
The Evolution of Employee Well-Being Interest in Management Sciences: Bibliometric and Scientometric Analyses

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Iwona Oleniuch¹

Abstract:

Purpose: The purpose of this paper is to assess the state of research on employee well-being and to answer the following questions: Q1. What was, is and will be the research context related to employee well-being? Q2. Who is the most influential author who it is worth collaborating with in research? Q3. Which scientific organizations should be contacted when planning research projects? Q4. In which journals should one publish to reach the largest number of people interested in the issue of employee well-being?

Design/Methodology/Approach: The analysis covered publications obtained from the Web of Science Core Collection for the period from 1989 (the first publication in this area of knowledge) to the end of 2023. The collection consisted of 1,720 items. The VOSviewer program was used for the scientometric analysis, and UCINET 6 for Windows with the NetDraw 2 application for the analysis of centrality measures.

Findings: The analyses allowed us to answer the following questions: Q1. The most important research contexts are employee well-being considered from the employee's perspective, the importance of employee well-being for the organization and employee well-being in the context of leadership. An evolution of interest can be observed from the initial search for definitions of concepts and theoretical models to the currently prevailing practical research using statistical modeling. Further multidisciplinary practical research should be expected, using modeling and developing specific diagnostic tools for the needs of management sciences. Q2. Based on the analysis of centrality measures, the following can be recommended as potential co-authors for further research: B.A. Bakker, A. van den Broeck, M. van Veldhoven and H. de Witte. Q3. The organizations that create the greatest potential for cooperation in projects in the field of employee well-being are: Erasmus University Rotterdam and Katholieke Universiteit Leuven. Q4. The first-choice journals for researchers studying employee well-being in the context of management should be: Personnel Review, International Journal of Human Resource Management and Journal of Occupational and Organizational Psychology.

Practical Implications: The obtained results may be a hint for scientists interested in various contexts of employee well-being for further research and for cooperation with indicated researchers and organizations. Taking into account the indications resulting from the study should increase the effectiveness of disseminating the results of their research and acquired knowledge.

¹Dr., Rzeszow University of Technology, Department of Management, Poland,
e-mail: iwonaole@prz.edu.pl;

Originality/Value: *This is the first article to undertake scientometric research and analyze centrality measures in the field of employee well-being. This topic, although considered in the context of management sciences for 35 years, has not yet been analyzed in this way. This study helps fill this research gap.*

Keywords: *Bibliometric analysis, scientometric analysis, employee well-being, VOSviewer, betweenness centrality, eigenvector centrality.*

JEL codes: *I31, M12.*

Paper type: *Research article.*

1. Introduction

The concept of well-being (Dodge, 2012; Kuzmina *et al.*, 2023) is enjoying increasing interest among management and business researchers (Jambrino-Maldonado, 2022). This was particularly noticeable during the COVID-19 pandemic when its effects were analyzed in various contexts (Zacher, 2021; Núñez-Sánchez, 2021). One of them was the impact of the pandemic on employee well-being. However, in spite of the growing interest, employee well-being has not yet received systematic bibliographic research.

The purpose of this article is to fill the existing research gap and obtaining answers to questions that will allow researchers interested in the subject of employee well-being to increase the effectiveness of disseminating the results of their research and the knowledge acquired:

Q1. What was, is and will be the research context related to employee well-being?

Q2. Who is the most influential author who it is worth collaborating with in research?

Q3. Which scientific organizations should be contacted when planning research projects?

Q4. In which journals should one publish to reach the largest number of people interested in the issue of employee well-being?

The analysis based on bibliometric data gives deep insight into the structure of a research field using a broad overview of the literature on a particular topic. It is especially useful when dealing with complex topics that cannot easily be represented by one or a few keywords or terms (Rodrigues, 2014).

Scientometric methods are also called "science mapping" (Waltman, 2010; van Eck, 2007; Chandra, 2018). As emphasized by C. Chen and M. Song, systematic scientometric reviews, empowered by computational and visual analytic approaches,

offer opportunities to improve the timeliness, accessibility, and reproducibility of studies of the literature of a field of research. It is especially useful nowadays because effectively and adequately identifying the most representative body of scholarly publications as the basis of subsequent analyses remains a common bottleneck in the time of big data and the information noise associated with it (Chen, 2019).

The most popular types of scientific maps assessing the state of knowledge in a given discipline are those descriptive terms or words (microanalysis), documents or authors (mezoanalysis) and journals (macroanalysis), which means that illustrate the research context. On the other hand there can be also created nets that show relations in the scientific domain or between domains. The nodes in those nets are authors, scientific organizations and countries. Each type of visualization presents different aspects and gives the scientist the possibility to analyze the domain in specific way.

Terms maps are bases to understand the cognitive relations of main terms and ideas in the domain. Nodes can be generated as terms from document titles and abstracts or authors / publisher keywords.

The most common analysis type is based on documents. These nets are used for domain analysis, finding leading documents or future trends in science.

A map of journals shows leading sources of knowledge about the domain, its relative position and relationships with other disciplines.

Visualizations based on authors occur in two forms: author co-citation maps and co-authorship maps. They are used to conclude about the intellectual structure of a field or to show the cooperation between the nodes in a discipline (authors, organizations or countries adequately) (Börner, 2003).

Visualisation is used in many fields of science, including: Environmental Sciences and Engineering (Nejc, 2021), Biochemistry (Chaves, 2021), Medicine (Cash-Gibson, 2018), Psychology (Anuradha, 2021), Ecology (Wang, 2021), Information and Communication Technology (Rojas-Sanchez, 2023), Management (Chandra, 2018; Zampeta and Chondrokoukis, 2023).

There is a research gap in the field of well-being in this regard. During the period covered by this study (up to 2023 inclusive), the author found only 5 publications in the Web of Science and Scopus databases ((mapping OR scientometr* OR bibliometri* OR bibliograph*) AND ((well-being OR wellbeing) AND (emplo* OR work* OR manag* OR leader* OR job))), in which a scientometric analysis of well-being in the context of work was undertaken. Individual articles concerned: employee well-being in the construction industry (Shi, 2023), management of happiness and well-being in organizations (Jambrino-Maldonado, 2022), entrepreneurs' well-being (Sánchez-García, 2018), workers' psychological well-

being influence on business growth and performance (Ambhore, 2023), and relationships between different types of well-being and job performance in which the authors use the VOSviewer maps (terms occurrence analysis) to complement the meta-analysis (Gutierrez, 2020).

