12.20
Shizuka Sekita	2011	Financial literacy and retirement planning in Japan	<i>Journal of Pension Economics and Finance</i>	389	7.08

emphasized the significance of programmes particularly designed for women since they may be more suited to address the basic difficulties that women confront.

[46]; with 812 citations for the Journal of Pension Economics and Finance publication, and the rest of the authors demonstrate a commendable level of research output and intellectual engagement, signifying the rich landscape of knowledge production and dissemination in economics and finance. In conclusion, the research papers shed light on the present state of retirement planning, financial literacy, and gender-related factors in multiple countries, offering insightful information for policymakers, researchers, and practitioners who are studying these fields.

5.7. Country collaboration map

Fig. 4 shows the international collaboration in financial literacy, inclusion, retirement, and pension. The United States (USA) is among the nations with the greatest frequency of partnerships and collaborates with nations like India, France, Germany, and the Netherlands. Other prominent partnerships include those between Australia and Bangladesh, Ghana, Malaysia, and South Africa, as well as between the UK and Malaysia, France, Germany, and Australia. With nations from many continents working together on scientific and scholarly endeavours, these partnerships underscore the global aspect of research and publishing. These collaborations signify valuable partnership in the field of financial literacy and women-related research. Similarly, Germany has collaborated with Denmark, UK with France and Malaysia, but the number of collaborations is relatively small (two collaborations each). Increased collaboration across countries and continents is necessary, as research partnerships among nations facilitate and foster the exchange of knowledge. The integration of diverse perspectives, methodologies, and data through collaborative research facilitates the development of comprehensive, detailed, and in-depth studies. It also allows scholars from different nations to understand how cultural, economic, and social aspects influence financial literacy. Additionally, it could assist in identifying best practices and can serve as a road map for financial education programs, policies and the creation of global standards and recommendations for financial literacy.

5.8. Co-occurrence network

Fig. 5 and Appendix provides a list of keywords related to various topics in the field of women's financial literacy, along with their occurrences and total link strength. "Link strength" (Appendix A) refers to the intensity of relationships between keywords in the literature. Higher values indicate stronger associations, while lower values suggest weaker connections in this field of research. Fig. 5 shows the keyword network, highlighting financial literacy (Green), financial inclusion (Red), women (Blue), and savings (Yellow). Financial literacy is a prominent topic, with high occurrences (121) and total link strength (421). Financial inclusion is another significant area of research, with 78 occurrences and a total link strength of 277. Gender is also a central theme, with keywords such as gender differences, gender gap, and gender inequality having high occurrences and total link strength. The high frequency of phrases

