11-2019

Journals Bibliometric Portfolios; Case of Nursing Research

Helena Blazun Vošner PhD
Health Center Adolf Drolc, helena.blazun@zdmb.si

Peter Kokol Prof
University of Maribor, Slovenia, peter.kokol@um.si

Journals Bibliometric Portfolios; Case of Nursing Research

Helena Blažun Vošner[1, 2], Peter Kokol[3]

[1] Community Healthcare Centre Dr. Adolf Drolc Maribor, Ulica talcev 9, 2000 Maribor, Slovenia, helena.blazun@zd-mb.si

[2] Faculty of Health and Social Sciences Slovenj Gradec, Slovenj Gradec, Slovenia

[3] University of Maribor, Faculty of Electrical Engineering and Computer Science, Koroška cesta 46, 2000 Maribor, Slovenia, peter.kokol@um.si*

*Corresponding author

Abstract

Number of journals is raising exponentially. Consequently authors have a problem which journal to select when publishing their research. Journal portfolios including information like impact factors and productivity trends, state of the art topics, topics evolution and citation patterns might help authors to select the journal where their paper will have optimal chances to be published, read and cited. To build portfolios we used two approaches; namely descriptive bibliometric analysis to extract distribution of types of documents, most prolific authors, institutions, countries, citation histories, etc. and bibliometric mapping to visualize the content Our study showed that journals portfolios can improve evidence based nursing and on the other hand offer health librarians an opportunity to extend their services and help prospective authors to select the optimal journal to publish their research.

Key words: Journal portfolios, Health library services, Nursing, Research, Bibliometric analysis

Introduction

Evidence-based nursing (**EBN**) aim is to use evidence from appraised and clinically significant, and applicable research to improve the health and safety of patients, and improve the outcomes in cost effective manner for both the patient and the healthcare system (1–3). EBN is the next step in the development of research based nursing practice RBNP (4). RBNP is defined as the nursing practice interventions, which are based on valid and reliable scientific research findings, instead of tradition and authority (5). While in EBN scientific research findings are the preferred evidence source, RBNP uses research findings only. The best source where nursing related research evidence could be find are scientific journals. However, the number of nursing journals is rapidly growing. There were 41 journals listed in the Journal citation index (Clarivate analytics, USA) in 1997, and 115 in 2017, meaning that the number of indexed journals has almost tripled in last 20 years. Consequently, authors are faced with a hard decision - which journal is the most appropriate to publish their research?. Wrong decision might result in either their paper not being published or in a delayed publication. As a result, their research evidence might not become available, or become available to late. On the other hand, nurses must decide which journals is the best source regarding the evidence they are seeking for each particular case, and also which journals to read to stay informed about the state of the art in their nursing speciality.

Bibliometrics, is becoming more and more popular also in nursing (6). The single journal study is another bibliometrics method to analyse journals, however not just from the quality point of view, but it also gives insight into the journal content, trends, hot topics, etc (7). Single journal studies have already been performed in the nursing field, for example Journal of Advanced Nursing (8), the Journal of Nursing Simulation (9) and the Journal of Nursing Regulation (10) etc. Recently, Giménez Espert and Prado-Gascó (11) published an interesting analysis of six nursing journals, however they analysed literature production of all six journals together, thus their study cannot be considered a single journal study. In this paper we claim that the single journal studies can serve as an excellent source of evidence to support the decision making presented above. We are introducing a concept of journal bibliometric portfolio and how another evidence-based practice discipline, namely Evidence based librarianship (EBL) can be used to develop such portfolios. It has been shown that the EBL decision-making processes is compatible with the EBN process (12–14).

Thus the aim of our study is first to show how EBL and single journal bibliometrics can be used to build journal bibliometrics portfolios.

METHODS

Železnik, Kokol and Blažun, Vošner (8) performed an extensive single journal study of the Journal of Advanced Nursing (JAN), Authors analysed a variety of bibliometrics attributes, for the period 1976 – 2015. The set of analysed attributes was used as a conceptual model for the journal bibliometric portfolio (Table 1.)

Table 1. The conceptual model of the journal bibliometrics portfolio

	Benefit for the EBN - author	**Benefit for the EBN - nurse**
Year of establishment	Older journals might be more prestigious	Evidence in prestigious journals might be more reliable
Period of analysis	New single journal studies are more usable to assess the journal	New single journal studies are more usable to assess the

		appropriates of the journal for gathering evidence
Percentage of review papers	Author can assess what kind of papers are preferable	Systematic reviews are on the higher level of evidence (5), thus journals with higher number of reviews might offer more high- level evidence
Trend in the number of publications	There is a positive correlation between productivity and the number of top papers (15)	There is a positive correlation between productivity and the number of top papers (15), thus more productive journals might include more top papers, and more usable evidence
Trend in the impact factor and rank	Journals with higher impact factor might have larger impact (16)	There is a positive correlation between the impact factor and quality of evidence (17). Journals with higher impact factors might offer better evidence
Trend in the number of pages per paper	Author can assess the optimal length of their paper	The length of paper is positively corelated to its citation impact and presumably with its quality (18). Journals with lengthy papers might publish better papers and thus better evidence
Trend in trend number of authors per paper	Author can assess the optimal numbers of authors per paper	The co-authorship is positively corelated with paper usefulness (19). Journals publishing papers with larger number of co-authors might be more useful in finding evidence
Trend in the number of organisations per paper	Author can assess if the journal prefers multi-organisational studies	Team science involving multidisciplinary and multi-institutional collaboration is is positively corelated to the quality of scientific research (20). Journals publishing papers with larger number of co-authoring organisations might publish better research and thus better evidence
Trend in the number of references per paper	Author can assess the optimal number of references per paper	Number of references is the strong predictor of the number of citations, and journal impact (21). Journals with larger number of references might publish more impactful papers and are those a good platform to gather evidence

Most productive countries	Author can determine in which country he should search for research partners	Journals where the list of the most productive countries coincides with the list of most productive countries in general might contain more high-quality articles and thus a better quality evidence
Most productive institutions	Author can determine in which institutions he should search for partners	Journals where the list of the most productive institutions coincides with the list of most productive institutions in general might contain more high-quality articles and thus a better quality evidence
Research themes	Author can assess if his study is compatible with journal publishing patterns	The nurse can select journals which publish themes related to the evidence she seeks
Hot topics	Author can assess if his study is compatible with journal publishing patterns	The nurse can select journals which publish hot topics related to the most current evidence she seeks
Sleeping papers	Author can asses if journal editors are prone to publish highly innovative research	The innovative and alternative evidence might be found in journals who publish sleeping papers

