

The development of servant leadership research: A brief bibliometric review

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Abstract: This study presents a simple yet informative bibliometric analysis of servant leadership literature, aiming to provide a basic overview of its scholarly landscape and identify general trends. We conducted this analysis in September 2023. We focused solely on the Scopus database to understand the current state of servant leadership research. Despite extensive search efforts, we found no similar bibliometric analyses within the servant leadership domain during our study period. Therefore, our focus is to present a brief and straightforward analysis of current research in this field based on identification trends over time, connection between co-occurrence of author keywords, most and less discussed keyword, and areas of high and low concentration. Our findings show an increase in scholarly publications, reflecting a growing acknowledgment of servant leadership's relevance in management practices. Interconnected keywords and themes such as leadership, transformational leadership, job satisfaction, work engagement, authentic leadership, ethical leadership, organizational citizenship behavior, trust, and leadership development emerge prominently. Additionally, less-discussed keywords such as accountability, core self-evaluations, educational leadership, stewardship, customer orientation, and psychological well-being provide alternative perspectives on these research results. While acknowledging limitations inherent in our bibliometric research, such as potential publication bias and language restrictions, our study offers valuable insights for scholars and practitioners interested in this area.

Keywords: bibliometric research; bibliometric analysis; vosviewer; servant leadership; leadership style; organization behavior

1. Introduction

Bibliometric analysis has experienced a significant surge in popularity within the field of business research in recent years can be attributed to several key factors that have contributed to its widespread adoption and use. Bibliometric analysis has experienced a significant surge in popularity within the field of business research in recent years (Arar and Yurdakul, 2023; Bota-Avram, 2023; Rodriguez-Lora et al., 2023). This can be attributed to several key factors that have contributed to its widespread adoption and use. Firstly, the development and accessibility of advanced bibliometric software tools such as VOSviewer, Leximancer, and Gephi have played a crucial role in simplifying the process of analyzing scientific data for researchers. Furthermore, scholarly databases like Scopus and Web of Science offer an extensive collection of valuable information that is indispensable for conducting comprehensive analyses. Another factor driving this increased interest lies in the cross-disciplinary influence stemming from information science into business research practices. It is important to recognize that this remarkable rise in popularity is not merely a passing trend but rather reflects the tangible benefits offered by bibliometric

analysis methodologies. These advantages include its capacity to effectively handle vast amounts of scientific data with precision while also fostering ground-breaking outcomes with high levels of impact on further investigation or study.

Bibliometric analysis has gained significant attention among researchers for its diverse applications. Scholars utilize this method to identify emerging trends in article and journal performance, collaboration patterns, research constituents, as well as explore the intellectual structure of specific domains within existing literature (Gingras, 2016; Mejia et al., 2021). The utilization of bibliometric analysis involves extensive data sets comprised of numerous objective measures such as citations, publications, keywords, and topics. Interpreting this rich dataset requires a combination of objective techniques like performance analysis alongside subjective evaluations like thematic analysis that are guided by established procedures.

In recent years, the concept of servant leadership has emerged as a prominent and extensively studied area in leadership research (Eva et al., 2019). Scholars have recognized the significance of comprehending and assessing servant leadership within various organizational contexts, with an emphasis on human management and the well-being of followers (Eva et al., 2019; Giolito et al., 2021). Previous studies pertaining to the examination of servant leadership have focused on various approaches such as systematic literature reviews, critical evaluations, systematic literature network analyses, and theoretical review approaches for comprehensive understanding (Canavesi and Minelli, 2022; Eva et al., 2019; Hai and Van, 2021; Mcquade et al., 2021).

Based on our preliminary search in the Scopus database, it is evident that there exists a research gap in relation to conducting a bibliometric analysis specifically focused on servant leadership. The incorporation of bibliometric analysis within the study of servant leadership can offer valuable insights into the existing body of literature concerning this subject matter. It has the potential to facilitate identification of prominent scholars and influential articles within the field, explore patterns of collaboration among researchers engaged in studying servant leadership, and highlight popular keywords and themes associated with research on this topic. Furthermore, employing bibliometric analysis enables an exploration into the intellectual framework underlying servant leadership research by unveiling major subfields and key thematic areas that have garnered significant attention as well as identifying potential gaps or unexplored areas deserve further investigation. Our study seeks to bridge this gap by conducting a comprehensive bibliometric analysis of the existing research on servant leadership, we are focusing on identification trends over time, connection between co-occurrence of author keywords, most and less discussed keyword, and areas of high and low concentration.

