



Exploring Work Engagement Among Nurses: Insights from a Bibliometric Analysis of Global Literature

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Abstract: This study offers a thorough bibliometric analysis of international research about nursing professionals' work engagement from 2004 to 2024, utilising a sample of 494 peer-reviewed journal articles sourced from the Scopus database. In order to clarify underlying ideas, emerging themes, and important contributors, the study examines performance metrics, scientific mapping, co-citation frameworks, bibliographic coupling, and co-word interactions using analytical tools like Bibliometrix and VOS viewer. The findings reveal a noteworthy average citation rate per document (30.1), a significant yearly growth rate of 20.18%, and a propensity towards collaborative authoring with an average of 4.13 co-authors per piece. With significant contributions from institutions like Peking University and Erasmus University Rotterdam, the study is mostly focused in the US, China, and the Netherlands. Central thematic areas in the literature include burnout, job satisfaction, authenticity in leadership, and employee engagement dynamics. The thematic trajectory indicates a transition from individual-centric psychological constructs to broader systemic and institutional determinants. With implications for the creation of policies, leadership techniques, and workforce development within healthcare systems, this bibliometric analysis offers crucial insights into the conceptual framework and worldwide progress of research on nurse job engagement.

Keywords: Work engagement; Nursing; Bibliometric analysis; Burnout; Authentic leadership; Co-citation analysis; Healthcare workforce

1 Introduction

Work engagement is a vital psychological concept that reflects an employee's enthusiasm, commitment, and involvement in their work., significantly impacting organizational efficacy. It is conceptualized as a constructive mental state that bolsters productivity, innovation, and the overall well-being of employees. Work engagement signifies a positive mental state where professionals exhibit enthusiasm, dedication, and deep involvement in their occupational roles. In response to rising demands, staff shortages, and psychological strain, the healthcare sector increasingly prioritizes research on nurse engagement. It is shaped by numerous variables, including empowerment and vocational passion, and positively affects workplace satisfaction (Borrego Alés, 2016). The work engagement of nurses is articulated as a constructive state of being that encompasses physical, emotional, and cognitive commitment to their profession. Factors that affect engagement include leadership styles, collaborative practices, autonomy, and individual perceptions of nursing as a fulfilling career (Mamari & Groves, 2023). Nurse work engagement is driven by intrinsic motivation, resulting in a sense of accomplishment and increased productivity. It includes cognitive, physical, emotional, and behavioral aspects of engagement, ensuring that nurses remain dedicated, involved, connected, and vigilant in their duties and patient care (Rasheedi & Chandra, 2024). Heightened levels of engagement are associated with diminished burnout and secondary traumatic stress, thereby enhancing job satisfaction and improving the quality of patient care (Wei et al., 2024).

Scholarly interest in this field has significantly increased over the last 20 years, producing a varied and interdisciplinary body of writing. Few studies have thoroughly described the field's intellectual framework, key



contributions, new trends, and knowledge clusters, despite the growing scholarly interest. A systematic method for quantitatively analysing trends and advancements in academic publications is offered by bibliometric techniques. Together, these methods—which include co-word analysis, bibliographic coupling, co-citation analysis, and performance metrics—can shed light on conceptual advancements, networks of collaboration, and foundational works that influence the conversation about nursing job engagement.

The subsequent research concerns are addressed in this study:

1. In the field of work engagement among nurses, which authors, institutions, and countries have exhibited the highest research productivity and impact?
2. In this domain, which theoretical frameworks and foundational studies have had the most significant impact on research, as indicated by co-citation clusters?
3. Which emerging research fronts in the study of work engagement among nurses are represented by recent publications that share strong bibliographic coupling?
4. What are the main themes and research trends that have evolved in relation to work engagement in nursing over time?

A bibliometric analysis of academic research can yield significant insights into the existing body of knowledge, highlight prevailing research trends, and uncover gaps and opportunities for future exploration. This study seeks to delineate the academic framework surrounding research on work engagement among nurses through a thorough analysis of pertinent publications. It will identify key themes, notable authors, influential journals, and significant research trends within this domain.