The model of how to use EBL, single journal studies and journal bibliometric portfolio in a holistic approach is shown in Figure 1. It defines three EBL activities, namely (1) performing a new single journal bibliometric portfolio (2), using evidence from existing single journal studies and (3) updating an existing journal bibliometric portfolio.
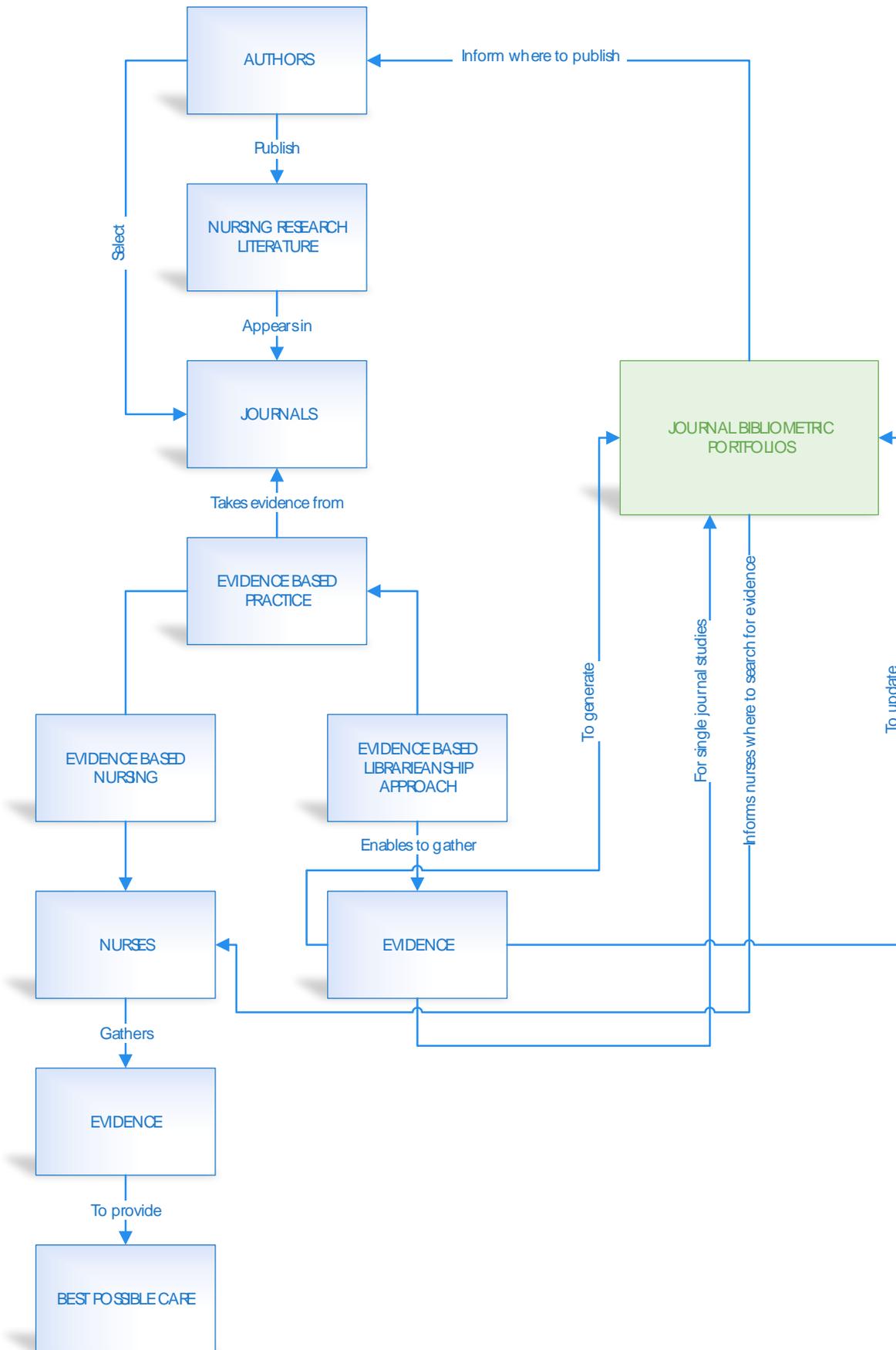
Figure 1. Model of using single journal studies and journal bibliometric portfolio in a holistic approach

While JAN has already been analysed, we selected another nursing journal, the Journal of Nursing Scholarship (JNS) as example for our bibliometric portfolio analysis. The JNS is highly respected by health professionals as one of the leading sources of published research in the nursing field.

Single journal analysis and the journal bibliometric portfolio

Our single journals analysis focused on the descriptive characteristics of the journal (document types, the trends in the number of information sources, average number of pages, authors, institutions, references, and citations per information source, Impact Factors and journal ranks), most prolific entities (authors, institutions and countries) and most cited information sources Additionally, we analysed the chronological evolution of JNS publications and emerged hot topics. Furthermore, we were interested to know if there were any Sleeping Papers (SPs) published in the JNS. SPs represent information sources not cited for a certain period of time (sleeping), and then suddenly starting to become cited (awakening) (22). Our JNS single journal analysis covers more bibliometrics attributes than listed in the above bibliometric portfolio. The reason is that we followed the usual structure of single journal studies and that a single journal study can also serve as an Appendix to the journal bibliometric portfolio.

Data Collection

Two corpuses were formed on 21th march, 2019 from the Scopus bibliographical database (Elsevier. Netherlands), using the search string: "Journal of Nursing Scholarship" in the Source title field. The information sources (e.g. articles, notes, editorials, letters, reviews etc.) for the first corpus, which was used for most analyses, were limited to the period 1983-2016. 1983 was the year when JNS was started to be covered in Scopus, and 2016 was selected, due to the fact that most other singe nursing journal studies ended in 2016. The second corpus used for the identification of hot topics was formed from information sources covering the period 2015 – 2016 . Concurrently, a search in the Scopus, WoS, Medline and Google Scholar databases was performed to locate other single nursing journals bibliometrics papers.

