
MAPPING THE GLOBAL RESEARCH LANDSCAPE ON THE NURSE RESILIENCE MANAGEMENT: A BIBLIOMETRIC ANALYSIS

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Abstract. Global critical events such as the COVID-19 pandemic significantly influence the healthcare system, particularly healthcare workers. In this view, more studies emphasized the necessity to increase healthcare resilience. However, the systematization of the literary sources showed no bibliometric studies devoted to a comprehensive investigation of nurse resilience management. The main aim of this study is to analyse the status of the global research landscape on nurse resilience management and detect the forthcoming trends in this research field. The research questions are as follows: 1) What is the current status of research on nurse resilience management? 2) What are the future research directions for developing nurse resilience management? The research object is the scientific documents published in high-quality scientific journals indexed in the Web of Science database. The total sample of publications is 245 documents. The study period covers 2005–2022 (up to 7 September 2022). The study involved bibliometric and knowledge visualization methods to achieve the research goal. The research was conducted in the following logical sequence: 1) collecting and pre-processing data; 2) analysing and visualizing data (general statistics, collaboration networks, and research trends); 3) interpreting results and discussing future research directions. The findings of bibliometric analysis allowed analysing the dynamic of publication activity, detecting the most influential articles, sources, and researchers, as well as setting up a typology of the themes of the analysed scope of literature.

Keywords: *Healthcare, management, nurse resilience management, resilience.*

JEL Classification: E22, O44, Q56

INTRODUCTION

It is estimated that approximately 90 % of nurses within the global health workforce are women (Gauci et al., 2022). At the same time, the World Health Organization (2019) report titled “Delivered by Women, Led by Men” states that globally, in healthcare, less than 25 % of policy decision-making and governance roles are held by women. Unequal leadership opportunities for women in nursing reduce job satisfaction and retention within the profession. Researchers consider nursing to be a high-stress occupation because of the big emotionality, physical and psychic exertion, overlabour, potential burnout (Kelly, 2020; Olaleye et al., 2022), the specific relationship with patients, doctors, and colleagues, bureaucratic inflexibility, modest pay, low job prestige and perspectives (Roth et al., 2022).

On the other hand, the career structure for nurses is very limited. It is mostly linked with managerial positions in healthcare institutions or academic careers in higher education and research institutions. Special requirements for certain positions in the clinical area are locally determined. Notably, the degrees are preferred but not mandatory in clinical nursing practice (Rafferty et al., 2019). The above poses risks of losing the nurses' interest in career development, exhaustion (Imo, 2017), and negatively affecting their mental and physical health (Bruria et al., 2022).

At the same time, the low professional interest and engagement provoke the nurse turnover. The findings from the literature analysis show that nurse turnover provokes quality degradation and loss of efficiency in healthcare (Bae et al., 2021) causing an adverse economic impact (Halter et al., 2017). Having systemized the global scientific investigations on the economic impact of nurse turnover, Li & Jones (2013) found that the nursing turnover costs were from 0.31 to 1.3 times the average nurse salary. In turn, findings by Jones (2005) and Ruiz et al. (2016) are slightly different: from 1.2 to 1.3 and 3 times the average salary of nurses, respectfully.

The above-mentioned requires the managers of healthcare organisations to design and implement strategies and policies to prevent the adverse economic implications of nurse turnover. One of the keys to decrease nurse turnover is to maintain the emotional well-being of the nurses in response to different challenges. In this view, Johnson et al. (2020) emphasised the necessity of developing and managing the resilience and morale of nurses implementing effective management strategies. Thus, the resilience management theory is gaining international attention in healthcare research. According to Menoni and Schwarze (2020), resilience management is focused on investigating different alternatives to prepare the system or individual for adverse events and stressors through necessary adaptation.

Herewith it stands to note that as a multidimensional concept, resilience could cover organisational (or community) and individual levels (Morgan et al., 2019). In general, the concept of resilience is associated with an ability to return to the state before a critical event. From the individual perspective, Robertson et al. (2016) defined the resilience of healthcare workers as their ability to overcome the adverse effects of stress or recover from it while staying optimistic and focused. In turn, Vercio et al. (2021) considered social and reflective capital, skills, temperament, societal factors, outlook, and talent as the factors influencing individual resilience. Individual healthcare resilience allows avoiding the burnout caused by jobbed stress. However, Robertson (2016) highlighted that resilience covered not only burnout but also adjustment and personal resources development.

On the other hand, organisational resilience demonstrates that organisational culture, work environment, communication patterns, and cultural characteristics are related to employee stress (Bruiria et al., 2022). Therefore, it is of significance to create and maintain workplace culture. Heath et al. (2020) concluded that the above could contribute to reducing work stressors and improving the individual resilience of healthcare workers. At the same time, factors influencing organisational resilience include material resources, preparedness and planning, collateral pathways and redundancy, governance process, information management,

leadership practices, human capital, organizational culture, social networks, and collaboration (Barasa et al., 2018). Therefore, it is important to pay sufficient attention to management, which can affect both organisational (hospital) and individual (nurse) resilience.

The aim of this study is to analyse the status of the global research landscape on nurse resilience management and detect the forthcoming trends in this research field. The main research questions are as follows:

RQ1: What is the current status of research on nurse resilience management?