2. Review of literature

The concept of servant leadership, introduced by Greenleaf in his influential essay in 1970, presents a new perspective and adds a certain nuance to leadership theory. Servant leaders prioritize the growth and well-being of their followers, as well as the organizations or communities they serve, contrasting with traditional leadership approaches focused on accumulating power (Frick, 2004). While Greenleaf's

description serves as a cornerstone, subsequent literature has offered diverse interpretations and conceptualizations of servant leadership. Despite the absence of an exact definition from Greenleaf himself, his essay laid the groundwork for further exploration and development of the concept.

Over recent decades, scholars have extensively examined and understood the philosophy of servant leadership (Eva et al., 2019; Karatepe et al., 2019; Liden et al., 2008; Mcquade et al., 2021; Ruiz-Palomino et al., 2023; Sendjaya and Sarros, 2002; van Dierendonck, 2011). This has led to a proliferation of research, contributing to a deeper understanding and various interpretations of servant leadership. While Liden et al. (2008) emphasize the prioritization of followers' needs for organizational success, Sendjaya (2015) advocates for a holistic approach encompassing rational, relational, ethical, emotional, and spiritual dimensions for transformative leadership. Van Dierendonck (2011) highlights servant leaders as stewards entrusted to enhance organizational resources while fostering personal development.

Despite differing interpretations, a common understanding is that servant leadership adheres to a specific framework consistent with Greenleaf's original conception. Greenleaf's emphasis on prioritizing followers' needs is reflected in Liden et al.'s (2014) dimensions, such as placing subordinates' interests first and supporting their growth. Servant leadership, as proposed by Liden et al. (2014), extends beyond prioritizing followers' needs to empowering and nurturing their growth potential, emphasizing value creation within the organization and broader community. Effective servant leadership necessitates leaders possessing essential conceptual skills and demonstrating a strong commitment to ethical behavior while understanding organizational intricacies.

3. Methodology

In conducting this bibliometric analysis, a systematic search and analysis of relevant literature on servant leadership was conducted. The procedure will be described as follows, detailing the steps taken to gather and analyze the necessary information.

4. Identification of source

For our bibliometric analysis, we chose to utilize the Scopus database as our primary source. This decision was made based on its extensive coverage and popularity among academic researchers. Various studies have shown that in fields of study beyond medicine and the physical sciences, Scopus offers more comprehensive access to sources compared to the Web of Science (Hallinger and Kovačević, 2019; Mongeon and Paul-Hus, 2016). In order to ensure inclusivity, a wide range of document types were considered for this review, including journal articles, books, book chapters, and conference papers. The Scopus search was carried out without setting a specific start date in order to capture the earliest papers available in the literature. The search string "servant leader*" OR "servant leadership" was used, yielding a total of 1681 documents based on publication date or language criteria. We included all these results to ensure comprehensive coverage of relevant literature and offer insights into the evolution of research on servant leadership over time. Our

objective is to provide a broad overview of the development of servant leadership research within the Scopus database without applying specific filters. Additionally, we aim to present a straightforward analysis. It's important to note that as of September 2023, the Scopus database did not yield any data on servant leadership and bibliometric analysis, highlighting the main objective of our study in introducing the growth trajectory of servant leadership research. The implementation of our search strategy is presented in **Figure 1**.