Data Analysis

In our study, we employed bibliometric analysis which was firstly introduced and defined by (23); however, later with the introduction of new techniques based on advanced information technologies, the basic definition and aim of bibliometrics evolved (24,25). Bibliometric analysis is a combination of different methods for conducting quantitative analysis of science and represents a study of measurement of the publication patterns of all forms of written communication and their authorship by means of using citation studies.

Thematic analysis and evolution of terms

Recently, a popular way of using bibliometrics is bibliometric mapping, which is used to visualize literature production with a variety of bibliometric maps and networks. It can be used to identify specific research themes, as well as for a general overview of the topology of the area, its themes, topics and terms, and how they relate to each other (26). To analyse the content of JNS, we induced various landscapes, as well as co-authors country and author – keywords co - occurrence networks by using VOSviewer software version 1.6.9 (Leiden University, Netherlands). The VOSviewer program visualizes bibliometric maps in various ways to emphasize different aspects of the literature production. Clusters represent the terms that are closely associated and are denoted by the same cluster colour and various networks represent associations between terms orother bibliometric units. First we used the clustered landscape for the thematic analysis (27) of JNS content based on title and abstract terms. General/common

terms, such as introduction, argument, debate, review, paper, article, author, scope, significance, test, baseline, interview, analysis, timestamps (e.g., month, day, hour) and country and city names were omitted from the analyses.Next we induced the timeline landscape, where colours represent the average years when terms emerged. Finally we superimposed both landscapes.

Hot topics
The author keywords` network was derived from the second corpus, while all other landscapes and networks were derived from the first corpus. The historical evolution of terms was deducted from the timeline landscape and the citation landscape was used to identify most cited terms. Hot topics were identified from the authors – keyword co – occurrence network, based on the keywords average citation rates.

Descriptive bibliometrics
The descriptive bibliometric analysis (distribution of types of documents, most prolific countries, institutions, and most cited articles) was performed employing Scopus built-in analysis services. Trends' analyses of JNS information sources` characteristics (average number of pages, references, authors, institutions and, citations per publication per year, distribution of citations, funding information), was performed on the publication meta – data exported to Excel 2007 (Microsoft, USA) and calculated using Excel built-in text and statistical functions.

Sleeping papers analysis
In order to identify SPs, we defined two sets of SP identification criteria. If the search using original Van Ran's criteria (five years and more of a sleeping period and below one citation per year on average in the sleeping period) wouldn't result in any SPs, less strict criteria will be used. Less strict criteria denoted the SP as an information source which was cited less than twice on average in the period of at least the first four years after it was published and had more than five citations per year on average after awakening. SPs were identified by our own software developed at the Faculty of Electrical Engineering and Computer Science, University of Maribor, Maribor, Slovenia. The software is based on a pattern recognition algorithm, which transforms information sources citation histories into signals, and analyzes/compares the signal characteristics to SPs` identification criteria.

Building portfolios using evidence from the existing nursing single journal studies
In this part of the study we used the evidence from three existing single nursing journal studies listed in the introduction to build the journal bibliometric portfolios,

Updating an existing journal bibliometric portfolio
In the last part of the study we updated the JAN bibliometric portfolio for the period 2016-2018 using the same methodology as in section ***New single journal bibliometrics***

RESULTS

JNS bibliometric portfolio
The study revealed that, in total, 2,341 information sources within 9 different document types were published in the JNS. Among those, the majority are research articles (n=1,717; 73.3%), followed by letters (n=249; 10.6%), reviews(n=113; 4.8%), notes (n=121; 4.8%), editorials (n=111; 4.7%), articles in press (n=27; 1.2%), short surveys (n=7; 0.3%), errata (n=4; 0.2%), and conference paper (n=1; 0.04

Figure 2. presents the dynamics of the number of information sources per type and total research literature production of JNS. Most of the curves exhibit unstable behaviour, with many relatively large fluctuations. The total production shows a positive power shaped trend from 1983 till 1995, when it reached its peak value. The negative trend reached its minimal value in 2013, followed by a strong exponentially shaped positive trend. A similar trend is observed in the article and letter production, despite that letters` production stopped after the year 2009. The number of editorials exhibits a different trend. The production was linear from 1983 till 1994, however, followed by an enormous peak value of 24 editorials in 1995. After that, the linear trend continued with a slight positive trend. The review papers started to appear in 1989, followed by a positive trend till 2006, reaching the peak value in 2005. After that, a strong drop in the number of reviews was observed, followed by a slightly negative production trend. Similar to review papers, notes started to be published in 1989, with a positive trend till 1999, when the peak was reached. After that, the production was almost non-existent until 2015 when the last note was published.
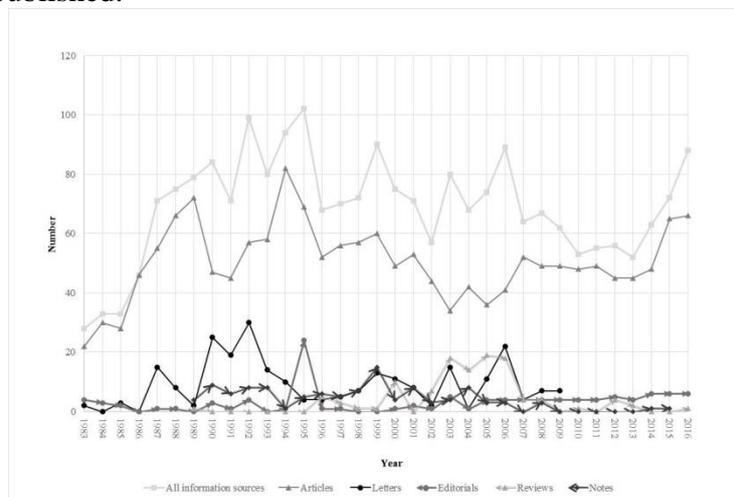
Figure 2 The dynamics of most prolific document types published in the JNS