RQ2: What are the future research directions for developing nurse resilience management?

Further, in this study, the section “Literature Review” provides the literature review of the studies under the research topic; the section “Methodology” unveils the methodology used in this study to answer the research questions; the section “Results” provides the results of bibliometrics analysis; the last section draws the main conclusions regarding the analysis of global research landscape on nurse resilience management and forthcoming trends in this research field.

1. LITERATURE REVIEW

Healthcare workers, particularly nurses, work under tremendous modern demands and challenges, high stress (Rushton et al., 2015), and critical events exhausting the professional environment (e.g., the COVID-19 pandemic, cyber-attacks, extreme climatic events such as floods, and terrorist attacks). The above sparks the scientists’ interest in the in-depth investigation of the resilience in nursing (Fig. 1).

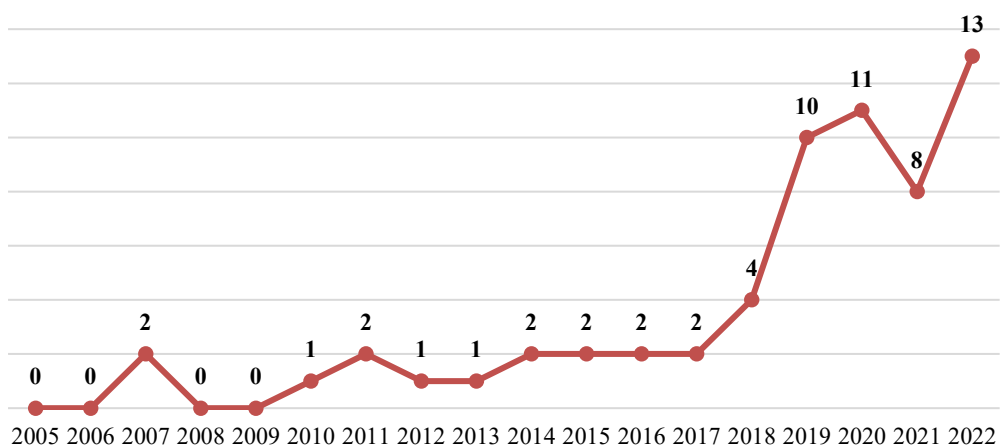


Fig. 1. The dynamics of “resilience” occurrences in the investigated studies, 2000–2022 (up to 7 September) (developed by the authors based on Web of Science data, 2022).

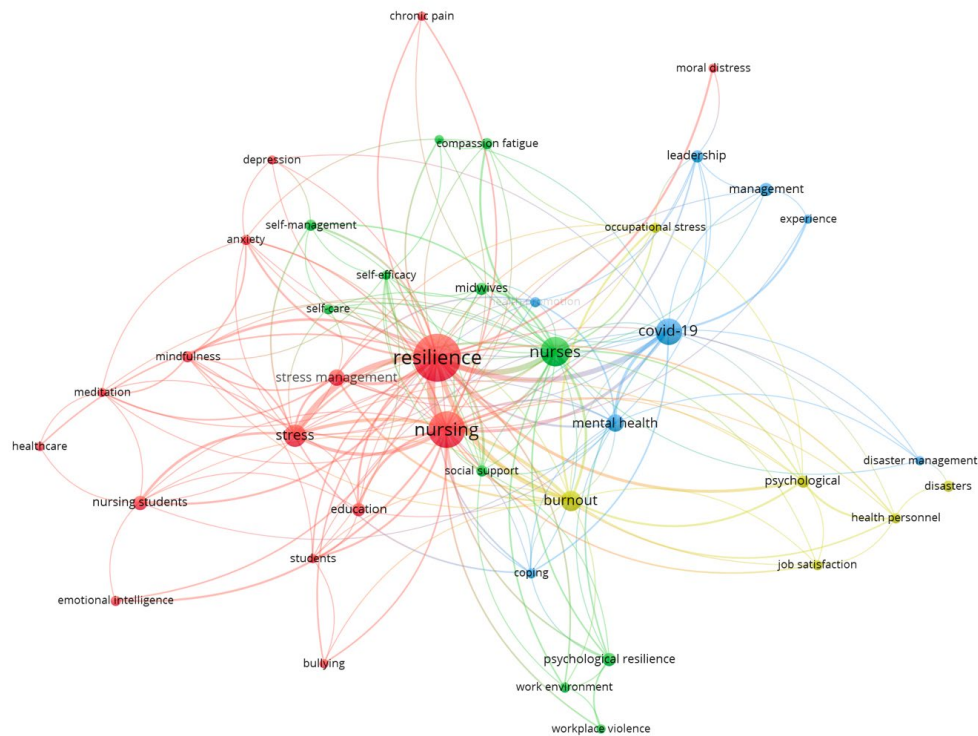


Fig. 2. The network map of keyword co-occurrence, 2000–2022 (up to 7 September).

Source: developed by the authors based on Web of Science data.