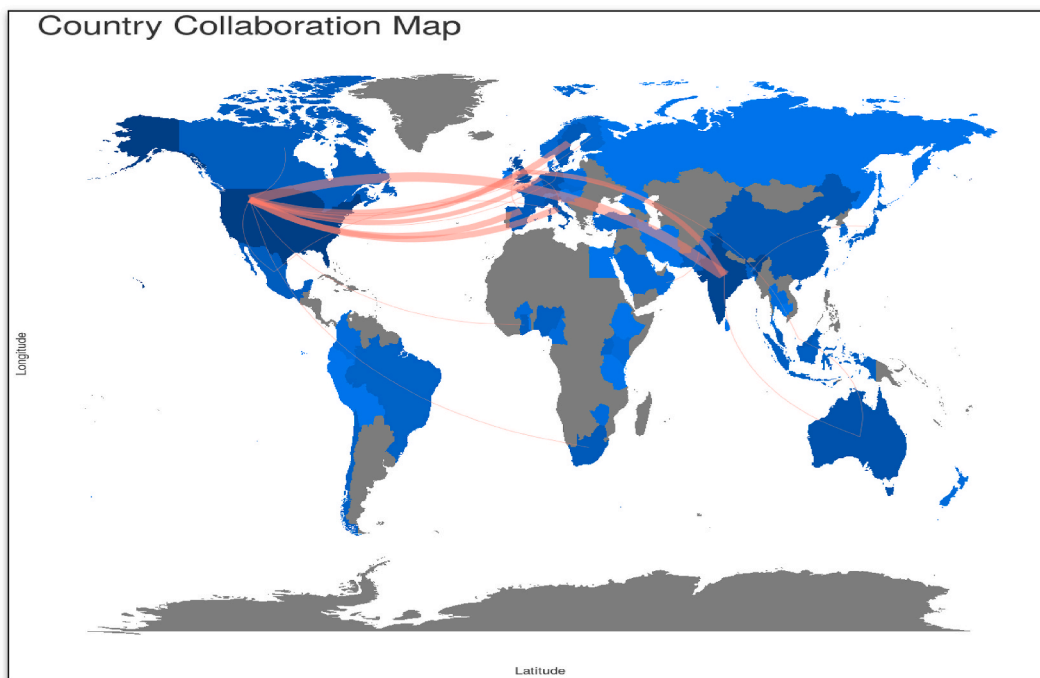


Fig. 4. Country collaboration map.
Source: Biblioshiny

like gender-differences, gender gap, and women empowerment indicates the need to address gender-based inequities. Other important keywords include education, empowerment, entrepreneurship, savings, and wealth, all of which are relevant to the discussion of financial literacy and gender. Some keywords have relatively lower occurrences and link strength, such as adoption, crisis, debt, and poverty, indicating they may be less frequently studied in this context. Overall, both Fig. 5 and Appendix A provide a snapshot of the research landscape on 'financial literacy and women', highlighting key themes and topics of interest in the field.

5.9. Bibliographic-coupling

To further discover the themes and the associations among the citing publications, we performed a bibliographic coupling using VOSviewer. A total of 312 articles were used in this exercise, and the citations were adjusted to 20 citations. Nevertheless, only 54 articles were captured in this bibliographic analysis. This analysis forms clusters based on the convergence of citing publications. Clustering supports a thematic assessment of the co-citation network [47]. It is a subjective method, requiring a review by knowledgeable parties to refine and generate meaningful clusters [41]. The bibliographic-coupling using VosViewer identified seven themes, based on 54 articles, as displayed in Fig. 6. Further manual review and analysis of all the articles indicated some similarities and thus the themes were merged to form four themes as shown below.

- Theme 1.** Global Financial Literacy: Addressing Disparities and Enhancing Education.
- Theme 2.** Addressing gender gap in financial inclusion and personal finance behaviour.
- Theme 3.** Empowerment through Financial Literacy: Overcoming the Manacles of Domestic Violence.
- Theme 4.** Women’s retirement planning and preparedness.

5.9.1. Theme 1 “Global financial literacy: Addressing Disparities and enhancing financial education”

Theme 1 examines the scholarly discourse surrounding global financial literacy, which is of considerable importance. Research in this domain indicates significant discrepancies in financial literacy levels among different countries and demographic groups. For instance, research conducted by Refs. [48,49] has shown that certain countries, such as Canada and Germany, display a greater level of financial literacy on average than other nations. Furthermore, significant differences in financial literacy across various demographic factors such as age, gender, race/ethnicity, and educational attainment have also been observed [50,51]. Lusardi et al. (2014) and Boisclair (2017) further indicated that individuals belonging to demographic groups such as women, people from diverse backgrounds, and those aged over 75 years exhibit a worrisome weakness in financial literacy in both the United States and Canada. The said

