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Identifying trends, patterns, and collaborations in nursing career research: A bibliometric snapshot (1980–2017)

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ABSTRACT

Background: Several studies have investigated the social and technical dimensions of a career in nursing. This paper reveals tendencies and patterns in relevant literature, through bibliometrics and scientometrics.
Aim: This article aims to shed light on the scientific literature of nursing as a career, which is a growing field of study in the *nursing category* of the Web of Science.
Methods: The researchers designed and conducted a bibliometric and scientometric study in the Web of Science Database, in April 2018. The 1,434 articles the authors evaluated were published between 1980 and 2017 in the Web of Science database. They analyzed the retrieved dataset through distance-based, graph-based, and timeline-based approaches, and text analytics in the scope of scientometrics and bibliometrics.
Findings: The authors used summary statistics, text, and network analytics to determine the number of publications over the years. In addition, citation metrics, demographics, co-authorship identifications, citations, co-occurrence networks, and topic structures were used. In the keyword analysis of the studies, the concepts "nurse restriction," "satisfaction," "difficulties in the working environment," and "burn out and stress" were found to be used intensively.
Discussion and Conclusion: This study is intended for nurses, managers, researchers, and also policymakers, because it is critical for them to see the rhetoric of the debates in the literature and provide the best governance and the best quality services.
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Summary of Relevance

Problem

Recruitment and retention are frequent concerns for nursing in healthcare services and for the nursing profession itself. Along with inadequacies in the numbers of nurses, significant problems occur in the nursing profession, due to difficult working conditions, irregular and long working hours, and work pressure.

What is already known

Bibliometric studies generally perform co-citation analyses to visualize the influence of authors and journals, and connections among them, whereas scientometrics may also mine the data, so as to highlight how the main subjects or terms change over time or in different domains.

What does this paper add

The authors found that keyword and topic analyses of nursing career studies cover employment problems in the nursing profession, shortage, nursing professionals' satisfaction and difficulties, and occupational decision making.

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1. Introduction

The nursing profession is involved in every phase of sustainability and improvement of human health and cure-related processes. The world's population is getting older, and the need for nurses (and healthcare staff from all disciplines) to manage this phenomenon has been increasing (Miers, Rickaby, & Pollard, 2007; Stevens, 2011). Therefore, the priority of workforce and human resources planning in the health sector gets higher all over the world. Inadequacy in the number of nurses has also become a relevant issue in the sector, even if the annual number of nursing graduates has been rapidly increasing (Buerhaus, Skinner, Auerbach, & Staiger, 2017). All countries have imbalances in health workforce (i.e., deficits, shortages, or inequitable distributions of workers) (Celletti, Reynolds, Wright, Stoertz, & Dayrit, 2011; Miers et al., 2007). Recruitment and retention are frequent concerns for nursing in healthcare services and for the nursing profession itself (Laschinger, Zhu, & Read, 2016; McLaughlin, Moutray, & Muldoon, 2008; Miers et al., 2007). As the threat of inadequacy in the number of nurses is ever larger, employers, policymakers, and researchers alike are interested in learning how they can keep nurses in the workplace. One key to tackle this inadequacy is a better understanding of nurses' satisfaction with their job and careers (Lorber & SkelaSavič, 2012). On the other hand, productivity and job performance are positively related to job satisfaction. Indeed, when job satisfaction increases, productivity and performance increase as well (Sahin, Akyurek, & Yavuz, 2014). From this perspective, development of nurses' professional competencies is an important factor affecting their service quality (Sahin et al., 2014; Sun et al., 2017; Wilkes, Cowin, & Johnson, 2015). Along with inadequacy in the number of nurses, difficult working conditions, irregular and long working hours, and work pressure cause significant problems in the nursing profession (Lee, Dai, & McCreary, 2015). In this regard, this study presents findings from many studies on work dissatisfaction (Sun et al., 2017) and work-related health problems (Lau, 2008) among nurses and physicians from most countries. Nursing research studies in different countries have identified factors contributing to nurses' intentions to leave their jobs. These factors include being young, or having low job satisfaction, a perceived lack of support from supervisors, deficiencies in work conditions, lack of career possibilities, and low income (Wilkes et al., 2015). Work stress and burnout issues are expressed as being the most critical factors (Birgit, Gunnevi, & Ann, 2013).