The analysis of the scientific treatise retrieved from the Web of Science database on nurse resilience management showed that the period of 2017–2018 was a benchmark period in the investigation of resilience (Fig. 2). The above makes it appropriate to consider the recent scientific contributions addressing this research topic. Thus, having applied the methodology of bibliometrics analysis (Soliman et al., 2021) the findings identified four clusters generalizing the studies on nurse resilience management (Fig. 2).

The biggest cluster (red) demonstrates that the papers investigated nurse resilience issues mostly under stress and stress management, anxiety, depression, mindfulness and meditation, emotional intelligence, chronic pain, and education. Taylor et al. (2022) claim that nurses and other healthcare workers experience higher levels of stress than the overall working population. According to Lee & Kim (2020), nurses have more workload stress than doctors, lawyers, teachers, life insurance agents, and engineers combined. In this view, it is appropriate to mention the study by Slatyer et al. (2018) who confirmed that workplace stress had a significant adverse influence on nurse well-being. It decreases their productivity and causes compassion fatigue and burnout (Alharbi et al., 2020). Based on interviewing 91 nurses working at an Australian tertiary hospital, the authors concluded that self-care interventions based on mindfulness could improve the

emotional state of nurses, increasing their resilience through an effective management strategy.

The second cluster (green) unveils the studies focused on the investigation of the nurse in line with psychological aspects such as self-care, self-efficacy, self-management, palliative care, social support, and work environment. The previous literature argues that the nurses' coping abilities and forms, as well as their coping style, could be improved due to the social support from colleagues, family, and friends. As a result, it reduces nurses' psychological stress (Chang & Cho, 2021).

The third cluster (blue) covers the papers addressing nurse resilience studies concerning disaster management, COVID-19, coping mechanisms, health promotion, leadership and management, mental health, etc. Based on the obtained results, Zhou et al. (2017) concluded that the resilience of nurses significantly depended on the effective managerial strategies, coping abilities, and coping literacy in hospitals. The COVID-19 pandemic made the problems of nurse resilience obvious to society during the COVID-19 pandemic. The COVID-19 pandemic has become a severe challenge to healthcare worldwide (Sihvola et al., 2022). Healthcare workers face high infection threats, a lack of adequate personal protective equipment, and work overload that exacerbates mental health diseases. However, Baskin & Batrtlett (2021) found that the healthcare personnel with a higher level of resilience were less immune to burnout and showed better productivity in taking care of the patients. The cross-sectional study by Jo et al. (2021) considers that organisational support ensuring the improving nurse status by involving them in policy development is a significant factor in strengthening nurse resilience during COVID-19. Noteworthy here, the scholars recommend focusing on building the environment supporting nurse resilience.

The fourth (yellow) cluster shows the recent studies that analysed the resilience of nurses in the interaction with job satisfaction (McIntosh, 2022), burnout (Olaleye et al., 2022), occupational stress (Cooper et al., 2021; Rees et al., 2018), etc. There is a large stream of literature that focuses on occupation-specific factors building nurse resilience. Compared to levels seen in the general population, nurses have been found to have lower levels of resilience and a higher prevalence of burnout (Bruiria et al., 2022). The nurses suffer from stress mainly due to their bad interpersonal relationships with their co-workers, dim job prospects, rigid bureaucracy, low job prestige and pay, working under rigorous hierarchical and legal control, etc. (Rafferty et al., 2019).

Based on the above findings, this study states that the resilience of nurses is essential for many reasons: nurse well-being, better patient care, smooth operation of the hospital, etc. However, the mentioned studies show that nurses require strengthening their resilience. There is a need for efficient management at hospitals to ensure nurses' resilience (Russo et al., 2018). At the same time, most studies on resilience in healthcare are conducted on the micro level (Berg et al., 2018). Therefore, the systematization of the worldwide scientific treatise on nurse resilience management is essential to understand how to improve the resilience of nurses.

2. METHODOLOGY

This paper provides a science mapping analysis detecting the existing interplay between the fields of research on nurse resilience management, scholars, journals, and countries. To give the general research framework that could identify the perspectives for future investigation in the field of nurse resilience management, this study applied the bibliometrics and knowledge visualization methods (Docherty et al., 2017). It stands to highlight that the main advantage of the bibliometric analysis is the systematization of the contributions in the research on nurse resilience without subjectivity (Della Corte et al., 2019). Therefore, the bibliometric and co-citation analysis was conducted through the bibliometrix R-package, which provides different procedures for conducting the bibliometric analysis. Besides, the relevant publications were systematically analysed using VOSviewer software tools.

The study was conducted in the following logical sequence:

- 1) Data collection and pre-processing;
- 2) Data analysis and visualization (general statistics; collaboration networks, and research trends);
- 3) The interpretation of results and discussion on future research directions.

2.1. Data Source

The study operates with the global scientific treatises devoted to nurse resilience management. The primary data are retrieved from the Web of Science multidisciplinary global citation database. The last access date is 7 September 2022. Even though some scholars (Falagas et al., 2008) consider the Scopus database to be more relevant for bibliometric analysis since it covers a wider journal range, the Web of Science database was chosen because it provided more publications devoted to nursing resilience, on the other hand, this paper avoided Google Scholar since its interface was unsuitable for bibliometric analyses (Harzing & Alakangas, 2015).