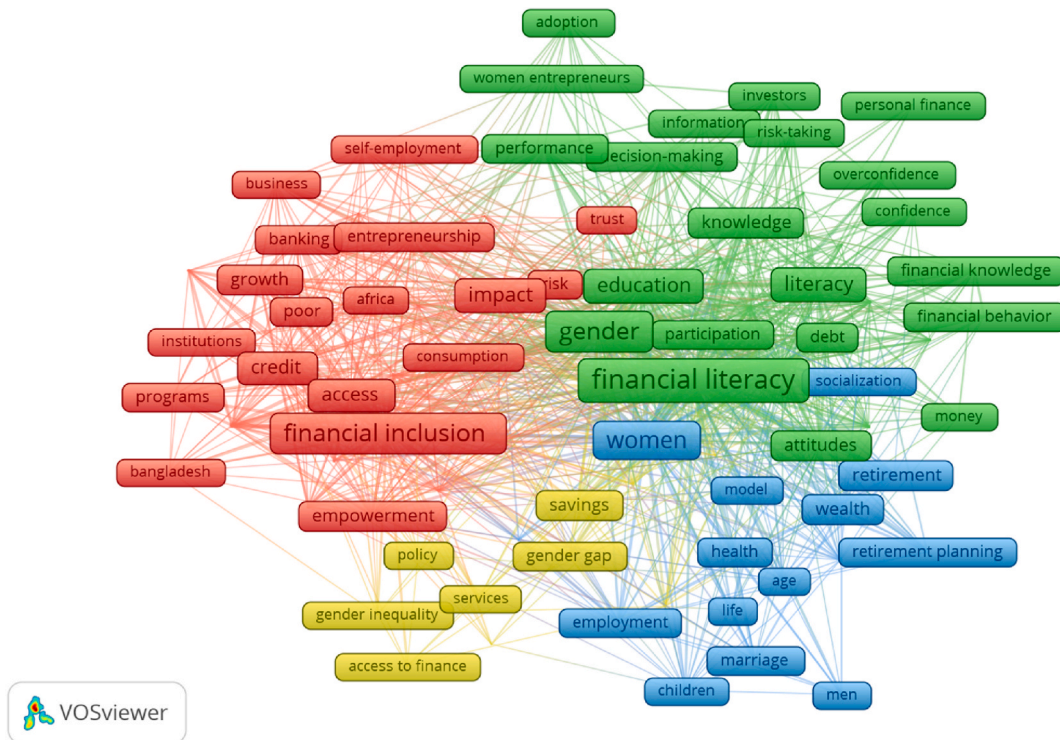


Fig. 5. Keyword Co-occurrence network. Source: Vosviewer

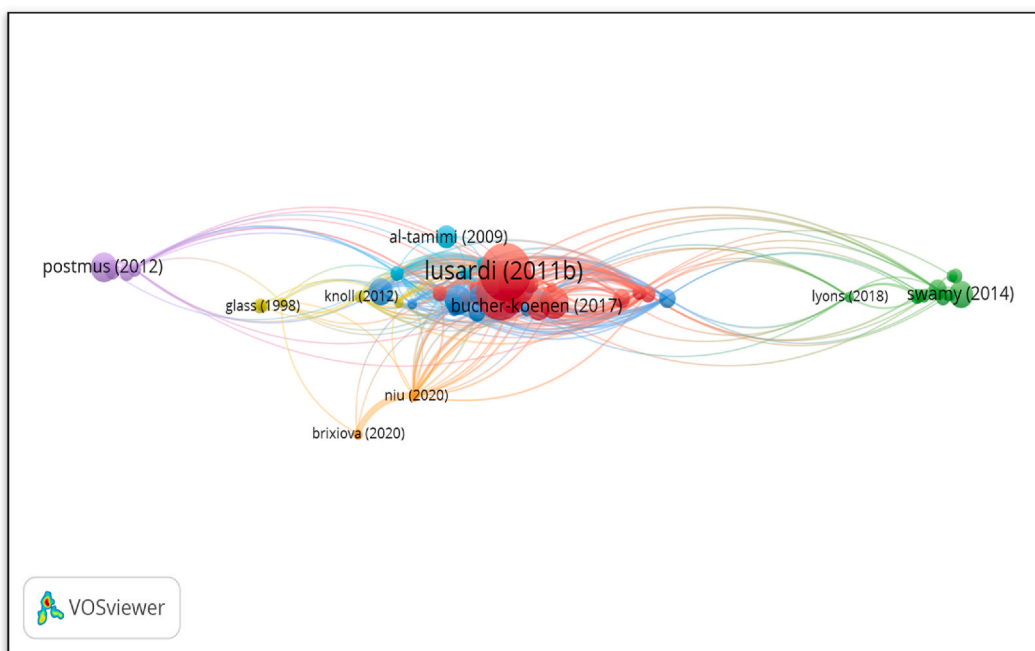


Fig. 6. Bibliographic-coupling.

Source: VosViewer

research highlights financial literacy disparities, particularly among marginalized communities, giving rise to concerns regarding reduced financial welfare, heightened economic inequality, and suboptimal financial decision-making.