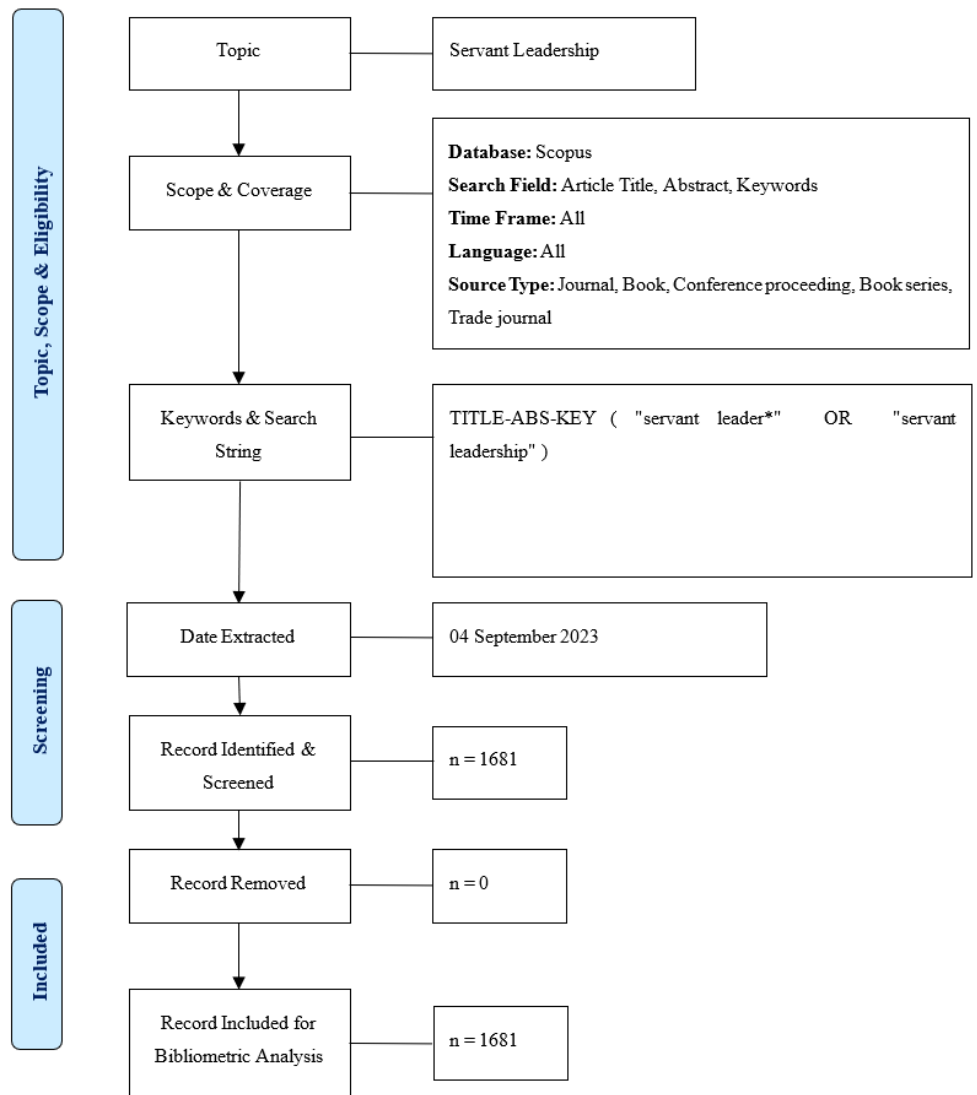


Figure 1. Flow diagram of the search strategy.

Source: Zakaria et al. (2021).

5. Data analysis

The data utilized for this review comprised bibliographic details encompassing characteristics of the 1681 documents indexed in Scopus. These metadata consisted of information such as author names, titles, publication dates, author affiliations, and extensive citation information. Trend analyses were performed using descriptive statistics to examine the growth and geographical distribution of research on servant leadership. To synthesize patterns of knowledge production in this field, bibliometric

analyses were conducted within VOSviewer software. The analysis conducted in this study utilized co-occurrence analysis to examine the keywords structure within the knowledge base.

Our research is focused on co-occurrence analysis, which has the potential to reveal the prominent themes and concepts that are extensively discussed in existing literature on servant leadership. This approach enables us to discern the intellectual framework of the field and gain insights into how various concepts within servant leadership research interrelate with one another. The analysis of keywords extracted from the documents allowed for the identification of frequently occurring terms. The keyword analysis was divided into two categories: author keywords and index keywords. Author keywords capture the key concepts and ideas that the authors consider central to their study. These keywords reflect the subjective perspective of the authors and represent their chosen focus areas, theories, methodologies, or significant elements within their work. Through author keywords, researchers aim to highlight and convey the most critical aspects of their research in a concise manner (van Eck and Waltman, 2014). In contrast, indexed keywords are formulated by the database indexers and originate from references, titles, and abstracts of the article. Their purpose is to encompass relevant concepts that authors may have overlooked in their selected keywords. Indexed keywords possess an objective quality as they strive to encapsulate the content of the paper within a wider scholarly framework (van Eck and Waltman, 2014). Our analysis will focus on single aspects of co-occurrence: analyzing author keywords. By conducting this type of analysis, we hope to gain insights into the primary focal points of the research as perceived by the authors while explore a broader comprehension of the research discourse and unveiling any interconnections or patterns within this field of study.

6. Results

The following section presents the findings of a comprehensive bibliometric analysis on servant leadership, encompassing documents published from 1977 to 2023.

6.1. Analysis of descriptive trends in servant leadership

The field of servant leadership as presented in **Figure 2** has witnessed significant growth over the past 46 years, as demonstrated by the 1681 Scopus-indexed documents published. The initial interest in servant leadership emerged in scholarly literature with a single publication recorded in 1977, followed by another in 1986. However, the number of publications steadily increased after 1991 and notably surged after 2000.



Figure 2. The growth of servant leadership publications (n = 1681).

The subsequent discussion delves into trends in author growth and collaboration within the field. An analysis of article growth on servant leadership reveals a notable increase in the involvement of authors dedicated to researching this subject over time, from 1977 to 2023. This growing interest among authors highlights both their inclination towards exploring and applying servant leadership principles in organizational contexts and an increased recognition of its significance within academic circles. The findings will be presented in **Table 1** for reference with data of top 15 authors in publication of servant leadership.