2 Methodology

The purpose of this study is to use bibliometric analysis to improve knowledge of current engagement research. Bibliometric analysis is a statistical method employed to quantitatively evaluate scientific research outputs. (Benckendorff & Zehrer, 2013). To analyse immense quantities of unstructured data, bibliometric analysis is a method used (Donthu et al., 2021). This study employs a bibliometric analysis using the Vos Viewer program and the Bibliometrix tool (Aria & Cuccurullo, 2017). A well-known and sizable collection of peer-reviewed literature, the SCOPUS database, provided the dataset for this study. Scopus offers comprehensive coverage in a number of topics, which is appropriate given the breadth of the research. In Table 1, the entire study framework is displayed. To obtain the articles, the following keyword string was used:

(TITLE-ABS-KEY ("work engagement") AND TITLE-ABS-KEY ("nurse" OR "nurses" OR "nursing staff")) AND (LIMIT-TO (SUBJAREA , "BUSI") OR LIMIT-TO (SUBJAREA , "NURS") OR LIMIT-TO (SUBJAREA , "SOCI")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (LANGUAGE , "English"))

To ensure the dataset included peer-reviewed scientific material, further filters were applied to limit the findings to journal articles. The study concentrated specifically on publications within nursing, business, and social science disciplines, thereby narrowing its analytical scope to these selected fields. Only final-stage publications written in English were included in the search. The search query produced 617 items as of January 7, 2025.

A final dataset comprising 494 articles was acquired for further analysis after the articles' content relevance was assessed and those that had nothing to do with the research topic were removed after their abstracts were reviewed. The 494 entries in the collection, which covers 20 years from 2004 to 2024, are drawn from 175 different books, journals, and other scholarly sources. The articles' yearly growth rate of 20.18% suggests that research interest in the topic is steadily increasing. With an average of 30.1 citations per document and an average age of 5 years, the



materials have a significant intellectual influence. Significant interaction with the literature was demonstrated by the 21,029 references that were referenced across the corpus. A total of 1,162 Author Keywords (DE) and 1,252 Keywords Plus (ID) were found, representing a variety of changing research trends. Authorship demonstrates a high level of collaboration, featuring 1,694 contributing authors and an average of 4.13 co-authors per work. Of the 30 papers, 26 were written by several authors, and the rest were written by one person. With a worldwide cooperation rate of 19.43%, international academic interaction is moderate yet notable. The fact that all 494 records are categorised as journal papers highlights how official and peer-reviewed the contributions are.

There were two stages to the study: performance evaluation and scientific mapping. Research elements' contributions to a particular field of study are evaluated using performance analysis (Ramos-Rodríguez & Ruíz-Navarro, 2004). Each research body's annual publication and citation counts are the primary metrics. Science mapping can be employed in bibliometric analysis to elucidate the bibliometric and intellectual frameworks within a specific domain, including co-word analysis, bibliometric coupling, and co-citation analysis, in order to examine the relationships between research elements (Donthu et al., 2021). A scientific mapping approach called co-citation analysis is predicated on the idea that papers that are often referenced together share themes (Hjørland, 2013). Bibliographic coupling assumes that documents referencing the same sources likely share similar content and themes. (Kessler, 1963). Co-word analysis explores the conceptual framework of a research issue by using the key phrases or keywords of documents (Callon et al., 1983).

Table 1: Data retrieval procedure using Scopus

Description	Results
Timespan	2004:2024
Sources (Journals, Books, etc)	175
Documents	494
Annual Growth Rate %	20.18
Document Average Age	5
Average citations per doc	30.1
References	21029
DOCUMENT CONTENTS	
Keywords Plus (ID)	1252
Author's Keywords (DE)	1162
AUTHORS	
Authors	1694
Authors of single-authored docs	26
AUTHORS COLLABORATION	
Single-authored docs	30
Co-Authors per Doc	4.13
International co-authorships %	19.43
DOCUMENT TYPES	
article	494

3 Analysis

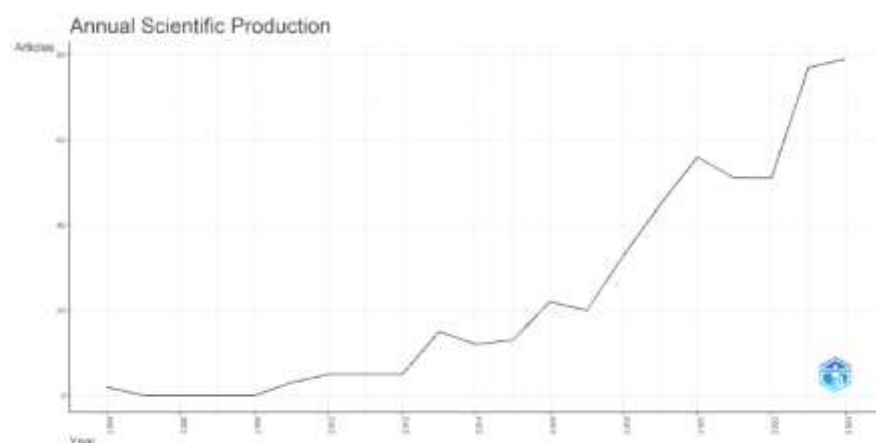
This section presents the findings obtained from the bibliometric analysis performed to achieve the objectives of this study. The analysis presents critical insights regarding the existing body of knowledge, significant contributors, and prominent organisations that are advancing research in this field.