2.2. Search Strategy

The study used the advanced search in the Web of Science Core Collection, which presents scientific publications dating from 1970. The following keywords were applied for the search: “resilienc* AND nurs* AND management”. The asterisks were used to include words with the same roots but different endings and cover their singular and plural forms. The Boolean operator “AND” was applied to include all terms and combinations of different search queries.

The findings were filtered under several parameters to enhance the data and make them more relevant. The results were filtered by the Web of Science categories: Nursing, Management, Economics, Business, and Social Issues. The study involved different types of documents, including book chapters, articles with early access, editorial materials, letters, meeting abstracts, proceedings papers, reviews, and reviews with early access.

Table 1. The Main Information on the Dataset

Description	Results
Documents	245
Sources (journals, books, etc.)	92
Authors	928
Single-authored documents	29
Authors of single-authored documents	27
Authors of multi-authored documents	901
Period	2005–2022 (up to 7 September 2022)

Sources: developed by the authors.

The publication period covers 2005–2022 (up to 7 September 2022). Therefore, the total sample of publications is 245 documents (29 single-authored documents and 216 co-authored documents). According to Table 1, the number of involved sources is 92, and the total number of authors is 928 (27 authors of single-authored documents and 901 authors of multi-authored documents).

2.3. Data Analysis and Visualization

1. General statistics

This study explored the productive and impact metrics to determine the tendency and the main contributors in the development of research on nurse resilience management worldwide by the countries, authors, scientific journals, and top-cited publications. The productive metric, namely, the annual growth rate was applied to evaluate the evolution of publication activity on the investigated topic.

The research explored the following formula proposed by Shi et al. (2019) to calculate the annual growth rates of publication activity on nurse resilience management from 2005 to 2022:

$$AGR_{ij} = \frac{N_i - N_j}{N_j} \times 100\%, \quad (1)$$

where

AGR_{ij} – the annual growth rate of the considered publications;

N_j – the amount of publications in $i-1$ year;

N_i – the amount of publications in the current year.

2. Collaboration network analysis delivers the collaboration world map visualizing the global collaboration between authors in researching nurse resilience management. To visualize the collaboration world map, the bibliometrix R-package was used.

3. Research trends. This study applied the co-word network analysis and clustering to detect the typologies of themes of the analysed keywords. The keywords were classified in the two-dimensional diagram (centrality and density), which consists of four quadrants (Fig. 5) indicating the motor (upper-right

quadrant), very-specialized or niche (upper-left quadrant), emerging or disappearing (lower-left quadrant), and basic themes (lower-right quadrant) (Della Corte et al., 2019).

The keywords placed in the upper-right quadrant have high centrality and density. They detect the motor themes which are essential, well-developed, and influential in the investigated research field. The keywords located in the upper-left quadrant have high density and low centrality. They uncover the niche themes of limited importance in the research field. These themes are well-developed but marginal in the analysed research field. The lower-left quadrant gathers the keywords with low centrality and density. This quadrant unveils the emerging or declining themes in the research field. It means these themes are new or will be insignificant soon. At last, the lower-right quadrant consists of keywords with high centrality and low density. These themes could be considered basic in the analysed research field. These themes have been developed.

For designing the thematic map, several parameters were applied: the field of analysis – keyword plus; the number of involved words – 150; the minimal cluster frequency – 5 words; the number of labels for each cluster – 3 labels; label size – 0.3.

3. RESULTS

The visualization of statistical data showed the growth of the publication activity of the retrieved document (Fig. 3). However, the distribution of scientific publications shows that the number of analysed publications was relatively small from 2005 to 2009 (9 publications or 4 % of the total amount of publications). The first growth of publication activity was detected in 2010. The slow growth period with fluctuations was detected from 2010 to 2016. The scientific treatise on nurse resilience management during this period increased by 47 documents (19 % of the total amount of publications). At the same time, the decrease in publications was fixed in 2009, 2011, 2013, and 2016.

On the other hand, according to Fig. 3, the number of publications devoted to nursing resilience management has increased since 2017. In 2022, the number of publications was 51, which was 3.4 times higher compared to 2017. From 2017 to 2022, the number of publications increased by 143 documents (58 % of the total number of publications). Noteworthy here, the annual publications growth rate was 27.03 %.

To detect the most influential articles, this study analysed the number of citations of each publication that signified their importance. Table 2 ranked 10 publications by the number of citations. In total, TOP-10 publications were cited 1178 times during the analysed period. At the same time, the average citations were 118 times (max – 303 and min – 78).