Table 1. Top 15 authors of publication in servant leadership.

Author	Total Publications (TP)
van Dierendonck, D.	27
Sendjaya, S.	16
Liden, R.C.	15
Ruiz-Palomino, P.	13
Karatepe, O.M.	11
Aboramadan, M.	10
Eva, N.	10
Patterson, K.	10
Winston, B.E.	9
Amah, O.E.	8
Khan, M.M.	8
Mahon, D.	8
Neubert, M.J.	8
Qiu, S.	8
Sousa, M.	8
Total	169

Table 2 presents the top 9 most frequently cited articles on servant leadership, along with their citation counts and publication years. The highest document citations to servant leadership is the article written by van Dierendock entitled “Servant Leadership: A Review and Synthesis.” This article offers a comprehensive understanding of servant leadership’s position in the research field. It delves into the

historical background of servant leadership, its key characteristics, available measurement tools, and presents relevant study results conducted so far.

Table 2. Top 9 most cited article in servant leadership.

Document Title	Author	Source	Year	Citations
Servant leadership: A review and synthesis	van Dierendonck, D.	<i>Journal of Management</i> , 37(4), pp. 1228–1261	(2011)	1056
Servant leadership: Development of a multidimensional measure and multi-level assessment	Liden, R.C., Wayne, S.J., Zhao, H., Henderson, D.	<i>Leadership Quarterly</i> , 19(2), pp. 161–177	(2008)	937
Leadership and procedural justice climate as antecedents of unit-level organizational citizenship behavior	Ehrhart, M.G.	<i>Personnel Psychology</i> , 57(1), pp. 61–94	(2004)	780
Do Ethical, Authentic, and Servant Leadership Explain Variance Above and Beyond Transformational Leadership? A Meta-Analysis	Hoch, J.E., Bommer, W.H., Dulebohn, J.H., Wu, D.	<i>Journal of Management</i> , 44(2), pp. 501–529	(2018)	612
Cognition-Based and Affect-Based Trust as Mediators of Leader Behavior Influences on Team Performance	Schaubroeck, J., Lam, S.S.K., Peng, A.C.	<i>Journal of Applied Psychology</i> , 96(4), pp. 863–871	(2011)	586
Servant Leadership: A systematic review and call for future research	Eva, N., Robin, M., Sendjaya, S., van Dierendonck, D., Liden, R.C.	<i>Leadership Quarterly</i> , 30(1), pp. 111–132	(2019)	580
Servant leadership and serving culture: Influence on individual and unit performance	Liden, R.C., Wayne, S.J., Liao, C., Meuser, J.D.	<i>Academy of Management Journal</i> , 57(5), pp. 1434–1452	(2014)	542
Servant Leadership, Procedural Justice Climate, Service Climate, Employee Attitudes, and Organizational Citizenship Behavior: A Cross-Level Investigation	Walumbwa, F.O., Hartnell, C.A., Oke, A.	<i>Journal of Applied Psychology</i> , 95(3), pp. 517–529	(2010)	532
Regulatory Focus as a Mediator of the Influence of Initiating Structure and Servant Leadership on Employee Behavior	Neubert, M.J., Kacmar, K.M., Carlson, D.S., Chonko, L.B., Roberts, J.A.	<i>Journal of Applied Psychology</i> , 93(6), pp. 1220–1233	(2008)	528

In terms of the country of publication origin, our research revealed that the United States has the highest number of publications with a total of 566 documents. China follows closely behind with 166 documents, and the United Kingdom with 111 documents. The findings indicate that servant leadership research is primarily dominated by scholars from the US and European countries. However, it is noteworthy that there has been an increasing awareness in Asia regarding this area of study as evidenced by significant contributions from China and other Asian countries. Understanding the geographical origins of authors in scholarly publications provides valuable insights into the global applicability of research findings. This knowledge offers a nuanced understanding of how cultural, institutional, and socio-economic factors influence study outcomes and recommendations, enhancing the credibility and relevance of the research. Moreover, it highlights trends in international research collaboration, fostering cross-cultural exchanges and knowledge-sharing. For policymakers and practitioners, this information can inform contextually relevant policies and interventions tailored to regional variations in servant leadership practices. Additionally, awareness of academic networks and research clusters facilitated by authors' countries of origin promotes interdisciplinary collaboration and knowledge dissemination, further enriching the scholarly discourse on servant leadership and

related fields. **Table 3** provides a summary overview highlighting the top 15 countries actively publishing on servant leadership.

Table 3. Top 15 countries of publication.