Despite inadequacy in the number of nurses and problems in working conditions, nursing is still an occupation students prefer (Rognstad, Aasland, & Granum, 2004). Young nursing students in the post-modern society have different motives for choosing the field of nursing education and the nursing profession (Liaw et al., 2016; Rognstad et al., 2004). The decision to select the nursing profession is affected by factors of gender, culture, level of knowledge, self-concept, and desire to help others (Liaw et al., 2016; McLaughlin, Moutray, & Moore, 2010; Porter, Edwards, & Granger, 2009). Career preferences and reasons to prefer such a career are essential factors to educate nurses in the above-mentioned directions, so as to meet the existing needs (Liaw et al., 2016). As existing studies indicate, the dynamics of the nursing profession (i.e., working conditions, job characteristics, and even social attitudes) can be considered as primary drivers of the increasing tendency in career studies in nursing research. These findings can shed light on the researchers and managers in nursing as to their future work and working life. Several existing methodologies, such as reviews, systematic reviews, bibliometrics, and scientometrics, can be used in this context to summarize and visualize the status of the current literature. In particular, bibliometrics and scientometrics have become popular methodologies, since they provide findings with the help of statistics, network structures, and text analytics. This paper presents studies that applied these methods to nursing career literature.

Different subtitles of nursing research contain the concepts "bibliometrics" and "scientometrics". Anderson, Keenan, and Jones, (2009) described the development and trends of nursing terminology. Their work includes the analysis of journals, co-authorship, and co-citation networks. Oermann et al. (2008) investigated nursing literature to highlight information sources regarding authorship, connections among studies, types of documents the authors cited, and the connections among the journals. Estabrooks, Winther, and Derksen, (2004) conducted a study (within the scope of bibliometrics) to evaluate academic performance of nursing students. As the threat of inadequacy in nursing looms ever larger, employers, policymakers, and researchers alike are interested in learning how they can keep nurses in the workplace. One key to address inadequacy is a better understanding of nurses' satisfaction with their job and with their career studies. In other research on academic performance measurement, Davidson et al. (2014) conducted a study to identify the role of bibliometrics and webometrics in nursing and midwifery.

Considering the importance of the nursing career, and the lack of studies within either the scope of bibliometrics or scientometrics in this subfield, this research was conducted to reveal the status of the current literature through the related metrics, concept patterns, co-authorship relationships, and citation relationships on the research and review articles in the Web of Science (WoS) database.

2. Methods

This article aims to shed light on the scientific literature of nursing career, which is a growing field of investigation in the nursing category of the WoS, through bibliometrics and scientometrics. This study presents the covered topics, trends in the cited journals and authors, and status of institutions and works, and thus illuminates the development in this field, providing a broader perspective on the current status of the literature from 1980–2017. The authors aimed to reveal the following issues:

- The distribution of publications over the years.
- The impact of selected studies on the related literature (based on h-index and total number of citations).
- Leading countries.
- Collaborations among countries and institutions.
- Leading journals and authors in relation to the number of publications.
- The most cited journals, papers, and authors as well as citing patterns.
- Trends and patterns in keywords and topic structures in the selected articles.

2.1. Data source and data characteristics

The study consists of the constellation of research and review articles about the nursing career which were published from 1980 to 2017 in the nursing field of the WoS database and indexed in SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, and ESCI. The search strategy was developed by querying the term ("career*") as a topic in the WoS nursing category. All articles which had been published between 1980 (1st January) and 2017 (31st December) were included. The search process was carried out on April 1st, 2018, within the WoS Core Collection database. The query returned 1,556 research and review articles. Between April 1 and 20, 2018, an expert reviewed the titles, keywords, and abstracts of these 1,556 articles through a web-based program, and filtered out 122 articles which were found to be unrelated to nursing. Finally, 1,434 arti-