Average number of authors per year and information source, as well as pages and institutions exhibit a linear positive trend. The average number of authors reached its peak value of almost five authors per information source in 2015, the average number of almost five organizations per information source in 2002, and almost nine pages per information source in 2010. After reaching the peak value, the average number of pages and authors per information sources started to decrease, while the average number of institutions first decreased and then stabilized (Figure 3).
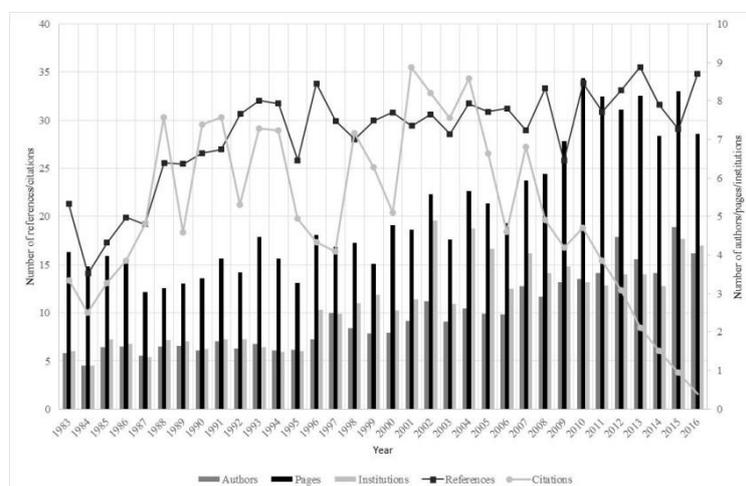
Figure 3. Trend of the number of authors, pages, institutions, references and citations

As expected, the number of citations per information source follows a bell-shaped curve, reaching its peak value of 35 citations in 2001. On the other hand, the average number of references per information source shows a positive trend, with a more steep slope till 1996, reaching its peak value of 35 references in 2013 (Fig. 2).

The JNS reached a high Impact Factor (IF) relatively quickly within both journal metrics, the Web of Science Journal Citation Record (JCR), and the Scopus Source Normalized Impact per Paper (SNIP). While JCR presents the average number of times articles from the journal published in the past two years have been cited in the JCR year (Thomson Reuters 2012), the SNIP presents the ratio of a journals' citation count per paper and the citation potential (average length of lists of reference lists in a field) for the journals' subject field (Elsevier 2017). The highest JCR IF was reached in 2015 (2,128) and the SNIP IF in 2013 (1,845); however, the study showed the overall increasing trends in both IFs. The JNS is assigned to the subject category "Nursing" where, according to both JCR and SNIP it achieved high rankings. Thus, the JNS ranked two times in 1st place according to SNIP; namely in 2000 (1/34) and in 2013 (1/79). Within JCR ranking the journals' best ranking was 6th place out of 32 journals in 2002; however, in 2015, the journal ranked in 7th place out of 116 journals, which actually indicates the high quality of the journal (Figure 4).
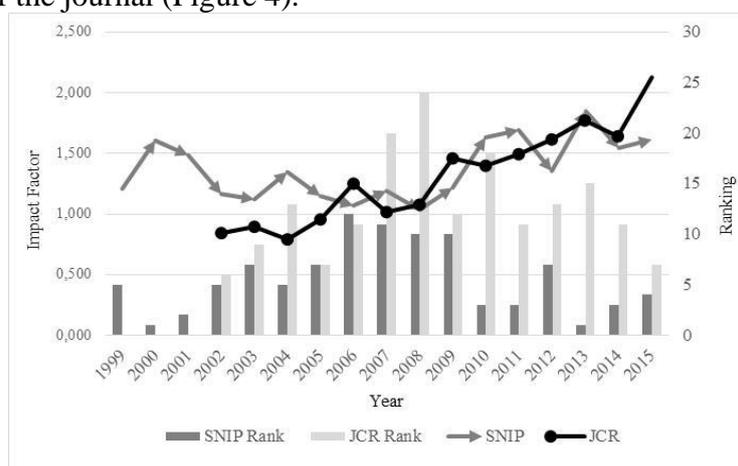
Figure 4. Rankings of the JNS

We performed additionally a citation analysis per article and found out that 19.99% articles (n=468) reached 1-5 citations, 12.09% (n=283) 6-10 citations, 32.72% (n=766) 11-50 citations and 6.54% (n=153) articles reached more than 50 citations. On the other hand, 28.66% (n=671) articles were not cited at all. The presented results demonstrate the high quality of the JNS, according to the fact that a majority of articles were cited more than 5 times. The citation analysis of terms showed that the terms appearing in the most cited information sources titles and abstracts are "stigma", "resilience", "illness", "theory", "hope" and "nurse staffing" with 40 and more citations on average. Additionally, the terms "nursing theory", "patient outcome", "adverse event", "Alzheimer, self-management and quality of life (QOL) are also highly cited, namely 30 to 40 times.

Institutional and geographical distribution of literature production
The information sources were published in 69 countries and 1,043 institutions. The most productive country covering more than two-thirds of the JNS literature production was the United States of America (USA) (n=1,585; 67.71%), followed by Canada (n=100; 4.27%), Australia (n=43; 1.84%), the United Kingdom (UK) (n=38; 1.62%), Taiwan (n=36; 1.54%), South Korea (n=29; 1.24%), Spain and Turkey (n=20; 0.85%), Israel (n=19; 0.81%), and Japan

(n=16; 0.68%). The 10 most productive institutions were also from the USA, namely the University of Pennsylvania (n=70; 2.99%), University of California (n=65; 2.78%), University of Washington (n=43; 1.84%), Boston College (n=38; 1.62%), New York University (n=33; 1.41%), University of Iowa (n=33; 1.41%), University of Illinois at Chicago (n=33; 1.41%), University of Wisconsin Madison (n=29; 1.24%), The University of North Carolina (n=28; 1.20%), and Yale School of Nursing (n=27; 1.15%). It is interesting to note that the first non-USA institution ranks in 35th place, namely the University of Toronto, with 14 published information sources. This may lead to the conclusion that USA researchers are extremely successful in publishing in the JNS.