Country	Documents
United States	566
China	190
United Kingdom	111
Australia	91
Pakistan	90
Malaysia	69
South Africa	69
Netherlands	67
Indonesia	62
India	61
Spain	60
Canada	57
South Korea	49
Turkey	47
Italy	29
Total	1618

Table 4 presents the subject area of documents or publications in the discourse of servant leadership. The subject area of documents present in Scopus data refers to the particular discipline or field of study in which the document falls or contributes to. It gives information about the academic or research context of each document. The data of subject area provide valuable insights into the interdisciplinary nature of servant leadership, the range of academic fields that it affects or is relevant to, and how research on the topic is distributed across different fields of study. Reflection upon this aspect reveals a deeper understanding regarding its impact and reach within various academic domains.

Table 4. Top 15 subject area of documents.

Subject Area	Documents
Business, Management and Accounting	985
Social Sciences	600
Economics, Econometrics and Finance	286
Psychology	266
Arts and Humanities	212
Medicine	163
Decision Sciences	84
Nursing	81
Engineering	74
Environmental Science	72

Table 4. (Continued).

Subject Area	Documents
Computer Science	69
Energy	31
Health Professions	22
Mathematics	13
Agricultural and Biological Sciences	11

6.2. Co-occurrence of author keywords

This section will examine the frequency and trends of author keywords in servant leadership research. The discussion begins with create map based on bibliographic data. To analyze the co-occurrence, we selected the option to use a unit analysis for author keywords and employed a full counting method. Next, we chose a threshold setting with a default minimum number of occurrences set at five, resulting in a threshold value of 174 keywords. The VOSviewer software produced an image illustrating the co-occurrence of author keywords on the topic of servant leadership, as depicted in **Figure 3**.

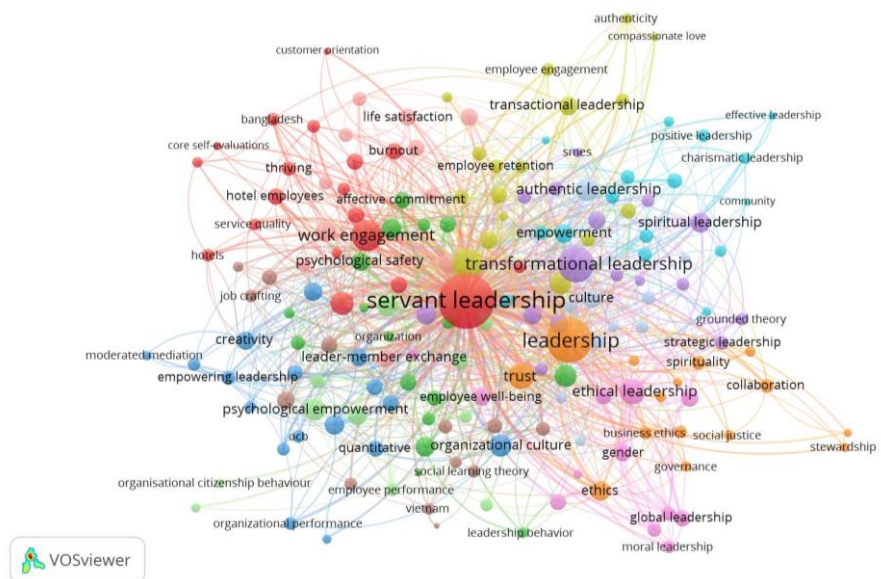


Figure 3. The network visualization image of servant leadership (based on co-occurrence of author keywords).

The node (circle) represents the result of a co-occurrence analysis of author keywords in research on servant leadership. The size of the node can be interpreted as an indication of the frequency and importance of the corresponding keyword (van Eck and Waltman, 2014). The co-occurrence of author keywords graph reveals that “servant leadership” is the predominant and central theme in the research on this topic. The prominence of servant leadership, as indicated by its large node size, highlights its significance and relevance in our bibliometric analysis. This finding aligns with the main focus of our study, which centers around exploring servant leadership. By examining the size of nodes within the graph, we can gain insights into various aspects such as topic popularity, research focus, trending topics, and keyword importance.

Node size is determined by factors such as linkages between keywords, total link strength, and frequency of occurrences (Donthu et al., 2021).

The node representing servant leadership has a weight occurrence of 896, indicating that it appears most frequently in the dataset. Additionally, the total link strength of 1393 suggests a strong association between servant leadership and other keywords within the research. This indicates that there is substantial scholarly attention dedicated to studying and exploring servant leadership as a topic. Furthermore, with a weight of 166 links, it is evident that servant leadership is connected to numerous other keywords present in the dataset. This extensive network highlights the significant body of research and literature surrounding this subject matter.