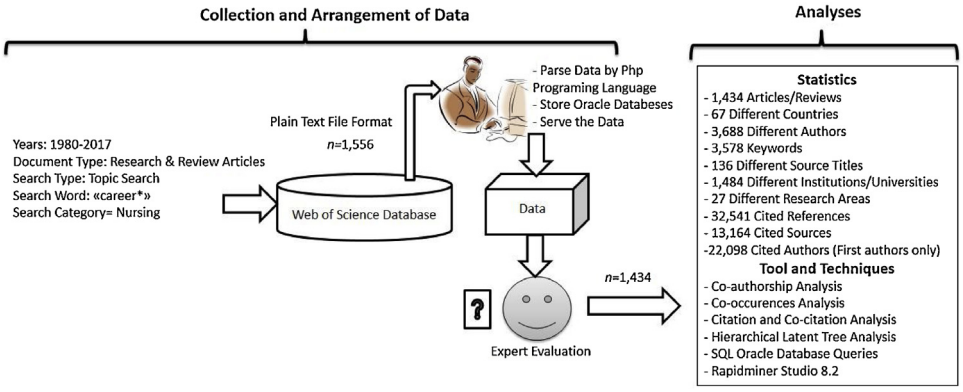


Fig. 1. The methodology of the study.

cles were included in the analyses in the scope of bibliometrics and scientometrics.

2.2. Analyses

Bibliometrics and scientometrics are similar methodologies, with regard to their theoretical background and the tools and techniques they use. However, the subjects on which they focus within the analyses may be different (Bornmann & Leydesdorff, 2014). For example, bibliometric studies generally involve co-citation analyses to visualize the influence of authors and journals, and connections among them, whereas scientometrics may also mine the data, so as to highlight how the main subjects or terms change over time or in different domains (Provalis Research, 2018). Hence, it is not easy to categorize related studies as being either bibliometric or scientometric studies, because of the intersections between them. Bibliometrics refers to the numerical analysis of bibliographic data, and can be used as a tool that allows for the collection of the most appropriate resources for users (Allen, Jacobs, & Levy, 2006; Urquhart, 2006). It is possible to reveal the intellectual and social structure of a research field, as well as the spread of ideas and research performance. Various techniques, such as counts, correlations, co-citations, and network analyses, are used for this purpose (Boyack, 2004). This study utilized network analytics and text categorizations on various dimensions of the dataset, such as journals, authors, countries, organizations, and individual publications, as well as summary tables and graphs. Over the analyses on the bibliometric data, the networks could be built and visualized through co-authorship, co-occurrences, co-citation, or other bibliographic relationships and collaborations, which represent the main patterns in the selected literature. Beside the co-occurrence network of the keywords and in order to determine the general structure of the subjects handled in the studies (Chen, Zhang, Poon, & Chen, 2016), the authors also analyzed the topic structure of the papers through enriched text data covering the abstracts, titles, and keywords, by means of hierarchical latent tree analysis (HLTA).

2.3. Data processing and tools

The researchers exported the *full record and cited references* of the data as two different file formats, that is a text file format and a tab-delimited format for Windows. The data in plain text format were stored relationally in a database the researchers designed in the Oracle platform through a program that was coded in the Hypertext Preprocessor (PHP). With the help of these PHP codes and of Structural Query Language (SQL), several queries could be retrieved, so as to generate partial datasets for different analyses. For network extraction and for some part of the text analyses in the scope of scientometrics and bibliometrics, the VOSViewer was

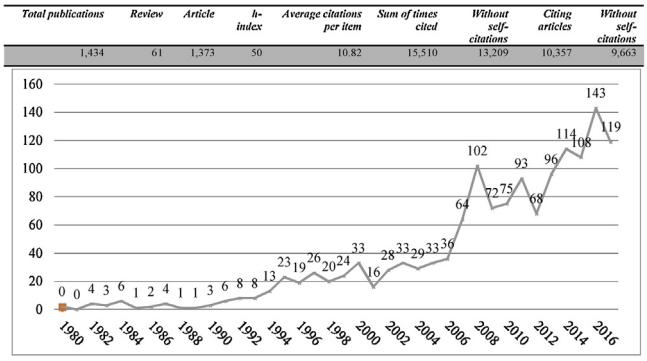


Fig. 2. The number of articles over the years; and related metrics (h-index, sum of the articles cited, and the number of citing articles).

utilized. The VOSViewer is a software package for analyzing and visualizing large bibliographic datasets for graphical representations of various dimensions (Van Eck & Waltman, 2010; VOSviewer, 2017). MS-Excel was also used to arrange summary tables and graphs. For topic analysis, the filtered dataset was firstly preprocessed in Rapidminer Studio 8.2 (Text Processing Extension) to tokenize the text data and to clear useless parts of the text (Ristoski, Bizer, & Paulheim, 2015). Afterwards, a Java application for HLTA was used to obtain topical hierarchies by using progressive expectation maximization in HLTA codes (Chen et al., 2016). Fig. 1 illustrates the overall design of the research.