Given its broad approach to employee well-being, without limiting it to the industry or the employee's position in the organizational hierarchy, this article is the first to broadly analyze the concept of employee well-being using bibliometric, scientometric (Nader, 2021) and Social Network Analysis (SNA) measures.

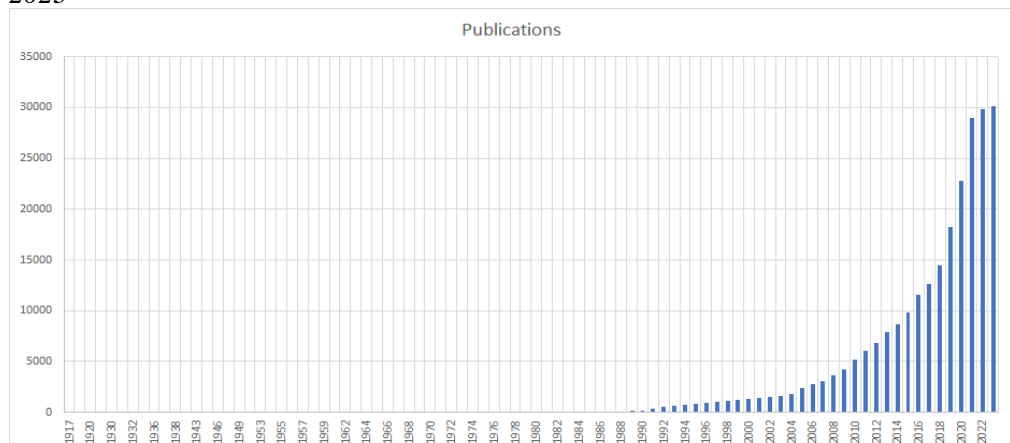
2. Materials and Methods

2.1 Data Preparation

We obtained bibliographic data from the Web of Science Core Collection (WoS), which I searched in the first step by entering the term "well-being"/"wellbeing" in all fields of the database. The aim was to see how much interest there is in this issue and in what contexts it has been analyzed. I received 291,042 records. We limited the results to articles and review articles, for the period up to the end of 2023. Finally, I received 245,288 publications.

The term well-being first appeared in the database in 1917 (Figure 1), in an article published in *The Lancet* (Kinloch, 1917). In the following years, several publications appeared, until 1974, when the number of articles exceeded 10 in one year. Over 100 articles related to the topic were published in 1989, and since then there has been a significant increase in the number of documents in subsequent years.

Figure 1. Number of articles regarding well-being for the period up to and including 2023



Source: Web of Science Core Collection data.

Considering the general interest in the well-being issue, the 5 most prolific fields (Web of Science Categories) were: Public Environmental Occupational Health (30,064 articles; 12.26% of the entire database), Psychiatry (16,484; 6.72%), Psychology Multidisciplinary (15,976; 6.51%), Environmental Sciences (5,129; 2.09%) and Medicine General Internal (9,805; 3.99%). Therefore, it can be assumed that this is primarily the domain of medical sciences (22.97%). Management ranks 24th in terms of the number of publications in this area (5,151; 2.10%), while Business ranks 33rd (3,501; 1.43%). However, it should be remembered that some of the journals where the articles listed in the database were published are classified as both Management and Business.

It is also worth paying attention to the journals where well-being was most frequently analyzed – the top 10 are: International Journal of Environmental Research And Public Health (4,140 articles; 1.69% of the database); Frontiers In Psychology (3,149; 1.28%); Plos One (2,861; 1.16%); Sustainability (2,182; 0.89%); BMJ Open (1,653; 0.67%); BMC Public Health (1,632; 0.66%); Social Indicators Research (1,590; 0.65%); Social Science Medicine (1,221; 0.50%); Journal Of Happiness Studies (1,092; 0.44%); Children And Youth Services Review (981; 0.40%).

The concept in question is most frequently analyzed in medical sciences and psychology. Therefore, researchers dealing with business and management, including representatives of human resource management, draw from these areas.

In order to obtain a picture of the research conducted in relation to employee well-being, in the next stage of the procedure I entered a search in the WoS databases, in which I compared the concept of well-being with the context of employment. The search path was: ((well-being OR well-being) NEAR/3 (employ* OR work* OR manag* OR leader*)).

As a result, we received 18,430 records. we reduced it, as before, limiting it to the articles and review articles, English language, and additionally narrowing it to the SSCI index and scientific disciplines according to WoS: management and business. We collected the data for the period up to the end of 2023, we subjected the received records (1,720) to bibliometric analysis in the VOSviewer program.

2.2 Analytical Approach

Research on the achievements in a given field should take into account several tools to explore the issue or several research perspectives, in order to ultimately obtain the broadest possible view of the current state (Wen, 2017). At the beginning, I used the analysis of the structure of the research area available in the WoS database, and then the tools from the VOSviewer and UCINET 6 for Windows programs with the NetDraw 2 application.

VOSviewer is a program developed by Nees Jan van Eck and Ludo Waltman from Centre for Science and Technology Studies of Leiden University, that unify mapping and clustering techniques to run bibliometric and scientometric research. The aim of these techniques is to answer questions such as: What are the main topics or the main research fields within a certain scientific domain? How do these topics or these fields relate to each other? How has a certain scientific domain developed over time? (Waltman, 2010).

VOSviewer can be used to construct maps of authors or journals based on co-citation data or to construct maps of keywords based on co-occurrence data. The program can display a map in various different ways, each emphasizing a different aspect of the map. The viewing capabilities of VOSviewer are especially useful for maps containing large number of items (van Eck, 2010).