3.1 Performance Analysis

3.1.1 Publication activity of work engagement research

From 2004 to 2021, the amount of work engagement (Figure 1) research published expanded dramatically, indicating its increasing importance in a variety of academic fields. With the creation of validated assessment tools and more multidisciplinary participation, research has grown steadily since 2010. From 2017 to 2020, there was a notable increase in publications, attributed to growing organisational concerns regarding staff productivity, well-being, and burnout. By 2021, the subject has progressed to a notable degree of scholarly output, underscoring its considerable importance in both theoretical inquiry and practical implementation.

Figure 1: Publication activity of work engagement research



3.1.2 Notable authors, institutions, and countries in the field of work engagement research

The field of work engagement research has been profoundly influenced by a notable array of prominent authors, nations, and organisations, as illustrated in Table 2. Carol A. Wong is the most referenced author, with a total of 694 citations from three articles. Arnold B. Bakker and Jef Adriaenssens have made significant contributions to the field, with each author accumulating over 500 citations. The experts have clarified key information regarding the organisational and psychological aspects of employee engagement. China and the Netherlands, recognised for their significant intellectual contributions in both Western and Eastern academic fields, rank second and third, respectively, following the United States, which leads with 88 publications and 2,150 citations, reflecting a strong and ongoing research output. Erasmus University Rotterdam in the Netherlands and Peking University in China are distinguished hubs of scientific research, generating a substantial volume of high-impact publications. Significantly, two prominent contributors, Lingnan University in Hong Kong and the University of Western Ontario in Canada have emerged as significant contributors, illustrating the transcontinental dissemination of work engagement research. These notable researchers and organisations have developed a thorough empirical and theoretical framework that has influenced the diversity and evolution of the literature on job engagement.



Table 2: Leading authors, nations, and institutions in the field of work engagement research

TC	Author	TP	TC	Country	TP	TC	Institution	TP
694	Wong, Carol A.	3	2150	United States	88	459	Peking University, Beijing, China	9
667	Bakker, Arnold B.	3	2084	China	84	341	Lingnan University, Hong Kong	1
523	Adriaenssens, Jef	4	1820	Netherlands	30	341	Erasmus University Rotterdam, Netherlands	1
510	Spence Laschinger, Heather K.	3	1745	Spain	32	341	Universidad Autónoma De Madrid, Spain	1
482	Wan, Qiaoqin	10	1716	Canada	28	327	Universidade De Lisboa, Portugal	1
406	Lorente, Laura	2	1011	Australia	37	327	Universitat De València, Spain	1
406	Martínez, Isabel M.	2	837	Belgium	14	327	Universitat Jaume I, Spain	1
353	Shang, Shaomei	6	773	Portugal	15	326	Eindhoven University of Technology, Netherlands	2
351	Demerouti, Evangelia	3	765	Italy	11	326	Erasmus University Rotterdam, Netherlands	2
343	Fernández-Castro, Jordi	5	673	United Kingdom	23	326	Lingnan University, Hong Kong	2
343	García-Sierra, Rosa	5	515	Japan	30	286	University of Alberta, Edmonton, Ab, Canada	1
341	Sanz-Vergel, Ana Isabel	1	374	Saudi Arabia	14	286	University of Western Ontario, London, On, Canada	1
339	De Gucht, Veronique	2	363	Egypt	12	280	University Of Cagliari, Italy	1
339	Maes, Stan	2	359	New Zealand	5	252	Sheridan College, Brampton, on, Canada	1
327	Chambel, Maria J.	1	311	Taiwan	8	252	University of Western Ontario, London, on, Canada	1

Notes: TP =total publications, TC =total citations



3.13 Key journals in the field of work engagement research

Nursing and healthcare papers provide a substantial segment of the leading journals' contributions to work engagement research (Table 3), underscoring the discipline's essential role in examining employee well-being. The publication of Nursing Management, being the foremost publication in the area, has published 65 articles and garnered 3,276 citations historically, with notable growth commencing in 2016. The Journal of Advanced Nursing has demonstrated significant impact, as indicated by 2074 citations across 33 publications, showcasing a steady output from 2011 to 2024. The International Journal of Nursing Studies and the Journal of Clinical Nursing each have 16 publications and together have received more than 700 citations. Journals including BMC Nursing, Healthcare (Switzerland), and International Nursing Review have markedly enhanced their contributions, especially post-2021, reflecting an increased focus on contemporary topics related to job engagement, such as remote care settings and resilience.