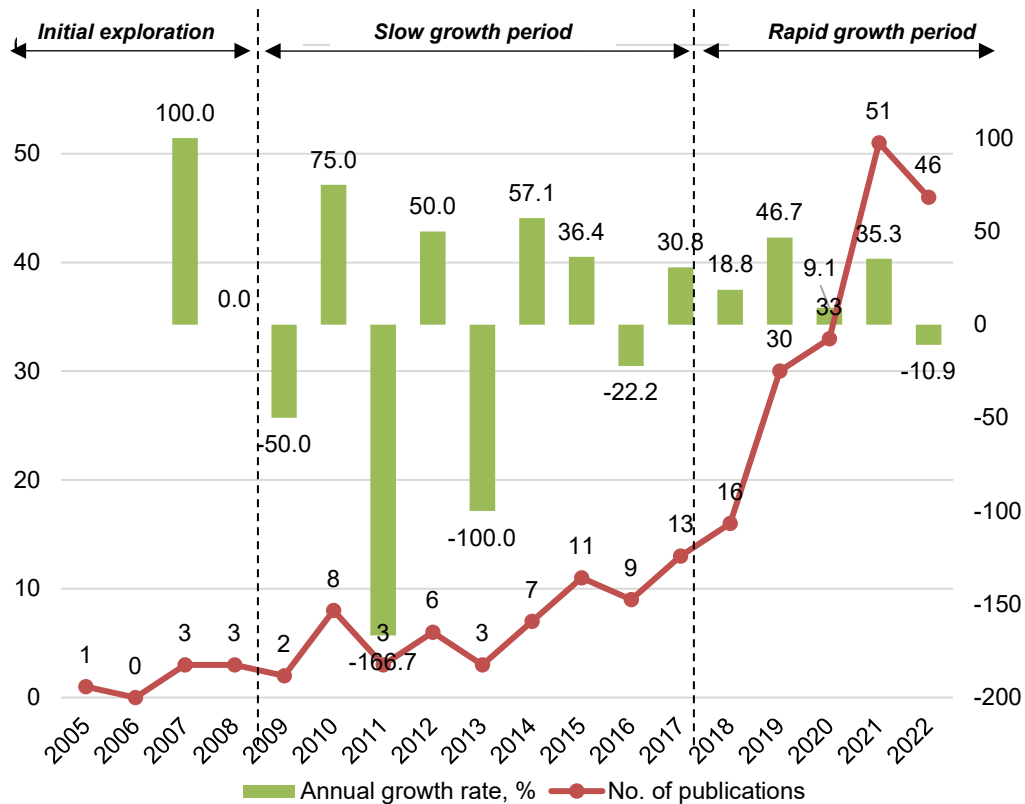


Fig. 3. Dynamic of publication activity, 2005–2022 (up to 7 September).

Source: developed by the authors.

The most frequently cited article “COVID-19 Anxiety among Front-Line Nurses: Predictive Role of Organizational Support, Personal Resilience and Social Support” was published in 2020 by scholars from Oman (corresponding author) and the Philippines. This article was published in the scientific journal “Journal of Nursing Management” (United Kingdom) and discussed the facilitation of personal resilience, social and organisational support in overcoming the burden of critical events (e.g., COVID-19).

The second-cited article “A Conceptual Review of Family Resilience Factors” by Black & Lobo (2008) determined the significant factors influencing family resilience in family nursing practice. This article has been published in the Journal of Family Nursing and cited 221 times since 2008. The third most representative paper is “Burnout and Its Association with Resilience in Nurses: A Cross-Sectional Study” by Guo et al. (2018). The main aim was to analyse the burnout incidence among nurses and detect its interplay with the personal resilience of nurses.

In total, 928 authors researched nurse resilience management, while 27 out of them were authors of single-authored documents. According to the results obtained using an open-source bibliometrix tool “Biblioshiny”, this study found that each author published 0.264 documents (on average). The average number of authors per document was 3.79.

Table 2. TOP-10 Representative Papers, 2005–2022 (up to 7 September)

No.	Author(s)/Year	Title	No. of citations	Corresponding author's country
1	Labrague, L. J., & De los Santos, J. A. A. (2020)	COVID-19 Anxiety among Front-Line Nurses: Predictive Role of Organizational Support, Personal Resilience and Social Support	303	Oman
2	Black, K., & Lobo, M. (2008)	A Conceptual Review of Family Resilience Factors	221	USA
3	Guo, Luo, Lam, Cross, Plummer & Zhang, 2018	Burnout and Its Association with Resilience in Nurses: A Cross-Sectional Study	98	China
4	Guo, Y. F., Luo, Y. H., Lam, L., Cross, W., Plummer, V., & Zhang, J. P. (2018)	Nurses as Leaders in Disaster Preparedness and Response: A Call to Action	89	USA
5	Drury, V., Craigie, M., Francis, K., Aoun, S., & Hegney, D. G. (2014)	Compassion Satisfaction, Compassion Fatigue, Anxiety, Depression and Stress in Registered Nurses in Australia: Phase 2 Results	81	Australia
6	Hayward, R. M., & Tuckey, M. R. (2011)	Emotions in Uniform: How Nurses Regulate Emotion at Work via Emotional Boundaries	81	Australia
7	Van der Riet, P., Rossiter, R., Kirby, D., Dluzewska, T., & Harmon, C. (2015)	Piloting a Stress Management and Mindfulness Program for Undergraduate Nursing Students: Student Feedback and Lessons Learned	78	Australia
8	McVicar, A. (2016)	Scoping the Common Antecedents of Job Stress and Job Satisfaction for Nurses (2000–2013) Using the Job Demands-Resources Model of Stress	77	England
9	Grafton, E., Gillespie, B., & Henderson, S. (2010)	Resilience: The Power within	76	Australia
10	Stieglitz, K. A. (2010)	Development, Risk, and Resilience of Transgender Youth	74	USA

Source: systemized by the authors.