We conducted the analysis on three levels, i.e., micro (terms), meso (authors) and macro (organizations and journals). We used the following program modules to analyze the state of knowledge about employee well-being:

- co-occurrence analysis for terms included in titles and abstracts,
- co-authorship analysis (for both authors and organizations).

In addition to Network Visualization, we also used Overlay Visualization. When creating result maps, we used previously built thesauruses, eliminating from individual databases terms with double spelling (e.g., well-being and wellbeing; CSR and Customer Social Responsibility, etc.), synonymous (e.g., consumer, customer, client, etc.), we excluded words resulting from publishing data (e.g. Journal, Issue, etc.), we merged records for the same authors, but listed differently (e.g., full name or first letter of name), and we removed words in plural/singular, leaving the term that appeared more often in the texts (e.g., employee/employees).

For two maps (authors and organizations) we determined Betweenness and Eigenvector Centrality Measures (Yan, 2009; Hevey, 2018; Wood, 2016). For this purpose we used UCINET 6, which is a Windows software package used for the analysis of social network data, developed by Steve Borgatti, Martin Everett and Lin Freeman in 2002 (Borgatti, 2002). In the first stage of the analysis we used the NetDraw application created by Steve Borgatti, generating networks of connections between authors and scientific organizations, based on data extracted from Web of Science (Borgatti, 2002; Apostolatos, 2013).

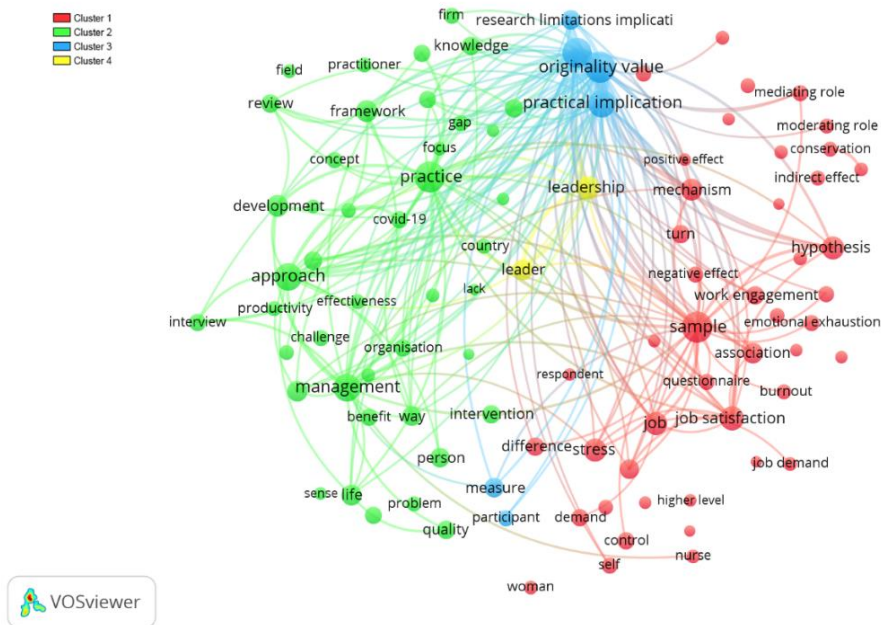
3. Results

3.1 Terms Occurance Analysis

To answer the first question Q1: What was, is and will be the research context related to employee well-being? a term co-occurrence map was made in the

VOSviewer program. The base were the titles and abstract fields. Before constructing the map, we used a previously created thesaurus of terms, and we assumed the minimum number of occurrences of a term at 50. As a result, out of 26,405 terms in the set of documents, 160 met the threshold, and of these the most relevant were 96 (relevance score 60%) (Figure 2).

Figure 2. Term co-occurrence map



Source: Author's own elaboration.

The map is dominated by cluster #1 (red; 45 nodes), where the largest nodes are the terms: sample, job satisfaction, job, hypothesis and stress (occurrences: 357; 233; 210, 204, 195 links: 95; 95; 95; 95; 95, total links strength: 2592; 1723; 1546; 1492; 1419). The cluster is dominated by references to research and well-being considered from the employee's perspective (job satisfaction, stress, emotional exhaustion, burnout).

The second largest is the green cluster (43 nodes), where the authors of the publication focused on the importance of employee well-being for the organization (management, organization, company, human resource management, effectiveness, productivity). The research aspect is also relevant here, and issues related to the impact of the COVID-19 pandemic on well-being and the organization as such appear.

The next largest is the blue cluster (6 nodes), which contains terms closely related to research (design methodology approach, measure, originality value).

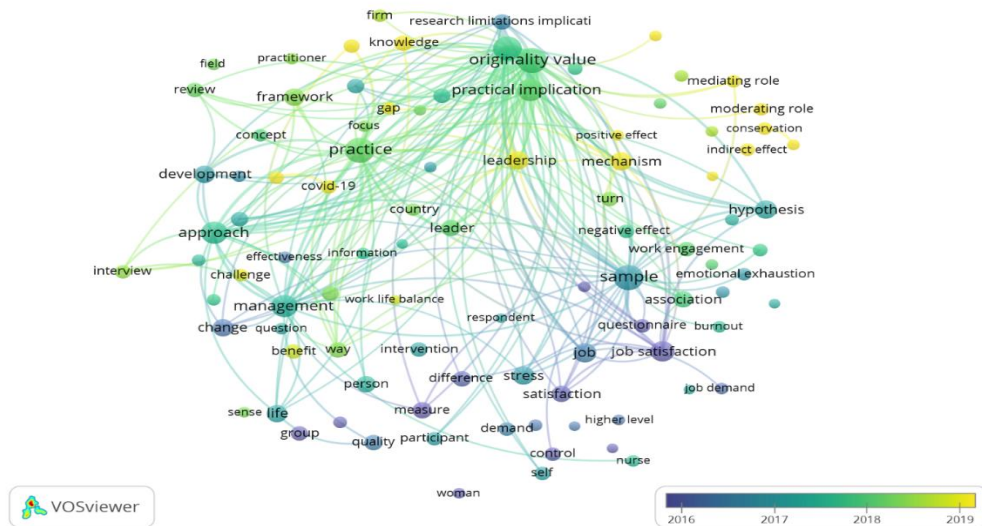
The last one – made up of only two terms (yellow cluster), refers to leadership (leader, leadership).