3. Findings

Fig. 2 shows the number of articles about the nursing career over the years. The figure shows that the number of career-related studies has increased over the years, and that the highest number of articles was produced in 2016. A high *h*-index (50) value and a significant number of articles (1,434) emphasize that research literature on nursing as a career has a relatively high ranking in the field.

3.1. Authors and co-authorship relations

In total, 3688 authors wrote 1434 articles. The articles were ranked in a list, whose top authors were *Happell B* (*n*=26), *Jackson D* (*n*=17), *Cleary M* (*n*=15), *Brewer CS* (*n*=13), *Kovner CT* (*n*=13), *Laschinger HKS* (*n*=13), *Duffield C* (*n*=10), *Robinson S* (*n*= 10), *Buerhaus PI* (*n*= 9), and *Horsfall J* (*n*=9). Table 1 shows the 15 most cited articles of these authors. When the researchers examined the references the authors used in their studies, they found that 1,434 articles cited a total of 22,098 different papers. The most cited

Table 1
The 15 most cited articles.

Rank	Title	Journal	FYIF	Year	Authors	C
1	Nurse turnover: The mediating role of burnout	*Journal of Nursing Management*	2.443	2009	Leiter, MP; Maslach, C	171
2	Nurses' job satisfaction, organizational commitment, and career intent	*Journal of Nursing Administration*	1.839	2002	Ingersoll, GL; Olsan, T; Drew-Cates, J; DeVinney, BC; Davies, J	171
3	Solving nursing shortages: A common priority	*Journal of Clinical Nursing*	1.825	2008	Buchan, J; Aiken, L	125
4	The nursing shortage in the United States of America: An integrative review of the literature	*Journal of Advanced Nursing*	2.612	2003	Goodin, HJ	125
5	Factors associated with work satisfaction of registered nurses	*Journal of Nursing Scholarship*	2.811	2006	Kovner, C; Brewer, C; Wu, YW; Cheng, Y; Suzuki, M	121
6	Job satisfaction among hospital nurses revisited: A systematic review	*International Journal Of Nursing Studies*	4.278	2012	Lu, H; Barriball, KL; Zhang, X; While, AE	113
7	A content analysis of staff nurse descriptions of job satisfaction and dissatisfaction	*Journal of Advanced Nursing*	2.612	1999	McNeese-Smith, DK	109
8	Staff-student relationships and their impact on nursing students' belongingness and learning	*Journal of Advanced Nursing*	2.612	2009	Levett-Jones, T; Lathlean, J; Higgins, I; McMillan, M	100
9	Nurses' intention to leave the profession: Integrative review	*Journal of Advanced Nursing*	2.612	2010	Flinkman, M; Leino-Kilpi, H; Salantera, S	97
10	The relationships among turnover intentions, professional commitment, and job satisfaction of hospital nurses	*Journal of Professional Nursing*	1.586	2002	Lu, KY; Lin, PL; Wu, CM; Hsieh, YL; Chang, YY	97
11	The effects of nurses' job satisfaction on retention – An Australian perspective	*Journal of Nursing Administration*	1.839	2002	Cowin, L	81
12	Perpetuation of ageist attitudes among present and future health-care personnel – implications for elder care	*Journal of Advanced Nursing*	2.612	1995	Lookinland, S; Anson, K	81
13	Job and career satisfaction and turnover intentions of newly graduated nurses	*Journal of Nursing Management*	2.443	2012	Laschinger, HKS	80
14	Addressing the turnover issue among new nurses from a generational viewpoint	*Journal of Nursing Management*	2.443	2008	Lavoie-Tremblay, M; O'Brien-Pallas, L; Gelinas, C; Desforges, N; Marchionni, C	79
15	Men in nursing: Issues of gender segregation and hidden advantage	*Journal of Advanced Nursing*	2.612	1997	Evans, J	77