Table 3: Contribution of leading journals to research on work engagement

Source	TC	TP	2004 - 2010	2011 - 2015	2016- 20	2021 -2024
Journal of Nursing Management	3276	65	4	8	23	30
Journal of Advanced Nursing	2074	33		6	13	14
International Journal of Nursing Studies	735	16	1	3	7	5
Journal of Clinical Nursing	723	16		3	7	6
Applied Nursing Research	542	5			5	
BMC Nursing	351	25			1	24
Western Journal of Nursing Research	329	6	1		4	1
Health Care Management Review	236	7		1	4	2
International Nursing Review	234	16			5	11
Journal of Nursing Administration	225	9			5	4
Healthcare (Switzerland)	173	15			1	14
Nursing and Health Sciences	123	6	1		2	3
Journal of Research in Nursing	104	5		2		3



Japan Journal of Nursing Science	81	5		1	2	2
Nursing Open	63	10				10

Notes: TP =total publications, TC =total citations

3.1.4 Leading articles in the field of work engagement research

The field of work engagement research has been significantly shaped by numerous well-cited academic studies, primarily focussing on the healthcare and nursing industries. The research conducted by Bakker and Sanz-Vergel (2013) holds considerable significance, evidenced by its 341 citations, which highlight its foundational importance in the conceptualisation of engagement through the job demands-resources (JD-R) model. Salanova et al. (2011) has garnered 327 citations, highlighting the mediating roles of job engagement and self-efficacy in linking transformational leadership to the extra-role performance of nurses. The leadership-centric perspective is apparent in Wong et al. (2010) and Giallonardo et al. (2010), which investigate the impact of genuine leadership on nurses' engagement, work satisfaction, and perceptions of care quality, garnering 286 and 252 citations, respectively. These contributions have established leadership as a vital area of focus in engagement research. De Simone et al. (2018) and Laschinger (2012) expanded the existing knowledge base by investigating the influence of job engagement, alongside self-efficacy and career satisfaction, on nurses' turnover intentions and patient outcomes. The findings, cited 280 and 248 times respectively, are particularly relevant for understanding employee retention in healthcare organisations. Gordon et al. (2018) made significant contributions to the field of job crafting, as evidenced by 209 citations. Similarly, Adriaenssens et al. (2015) focused on occupational stress in emergency nurses, garnering 207 citations. Both studies enhance the practical application of engagement concepts within clinical settings. The research conducted by Lai et al. (2020) and Moloney et al. (2018) extends the JD-R framework by integrating leadership and organisational commitment, thereby contributing to the advancement of the discipline. The studies referenced herein collectively demonstrate the complex and multidisciplinary nature of work engagement research, highlighting the roles of leadership, well-being, and organisational outcomes in high-stress professional environments.

Table 4: Key articles on work engagement research from 2001 to 2024

Author(s)	Title	TC
Bakker & Sanz-Vergel, (2013)	“Weekly work engagement and flourishing: The role of hindrance and challenge job demands”	341
Salanova et al., (2011)	“Linking transformational leadership to nurses' extra-role performance: The mediating role of self-efficacy and work engagement”	327
Wong et al., (2010)	“Authentic leadership and nurses' voice behaviour and perceptions of care quality”	286
De Simone et al., (2018)	“The role of job satisfaction, work engagement, self-efficacy and agentic capacities on nurses' turnover intention and patient satisfaction”	280
Giallonardo et al., (2010)	“Authentic leadership of preceptors: Predictor of new graduate nurses' work engagement and job satisfaction”	252



Laschinger, (2012)	“Job and career satisfaction and turnover intentions of newly graduated nurses”	248
Gordon et al., (2018)	“Individual job redesign: Job crafting interventions in healthcare”	209
Adriaenssens et al., (2015)	“Causes and consequences of occupational stress in emergency nurses, a longitudinal study”	207
Lai et al., (2020)	“Transformational Leadership and Job Performance: The Mediating Role of Work Engagement”	202
Moloney et al., (2018)	“Factors predicting Registered Nurses’ intentions to leave their organization and profession: A job demands-resources framework”	174
Van Bogaert et al., (2017)	“Predictors of burnout, work engagement and nurse reported job outcomes and quality of care: A mixed method study”	172
Fiabane et al., (2013)	“Work engagement and occupational stress in nurses and other healthcare workers: The role of organisational and personal factors”	169
García-Sierra et al., (2016)	“Work engagement in nursing: An integrative review of the literature”	162
Bamford et al., (2013)	“The influence of authentic leadership and areas of worklife on work engagement of registered nurses”	156
Mason et al., (2014)	“Compassion fatigue, moral distress, and work engagement in surgical intensive care unit trauma nurses: A pilot study”	151