In our research, we aim to establish connections between SL node and other nodes in the co-occurrence of author keywords graph. Our goal is to explore the intricate relationships and interdependencies that exist between servant leadership and various other related keywords within this field of study. In the meantime, we analyze **Figure 3**, it becomes apparent that there are notable nodes which encompass larger significance in terms of their associated keywords. These include but are not limited to: leadership, transformational leadership, job satisfaction, work engagement, authentic leadership ethical leadership organizational citizenship behavior trust and leadership development.

As previously mentioned, we are providing an analysis of the top 10 keywords associated with servant leadership within our research dataset. The data presented in **Table 5** is extracted using VOSviewer software, which allows us to examine the co-occurrence patterns of author keywords. These keywords in **Table 5** reflect how authors perceive and prioritize key aspects of their work related to servant leadership. By studying these keyword associations, we can gain certain perspective into the underlying themes and concepts that emerge within this research field.

Table 5. Top 10 keywords co-occurrence (based on author keywords).

Label	Weight		
	Links	Total Link Strength	Occurrence
Servant leadership	166	1393	896
Transformational leadership	71	219	79
Job satisfaction	51	132	59
Work engagement	52	125	50
Authentic leadership	31	99	36
Ethical leadership	36	109	35
Organizational citizenship behavior	31	73	32
Leadership development	20	45	26
Self-efficacy	25	47	21
Higher education	22	48	21

The table has been sorted in descending order based on the weight of occurrences. This decision to sort the keywords is rooted in our understanding of occurrences, where a higher weight indicates more frequent appearance within the dataset (Donthu

et al., 2021). In our analysis, we present the top 10 keywords associated with servant leadership within our research dataset, extracted using VOSviewer software to examine co-occurrence patterns. These keywords reflect authors’ perceptions and prioritization of key aspects of servant leadership research. By studying these associations, we gain insights into the themes and concepts commonly discussed in this field. Sorting the keywords in descending order based on occurrences helps identify the most frequently discussed topics, such as Servant leadership, Transformational leadership, Job satisfaction, Work engagement, and Authentic leadership. This indicates the areas of interest and research focus within servant leadership studies.

Table 6 provides raw data from VOSviewer analysis, displaying keywords less frequently encountered in servant leadership studies. By including less commonly studied occurrences, this table offers an alternative view of servant leadership keywords, aiming to shed light on emerging themes in research. It presents keywords with lower frequencies, ensuring comprehensive analysis and facilitating a thorough understanding of servant leadership keywords.

Table 6. Bottom 10 keywords co-occurrence (based on author keywords).

Label	Weight		
	Links	Total Link Strength	Occurrence
Core Self-Evaluations	4	7	5
Educational Leadership	5	7	5
Stewardship	5	7	5
Psychological Well-Being	4	8	5
Compassionate Love	4	9	5
Organizational Climate	8	11	5
SMES	5	11	5
Paternalistic Leadership	9	12	5
Values-based Leadership	7	12	5
Workplace Spirituality	10	13	5

Figure 3 provides a visual representation of the clusters that emerged from analyzing the co-occurrence of author keywords in relation to servant leadership. These clusters represent different themes or categories that are discussed together within scholarly literature. The analysis identified a total of 12 clusters, each denoted by node color and size, which indicate the strength and frequency of co-occurrence among the keywords within each cluster. This analysis allows us to better understand the interconnectedness and common discussions surrounding various aspects of servant leadership through bibliometric techniques. The items within the clusters represent how keywords are grouped based on their co-occurrence patterns with their main topic (van Eck and Waltman, 2014). The significance of each item can be interpreted through its weight, indicating its importance or relevance in relation to servant leadership. Higher weight occurrences suggest that the keywords are significant trends or have received substantial attention in the dataset, while lower weight occurrences indicate less frequent mentions or lesser emphasis on those

particular keywords in relation to servant leadership. **Table 7** provides a comprehensive overview of each cluster in servant leadership, offering detailed information about the topics and trends. By combining this data with the weight occurrences of keywords, we can gain a deeper understanding of the prominence and significance of certain keywords within each cluster. In order to offer valuable insights, we have included the top five items with high weight occurrence values associated with these clusters.

Table 7. Top 5 keywords co-occurrence cluster.