FYIF: Five-Year Impact Factor; C: Citations.

authors within the articles in the dataset (referring to the first author only) were *Happel B* (*n*=300), *Aiken LH* (*n*= 249), *Lashinger HKS* (*n*=172), *Buerhaus PI* (*n*=135), *Benner P* (*n*=124), *Buchan J* (*n*=113), *Cleary M* (*n*=77), *Kramer M* (*n*=73), *Duffield C* (*n*=69), and *Bandura A* (*n*=69). In addition, the articles in the dataset cited institutional publications, such as reports of the *Department of Health* (*n*=252), *the American Association of Colleges of Nursing* (*n*=164), *the Institute of Medicine* (*n*=88), and the *World Health Organization* (*n*=102).

3.2. Journal list

The researchers extracted the journals that had published the articles from the dataset, and obtained the top 20 journals that had published most of them (Table 2). Furthermore, they found that the articles in the dataset cited 13,164 different journals. The journals which had published the most-cited articles were the *Journal of Nursing Management* (*n*=3), the *Journal of Nursing Administration* (*n*=2), the *Journal of Clinical Nursing* (*n*=1), the *Journal of Advanced Nursing* (*n*=9), the *Journal of Nursing Scholarship* (*n*=1), the *International Journal of Nursing Studies* (*n*=2), the *Journal of Professional Nursing* (*n*=1), and *Cancer Nursing* (*n*=1).

3.3. Institutions and country pattern

The authors conducted an analysis of papers and related 1,434 studies from different universities. The top five universities that made the most contributions to the relevant field of literature were *Western Sydney University* (*n* = 36, 2.51%), *the University of Sydney* (*n* = 28, 1.95%), the *University of Technology Sydney* (*n* = 26, 1.81%), *the University of Toronto* (*n* = 26, 1.81%), and *Monash University* (*n* = 24, 1.67%).

From the perspective of the *country* dimension, 3,688 authors in the dataset were from 67 different countries. The countries that made the most contributions to the relevant field of literature were *the USA* (*n* = 547, 38.14%), *Australia* (*n* = 263, 18.34%), *England* (*n* = 180, 12.55%), *Canada* (*n* = 110, 7.67%), *the People's Republic of China* (*n* = 41, 2.65%), *Scotland* (*n* = 39, 2.72%), *South Korea* (*n* = 29, 2.02%), *Finland* (*n* = 25, 1.74%), *Taiwan* (*n* = 25, 1.74%), and *Sweden* (*n* = 24, 1.67%). Network analysis allowed identifying co-authorships as well; the results were visualized by countries and institutions, as Fig. 3 shows. In this network, nodes represent authors, institutions, or countries in their co-authorship relationships. Various dimensions can be integrated in the analysis to visualize the clusters and associations among the dimensions or the change in time. In this sense, co-authorship analysis and the related networks in Fig. 3 highlighted collaboration patterns among individuals and organizations. Fig. 3a shows that the *USA* is the leading country, when all years are evaluated, and *Australia* comes just after the USA. However, *Singapore*, *South Korea*, *China*, *Saudi Arabia*, *Italy*, *Netherlands,* and *Thailand* number among the countries which have contributed to the related literature in recent years. This pattern reflects the institutions of these countries (Fig. 3b).

3.4. Keyword analysis and topic structures (research field and co-occurrence of words)

When the researchers examined other research areas in which nursing as a career was investigated, they observed the top 10

Table 2
The most cited journals.