Notes: TC =total citations

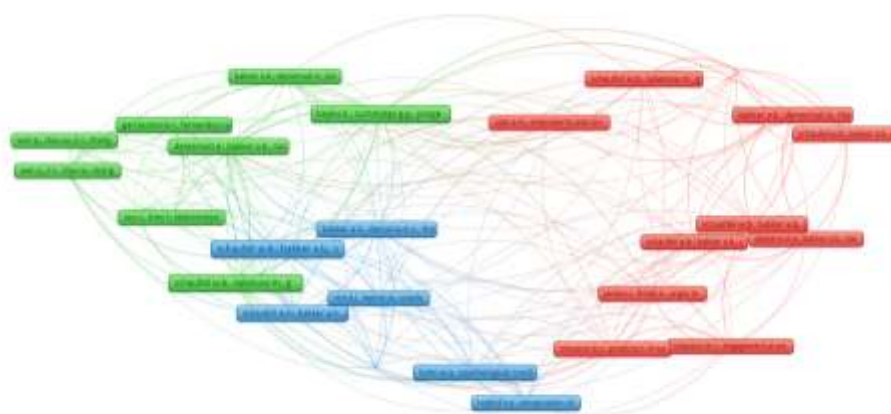
3.2 Science Mapping

3.2.1 Knowledge foundations of work engagement research through co-citation analysis

A structured intellectual landscape is created by the co-citation analysis of work engagement literature (Figure 2), which is separated into three different topic categories according to scholarly publications that are commonly co-cited. These groups carry out empirical studies, offer research frameworks, and embody fundamental ideas that collectively influence the field. Work engagement research's fundamental theoretical and empirical underpinnings are indicated by Cluster 1 (Red). Bakker, Demerouti, and Schaufeli's groundbreaking work from this cluster focusses on the Job Demands–Resources (JD-R) model, the burnout–engagement continuum, and the organisational predecessors of engagement. Maslach, Saks, and Simpson, who study leadership, role-specific behaviours, and engagement, have made significant contributions to it. This cluster's concentration of citations highlights its significance and long-lasting impact on future research avenues. Cluster 2 (Green) emphasises how work engagement themes may be applied broadly and across disciplines. Studies relating engagement to cross-cultural analysis, healthcare, and organisational performance are included. Writers like Wan Q., Garcia-Sierra R., and Cao X. enhance context-specific knowledge, particularly in Asian and nursing work environments. The existence of collaboration study involving academics from various geographic places is indicative of the

increasing globalisation of engagement research. The theoretical foundations and psychological concepts that support work engagement are included in Cluster 3 (Blue). Kahn's (1990) fundamental framework of psychological conditions and Hobfoll's Conservation of Resources theory, which was further developed by Rich, Lepine, and Crawford, are notable contributions in this area. This collection of co-cited publications contributes to continuing discussions about measurement and construct validity and serves as the psychological underpinning for empirical models of involvement. A high degree of connection both inside and across clusters is evident from the network map, especially between academics who connect theoretical advancements with empirical research, such as Schaufeli, Bakker, and Demerouti. The well-organised format and strong citations support the development of work engagement as a field supported by reliable theory, well-established models, and a wide range of empirical applications.

Figure 2: Knowledge foundations of work engagement research



3.2.2 Thematic clusters for work engagement research through bibliographic coupling

This study uses bibliographic coupling to further explore the scholarly landscape of work engagement, building on the fundamental knowledge presented in the previous section. As shown in Table 5 and Figure 3, the thematic categorisation produced by this approach identifies four core clusters that are essential to work engagement research in the nursing field: Work Engagement, Authentic Leadership, Burnout, and Job Satisfaction. The most significant articles in each cluster are highlighted in the table.