Author Keywords	Weight Occurrences	Author Keywords	Weight Occurrences
Cluster 1 (Red)		Cluster 7 (Orange)	
Servant leadership	896	Leadership	213
Work engagement	50	Trust	32
Organizational citizenship behavior	32	Ethics	20
Hospitality	11	Spirituality	12
Perceived organizational support	11	Collaboration	8
Cluster 2 (Green)		Cluster 8 (Light Brown)	
Leadership style	20	Job performance	14
Psychological safety	17	Environmentally specific servant leadership	14
Performance	16	Innovative work behavior	13
Emotional exhaustion	14	Job crafting	11
Organizational identification	14	Corporate social responsibility	11
Cluster 3 (Dark Blue)		Cluster 9 (Pink)	
Organizational commitment	20	Ethical leadership	35
Organizational culture	18	Gender	13
Creativity	17	Entrepreneurship	9
Employee creativity	14	Leadership effectiveness	8
Meta-analysis	12	Global leadership	7
Cluster 4 (Yellow)		Cluster 10 (Light Red)	
Job satisfaction	59	Higher education	21
Management	16	Self-efficacy	21
Employee engagement	10	Leader-member exchange	14
Transactional leadership	9	Life satisfaction	13
Innovation	9	Scale development	11
Cluster 5 (Purple)		Cluster 11 (Light Green)	
Transformational leadership	79	Psychological empowerment	22
Leadership development	26	Covid-19	18
Servant leader	20	Public service motivation	14
Spiritual leadership	16	Psychological capital	13
Sustainability	14	Resilience	9
Cluster 6 (Turquoise)		Cluster 12 (Light Blue)	
Empowerment	16	Authentic leadership	36
Human resource management	11	Culture	12

Table 7. (Continued).

Author Keywords	Weight Occurrences	Author Keywords	Weight Occurrences
Humility	9	Employees	8
Nurses	7	Compassion	8
Motivation	7	Leaders	8

Table 7 provides a detailed overview of each cluster in servant leadership, highlighting key topics and trends. By correlating this data with keyword occurrences, we gain insights into the prominence of specific keywords within each cluster. The table includes the top five items with high occurrence values associated with these clusters, offering valuable insights into scholarly discussions on servant leadership. This analysis reveals patterns and trends in servant leadership research, with higher occurrence values indicating the significance of certain keywords. Conversely, lower occurrence values may suggest keywords receiving less attention or considered less significant. However, this interpretation is subjective and may vary based on individual research interests. Researchers bring unique viewpoints, resulting in variations in keyword selection and emphasis in studying servant leadership.

The analysis also includes an examination of overlay visualizations to gain insight based on publication years. By studying the trends in publications over time, we aim to provide certain insights into this area. **Figure 4** presents a visual representation of the overlay visualization for further clarity and understanding.

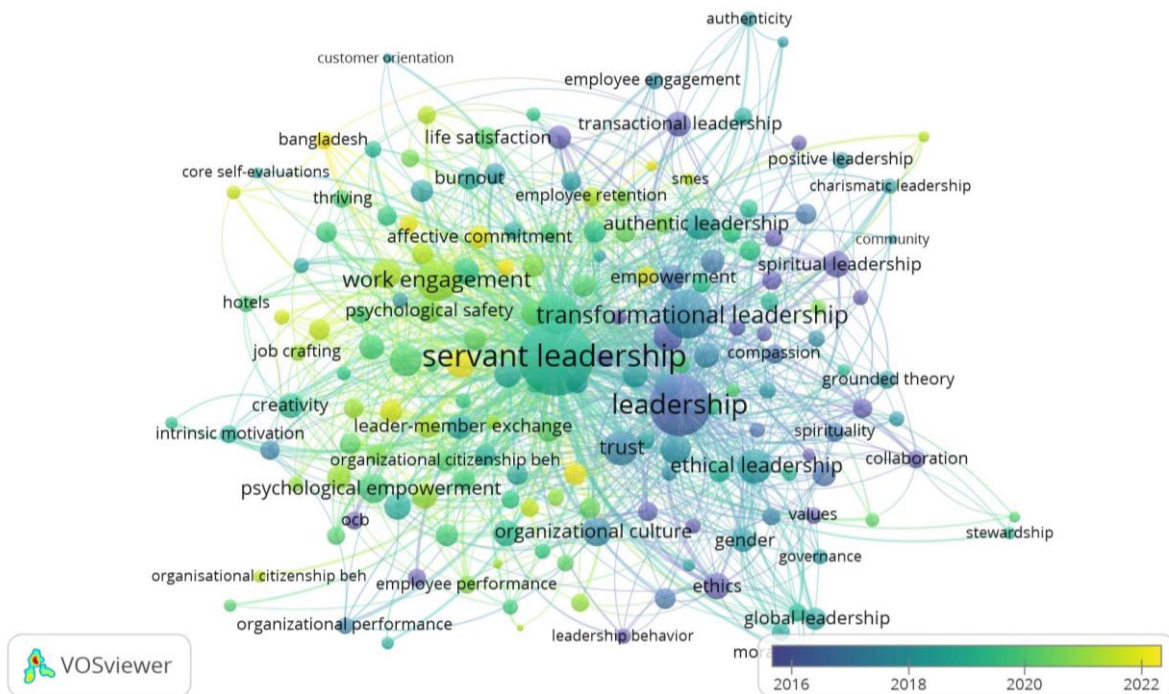


Figure 4. The image of overlay visualization publication year in servant leadership (based on co-occurrence of author keywords).