Rank	Journal	Publisher	Country of Publication	MeSH	FYIF	N	n	%
1	*Nurse Education Today*	Churchill Livingstone	Scotland	Education, Nursing	2.636	2,955	164	11.43
2	*Journal of Advanced Nursing*	Oxford, Blackwell	England	Nursing	2.612	8,102	144	10.04
3	*Journal of Nursing Education*	Slack Incorporated	USA	Education, Nursing	1.444	2,305	84	5.85
4	*Journal of Professional Nursing*	W. B. Saunders Co., Ltd.	USA	Nursing	1.586	1,110	83	5.78
5	*Journal of Clinical Nursing*	Blackwell Publishing Inc.	England	Nursing Care	1.825	5,108	75	5.23
6	*International Journal of Nursing Studies*	Pergamon Press	England	Nursing	4.278	3,002	64	4.46
7	*Journal of Nursing Administration*	Lippincott Williams & Wilkins Ltd.	USA	Nursing, Supervisory	1.839	2,987	57	3.97
8	*Journal of Nursing Management*	Blackwell Publishing Inc.	England	Nursing/organization & administration, Nursing Supervisory	2.443	1,051	55	3.83
9	*Nursing Outlook*	Mosby Inc.	USA	Nursing	2.528	1,432	49	3.41
10	*Contemporary Nurse*	Taylor & Francis	Australia	Nursing Care, Nursing	1.429	701	33	2.30
11	*International Nursing Review*	Blackwell Publishing Inc.	England	Nursing	1.717	760	27	1.88
12	*Journal of Continuing Education In Nursing*	Slack Incorporated	USA	Education, Nursing, Continuing	1.044	658	27	1.88
13	*Nursing Economics*	Jannetti Publications Inc.	USA	Medicine, Nursing	1.408	807	26	1.81
14	*Australian Journal of Rural Health*	Blackwell Publishing Inc.	Australia	Australia, Rural Health	1.185	577	23	1.60
15	*Nurse Education in Practice*	Churchill Livingstone	England	Education, Nursing	–	570	23	1.60
16	*Journal of Nursing Scholarship*	Hoboken, NJ: Wiley	USA	Economics, Nursing	2.811	999	22	1.53
17	*Australian Journal of Advanced Nursing*	Royal Australian Nursing Federation	Australia	Nursing	0.617	400	21	1.46
18	*Collegian*	Elsevier Australia	Australia	Australia, Nursing Care, Nursing	1.685	369	19	1.32
19	*International Journal of Mental Health Nursing*	Blackwell Publishing Inc.	Australia	Mental Disorders/nursing*, Psychiatric Nursing	2.175	754	18	1.25
20	*Journal of Psychiatric and Mental Health Nursing*	Blackwell Publishing Inc.	England	Mental Disorders/nursing*, Psychiatric Nursing*	1.353	1,146	17	1.18

N = Published all articles; FYIN = Five-Year Impact Factor, MeSH: Medical Subject Headings.