In that context, the complex and versatile nature of financial literacy underlines the need for targeted interventions and financial education to enhance financial literacy levels among different demographic groups worldwide [50,51]; Lusardi et al., 2014 [48,49]. [52–54]; and Ozdemir et al. (2019) argue that financial education plan is a critical policy instrument that can be implemented relatively easily to enhance financial well-being. These scholars found that financial education was low across different countries, cultures, and age groups, with low levels particularly pronounced among women, younger adults, and individuals with lower levels of education and income [52]; Hassan and Kalli, 2009; Ozdemir et al., 2019). Moreover, they noted a significant relationship between financial education and investment decisions [53]. The scholars further observed that financial education programs should reflect social and personal psychological factors to enhance program effectiveness [54]. They also highlighted the importance of adopting personalized financial education programs tailored to suit gender and other demographic variances to improve program efficiency [54]; Ozdemir et al., 2018), particularly among women, younger adults, and low-income individuals [52]; Ozdemir et al., 2018). In conclusion, **theme 1** emphasizes the disparities in financial literacy across countries and demographic groups, highlighting the need for targeted financial education interventions to resolve these disparities and enhance financial well-being.

5.9.2. Theme 2 “Addressing gender gap in financial inclusion and personal finance behaviour”

Theme 2 discusses a thorough and detailed knowledge of the nuances of gender inequality in financial inclusion and personal finance behavior, which has been a focal point of extensive academic inquiry across various nations. Scholars have examined this issue in Nigeria [55], Sub-Saharan Africa [56], West Africa [57], Peru [58], India [59], and internationally [28]. This body of research has shed light on the negative impacts of gender inequality on underrepresented groups including women, the less educated, and the poor. It has also highlighted the complex link among financial inclusion, gender, and technology. Socioeconomic, sociocultural, institutional, legal, and regulatory issues are identified as the primary causes of the gender gap in financial inclusion. In addition, age, education, income, institutional trust, and ease of doing business [60] have a significant influence in advancing financial inclusion. Studies in this domain also highlighted the significance of financial inclusion’s role in improving women’s equality and promoting advancement on gender equality (Sarah Hendriks, 2019). Ignoring these issues could negatively impact economic growth, social protection, and welfare.

In addition to financial inclusion, research on the interaction between gender, financial literacy and personal finance behavior has shown that financial literacy is a significant predictor of an individual’s financial well-being [23]. Women’s educational levels were also found to magnify the impact of financial literacy on their financial affluence. Moreover, financial self-efficacy, or a person’s self-confidence in their financial planning competence, also played a crucial role in determining the financial behavior of women (Farrell et al., 2015). Gender inequality in over-indebtedness was reported [61], but gender disparities in capital market involvement decreased when financial literacy was controlled for [5,62], highlighting the importance of financial literacy in addressing gender inequality and financial behaviour. Gender disparities in financial literacy were found to be most pronounced in industrialized

countries, attributed to personal traits, economic, and social factors (Cupak et al., 2018). Research in this domain also indicates that financial literacy training primarily benefited male counterparts, perpetuating gender inequality (Brixiova et al., 2020). Therefore, it is necessary to promote greater financial literacy, particularly among women, to enhance their personal finance behavior and overall economic well-being.

5.9.3. *Theme 3 “Overcoming the Manacles of Domestic Violence and intimate partner violence (IPV) through financial literacy”*

Theme 3 examines the pervasiveness of intimate partner violence (IPV) and domestic violence in the realms of financial literacy as they have garnered worldwide attention, and multiple studies have examined the underlying factors contributing to this phenomenon. For low-income women, financial reliance has emerged as a major element that fosters IPV and domestic violence. Financial instability and reliance on abusers for economic assistance are common challenges for survivors of domestic violence [63]. The authors postulated that the abuser is able to exercise more control over the victim when the victim is financially dependent on the abuser. Financial illiteracy, lack of economic independence, and lack of self-sufficiency have all been linked to the persistence of intimate partner violence (IPV). To combat this issue, multiple studies have suggested that financial literacy and economic empowerment could be key to reducing IPV and domestic violence. For instance Ref. [37], found that financial literacy programs were associated with lower rates of IPV perpetration and victimization. Similarly [64], noted that financial empowerment, which includes strategies for achieving financial stability and security, could help survivors of domestic violence break free from abusive relationships. Furthermore, Sanders (2006) emphasized that the provision of economic resources and financial education could aid survivors in achieving economic independence. These studies stress the need for IPV and domestic abuse policies, programs, and practices to emphasize financial literacy, economic empowerment, and self-sufficiency. The chance of IPV and domestic violence being perpetuated might be lowered if survivors were given the means to become economically self-sufficient. In conclusion, **Theme 3** discusses the interplay between financial literacy, economic empowerment, and self-sufficiency in IPV and domestic violence. These are effective ways to counteract intimate partner violence (IPV) and domestic abuse and simultaneously empower survivors.