The overlay visualization of average publication years presents a visual breakdown of servant leadership publications over time, enabling researchers to discern patterns and trends. This map reflects the evolving focus and heightened

interest in servant leadership within academia, with recent research spanning from 2016 to 2023, indicating ongoing exploration in this field. It offers a comprehensive overview of how research interests in servant leadership have developed over the years, with brightness and color variations indicating publication years, from recent yellow hues to older purple shades. This visualization not only unveils emerging trends but also underscores enduring topics within servant leadership research. By analyzing publication trends over time, scholars can identify central themes and emerging areas of inquiry, providing insights into the historical growth and evolution of servant leadership as a field of study. This analysis sheds light on the dynamic nature of research interests in servant leadership, highlighting both continuity and evolution in scholarly discourse.

Density visualization offers another useful tool for analyzing trends in servant leadership research. This form of visualization allows for the identification of the concentration of research activity within specific areas or themes related to servant leadership. The following **Figure 5** displays a density visualization of servant leadership research, showing the concentration of research activity within different areas or themes.



Figure 5. The image of density visualization based on item density (based on co-occurrence of author keywords).

The color-coded areas in the visualization highlight varying densities of research publications within different themes, with brighter areas indicating higher concentrations of research activity and darker areas representing lower density. This allows for a clear understanding of how each keyword is represented relative to others. For instance, servant leadership, leadership, transformational leadership, and work engagement exhibit higher research activity densities, suggesting a strong focus on these areas in servant leadership research. The proximity of keywords to each other indicates the strength of their relationship or connection in terms of research activity. Conversely, less bright areas suggest lower research activity densities, indicating less

prevalent or explored themes in servant leadership research. However, areas with lower density may represent emerging or less explored themes, presenting valuable opportunities for further investigation and fresh insights.

7. Conclusion

The bibliometric analysis provides insights into the evolving landscape of servant leadership research, addressing key aspects outlined in our research question. Trends over time indicate significant growth in the field, particularly post-2000, highlighting a growing recognition of servant leadership's importance in academic and organizational contexts. The examination of author growth and collaboration reveals an expanding community of scholars dedicated to servant leadership, reflecting increased interest in applying its principles in organizations. Influential works like van Dierendock et al.'s highly cited document have shaped discourse on servant leadership. Geographical analysis shows the dominance of the United States in publishing on servant leadership, with significant contributions from China and the United Kingdom, indicating widespread scholarly engagement in understanding and implementing servant leadership principles. Rising contributions from Asian countries suggest a growing awareness and interest in this area, enhancing its global impact.

Our analysis reveals that servant leadership is a central theme in academic discussions, as evidenced by the interconnected keywords, indicating its widespread exploration among scholars. Notable themes such as leadership, transformational leadership, job satisfaction, work engagement, authentic leadership, ethical leadership, organizational citizenship behavior, trust, and leadership development emerge as significant areas of focus. Additionally, identifying both the most and less discussed keywords offers insight into the focal points of servant leadership research. While themes like leadership, transformational leadership, and work engagement show sustained interest, less studied keywords such as Core Self-Evaluations, Educational Leadership, Stewardship, Psychological Well-Being, Compassionate Love, Organizational Climate, SMES, Paternalistic Leadership, and more (details at **Table 6**) can provide a new point of view and an even ideas to explore the research with such keywords for further exploration.

Analyzing areas of high and low concentration offers insights into the thematic density in servant leadership research. Prominent themes like servant leadership, leadership, transformational leadership, and work engagement show higher research density. Meanwhile, less bright areas indicate emerging or less-explored themes, suggesting potential for future research. The overlay visualization and density analysis provide an understanding of temporal and thematic dynamics, with bright nodes representing recent publications and density visualization revealing prevalent areas of exploration. Our bibliometric analysis offers a simple and straightforward examination of servant leadership research, providing scholars, practitioners, and policymakers with insights to understand and contribute to this dynamic field. The findings of our research aim to offer insight for future research ideas while also briefly presenting the ongoing development of servant leadership scholarship.

Author contributions: Conceptualization, MF; methodology, MF; software, MF; validation, SJR, MP and RR; formal analysis, MF; investigation, MF; data curation, MF; writing—original draft preparation, MF; writing—review and editing, MF; supervision, SJR, MP and RR. All authors have read and agreed to the published version of the manuscript.

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