It is not surprising that, assuming the criterion of the minimum number of occurrences of a term at the level of 50 and a long period of analysis, the most relationships between terms are those related to research, while "employee well-being" appears only 66 times (89 links and 430 total links strength), and "work life balance" 58 (89; 438, respectively).

3.2 Development Potential – Urgent Issues

In order to assess the potential for the development of research on employee well-being, we also conducted a term analysis with an overlay of the average year of publication of documents for the entire 34-year period. We assumed the minimum occurrences to be 50 (Figure 3).

Figure 3. Terms co-occurrence map – average year overlay visualization



Source: Author's own elaboration.

To generalize the conclusions from the map, the earliest period is dated to theoretical speculations on the concept of well-being and its relations with related terms (including job, employee well-being, satisfaction, job satisfaction, life satisfaction, psychological well, effectiveness). The average year of publication of articles devoted to these issues is 2016. The current trend is the development of research methodology and its practical application. The latest terms are, mechanism, mediating/moderating role, leadership, conservation resources theory, structural equivalence modeling (and of course COVID-19 and pandemic). In the period between, we can see primarily terms such as: practical implication, originality value, practice, framework, practitioner, review, concept.

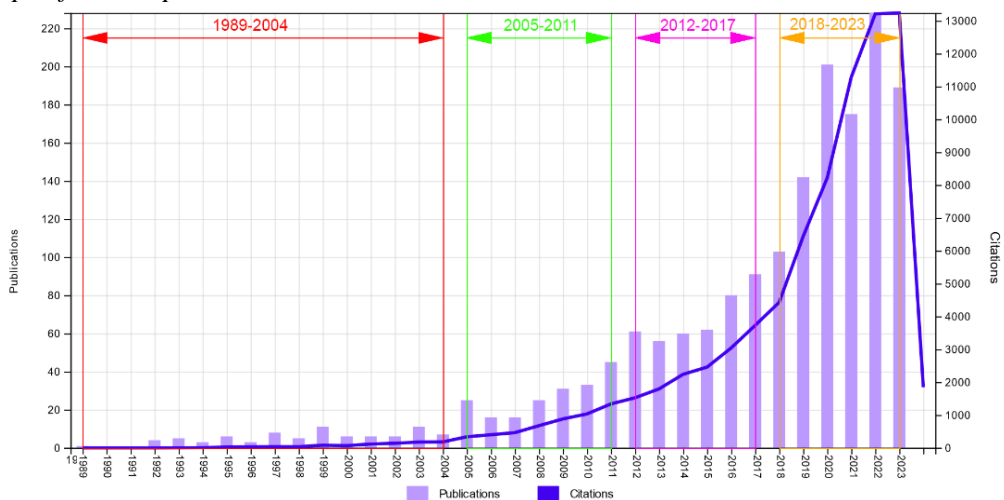
Therefore, there is a noticeable shift from the previously dominant interest in definitions, the essence of well-being or its components, to considerations of its practical significance, and recently to the use of models in research. That is why, we should expect this research area to develop, with the development of specific diagnostic tools for the needs of management sciences (currently, they are generally borrowed from psychology and medicine) (Cooke, 2016; Yang, 2014; Linton, 2016; Jarden, 2023).

3.3 Sub-Periods Analysis

In order to analyze better the development of interest in the issues of employee well-being in management and business sciences, we decided to divide the considered period of 43 years into 4 sub-periods (Chandra, 2018; Zhang, 2019). We designated them as follows: 1989-2004; 2005-2011; 2012-2017; 2018-2023. The periods have different lengths. The first one begins with the first publication where the term "well being" appears in the context of work (Neergaard, 1989).

We determined the beginning of the second and third periods by assuming the moment of a significant increase in the number of publications compared to the previous period, while for the periods 3 and 4, we assumed an identical duration (6 years), due to similar increases in the number of publications and the lack of a year in which this increase would have changed the growth dynamics dramatically (the clearly visible jump in 2020 results from the large number of publications on the impact of the pandemic on well-being, but in the following year the number of new publications returned to the previous upward trend) (Figure 4).

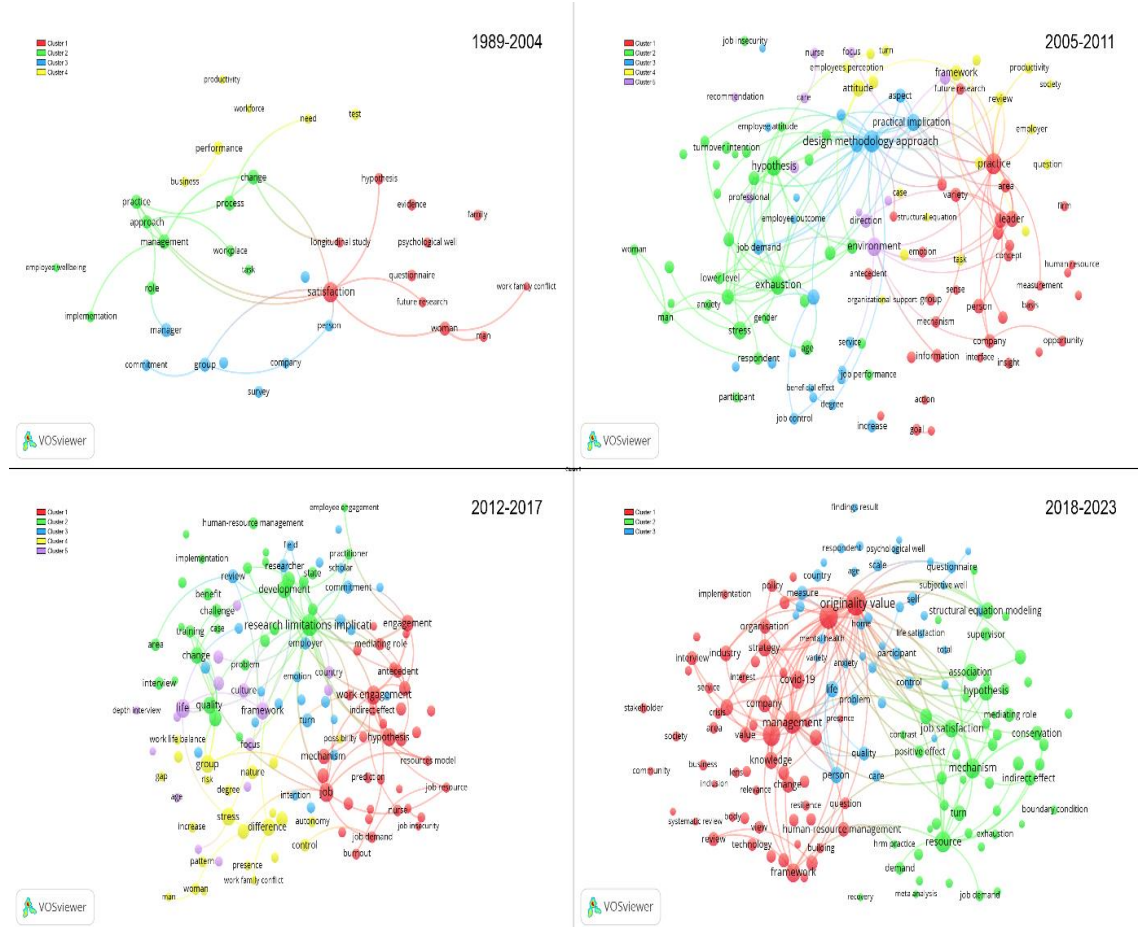
Figure 4. Number of articles and citations regarding employee well-being in the specified sub-periods