Cluster 1 (Red Cluster) , is centred on work engagement. Bakker & Sanz-Vergel (2013), Salanova et al. (2011), and Gordon et al. (2018) have the highest number of citations in this cluster, with 341, 327, and 209 citations, respectively. The different impacts of job demands—classified as challenge and hindrance—on weekly work engagement and psychological flourishing are critically examined by Bakker and Sanz-Vergel (2013). According to their findings, unless they are excessive, challenge demands can increase engagement and well-being while hindrance demands consistently lower both. Gordon et al. (2018) investigate job crafting interventions in healthcare, which allow medical professionals, including nurses, to proactively rethink their roles to better fit institutional requirements and individual needs. These interventions are based on the Job Demands-Resources (JD-R) model. According to Salanova et al. (2011), transformational leadership has a positive impact on nurses' self-efficacy and work engagement, which results in discretionary work practices that are advantageous to healthcare institutions. Together, these studies support the complex nature of work engagement and the vital roles that job design and leadership play for preserving it.

Cluster 2 (Green Cluster), discusses Authentic Leadership in connection to nurses' involvement at work. Laschinger (2012), Giallonardo et al. (2010), and Wong et al. (2010) had the most citations (286, 252, and 248

citations, respectively). The impact of authentic leadership on nurses' trust, engagement, voice behaviour, and perceived quality of care is evaluated by Wong et al. (2010), who conclude that authentic leadership is a major factor in creating a supportive and open work environment. In their study of recently graduated nurses, Giallonardo et al. (2010) demonstrate how preceptors who exhibit genuine leadership traits greatly increase the engagement and job happiness of inexperienced employees. Laschinger (2012) further explores early career experiences, noting that although new nurses are generally satisfied, organizational factors contribute to high turnover intentions—highlighting the need for system-level interventions.

Cluster 3 (Blue Cluster) encompasses research on Burnout. The leading articles in this group are authored by Adriaenssens et al. (2015, 2011) and Van Bogaert et al. (2017), with 207, 132, and 172 citations, respectively. Adriaenssens et al. (2015) investigate occupational stress among emergency nurses and conclude that organizational stressors critically influence job satisfaction and retention. Van Bogaert et al. (2017) use a mixed-methods approach to analyze how the psychosocial work environment, burnout, and work engagement affect job outcomes and care quality, revealing complex interdependencies. The earlier study by Adriaenssens et al. (2011) identifies predictors such as decision authority, skill discretion, social support, and reward systems as significant factors in reducing stress and improving engagement and satisfaction. Together, these studies underscore the systemic contributors to burnout and the importance of targeted organizational interventions.

Cluster 4 (Yellow Cluster) deals with Job Satisfaction. The most cited contributions in this domain are from De Simone et al. (2018), Fiabane et al. (2013), and Antoinette Bargagliotti (2012). De Simone et al. (2018) emphasize that job satisfaction, work engagement, self-efficacy, and agentic capacities are key psychosocial resources for nurse retention and high-quality patient care, with job satisfaction playing a mediating role in turnover intentions. Fiabane et al. (2013) adopt a holistic approach to occupational stress and engagement, suggesting that interventions must address both individual well-being and organizational context. Bargagliotti (2012) provides a conceptual analysis of work engagement in nursing, advocating for a focus on trust and autonomy rather than a purely transactional demands-resources framework.

In conclusion, bibliographic coupling reveals a rich and interconnected body of literature that situates work engagement in nursing within broader themes of leadership, burnout, and job satisfaction, underscoring the need for integrative strategies that simultaneously support individual nurses and enhance organizational effectiveness.

Figure 3: Thematic clusters for work engagement research

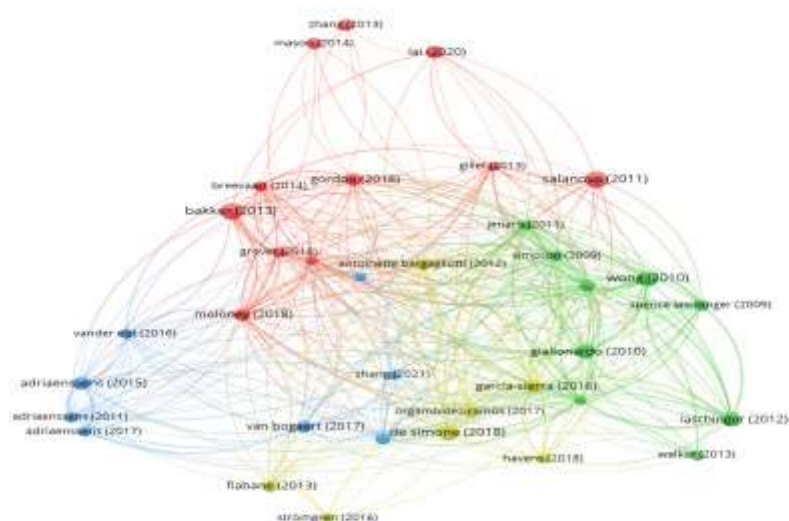


Table 5: Thematic clusters of Work engagement Research through Bibliometric Coupling