On the other hand, the most productive author (Table 3) by the number of published documents was American scholar Chesak Sherry (5 documents). In sum, this scholar published 19 documents in the scientific journals cited by the Web of Science database and cited 228 times. The individual contribution of Chesak Sherry to the published scope of articles was 3.5, the highest among the analysed authors.

It stands to mention the low international collaboration between the scholars that demonstrates that the research into the nurse resilience management is mainly conducted on the national level. However, the network visualization of co-

authorship by countries (Fig. 4) shows that the scholars from the USA and the UK are the most internationalized. Thus, the USA authors published 82 documents in co-authorship with scholars from Australia, Norway, Canada, South Korea, China, Pakistan, and Brazil. In turn, the UK scholars collaborated more with researchers from Italy, Ireland, Taiwan, Canada, China, and Australia and published 24 articles in sum.

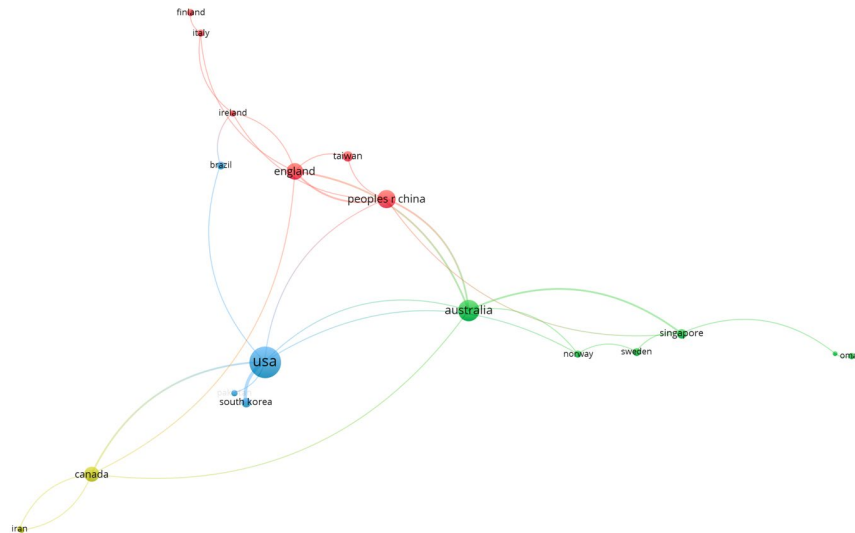


Fig. 4. The network visualization of co-authorship by countries, 2005–2022 (up to 7 September).

Source: developed by the authors.

Table 3. The Most Influential Scholars, 2005–2022 (up to 7 September)

Authors	No. of papers	Total no. of papers/ cited	h-index	Article fractionalized	Country	Total citation
Chesak Sherry	5	19/228	9	3.5	USA	93
Cao Xue	4	11/113	5	1.3333	China	22
Labrague Leodoro J.	4	26/273	10	1.1667	Oman	380
Brown Julia A.	3	25/3445	13	1.1	USA	20
Cutshall Susanne M.	3	43/869	16	1.025	USA	25
Foster K	3	36/94	5	1	Australia	83
Li Jing	3	1/1	1	1	China	11
Sood A	3	4/17	2	1	India	70
Andrusyszyn Mary-Anne	2	20/477	12	1	Canada	91
Austin Ralph	2	16/647	10	1	UK	6

Source: systemized by the authors.

Considering the journals involved in the investigated field, Table 4 presents TOP-10 journals that published most of the documents. Notably, 7 out of 10 journals are affiliated with institutions from the United Kingdom. Thus, Journal of Nursing Management (the UK) published the biggest number of articles (53 documents). This journal's main subject area is leadership and management issues in nursing. The second place is taken by the Journal of Advanced Nursing, which published 15 articles mainly concerning general nursing. 14 articles were published in the Journal of Clinical Nursing, which specializes in the issues of general nursing.

The scientific journals established in the United States ranked fourth and fifth. These journals published 6 articles out of the analysed scope of documents. In addition, Journal of Holistic Nursing presents articles investigating the miscellaneous aspects of nursing, while Journal of Nursing Administration – leadership and management issues in nursing.

The general nursing themes with an emphasis on nurse education are covered in such journals as Nurse Education in Practice, Nurse Education Today, and Journal of Nursing Education. The United Kingdom journals BMC Nursing and Issues in Mental Health Nursing focus on general nursing and psychiatric mental health, respectively.

Table 4. The Most Productive Sources, 2005–2022 (up to 7 September)

Sources	No. of publications	Country	h-index	SNIP 2021	CiteScore 2021	SJR 2021/Q
Journal of Nursing Management	53	UK	83	1.637	5.0	1.11/Q1
Journal of Advanced Nursing	15	UK	161	1.368	4.3	0.77/Q1
Journal of Clinical Nursing	14	UK	109	1.532	5.3	0.83/Q1
Journal of Holistic Nursing	6	USA	42	1.331	2.8	0.55/Q1
Journal of Nursing Administration	6	USA	85	0.790	2.1	0.54/Q2
Nurse Education in Practice	6	UK	53	1.502	3.7	0.78/Q1
Nurse Education Today	6	UK	84	1.998	5.3	0.99/Q1
BMC nursing	4	UK	42	1.559	2.6	0.63/Q1
Issues in Mental Health Nursing	4	UK	63	0.631	2.2	0.41/Q3
Journal of Nursing Education	4	USA	67	1.120	2.4	0.64/Q1

Source: systemized by the authors.