The analysis of the country co-authorship network including countries cooperating with at least two other countries showed that the USA cooperates with the largest number of countries. A lot of European (EU) countries, such as France, Spain, Switzerland, and Italy, cooperate very intensively with the USA. The UK cooperates mainly with EU countries, Canada, the USA, Australia and New Zealand. The country citation analysis revealed that the most cited countries are Canada and Jordan with more than 25 citations on average per article, followed by Turkey, the USA and Thailand with 20 to 25 articles on average per article. Interestingly, countries like Jamaica, Israel and Malawi, countries which cooperate only with the USA, reach on average the minimum number of citations, namely 3-7 citations per article.
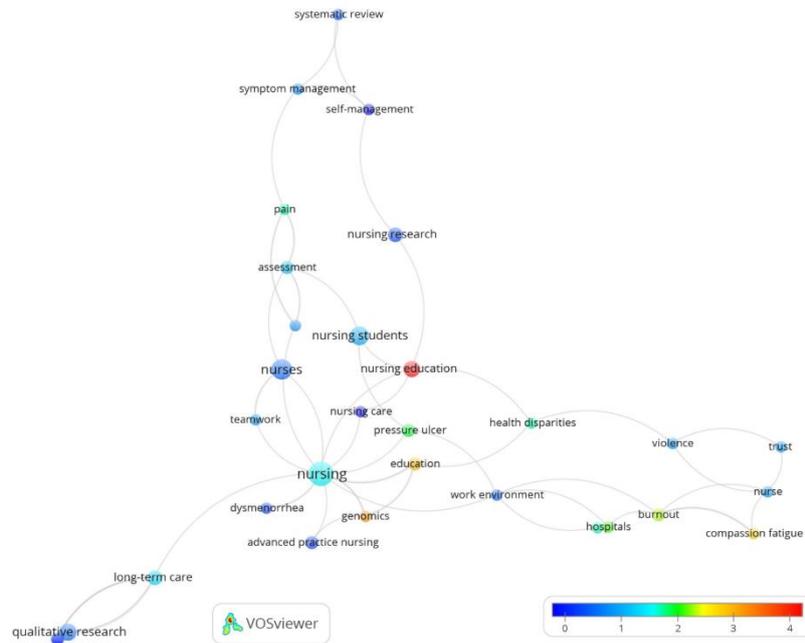
Thematic analysis

Within the thematic analysis we generated scientific landscapes of literature production published in JNS from 1983 to 2016. The study was performed on the basis of terms occurring in articles' titles and abstracts (occurrence > 20) by using the VOSviewer program. In total, 26,362 different terms appeared. Based on the mapping and clustering approach, six clusters emerged automatically in the scientific landscape (approximately denoted by coloured circles in Figure 5). We labelled each cluster with an appropriate research theme on the basis of the most prolific terms found in these clusters:

- **Family planning and parenthood (yellow circle):** This cluster includes terms such as "women", "mother", "father", "child", "parent", "pregnancy", "stress", "anxiety" etc.
- **Health care issues of youth (turquoise circle):** This cluster presents terms such as "mental health", "obesity", "physical activity", "alcohol", "copd" (Chronic Obstructive Pulmonary Disease), "abuse", "adolescent", "young adult", "counseling" etc.
- **Self-management of health and disease (blue color):** This cluster includes terms such as "self-management", "documentation", "pain", "injury", "cancer", "pain management", "illness", "symptom", "healthcare professional", "medication" etc.
- **Nursing research (red circle):** This cluster includes terms such as "nursing", "research", "nursing practice", "nursing research", "nursing science", "nursing profession", "nursing theory", "philosophy", "competence" etc.
- **Nurse work environment, job satisfaction and stress (green circle):** This cluster includes terms such as "nurses", "practice environment", "work environment", "job satisfaction", "burnout", "patient care", "leadership", etc.
- **Caring for older adults (violet circle):** This cluster includes terms such as "long term care", "older adults", "nursing home", "caregiver", "family member", "dementia", "Alzheimer", "emergency department", etc.

Chronological analysis of terms was based on the average publication date of information sources in which the terms appeared in the JNS. The study showed that, chronologically, information sources content progressed through nine phases. Information sources published before 1995 were focused on aids and philosophy, in the next period around 1998 on nursing science, research and practice, around 2000 on diseases and associated factors, and around 2003

on research in nursing practice, especially for older people, infants and family care. In the next period from 2003 till 2007, published research was focused mainly on patient care, competences and decision-making; however, in the period between 2003 and 2005, the focus was on health care issues (i.e. cancer, diabetes, symptoms etc.) and patient outcomes. Around 2008 the literature production was devoted to obesity and breast cancer research with a special focus on stigmatization. Between 2010 and 2013 the research was focused on nurses` practice environment, workload, burnout and other consequences of stressed situations experienced by nurses and other healthcare professionals with emphasis on searching solutions for previously encountered problems in the scope of patient self-management of health. The last period is also characterized with genomic research (Figure 5).

Figure 5 Chronological landscape of terms based on average publication date

Authors of information sources published in JNS in the period 2015 – 2016 used 569 different author keywords, which are used as a means of communication between authors and the scientific community. Namely, with defined keywords, authors in their best way represented the main concepts of their work to readers. The present study showed which author keywords occur more often, how they co-occur, and how often they were used in most cited papers. The larger the circles and character fonts are, the more often the particular author keywords were used. Additionally, the co-occurrences of author's keywords are connected with links, showing which keywords co-occur in the same title or abstract. The network presents only the keywords which occurred more than 3 times, and these are interconnected by 50 links. By far the mostly used keywords are "nursing", "nursing students", "nurses", "qualitative research" and "nursing research"; but, at the same time, they reached the minimal number of citations (on average 0-1 citation). On the other hand, the keyword "nursing education" is still very often used by authors and also reaches the maximum number of citations (on average 4 and more citations). Often cited author's keywords were also "pain", "education", "genomics", "burnout", "pressure ulcer" and "compassion fatigue" which, on average, reached 2-3 citations. According to our methodology, more cited author keywords represent the hot topics published in JNS (Figure 6).

Fig 7 Author keywords co-occurrences` network (n > 3)

Identification of Sleeping Papers published in the Journal of Nursing Scholarship
With our analysis we were not able to identify any SPs using Van Raan criteria, thus we used less strict criteria defined by the authors of this article. On this basis, we identified two SPs. The first identified SP emerged in 1998 (28), reached 92 citations; however, it slept for 10 years with 1.8 average citations per year in the sleeping period. The second identified SP (29), was published in 2001, reached 182 citations, slept for four years and reached on average 2 citations during the sleeping period.

Building bibliometric portfolios from existing single nursing journal studies
Table 2 presents the comparison of JNS and three journals identified above. It revealed that the trend in the number of publications in all four journals is positive, however in JAN and CSN the number of publications have declined in last years. Trends in SNIP differ between journals. The number of pages, authors, affiliations and references is in general increasing. USA and Canada are among five most productive countries in all four journals and UK and Australia in three of them. Contrary, all most productive institutions are different, not a single institution appears in more than one journal. Themes differ between journals, only repeating themes seems to be nursing research. Hot topics differs between journals and cover different themes, each hot topic is covered in only one journal. Sleeping papers appeared in three journals, for JNR the data about the SP's were not available.