5.9.4. *Theme 4 - Women’s retirement planning and preparedness*

Theme 4 discusses retirement planning and preparedness as essential factors in achieving a secure and fulfilling retirement. Research studies have shown that women face several unique challenges that impact their retirement planning and preparedness, such as lower lifetime earnings, caregiving responsibilities, and longer life expectancies. Scholarly discussion under this theme has examined on how retirement planning and preparation affects women [65]; [66,67]; Knoll & Tamborini, 2012; Lee, 2008 [68]; and Niu & Gan, 2020). Planning for and being ready for retirement are essential factors for a fulfilled retirement. There are a number of factors, such as lower lifetime earnings, caregiving duties, and longer life expectancies, that make it more difficult for women to save for retirement. These studies have found that working women had higher levels of financial education [67] and tend to have better retirement planning and preparedness. Similarly, financially literate women also plan and prepare for retirement more effectively [69] and women who had access to workplace retirement plans [68] or financial advisors [66] have higher retirement savings, planning, and preparedness, emphasising the importance of these resources.

The scholarly discussion in this area also revolves around women’s priorities in their retirement planning, such as healthcare and wellness [70], which underscores the importance of healthcare planning in retirement. Niu and Gan (2020) on the other hand, found that women tend to have a lower risk tolerance than men, which could impact their investment decisions, retirement plans and savings. Thus, financial education and literacy programs may help women become more financially risk-tolerant and reduce these inequities. In summation, the scholarly research conducted in **Theme 4** elucidates the distinctive obstacles encountered by women in the realm of retirement strategizing and readiness. This statement underscores the significance of fostering financial literacy, facilitating access to retirement vehicles, and prioritizing healthcare considerations as pivotal factors in attaining enhanced retirement prospects for women. By attending to these pertinent factors, one can effectively mitigate gender disparities and enhance the prospects of women’s retirement preparation and financial reserves.

5. Discussion

Based on the outcomes of the scientific bibliographic coupling, dominant themes were identified – “Global Financial Literacy: Addressing Disparities and Enhancing Education”, “Addressing gender gap in financial inclusion and personal finance behaviour”, “Empowerment through Financial Literacy: Overcoming the Manacles of Domestic Violence” and “Women’s retirement planning and preparedness”.

Theme 1 predominantly highlights the disparities in financial literacy among different demographic groups, specifically women and how education could assist in bridging the gap. Targeted financial education interventions that reflect social and psychological factors are crucial for enhancing the financial well-being of individuals, particularly women, across the globe. Therefore, policymakers and educators must use their sagacity and foresight to collaborate, create and implement decisive and effective targeted interventions that serve this vulnerable and marginalized population. The empirical evidence suggests that potential research under this domain includes further investigation of the global gender disparities in financial literacy across borders and targeted intervention strategies, mainly through financial education. Studies comparing gender disparities in financial literacy, inclusion, capability, and retirement planning in developed and developing countries can shed light on the causes and effects of these inequalities. Policymakers can use these insights to devise effective strategies for promoting financial literacy and well-being among women. Tailored financial education programs in developing nations, especially through remote learning, can empower women in making financial decisions and achieving independence and wealth growth. Studies that explore the influence of cultural and socioeconomic factors on women’s financial

literacy can help create culturally responsive education programs. Investigating the impact of financial technology on women's financial literacy can also bridge the digital divide and increase inclusion. Exploring a comprehensive "cradle to grave" financial literacy program (Sundarasan et al., 2013) involving schools, parents, businesses, and government can empower women throughout their lives and foster financial independence. These studies pave the way for gender equality and improve women's well-being globally.