Source: Author's own elaboration.

For the periods defined in this way, we built and analyzed cluster maps (Figure 5).

Figure 5. Term co-occurrence map for sub-periods 1989-2004; 2005-2011; 2012-2017; 2018-2023



Source: Author's own elaboration.

For greater clarity and a better understanding of changes in researchers' approach to employee well-being, Table 1 presents cluster profiles in subsequent periods, corresponding to the maps in Figure 5.

Table 1. Changes of well-being context in research periods

1989-2004: 1,722 terms restriction for the map: minimum number of occurrences of a term 5 (threshold = 59); most relevant 60% = 35					
cluster#	1	2	3	4	
characteristic terms in cluster	woman, family, man, psychological	management, workplace, employee	group, manager, attitude,	no specific words	

	well, work family conflict	well-being	commitment, person, company		
well-being context	private life	employees	organizational	others	
# terms	11	10	8	6	
share	31.43%	28.57%	22.86%	17.14%	
2005-2011: 3,943 terms restriction for the map: minimum number of occurrences of a term 5 (threshold = 198); most relevant 60% = 119					
cluster#	1	2	3	4	5
characteristic terms in cluster	context, variety, future research, goal, interview ver. leader, person, group, emotion, client, human resource	current study, hierarchical regression analysis ver. stress, burnout, psychological well, family, life satisfaction, work family conflict	research limitations, scale, degree, research agenda ver. employee well-being, personnel, employee attitude, public sector employee	attitude, organizational commitment, organization, business, productivity, employer	direction, interaction, focus, theoretical model, recommendation, possibility
well-being context	research need / wide context	present research / private life	present research / employees	organizational effects	future research / challenges
# terms	35	32	22	19	11
share	29.41%	26.89%	18.49%	15.97%	9.24%
2012-2017: 7,828 terms restriction for the map: minimum number of occurrences of a term 10 (threshold = 220); most relevant 60% = 132					
cluster#	1	2	3	4	5
characteristic terms in cluster	work engagement, job demand, organizational support but also emotional exhaustion, burnout, job insecurity but also hypothesis, structural equation modeling	research limitations, interview, area, case, further research but also development, intervention, challenge, social implication, training, quality, society	review, researcher, indicator, concept, moderator, question but also emotion, life satisfaction, motivation, happiness, positive effect, commitment, effectiveness,	stress, conflict, control, work environment, risk, work life balance, work family conflict	life, psychological well, lack, sense, anxiety, depression, threat
well-being context	wide context research	research / qualitative	research / positive	adverse effects / work	adverse effects / psychological

		approach	psychology	context	context
# terms	36	30	26	24	16
share	27.27%	22.73%	19.70%	18.18%	12.12%
2018-2023: 18,526 terms					
restriction for the map: minimum number of occurrences of a term 20 (threshold = 252); most relevant 60% = 151					
cluster#	1	2	3		
characteristic terms in cluster	systematic review, conceptual model, future research but also COVID-19, pandemic, crisis but also industry, organization, business, HR	structural equation modeling, moderating role, mediating role, resources theory, moderator, moderated mediation model, self-determination theory, meta-analysis	life, quality, care, sense, nurse, work life balance, mental health, feeling, psychological well, family conflict, family, subjective well		
well-being context	pandemic effects / research needs	models	psychological and subjective well-being		
# terms	59	52	40		
share	39.07%	34.44%	26.49%		

Source: Author's own elaboration.

Similarly to the increase in the number of publications, the number of terms that appear in the titles and abstracts of articles related to well-being in the context of work also grows in subsequent periods (for subsequent periods: 1,722; 3,943; 7,828; 18,526, respectively). This indicates the development of interest in the research area and the researchers' perception of the multitude and diversity of factors related to employee well-being.

The first period is the time when the concept of well-being was adopted from other sciences and compared with the context of management/business. The subject matter of the few publications (82 in total; 5.47 per year on average) focuses equally on employee well-being in the context of the organizational environment and private life, as well as on the relationship between well-being and the organization as a market entity. "Satisfaction" is the most common concept in the network, and appears 25 times, and has connections with 32 other terms, with which it is connected a total of 87 times. It is also a bridge between all clusters.

Among the terms directly related to well-being (we omitted words referring to research as such or ambiguous), the bridge with the remaining three clusters is similarly formed by "psychological well" (links: 20; total link strength: 26), "mental health" (18; 22, respectively) and "employee well-being" (11; 18, respectively).