Fig. 5 sets up a typology of the themes of the analysed literature scope. For designing a thematic map, the keyword plus field was used. According to Table 5, the motor theme in the investigated research field is mental health (the 2nd cluster). The mental health research direction is essential in the investigated scientific studies. This theme is connected with predictors, job-satisfaction, workplace, model, registered nurses, adversity, retention, and conservation keywords which have high centrality and destiny.

The basic themes in the analysed research field are resilience (the 4th cluster) and nurses (the 6th cluster). The scholars paid significant attention to the investigation of resilience in healthcare under consideration of management and strategies, education and nursing student, social support and empowerment, experience, workplace violence, perceived stress, etc. In turn, the studies on nurse resilience management cover the issues of experiences, performance, quality, leadership, self-efficacy, challenges, etc.

The lower-right quadrant detects the themes which are emerging or declining in nurse resilience management research field. According to Table 5, this theme could be entitled health (the 5th cluster). This theme is linked with stress, burnout, work, anxiety, mindfulness, personal resilience, distress, outcomes, disease, intervention, meditation, etc.

The niche themes of limited importance in the research field on nurse resilience management are perception (the 1st cluster) and depression (the 3rd cluster). The findings show that theme of perception is connected with quality of life, children, support, competence, and adjustment. In turn, the theme of depression is linked with satisfaction, risk, and recourses.

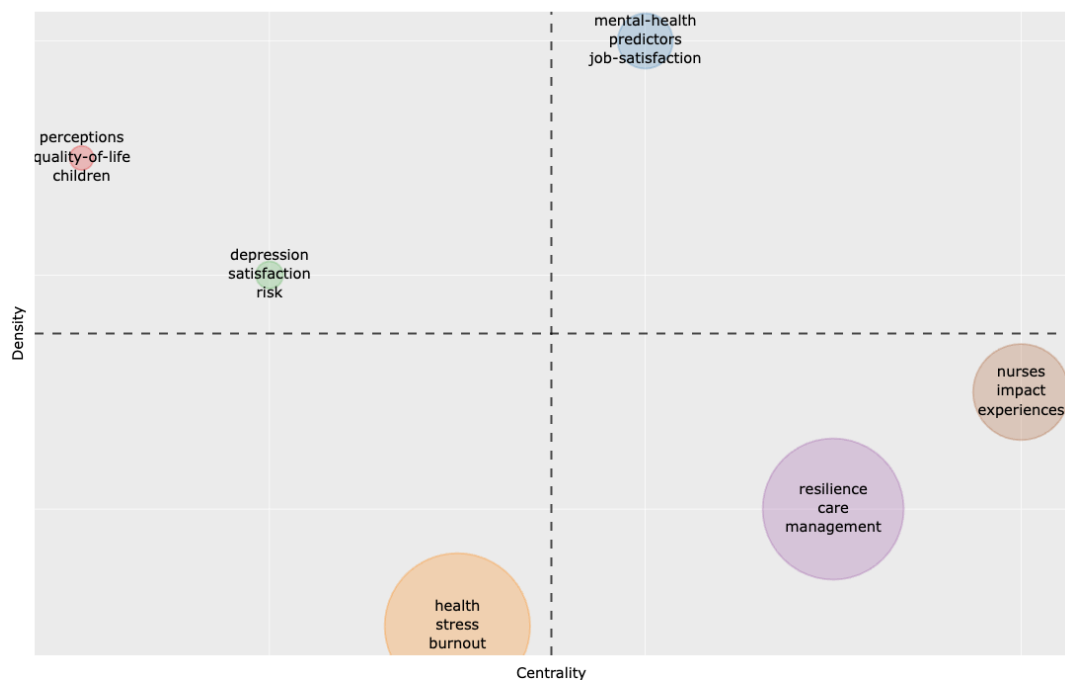


Fig. 5. Thematic map, 2005–2022 (up to 7 September).

Source: developed by the authors.

Table 5. Clusters of the Thematic Map, 2005–2022 (up to 7 September)

Cluster #1 Perception	Occur.	Cluster #2 Mental-health	Occur.	Cluster #3 Depression	Occur.
Perceptions	12	Mental-health	15	Depression	13
Quality of life	9	Predictors	11	Satisfaction	13
Children	7	Job-satisfaction	9	Risk	12
Support	7	Workplace	8	Recourses	9
Competence	5	Model	6		
Adjustment	5	Registered nurses	5		
		Adversity	5		
		Retention	5		
Cluster #4 Resilience	Occur.	Cluster #5 Health	Occur.	Cluster #6 Nurses	Occur.
Resilience	62	Health	44	Nurses	41
Care	44	Stress	37	Impact	22
Management	35	Burnout	35	Experiences	13
Education	16	Work	16	Health-care	12
Nursing-students	12	Scale	15	Performance	9
Social support	10	Outcomes	12	Quality	8
Prevalence	9	Intervention	12	Leadership	6
Life	7	Anxiety	11	Self-efficacy	5
Strategies	5	Program	11	Challenges	5
Symptoms	5	Exposure	7		
Empowerment	5	Mindfulness	7		
Experience	5	Validation	6		
Work violence	5	Personal resilience	6		

Source: developed by the authors.