Theme 2 emphasizes gender disparity in financial inclusion and personal finance behaviour. Therefore, policymakers must prioritize financial inclusion for marginalized populations and promote financial literacy, particularly among women, to enhance their personal finance behavior and overall economic well-being. These strategies are critical in bridging the gap between genders and promoting financial inclusion. Potential future research on gender disparities in financial inclusion and personal financial behavior could have significant impacts. By examining factors such as societal and cultural barriers, digital illiteracy and lack of technology [71–95], policymakers can design effective strategies to bridge gender disparities in financial inclusion across nations and regions. Investigating the role of Artificial Intelligence (AI) and financial technologies can open new pathways to overcome restrictions in developing nations, promoting financial inclusion. Analyzing microfinance's role in closing the gender gap in access to credit and services can also lead to improved regulations, policies, and initiatives, ultimately enhancing the financial well-being of women. Overall, to address gender disparities across nations, the literature recommends comprehensive policy interventions, including inclusive financial policies, regulations, digital financial inclusion initiatives, and tailored financial literacy programs, targeting vulnerable populations. These studies have the potential to drive positive change in gender equality and financial inclusion.

Theme 3 explores the critical relationship between financial literacy, economic empowerment, and self-sufficiency in the context of domestic abuse and intimate partner violence (IPV). This subject stresses the possibility of financial education and empowerment to break the cycle of abuse and encourage survivor independence by shedding awareness on the effect of financial dependency on abusive relationships. It is a complex issue that requires comprehensive policy interventions. The studies recommend the inclusion of financial literacy and economic empowerment in IPV and domestic violence policies, programs, and research to combat financial dependence, financial stressors and aid survivors in achieving financial independence. By addressing these factors, support could be extended to the survivors in breaking the cycle of violence and achieving economic security and self-sufficiency. Potential future research on financial literacy, economic empowerment, and domestic abuse includes comprehensive studies on the effectiveness of programs in minimizing intimate partner violence and domestic abuse across diverse cultural and socio-economic contexts. Additionally, investigating the impact of cultural and societal standards on victims' financial literacy and empowerment can provide valuable insights. Research exploring the association between financial literacy, economic empowerment, self-sufficiency, and re-victimization among domestic abuse survivors can contribute to understanding their mental health and well-being. Furthermore, studying the causes and effects of financial literacy and empowerment programs for male perpetrators of domestic abuse can inform tailored intervention strategies. These studies have the potential to optimize program techniques, support survivors' well-being and stability, and facilitate the development of effective policies promoting independence and mental health among domestic violence survivors.

Theme 4 examines the importance of retirement planning and preparation in attaining a secure and satisfying retirement. Gender-specific policies, tailored strategies, and financial education initiatives that account for women's diverse life circumstances and priorities can help bridge the retirement savings gap and promote greater retirement readiness among women. Women from diverse socioeconomic origins may encounter different problems and need specific measures to improve their retirement planning and preparation. Lower-income women may benefit from financial education programs that concentrate on budgeting and saving, whereas higher-income women may need more complex investing and tax planning tactics. Older women may face challenges in retirement due to lesser financial resources, while married young individuals may view retirement as a financial goal and require retirement planning. In fact, research indicates that financial literacy is generally low among elderly, hence, promoting financial literacy at a younger age may improve women's retirement preparedness. In that regard, potential future research in the area of women's retirement planning and financial well-being could involve studying factors influencing low participation rates in pension schemes, inequalities in access to financial services, and cultural/societal standards. Customized financial literacy programs, workplace policies, and the role of social security systems can also be investigated. The findings can contribute to promoting gender equality, reducing financial insecurity in retirement, and enhancing women's economic well-being globally. This research can inform intervention strategies, policy development, and program implementation to address the unique financial literacy needs of women and promote their economic independence and retirement security, ultimately closing the retirement gap between genders.

6. Conclusion

This study employed a bibliometric and content analysis to explore the scholarly discussion in different domains of women's financial literacy. Using a dataset of 312 articles that were published between 1998 and 2022, the study identified the publication trends, the main sources, articles, authors, countries and affiliation. Additionally, four main themes and the related potential areas of research were discussed. In a nutshell, it can be concluded that financial literacy for women is an extremely vital and significant area of study as the outcome could immensely support regulatory bodies and agencies, non-profit organizations and all stakeholders in planning and executing regulations and programs. This would further enhance the financial literacy level of women, subsequently empowering them to be financially independent and having the competency for their own wealth management and to face any adverse repercussions.