The second period is a time of slow growth in interest in the new term in management sciences (a total of 191 publications; an average of 27.3 per year). The research field is significantly expanding (the network creates 5 clusters), although the boundaries of research areas are still not clearly defined, as evidenced by the structure of the red cluster. It is the largest (accumulating almost 30% of all terms on the map), and at the same time thematically very diverse, so it is difficult to define a leading theme for it.

The second cluster (green) focuses on the relations between well-being of employees and their private life, while the third (blue) on relations with professional life. The relations between employee well-being (micro level) and the meso area (organizations) are the domain of the fourth cluster. It is worth emphasizing that during this period references to research appear – whether implemented, planned or proposed as important for the future (terms related to research appear in each of the clusters).

The strongest bridges between all clusters are: exhaustion (links: 83; total link strength: 168), stress (72; 138), employee well-being (55; 82), leadership (53; 90) and organizational commitment (51; 74). This indicates increasingly strong connections between well-being and other terms, and consequently broadening the field of analysis to include various contexts of this phenomenon.

The third period is a continuation of the upward curve, both for the number of publications and the number of citations, which indicates the creation of relationships between the areas of interest of scientists. This is a time (similarly to the second period) of great diversity of thematic areas, which can be included in 5 clusters. This diversity is particularly visible in the largest, most strongly linked to the others, red cluster.

However, during this period, there was a growing interest in specific conditions and effects, both positive (cluster #3) and negative (clusters #4 and #5) affecting well-being, both in the context of employment and employee personality. There are numerous research publications, including qualitative studies. The strongest bridges between all clusters (apart from terms related to research procedures, e.g. research limitations, hypothesis) are created by the terms: work engagement (links: 112; total link strength: 395), job (117; 368), stress (117; 314), development (111; 336), life (110; 324).

The last period (still ongoing) is a time of increasingly frequent attempts at a structured understanding of well-being and its complexity. Models, systematics and studies of well-being in cross-sections are emerging, including primarily psychological well-being and subjective well-being. This is a time of intensified research using statistical modelling.

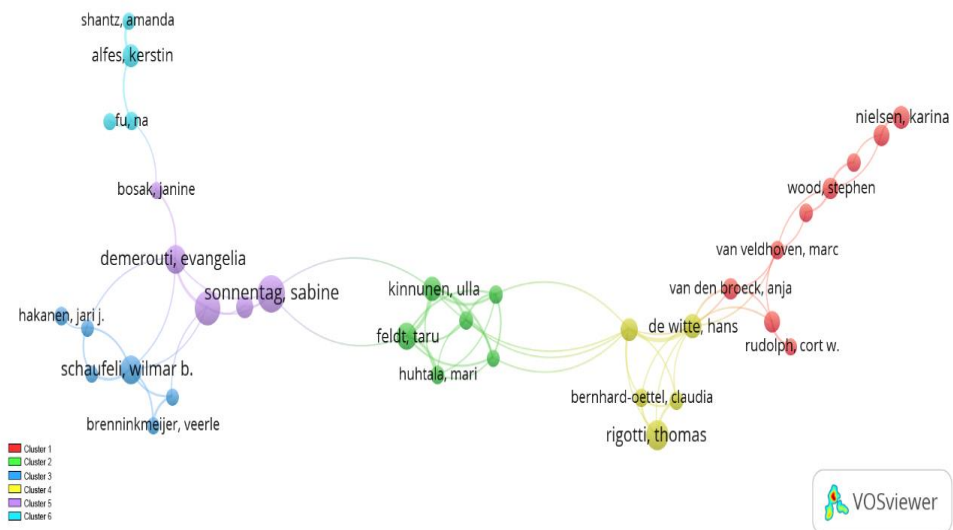
This is probably also the aftermath of the COVID-19 pandemic and attempts to determine its impact on employee well-being and its individual aspects (a jump in the number of publications can be seen in 2020 (Figure 5). This is a period of very strong links between clusters, in which the vast majority of terms are connected with many terms in both other clusters.

3.4 Co-Authorship Analysis

To answer the second question Q2: Who is the most influential author who it is worth to start a research collaboration with? we used the co-authorship tool available in VOSviewer, selecting the authors module.

Initially, we checked the number of authors who published at least one article (4,243 scientists met the criterion). To designate the main authors for the research field, we used Price's law (Li, 2022). The main authors were those who published at least 4 articles. By limiting the map conditions in this way, we obtained 90 authors who met the criterion, and, for the sake of network transparency, we excluded single-person clusters and left only authors who published works in co-authorship (35 people). The authors were included in 6 clusters (Figure 6).

Figure 6. Visualization of co-authorship for authors



Source: Author's own elaboration.

Taking into account the results of the visualization, it can be winded up that scientists are just creating a cooperation network and leaders in the flow of knowledge in this field have not yet been established. The largest number of articles was published by Sabine Sonnentag (18 articles in cooperation with 5 authors from clusters #1 and #2). Arnold B. Bakker is the link between the authors from clusters #5 and #3, and Thomas Rigotti between clusters #4 and #1. Ulla Kinnunen and Nele de Cuyper are cooperating with scientists from three clusters at the same time. It seems that at the moment the cooperation is local and takes place primarily between authors employed in the same scientific organizations.

This assumption is confirmed by the values of centrality measures (Beetweeness and Eigenvector Centrality) determined for all authors listed in the database obtained from WoS (without introducing a limitation on the number of publications). We used the NetDraw tool for the calculations. In Table 2, we showed the highest values of the measures, with Betweenness Centrality given for the top 10 authors, and Eigenvector Centrality for 8, due to the fact that for the next 17 it had the same value (0.1950). It should be emphasized that these are authors who were not necessarily included on the map, due to the limitations adopted for visualization (minimum 4 articles per author), but those who have the greatest potential for building relationships for publishing in co-authorship.