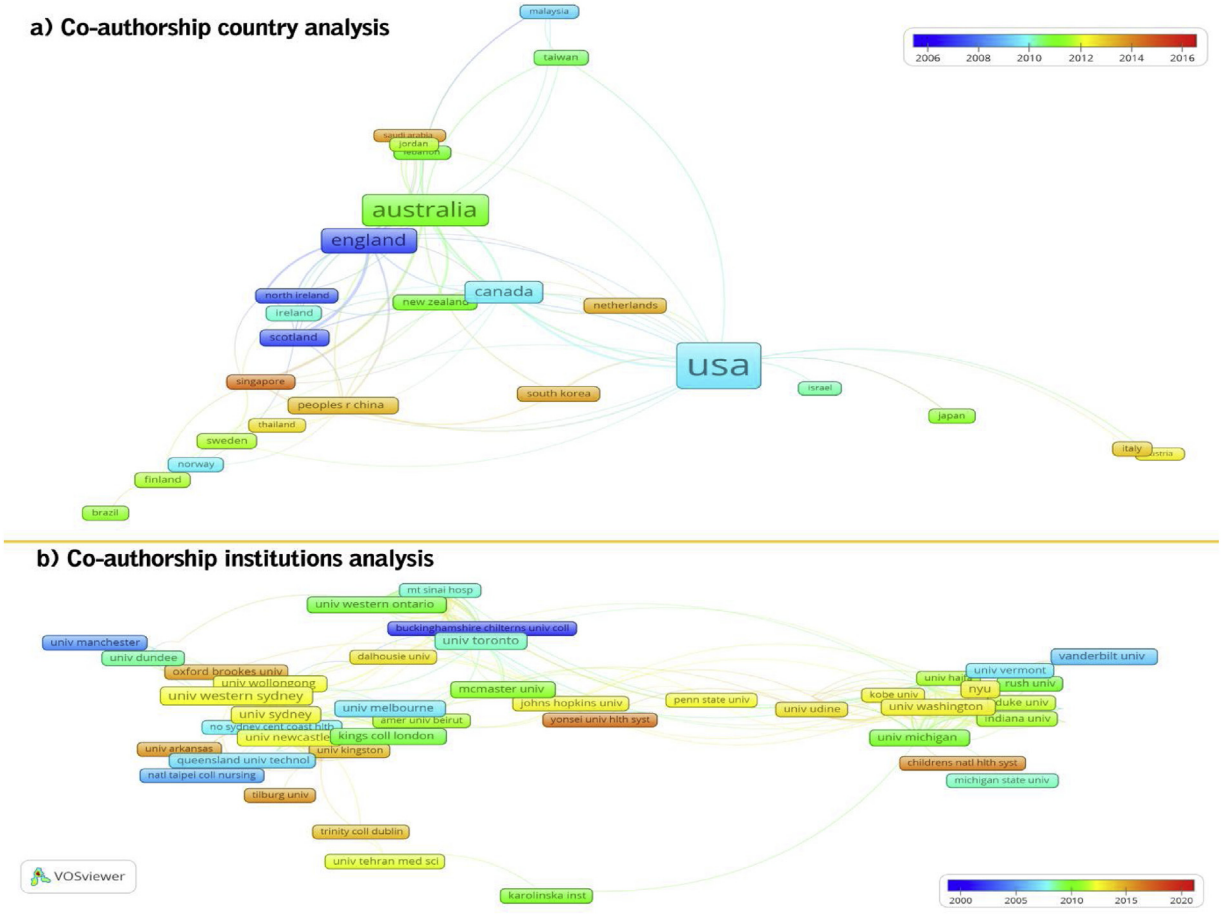


Fig. 3. Co-authorship (country/institutional) analysis by overlaid visualization displayed by year.

research fields were *education and educational research* ($n = 164$, 11.43%), *business and economics* ($n = 55$, 3.83%), *psychiatry* ($n = 54$, 3.76%), *public, environmental and occupational health* ($n = 37$, 2.58%), *oncology* ($n = 15$, 1.04%), *geriatrics and gerontology* ($n = 12$, 0.83%), *healthcare sciences and services* ($n = 6$, 0.41%), *pediatrics* ($n = 6$, 0.41%), *history* ($n = 5$, 0.34%), and *history* and *philosophy of science* ($n = 5$, 0.34%).

The authors carried out co-occurrence analysis for 3,578 keywords of the related articles by using the VOSViewer via seven keywords (min.7) and clusters. This analysis generated keyword networks and a word cloud (Fig. 4). When the researchers evaluated keyword distributions in the related articles, they obtained *education* (n=282), *student* (n=201), *health* (n=188), *research* (n=133), *clinical* (n=105), *professional* (n=103), *care* (n=103), *practice* (n=102), *workforce* (n=100), *development* (n=93), *job* (n=90), *satisfaction* (n=85), *work* (n=84), and *mentor-mentoring* (n=70) as being the most frequent ones. Fig. 4b shows that, in recent years, the related articles have been about *the first year in work life*, *authentic leadership*, *older people*, and *simulation*.

Keyword clusters identified the primary groups of subjects in the articles. The educational career cluster (c1) describes career studies in undergraduate, graduate, and doctoral education programs. The negative working environment cluster (c2) covers the studies about nurses' experiences of adverse working conditions, stress, pain, and burnout and job separation. The cluster related to the period of a novice in a career (c3) includes the first year of his/her working life, the orientation process, and the decision-making, knowledge, and skill-oriented work. The cluster related to specific career areas (c4) consists of studies for psychiatry and geriatrics. The cluster related to choosing a nursing career (c5) involves studies that affect the relevant decision-making process. The next cluster (c6) refers to inadequacy of a number of nurses. The cluster about career planning (c7) covers studies on students' and employees' future career plans. Keywords such as *qualitative*, *experience*, and *phenemology* exist within most of these clusters (Fig. 4). Similar to the results of the keyword clustering, outputs of the HLTA indicate that the studies of nursing career have primarily focused on the relationships between *burnout* and *satisfaction,* and also *night shift work* and *cardiovascular diseases*. Another finding in nursing and career research is the fact that PhD programs and academic development are also the one of hot topics that have been handled by researchers.