Clusters	Author(s)	Title	TC
Work Engagement	Bakker & Sanz-Vergel, (2013)	“Weekly work engagement and flourishing: The role of hindrance and challenge job demands”	341
	Salanova et al., (2011)	“Linking transformational leadership to nurses' extra-role performance: The mediating role of self-efficacy and work engagement”	327
	Gordon et al., (2018)	“Individual job redesign: Job crafting interventions in healthcare”	209
Authentic leadership	Wong et al., (2010)	“Authentic leadership and nurses' voice behaviour and perceptions of care quality”	286
	Giallonardo et al., (2010)	“Authentic leadership of preceptors: Predictor of new graduate nurses' work engagement and job satisfaction”	252
	Laschinger, (2012)	“Job and career satisfaction and turnover intentions of newly graduated nurses”	248
Burnout	Adriaenssens et al., (2015)	“Causes and consequences of occupational stress in emergency nurses, a longitudinal study”	207
	Van Bogaert et al., (2017)	“Predictors of burnout, work engagement and nurse reported job outcomes and quality of care: A mixed method study”	172
	Adriaenssens et al., (2011)	“Exploring the burden of emergency care: Predictors of stress-health outcomes in emergency nurses”	132
Job satisfaction	De Simone et al., (2018)	“The role of job satisfaction, work engagement, self-efficacy and agentic capacities on nurses' turnover intention and patient satisfaction”	280
	Fiabane et al., (2013)	“Work engagement and occupational stress in nurses and other healthcare workers: The role of organisational and personal factors”	169
	Antoinette Bargagliotti, (2012)	“Work engagement in nursing: A concept analysis”	149

Notes: TC =total citations

3.2.3 Thematic trends established in the discipline of Work engagement research through Co-occurrence analysis

Keyword co-occurrence analysis is a widely utilised bibliometric technique that examines the frequency and patterns of phrases appearing together in academic literature, aiding in the clarification of the conceptual framework surrounding a research topic. This approach makes work engagement research easier to understand and allows for the categorisation of related topics that form its conceptual framework. The co-occurrence network presented in figure 4 illustrates a systematic relationship among key elements, including leadership, job demands, mental health, nurse retention, and employee engagement. The basic concept is work engagement, with additional clusters representing the more general spheres of human resource development, occupational health psychology, and organisational behaviour. Each node's size indicates the frequency of a keyword, and the colour-coded clusters show the different types of issues, such as workforce sustainability, leadership paradigms, and psychological well-being. This study shows the development of related concepts while highlighting the significance of job engagement in influencing nursing and healthcare outcomes. The interaction of moral distress, burnout, and compassion fatigue highlights the negative effects of stress, while associations with resilience, support, and genuine leadership point to moderating aspects that improve worker well-being.

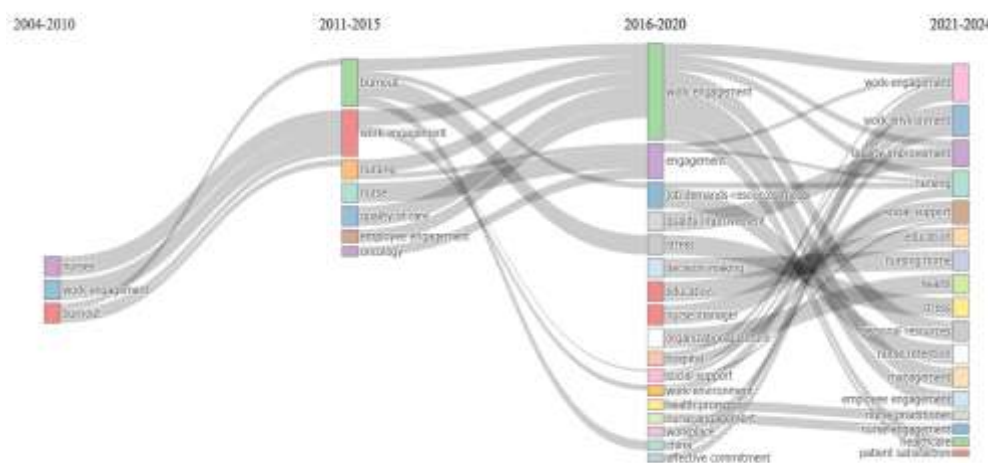
Figure 4: Thematic trends of Work engagement research through Co-occurrence analysis