Table 2. *Beetweeness and Eigenvector Centrality for top authors*

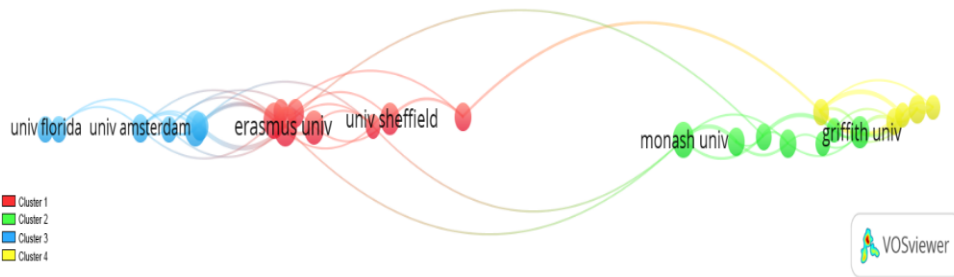
Authors by name	Beetweeness Centrality	Authors by name	Eigenvector Centrality
Bakker, Arnold B.	19,371.69	van den Broeck, Anja	0.2251
van den Broeck, Anja	19,216.63	de Witte, Hans	0.2020
van Veldhoven, Marc	15,853.37	van Veldhoven, Marc	0.1990
Sonnentag, Sabine	13,767.44	Schalk, Rene	0.1986
Ilies, Remus	13,667.67	Hansez, Isabelle	0.1957
de Cuyper, Nele	12,392.88	Zacher, Hannes	0.1957
Demerouti, Evangelia	11,886.41	Tordera, Nuria	0.1957
Dimotakis, Nikolaos	11,133.42	Stamov-Rossnagel, Christian	0.1953
Rosen, Christopher C.	10,848.54		
de Witte, Hans	10,848.11		

Source: *Author's own elaboration.*

The strongest links to other important authors are shown by A.B. Bakker, Anja van den Broeck, Marc van Veldhoven, Sabine Sonnentag and Remus Ilies. Two of them have the strongest potential to continue information flow. Potentially, they can therefore become the core of the future web of cooperation in the field of employee well-being. Other authors with great potential to use their position to disseminate knowledge in the future are, Rene Schalk, Isabelle Hansez, Hannes Zacher, Nuria Tordera and Christian Stamov-Rossnagel.

Considering the maturity of the adopted research area, we also checked whether it was possible to speak of broad and multi-linked cooperation between research organizations. This made it possible to answer question 3 posed in the article Q3: Which scientific organizations should be contacted when planning research projects? We used the co-authorship module for organizations and assumed the minimum number of documents at 15, which gave 27 organizations meeting the criterion (out of 1,557 that published documents related to employee well-being). Among them, one did not show any connection with another visible on the map and was therefore excluded from the analysis (Figure 7).

Figure 7. Visualization of co-authorship for organizations



Source: Author's own elaboration.

Based on the map, it can be assumed that cooperation is very small-scale, as evidenced by the small size of the clusters and the few relationships between organizations. Cooperation is local in nature (Table 3), similar to the cooperation of scientists. This is particularly visible in clusters 2 (apart from one university, only universities from Australia), 3 (Netherlands and USA) and 4 (New Zealand and Australia).

Table 3. Clusters of main cooperating organizations

Cluster #	1	2	3	4
Organization / Country	Erasmus University Rotterdam, / Netherlands	Griffith University / Australia	Eindhoven University of Technology / Netherlands	The University of Waikato / New Zealand
	Tilburg University / Netherlands	Monash University / Australia	Utrecht University / Netherlands	Massey University of New Zealand / New Zealand
	King's College London / UK	Queensland University of Technology / Australia	University of Groningen / Netherlands	Edith Cowan University / Australia
	Katholieke Universiteit	The University of Queensland /	University of Amsterdam /	Auckland University of

	Leuven / Belgium	Australia	Netherlands	Technology / New Zealand
	University of Jyväskylä / Finland	Royal Melbourne Institute of Technology / Australia	Michigan State University / USA	The University of Auckland / New Zealand
	The University of Manchester / UK	Deakin University / Australia	University of Florida / USA	
	The University of Sheffield / UK	The Hong Kong Polytechnic University / China		
	Johannes Gutenberg-Universität Mainz / Germany			

Source: Author's own elaboration.

Based on both maps, it can be assumed that an interest in employee well-being is in the initial phase of development. Considering the constantly growing number of publications and citations of coming up articles, it can be assumed that this interest will increase and it is possible that with the development of this research field, important leaders will emerge – authors and research organizations that will create a relatively permanent core of this research area.

Similarly to the authors, we checked the centrality measures for the organizations (Table 4). As before, we determined the values for all organizations listed in the database obtained from WoS.

In Table 4, we included the names of the top 10 organizations with the highest measure values. As in the case of the authors, not all of the organizations are visible on the map and in the previous table (Figure 7; Table 3). These are universities with the greatest potential for spreading knowledge and creating future cooperation in the analyzed research area.

Table 4. *Betweenness and Eigenvector Centrality for top organizations*

Organization	Betweenness Centrality	Organization	Eigenvector Centrality
Erasmus University Rotterdam	26,794.06	Erasmus University Rotterdam	0.2551
King's College London	14,505.24	Katholieke Universiteit Leuven	0.2421
Katholieke Universiteit Leuven	14,260.54	Eindhoven University of Technology	0.2052
The University of Queensland	13,294.20	Vrije Universiteit Amsterdam	0.2004
University of Valencia	12,192.53	University of Valencia	0.1850

Université Grenoble Alpes	11,976.38	University of Groningen	0.1842
The University of Manchester	11,637.63	Tianjin University	0.1838
The University of Arizona	11,350.28	University of Twente	0.1826
The University of Sheffield	11,321.04	University of Zurich	0.1802
Tilburg University	10,908.26	Heidelberg University	0.1770

Source: Author's own elaboration.

The universities that have the most relationships with other important organizations are primarily: Erasmus University Rotterdam, King's College London, Katholieke Universiteit Leuven, The University of Queensland and University of Valencia. Three of them were also in the top 5 universities with the greatest potential to create knowledge flow and set the direction for development of research on employee well-being: University Rotterdam, Katholieke Universiteit Leuven and University of Valencia. The remaining two in the top 5, taking into account the Eigenvector Centrality Measure value, are: Eindhoven University of Technology, Vrije Universiteit Amsterdam.