Table 2   Journal bibliometric portfolios for the JNS, JAN, CRN and JNR

	Journal of Nursing Scholarship (JNS)	Journal of Advanced Nursing (JNA)	Clinical Simulation in Nursing CSN)	Journal of Nursing Regulation (JNR)
Year of establishment (country)	1967 (UK)	1976 (UK)	2007 (USA)	2010 (USA)
Period of study	1967-2016	1983-2015	2007-2016	2010 - 2016

12

Trend in number of publications	Positive till 1995, then negative till 2010 and positive after 2010	Positive till 2002, then negative	Positive till 2014, then negative	Positive from 2013
Trend of rank according to SNIP	Getting lower in last years	Getting lower in last years	Steady	Continuously rising
Trend in number of pages per paper	Increasing from approx. 4 to 8	Increasing from approx. 7 to 11	Increasing from approx. 4 to 7 in 2012, then decreasing to 6	Not the focus of the study (NFS)
Trend in number of authors per paper	Increasing from approx. 1 to 4	Increasing from approx. 1 to 4	Increasing from approx. 2 to 3	NFS
Trend in number of organisations per paper	Increasing from approx. 1 to 4	Increasing from approx. 1 to 4	Increasing from approx. 1 to 2	NFS
Trend in number of references per paper	Increasing from approx. 20 to 35	Increasing from approx. 24 to 46	Increasing from approx. 11 to 21	NFS
Most productive countries	USA Canada Australia UK Taiwan	UK USA Australia Canada Sweden	USA Canada Australia UK Norway/Qatar	USA Canada Switzerland Mexico Spain
Most productive institutions	University of Pennsylvania (USA) University of California (USA) University of Washington (USA) Boston College (USA) New York University (USA)	Kings College London (UK) University of Manchester (UK) Ulster University (UK) University of Sheffield (UK) University of Alberta (CA)	University of San Francisco (USA) Washington State University Spokane (USA) Boise State University (USA) University of Washington Takoma (USA) Robert Morris University (USA)	National Council of State Boards of Nursing (USA) Duke University (USA) University of Minesota System (USA) University of Maryland (USA) College of Registered

				Nurses of British Columbia (CA)
Research themes	Family planning and parenthood Health care issues of youth Self-management of health and disease Nursing research Nurse work environment, job satisfaction and stress Caring for older adults	Nursing research practice and education Nursing care and quality Research methods Team work and partnership in health care Family care	Simulated clinical experience in health care Education Interpersonal simulation in teams Research in human patient simulation Simulation centres Debriefing	Simulation Conduct Delegation and supervision Transition to practice Public protection
Theme of the journals classics (the most cited papers)	theory of illness, psychometric toolboxes, transitions, qualitative research methods, adverse events and quality of life	Qualitative methods Delphi studies Help seeking Workplace stress in nursing Evidence based practice Symptom management	NFS	NFS
Hot topics	Nursing education Pain management Genomics Burnout Pressure ulcer	Long-term care Dementia Nursing research Nursing care management	Experiential learning Self-efficacy Inter-professional education Debriefing	Telehealth Educational accreditation Continuing competence Scope of practice

	Compassion fatigue			Substance use and fit person Team-based regulation complex Research designs Regulatory impact assessment Regulatory Model effectiveness
Sleeping papers	2	2	1	NFS

Updating JAN bibliometric portfolio

In the last part of the study we updated its journal bibliometric portfolio for the period 2016-2018 (Table 3). During this period 879 information sources were published. Among them, there were 641 research articles (72.9%). 118 review papers (13.2%), 75 editorials (8.5%). 35 articles in press (4.0)%, 8 errata (1%) and 2 notes (0.2%). In regard to the original JAN bibliometric porfolio the structure of information source types notably changed. There wer no letter, short surveys and ony he minimal number of notes. While the percentage of original articles remained approximately the same, the percentage of reviews, editorials and article in press significantly increased. The descriptive parameters like number pf authors, organisations and references become more or less steady, but on higher values then in the original portfolio. Contrary the length of paper started to decrease. There were also sustainable changes in the top most productive countries. UK become the most productive country, while USA dropped to the third place. The most productive institutions completely changed - all five USA institutions were replaced by non USA ones, led by Australian institutions, From the thematic point of view most themes also changed but focus still remains on qualitive research, self-management care fol elderly and burn-out,

Table 3. JAN bibliometric portfolio update for the period 2016 - 2018

Trend in number of publications	Positive till 1995, then negative till 2010 and positive after 2010
Trend of rank according to SNIP	Getting lower in last years
Trend in number of pages per paper	Reducing from approx., 11 to 9
Trend in number of authors per paper	Steady. to 4.5
Trend in number of organisations per paper	Steady around 3.5
Trend in number of references per paper	Steady around 37
Most productive countries	UK

	Australia
	USA
	Canada
	Sweden
Most productive institutions	University of Technology Sydney (Australia)
	Monash University (Australia)
	La Trobe University (Canada) University of Washington University of Hull (UK)
	University of Gent (Belgium)
Research themes	Quality of life and care
	Patient education
	Self-management
	Qualitative approaches in nursing research and theory development
	Developing nursing knowledge
	Professional development and job satisfaction
Theme of the journals classics (the most cited papers)	theory of illness, psychometric toolboxes, transitions, qualitative research methods, adverse events and quality of life
Hot topics	Self-management
	Resilience
	Burnout
	Depression
	Older person
Sleeping papers	No new SPs emerged

DISCUSSION

The single journal analysis of JNS which served as the basis to build JNS bibliometric porfolio revealed that the dynamics of JNS literature production is characterized with large fluctuations and mixed trends; however, the trend in recent years is positive. The information sources published in JNS are becoming more inter – institutional, written by increasingly more authors,

longer and with a growing number of references. Despite the fact that the USA covers more than two-thirds of the JNS scientific literature production, the country distribution of authors shows the wide reach of the journal. The most prolific countries are also the most prolific in overall research literature production, as well as in the nursing literature production. The content analysis showed that the JNS covers a wide range of contemporary themes related to nursing and health..