CONCLUSION

This study was conducted to analyse the global scientific treatise on nurse resilience management status to detect the forthcoming trends in the investigated research field. The research questions were answered through bibliometrics and knowledge visualization methods. The recent scientific publications indexed in the Web of Science database from 2005 to 2022 (up to 7 September) were analysed to detect the main interplay between the fields of research on nurse resilience management, most prominent scholars, collaboration networks, journals, and countries.

The findings revealed the snowballing growth of the publication activity on nurse resilience management from 2017, while the initial exploration period was 2005–2009, and the slow growth period was 2009–2017.

The obtained results identified the TOP-10 most cited publications amounting to 1178 times (max – 303 and min – 78). The scientific article “COVID-19 Anxiety among Front-Line Nurses: Predictive Role of Organizational Support, Personal Resilience and Social Support” published in 2020 by scholars from Oman and the Philippines was the most frequently cited as of 7 September 2022.

The evidence revealed strong internal collaboration between scholars and low cooperation in the global scope. This statement is confirmed in the study by Berg et al. (2018), who noted that resilient healthcare studies were mainly conducted at the micro, not macro levels. Therefore, future studies require more analysis of nurse resilience management at the macro level with deeper international collaboration among scholars. Despite the above, most international publications were prepared by scholars from the USA and the UK. The USA scholars published 82 documents with their colleagues from Australia, Norway, Canada, South Korea, China, Pakistan, and Brazil. In turn, the UK scholars collaborated more with researchers from Italy, Ireland, Taiwan, Canada, China, and Australia.

Only 3 % of scholars were authors of single-authored documents. At the same time, each author published 0.264 documents (on average), while the average number of authors per document was 3.79. On the other hand, the most prominent author by the number of published documents was American researcher Chesak Sherry (5 documents).

The findings showed that 7 out of TOP-10 journals investigating the studied research topic were affiliated with UK institutions. The biggest number of articles (53 documents) were published in the Journal of Nursing Management which addresses leadership and management issues in nursing.

To give the general research framework that could identify the perspectives for future investigation in the field of nurse resilience management, this study applied the co-word network analysis and clustering. The results unveiled the main motor, basic, emerging or declining, and niche themes in the investigated research field. The basic theme in the research scope is resilience in nursing. The researchers investigated nurse resilience mostly under consideration of management and strategies, education and nursing student, social support and empowerment, experience, workplace violence, perceived stress, etc. Besides, these studies cover the issues of experiences, performance, quality, leadership, self-efficacy, challenges, etc.

The essential, well-developed, and influential theme in the nurse resilience management research scope is the mental health of nurses. This theme covers the analysis of issues concerning predictors, job-satisfaction, workplace, model, registered nurses, adversity, retention, and conservation keywords.

The well-developed but marginal themes in the research field on nurse resilience management are perception and depression. Noteworthy here, the theme of perception is connected with quality of life, children, support, competence, and adjustment, while depression is linked with satisfaction, risk, and recourses. These themes need more exploration in future studies.

Considering the findings of this research, it is clear that the mental health of nurses has been coming to the fore. Given the detected demotivating features of the nurse occupation, the modern challenge of COVID-19 brought additional pressure

on the mental health of nurses and decreased their job satisfaction. Moreover, it was proved that the mental burden on healthcare workers increased their incidence rate (Röthke et al., 2021). It is also important to mention that nurse resilience is important not only to nurses from an individual perspective but also from an economic perspective. Not all nurses endure difficult working conditions and leave their job. Nurse turnover in the workplace is an economic burden for states (e.g., Li & Jones, 2013).

Therefore, the perspective themes for future research could be health topics of nurses linked with stress, burnout, work, anxiety, mindfulness, personal resilience, distress, outcomes, disease, intervention, meditation, etc. The future research trends should cover maintaining the nurses' mental health to prepare them for stressful events, systemic shocks, and outbreaks. It is appropriate to elaborate on mindfulness and meditation practices to strengthen nurses' personal resilience, promote their life and job satisfaction, and decrease the risk of depression, anxiety, and burnout. Future research is needed to develop adaptive measures, public health initiatives, and management strategies to reduce stressors in the work environment and recover nurses after COVID-19. Moreover, it is appropriate to galvanize the studies on the investigation of the interplay between nurse resilience level and economic outcomes.

To avoid misunderstanding, it is appropriate to note the main limitation of this study. Since this research covers only the scientific documents published in the journals indexed in the Web of Science database, it is essential to explore the studies presented in other scientific databases (e.g., Scopus, PubMed, Google Scholar, etc.). It would allow for a more comprehensive analysis of global scientific treatise on nurse resilience management.

ACKNOWLEDGMENT

This research has been funded by a grant (No. P-LU-PAR-22-53) from the Research Council of Lithuania.

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