3.5 Journals Analysis

To answer the fourth question Q4: in which journals should one publish to reach the greatest number of people interested in the issue of employee well-being? We conducted an analysis of the journals in which the largest number of 1,720 papers found in the Web of Science database were published. In the period under consideration, the articles were published in 193 journals. Table 5 includes a list of 10 titles where one-third of the articles were published in total, along with the number and share of articles and Research Areas assigned to them.

Table 5. *Top 10 Journals regarding the number of articles on employee well-being (1989-2023)*

Journal Title	Articles	% of 1,720	Research Areas
Personnel Review	84	4.88	Psychology; Business & Economics
International Journal of Human Resource Management	80	4.65	Business & Economics
European Journal of Work and Organizational Psychology	78	4.53	Psychology; Business & Economics
Journal of Occupational and Organizational Psychology	72	4.19	Psychology; Business & Economics
Journal of Applied Psychology	66	3.84	Psychology; Business & Economics
Journal of Organizational Behavior	56	3.26	Psychology; Business & Economics
Journal of Managerial Psychology	55	3.20	Psychology; Business & Economics
Journal of Business Ethics	54	3.14	Business & Economics;

Journal Title	Articles	% of 1,720	Research Areas
			Social Sciences
Employee Relations	53	3.08	Business & Economics
Journal of Nursing Management	51	2.97	Business & Economics; Nursing
Total	649	37.73	

Source: Author's own elaboration.

It can be stated that articles in the area of employee well-being are published primarily in journals classified in the fields of science: Psychology and Business & Economics.

To check whether journals emerged in the period under consideration that regularly and consistently published articles from the discussed research field, we analyzed the top 20 journals separately in each of the four previously mentioned sub-periods. Six journals appeared in the top 20 in each of the four periods. Obviously, all of them were simultaneously in the top 20 for the entire period under consideration. The share of articles published in 6 journals in the total number of texts published in the period 1989-2023 (1,720) was 22.68%. We presented detailed data in Table 6.

Table 6. *Titles of journals staying in top 20 sources for 4 periods*

Journal Title	Articles	% of 1,720	Research Areas
Personnel Review	84	4.88	Psychology; Business & Economics
International Journal of Human Resource Management	80	4.65	Business & Economics
Journal of Occupational and Organizational Psychology	72	4.19	Psychology; Business & Economics
Journal of Applied Psychology	66	3.84	Psychology; Business & Economics
Journal of Business Ethics	54	3.14	Business & Economics; Social Sciences
International Journal of Manpower	34	1.98	Business & Economics
Total	390	22.68	

Source: Author's own elaboration.

It can be assumed that the leading journals for the analyzed well-being context are 6 journals assigned to the research area: Business&Economics. However, it is worth mentioning that 3 of them are simultaneously classified as "psychology" (Personnel Review, Journal of Occupational and Organizational Psychology and Journal of Applied Psychology) and one as "social sciences" (Journal of Business Ethics). As we can see, the issue of employee well-being is multidisciplinary in nature, and scientists examining it from a management perspective draw on the achievements of "older sciences", including primarily psychology.

4. Conclusions

Taking into account articles from journals indexed in the Web of Science Core Collection, it can be assumed that the period of interest in the issue of employee well-being is about 35 years. It is obvious that during this time the context of considerations related to the research area under consideration has changed.

Based on the analyses made, it is possible to answer the first question: Q1. What was, is and will be the research context related to employee well-being?

In general, the most important contexts are employee well-being considered from the employee's perspective, the importance of employee well-being for the organization, and employee well-being in the context of leadership. Taking into account the interest in employee well-being over time, there is a noticeable shift from the previously dominant interest in definitions, the essence of well-being or its components, to considerations of its practical significance, and recently to the use of models in research.

Furthermore, the analysis of the topics in reference to the four sub-periods adopted in the study leads to the conclusion that over the 35 years of interest of representatives of management sciences, the area of their research has significantly expanded. During the first five years of the study, they focused equally on employee well-being in the context of the organizational environment and private life, as well as on the relationship between well-being and the organization as a market entity.

In the next period, a very broad approach to the phenomenon of employee well-being can be seen, as well as attempts to determine research contexts relevant to business practice.

The period 2012-2017 was primarily a study of the relationship between actions shaping employee well-being and their effects (both positive and negative) experienced by employees and organizations. It is also a time of research on the relationship between personality and employee well-being. The last period, largely determined by the pandemic, abounded in models, systematics and studies of well-being in cross-sections, including primarily psychological well-being and subjective well-being. This was a time of intensified research using statistical modeling.

Further multidisciplinary practical research should be expected, using modelling and developing specific diagnostic tools for the needs of management sciences.

Based on co-author analysis and assessment of centrality measures, the second question can be answered: Q2. Who is the most influential author who it is worth undertaking research cooperation with? It should be emphasised that at present there are no clear leaders in the research area under consideration. The largest number of papers was published by Susan Sonnentag, however, the analysis of centrality

measures indicates that the three authors with the strongest links to other important scientists are: B.A. Bakker, A. van den Broeck and M. van Veldhoven. The three scientists with the greatest potential for knowledge dissemination are A. van den Broeck, H. de Witte and M. van Veldhoven. This is an indication for researchers interested in the discussed issue to undertake scientific and publication cooperation with these authors.

In response to the third question: Q3. Which scientific organisations should be contacted when planning research projects? it should be emphasized, similarly to the case of the authors, that there is no organization that would clearly define the direction of conducting research on employee well-being. Taking into account the centrality measures, Erasmus University Rotterdam and Katholieke Universiteit Leuven should be indicated as potential entities for cooperation on research projects.

Answering the fourth question: Q4. In which journals should one publish to reach the largest number of people interested in the issue of employee well-being? researchers interested in issues related to employee well-being should publish primarily in *Personnel Review*, *International Journal of Human Resource Management* and *Journal of Occupational and Organizational Psychology*. It is also worth considering the remaining journals listed in Tables 5 and 6.

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