Comparing bibliometric portfolios from existing single nursing journal studies
Within the last aim we performed the comparison between JNS and other singe nursing journal bibliometric studies and found out that JNS is the oldest among four nursing journals compared. It was established 9 years before JAN. Remaining two nursing journals, namely CSN and JNR are much younger, the first one was established in 2007 and the second three years later in 2010. Bibliometric analysis of single nursing journals were performed recently, which, in fact, is not surprising, due to rising popularity of bibliometrics in nursing. Bibliometric analysis enable nursing researcher to acquire desired information and knowledge more effectively. In regard to the trend in number of publications, almost all journals had positive trend after their establishment with some period of negative trends in between. The negative trend in the last years in JAN and CSN might be the consequence of the fact that in the last 15 years the number of nursing journals increased, which in turn means that researchers have much more opportunities to publish their research. At the same time, it is interesting, that relatively young journal as JNR started with smaller number of publications and reversed the trend after 2013, which could show that the journal is developing and becoming scientifically more and more popular. New journals are normally established when a new subspecialty reaches the critical mass of researchers, which previously were not able to publish in their own specialized journals or were not able to publish at all. Hence they start intensively publishing their research in new journals, which might be another reason for the positive trend in the number of articles. The variances in trend patterns may be also the consequence of changing editorial board polices - accepting only the articles of highest quality might lead to higher impact factors. As far as it concerns the trend of rank according to SNIP we found out that SNIP of older journals is getting lower in last years and of younger journals is rather steady or continuously rising. This may indicate that the trend of rank according to SNIP is probably logically rising a few years after journal's establishment, when papers become cited, and later subsequently decreases, when newer journals become recognized. Completely comparable are the results as far as concerns the trend in number of pages, authors, organizations and references per paper among JNS, JAN and CSN (the comparison with JNR was not possible since authors of this single journal study didn't focus on this kind of analysis). The reasons behind the rising number of authors and institutions are the globalization and internationalization of the research in nursing. Global problems cannot be tackled on a single country or even single institution level and without a team approach. The increase in the number of references might be the consequence of the increased number of publications concerning nursing research and the digitalisation of the scientific publishing – authors can search for similar research more effectively in a larger pool of publications. Among the most productive countries in all four journals are USA, and Canada, however Australia and UK are the most productive in three journals namely, JNS, JAN, CSN. This is comparable to the country rankings in nursing in general (Scimago Lab, Scopus Elsevier, 2018), where USA is first, UK second, Australia third and Canada sixth. Among most productive countries in our study are also additional four EU countries, namely; Sweden (JAN), Norway (CSN), Switzerland and Spain (JNR), two Asian countries Taiwan (JNS) and Qatar (CSN) and one south American country Mexico (JNR), which are among most productive countries in only one journal. While Spain, Sweden and Taiwan are among top ten countries regarding overall nursing research literature production (Scimago Lab, Scopus Elsevier, 2018),

there is no surprise that they are also among most productive countries in one of the journals compared in our study. Contrary, remaining four countries cannot be counted as very productive in the overall nursing research literature production i.e. Norway is ranked on 17th, Switzerland on 22nd, Mexico, on 37th and Qatar on 64th place. Hence, we can reasonably assume that according to their high productivity in a single specialized journal researchers from those countries focus their research endeavours to the main journal theme, that is, nursing simulation for Norway and Qatar, and nursing regulation for Switzerland and Mexico. It is interesting to note that Brazil which is ranked fourth in nursing research literature production is not among the most productive counties in any of the four single journal studies. In JNS, CSN and JNR the most productive institutions mainly arise from USA and in JAN mainly from UK. This might be the consequence that these journals are established either in USA or UK. In two journals (JAN and JNR) among the most productive institutions are also from Canada. Interestingly, no institution does appear as most productive in two or more journals. Identified most prolific research themes revealed that journals mostly follow their stated scope. We can notice similarity among JNS and JAN, since the fact that some research themes are quite similar e.g. family planning and parenthood /family care, nursing research/research methods, nursing research practice and education, nurse work environment, job satisfaction and stress/team work and partnership in health care, which might be due to the fact that both journals are oriented to nursing in general. On the other hand, we can also notice similarities between CSN and JNR, especially in the field of simulation e.g. simulated clinical experiences in health care, interpersonal simulation in teams, simulation centres, research in human patient simulation/simulation and education, debriefing/delegation and supervision, which is surprising, due to the fact that both journals cover quit specialized themes. Concerning the most recent hot topics there are some similarities for example, nursing education could be found as hot topic in JNS, CSN (experimental learning, inter-professional education) and JNR (educational accreditation, continuing competence). Nursing research as hot topic was found in JAN and JNR (research designs), all other hot topics found are more or less reflection of scope of a particular journal. In three journals we identified sleeping papers, two in JNS and JAN, and one in the journal CSN; however the comparison in this manner with JNR study was not possible, since the fact that researchers did not performed identification of SP's within their study. Most SPs emerged in older journals, which due to the definition of a SP is logical. On the other, hand the presence of SPs also reveals that editorial boards and reviewers were open to new and unconventional ideas also in nursing journals.

To conclude, JNS is comparable to other three journals regarding the descriptive bibliometric characteristics, however despite some similarities, it differs considerably in the content. The performed comparison also revealed some factors which contribute to the success of a nursing journal in general. The most obvious would be the positive trend in the journal impact factors and the journal rank. The second would be to attract prominent authors and quality articles on the global level. The third would be to follow the aim and scope stated by individual journal and to be different in content compared to other journals. And finally, to have open minded members of the editorial board and reviewers, which can look into the future and accept papers presenting unconventional, but far reaching and useful ideas.

Strengths and limitations
Our research study did have some limitations. The first is the use of the Scopus database as the only source, meaning that, if other databases would be used, the results of the study might be slightly different. Regarding the identified document types, the authors of this study rely on the accuracy of publication author's categorization; however it might happen that in some cases categorization of publications may be incorrect. It is also a fact that the thematic and chronological analysis was qualitative, and, consequently, subjective.

Conclusions

Nursing is changing and developing rapidly, evidence based nursing is or should become everyday practice, therefore, it is essential for nursing and also other health care professionals to have access to reliable evidence published in the scientific journals. . Due to the fast growing volume of nursing journals we proposed the introduction of journal bibliometric portfolio, which enable authors to publish the evidence in most appropriate journals, and nurses to find evidence in a more efficient way. In other words, journals bibliometric portfolios offer authors and nurse the evidence about evidence. It is clear that portfolios can't replace other evidence searching approaches, however they can augment traditional approaches and support optimisation of searching processes. Journal bibliometric portfolios are not meant to prescribe, but to inform.