Planning and executing regulations and programs, specifically for women is pivotal in today's fast-paced but indeterminate post-pandemic financial environment. In modern times, women are contributing just as much as men, if not more, to the financial stability of their families by serving as primary or secondary breadwinners and sharing the burden of financial responsibilities. As the global

landscape is becoming more unstable and complex, making good investment decisions, ability to access financial services, and building resilience are becoming dominant. Gender inequalities, social and cultural effects on marginalized women's financial literacy should be better understood as it is currently tacit and unspoken. Financial literacy and knowledge give women the skills and experience to maneuver the ever-changing economic landscape and to take control on their future financial well-beings, while financial inclusion allows users to access the financial services and products needed to develop and expand businesses, accumulate wealth, and safeguard themselves and their families from financial instability.

An inclusive understanding of these matters could facilitate and lead regulators and policymakers to design policies and programs that enable women to make wise financial decisions, safeguard their future, and ultimately contribute to strengthening an economy. Governments, private sectors, non-profits, and financial institutions must collaborate to bridge women's financial literacy, inclusion, education, and capability gaps. Government-funded financial education programs, mandatory financial education in schools, public education campaigns, mentoring programs, and networking opportunities can positively impact financial decision-making, gender inequality in the financial sector, and financial inclusion policies. In conclusion, financial literacy, inclusion, education, and capability are extremely important for women's financial well-being in today's rapidly changing world and it could empower women with a sustainable financial management and retirement planning.

CRediT authorship contribution statement

Sheela Sundarasan: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Writing – original draft, Writing – review & editing. **Usha Rajagopalan:** Funding acquisition, Project administration, Writing – review & editing. **Malathi Kanapathy:** Methodology, Writing – original draft, Writing – review & editing. **Kamilah Kamaludin:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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APPENDIX. Keyword co-occurrence

Yellow Cluster		
keyword	occurrences	total link strength
determinants	21	111
savings	18	75
gender gap	14	56
household finance	7	35
services	7	32
decisions	6	32
household	6	46
policy	6	26
gender inequality	5	25
intimate partner violence	5	22
access to finance	5	11
Blue Cluster		
keyword	occurrences	total link strength
women	67	291
gender-differences	19	104
wealth	16	72
retirement	15	56
retirement planning	14	39
health	12	44
marriage	10	50
employment	10	40
age	8	32
model	7	30
life	7	29

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Yellow Cluster		
keyword	occurrences	total link strength
investment	6	28
family	6	30
socialization	5	32
men	5	20
income	5	30
children	5	31
Green Cluster		
Keyword	Occurrences	Total link strength
financial literacy	121	421
gender	86	347
behavior	35	160
education	35	179
literacy	34	166
knowledge	22	106
attitudes	15	76
financial education	15	53
performance	14	66
debt	13	64
financial knowledge	11	43
gender differences	11	47
decision-making	10	48
participation	10	55
financial behavior	9	32
gap	9	52
investors	8	41
risk tolerance	7	39
personal finance	6	13
risk-taking	6	34
confidence	5	32
financial self-efficacy	5	28
information	5	21
money	5	28
overconfidence	5	29
portfolio choice	5	24
adoption	5	18
Red Cluster		
Keyword	Occurrences	Total link strength
access	26	133
financial inclusion	78	277
microfinance	37	129
impact	35	173
credit	26	125
india	17	86
growth	16	81
empowerment	15	67
poverty	15	63
entrepreneurship	14	60
risk	14	59
banking	13	45
women empowerment	11	41
inequality	10	49
microcredit	10	38
economic empowerment	9	40
poor	9	41
programs	9	40
sub-saharan africa	9	36
africa	8	43
business	8	36
institutions	8	39
self-efficacy	7	42
self-employment	7	30
bangladesh	5	21
consumption	5	18
countries	5	23
crisis	5	14
female entrepreneurship	5	22
finance	5	17

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Yellow Cluster		
keyword	occurrences	total link strength
inclusion	5	21
trust	5	24
women entrepreneurs	5	18

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