The co-occurrence analysis, organised by time intervals (Figure 5), demonstrates the progression of topic focus and conceptual advancement in work engagement research from 2004 to 2024. In the initial phase (2004–2010), the literature concentrated on broad themes including nursing, job engagement, and burnout, reflecting a growing interest in occupational health and emotional distress in the healthcare sector. Between 2011 and 2015, the study expanded its focus to encompass areas such as quality of care, nursing, employee engagement, and cancer. This shift indicates a heightened emphasis on performance outcomes and the specialised applications of engagement theory. Burnout and job engagement persist, highlighting the relationship between psychological stress and engagement as a continuous subject of investigation. The period from 2016 to 2020 marked a notable shift towards theoretical advancement and organisational execution, highlighted by the significance of the Job Demands–Resources (JD-R) model, decision-making processes, and the interplay of organisational culture as frequently related factors. The terms health promotion, workplace, and education illustrate a comprehensive systemic approach to understanding participation beyond individual responsibilities. The current phase, spanning from 2021 to 2024, demonstrates notable conceptual diversity and practical integration. The text highlights terminology

such as quality improvement, nursing home, nurse practitioner, personal resources, and patient satisfaction, while emphasising recurring themes related to work environment, stress, and social support. The importance of employee engagement, management, and healthcare highlights an increased implementation of engagement frameworks in both organisational and clinical settings.

Figure 5: Thematic evolution of Work engagement research through Co-occurrence analysis



4 Discussion

This bibliometric analysis has identified the intellectual, conceptual, and collaborative frameworks that shape global research on work engagement within the nursing field. The performance analysis revealed a consistent upward trend in publishing from 2004 to 2024, with a notable increase in research output post-2017. This rise aligns with an increased institutional focus on issues such as burnout, staff turnover, and the quality of care within healthcare settings. The contributions of scholars such as Wong, Bakker, and Adriaenssens underscore the critical influence of psychological and organisational models, particularly the Job Demands–Resources (JD-R) framework, on the discourse. Scholarly contributions and citation impact are predominantly concentrated in countries including the United States, China, and the Netherlands. Notable institutions such as Peking University and Erasmus University serve as significant academic hubs within this field. The global increase in co-authorships, albeit modest, indicates a developing trend in international collaboration, especially in addressing context-specific challenges such as emergency nursing, turnover intention, and leadership effectiveness. The co-citation mapping revealed a structured knowledge architecture consisting of three primary intellectual domains that support the theoretical and empirical advancement of the field. This triangulation highlights the maturity of the field, demonstrating robust connections between foundational theorists and empirical researchers. Bibliographic coupling provided additional validation for the consistency of themes within the literature, focussing on authentic leadership, burnout, job satisfaction, and strategies for improving engagement. The thematic groupings indicate a consistent impact of leadership dynamics and institutional support on engagement-related outcomes across various studies. Co-word and co-occurrence analyses have demonstrated the dynamic nature of the discourse. Previous research focused on emotional labour and burnout has transitioned in recent years to encompass themes of leadership, resilience, and systemic improvements. Thematic development signifies a shift from evaluations centred on individuals to those that analyse broader organisational and structural transformations. Terms such as "patient satisfaction," "personal resources," and "nursing home" are prevalent in the literature, reflecting both conceptual diversity and the practical application of job engagement theory within healthcare environments.



5 Conclusion

This bibliometric study provides a comprehensive and systematic examination of the global literature concerning job engagement among nurses, offering critical insights into its conceptual framework, thematic evolution, and research dynamics. The findings indicate that work engagement is a complex concept essential to nursing practice, significantly impacting staff retention, the quality of patient care, and organisational resilience. The research has pinpointed key authors, journals, institutions, and emerging themes that define the field by employing a combination of performance analysis, co-word mapping, bibliographic coupling, and co-citation techniques. The JD-R model plays a crucial role, highlighting the significance of authentic leadership while addressing ongoing challenges related to burnout and job satisfaction. These factors collectively shape both the theoretical frameworks and practical applications in current research.

The study emphasises the necessity for continuous collaboration across multiple disciplines, improved geographical representation, and more comprehensive analytical approaches as the healthcare sector addresses complex workforce issues. These factors will be essential for addressing future challenges in nurse engagement, such as digital transformation, ageing populations, and workforce resilience in the post-pandemic context. This bibliometric study provides insights that guide future research priorities, improve evidence-based leadership strategies, and support the development of sustainable and engaging work environments for nurses globally.

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