In our study we didn't answer the important question, who should be preparing the journal bibliometrics portfolios, we left that for the discussion. However, we can propose some ideas. The number of single journal studies is increasing and as we showed, those studies represent a form of the bibliometric portfolio. Journal bibliometric portfolios can be prepared by health librarians or skilled nurses or even nursing students in scope of EBL or EBN activities at health libraries, "evidence based research institutes", university research, centres, etc, Bibliographic databases services and bibliometric software enable a skilled person to gather journal bibliometric attributes in one or two working days. Similar amount of time is needed for a domain expert to perform the thematic/content analysis of bibliometric maps.

REFERENCES

1. Iowa MC, Buckwalter KC, Cullen L, Hanrahan K, Kleiber C, McCarthy AM, et al. Iowa Model of Evidence-Based Practice: Revisions and Validation. Worldviews Evid Based Nurs. 2017;14(3):175–82.

2. Melnyk BM, Fineout-Overholt E. Evidence-based practice in nursing & healthcare: a guide to best practice. 2015.

3. Saunders H, Vehviläinen-Julkunen K. The state of readiness for evidence-based practice among nurses: An integrative review. Int J Nurs Stud. 2015;56:128–40.

4. Pearcey PA. Achieving research-based nursing practice. J Adv Nurs. 1995;22(1):33–9.

5. Thompson CJ. Mind the Research-Practice Gap! [Internet]. Nursing Education Expert. 2018 [cited 2019 Jan 26]. Available from: https://nursingeducationexpert.com/research-practice-gap/

6. Alfonzo PM, Sakraida TJ, Hastings-Tolsma M. Bibliometrics: Visualizing the impact of nursing research. Online J Nurs Inform. 2014;18(1).

7. Ho Y-S, Fu H-Z. A bibliometric analysis of the Journal of Membrane Science (1976-2010). Electron Libr. 2015 Jul 21;33(4):698–713.

8. Železnik D, Blažun Vošner H, Kokol P. A bibliometric analysis of the Journal of Advanced Nursing, 1976–2015. J Adv Nurs. 2017;73(10):2407–19.

9. Kokol P, Blažun Vošner H, Železnik D. Clinical Simulation in Nursing: A Bibliometric Analysis after Its Tenth Anniversary. Clin Simul Nurs. 2017 Apr 1;13(4):161–7.

10. Benton DC, Alexander M. The Journal of Nursing Regulation at Age 6: A Bibliographic Analysis. J Nurs Regul. 2016;7(2):4–8.

11. Del Carmen Giménez Espert M, Javier Prado-Gascó V. Bibliometric analysis of six nursing journals from the Web of Science, 2012-2017. J Adv Nurs. 2018 Oct 5;

12. Cleyle S, Bayley L, Mckibbon A. Evidence-based librarianship: A personal perspective from the medical/nursing realm. Libr Hi Tech. 2006;24(3):317–23.

13. Eldredge JD. Evidence-based librarianship: An overview. Bull Med Libr Assoc. 2000;88(4):289–302.

14. Marshall JG, Morgan JC, Klem ML, Thompson CA, Wells AL. The value of library and information services in nursing and patient care. Online J Issues Nurs. 2014;19(3).

15. Sandström U, Besselaar P van den. Quantity and/or Quality? The Importance of Publishing Many Papers. PLOS ONE. 2016 Nov 21;11(11):e0166149.

16. Garfield E. The history and meaning of the journal impact factor. JAMA. 2006 Jan 4;295(1):90–3.

17. Cheek J, Garnham B, Quan J. What's in a Number? Issues in Providing Evidence of Impact and Quality of Research(ers). Qual Health Res. 2006 Mar 1;16(3):423–35.

18. Falagas ME, Zarkali A, Karageorgopoulos DE, Bardakas V, Mavros MN. The Impact of Article Length on the Number of Future Citations: A Bibliometric Analysis of General Medicine Journals. PLOS ONE. 2013 Feb 6;8(2):e49476.

19. Finlay SC, Ni C, Sugimoto CR. New methods for an old debate: Utilizing reader response to investigate the relationship between collaboration and quality in academic journal articles. Libr Inf Sci Res. 2012 Apr 1;34(2):131–7.

20. Rosenkrantz AB, Parikh U, Duszak R Jr. Citation Impact of Collaboration in Radiology Research. J Am Coll Radiol. 2018;15(2):258–61.

21. Onodera N, Yoshikane F. Factors affecting citation rates of research articles. J Assoc Inf Sci Technol. 2015;66(4):739–64.

22. van Raan AFJ. Sleeping Beauties in science. Scientometrics. 2004 Mar 1;59(3):467–72.

23. Pritchard A. Statistical Bibliography or Bibliometrics? J Doc. 1969 Jan 1;25:348–9.

24. Hawkins DT. Bibliometrics of electronic journals in information science. Inf Res Int Electron J. 2001 Jan 1;7(1):120.

25. Bellis ND. Bibliometrics and Citation Analysis: From the Science Citation Index to Cybermetrics. Lanham, Md: Scarecrow Press; 2009. 450 p.

26. van Eck NJ, Waltman L. Visualizing Bibliometric Networks. In: Ding Y, Rousseau R, Wolfram D, editors. Measuring Scholarly Impact: Methods and Practice [Internet]. Cham: Springer International Publishing; 2014 [cited 2018 Oct 26]. p. 285–320. Available from: https://doi.org/10.1007/978-3-319-10377-8_13

27. Vaismoradi M, Turunen H, Bondas T. Content analysis and thematic analysis: Implications for conducting a qualitative descriptive study. Nurs Health Sci. 2013 Sep;15(3):398–405.

28. Nicholson J, McCrillis A, Williams JD. Collaboration challenges in systematic reviews: A survey of health sciences librarians. J Med Libr Assoc. 2017;105(4):385–93.

29. The Point of Triangulation - Thurmond - 2001 - Journal of Nursing Scholarship - Wiley Online Library [Internet]. [cited 2019 Oct 1]. Available from: https://sigmapubs.onlinelibrary.wiley.com/doi/abs/10.1111/j.1547-5069.2001.00253.x