4. Discussion

Hirsch (2005) developed the *h*-index and described the 20-year scientist as being a *successful scientist*, if his or her *h*-index is 20, and as an *outstanding scientist*, if it is 40. This description can be extended to research fields. The subfield of studies in nursing as a career has a high *h*-index value that is 50; thus, according to Hirsh's approach, nursing career is a subject of high interest in research literature. This finding is one of the primary points in this research, as researchers in the field can evaluate.

Differently from many papers in bibliometrics and scientometrics, this study presented detailed findings of the contents of the papers. In this regard, based on the results of the keyword and HLTA analyses, the authors found stress, burnout, and environmental factors to be intensively studied subjects. Difficulties in working conditions, intense and irregular working hours, and stress are another set of topics the studies mention. These factors negatively affect nurses' job satisfaction, and result in they quitting the nursing profession (Bae, 2011; Cullen, 2016). The intensive use of the keywords *shortage* and *turnover* in these studies supports the finding that *shortage* and *retention* issues in nursing have been significant (Laschinger et al., 2016; McLaughlin et al., 2008). Nurses' health and satisfaction are essential not only for the nurses themselves, but also for the quality of the healthcare they provide (Laschinger, 2012). Almost all of the 15 most cited articles focused on nurse problems, such as turnover, retention, shortage, and satisfaction, express intense interest in these issues.

Moreover, *aging* and *lack of health personnel* affecting the shortage issue were remarkable factors among the keywords supporting the related literature (Hill, 2011; Miers et al., 2007). Further, nurse shortage is a global issue that has been studied in many countries (Celletti et al., 2011; Miers et al., 2007). In this research, co-authorship-country and keyword cloud graphs highlighted that, so far, the United States, England, China, Jordan, Israel, and Iran have been the leading countries that have tried to find answers to different issues in the field of nursing as a career. Content analysis (including analysis of abstracts, titles, and keywords) yielded the finding that the concept of *satisfaction* has been studied extensively. Nursing researchers from different countries have also studied new graduate nurses to find effective strategies both for supporting successful transition to practice and for improving retention in the field of nursing (Laschinger & Fida, 2014).

In the cluster analysis the authors performed on keywords, *choice of nursing career* and *nursing profession*, along with other related keywords, were at the forefront of findings emphasizing why people choose nursing as a profession. In this sense, Eley, Eley, Bertello, and Rogers-Clark, (2012) investigated the reason behind choosing nursing as a profession, and revealed five themes: nurturance, emotional needs, financial needs, employment opportunities, and an interest in science/knowledge. Penprase, Oakley, Ternes, and Driscoll, (2013) addressed the same research problem, considering country and gender. When the intensity of *doctorate* and *master* words in the keyword cluster analysis is taken into account, that means nurses may also prefer nursing as an academic profession.

Other recent concepts the authors observed were *first year*, *authentic leadership,* and *simulation*. In the first year of their profession, nurses can experience reality shock not being satisfied with their work, and can leave their work (Laschinger, 2012; Laschinger et al., 2016). Additionally, many other studies researched *the first year* of the nursing profession. *Authentic leadership* is a new and remarkable issue that has been on the agenda in recent years. Authentic leadership may support the establishment of a healthy working environment for nursing practice; this is crucial to maintain an adequate nursing workforce (Carvalho, Cunha, Balsanelli, & Bernardes, 2016). The implementation of authentic leadership may positively affect, not only the nursing workforce and the occupation itself, but also the healthcare delivery system and society as a whole. It is known that working environments with active leadership behaviors can increase group integration, reduce work stress, and reduce early permanent separation rates; therefore, nurses may become more autonomous. This kind of favorable organizational climate, which is characterized by reduced exhaustion, is expected to improve both patient and job satisfaction levels (Negussie & Demissie, 2013).

5. Limitations

The general pattern of a research area is shaped by the studies which are published in well-known journals. Researchers frequently reach those journals via online databases, such as WoS, Scopus, PubMed or local ones (i.e., TRDIZIN). Each database has its own portfolio covering hundreds of journals, which may sometimes overlap with the other databases. In this regard, the dataset and findings of this study are limited to papers and journals within the WoS database and the selected time range. WoS can be considered as a representative database of the related literature, but not of the entire population. The other databases can also be investigated by considering the radical differences between database designs,

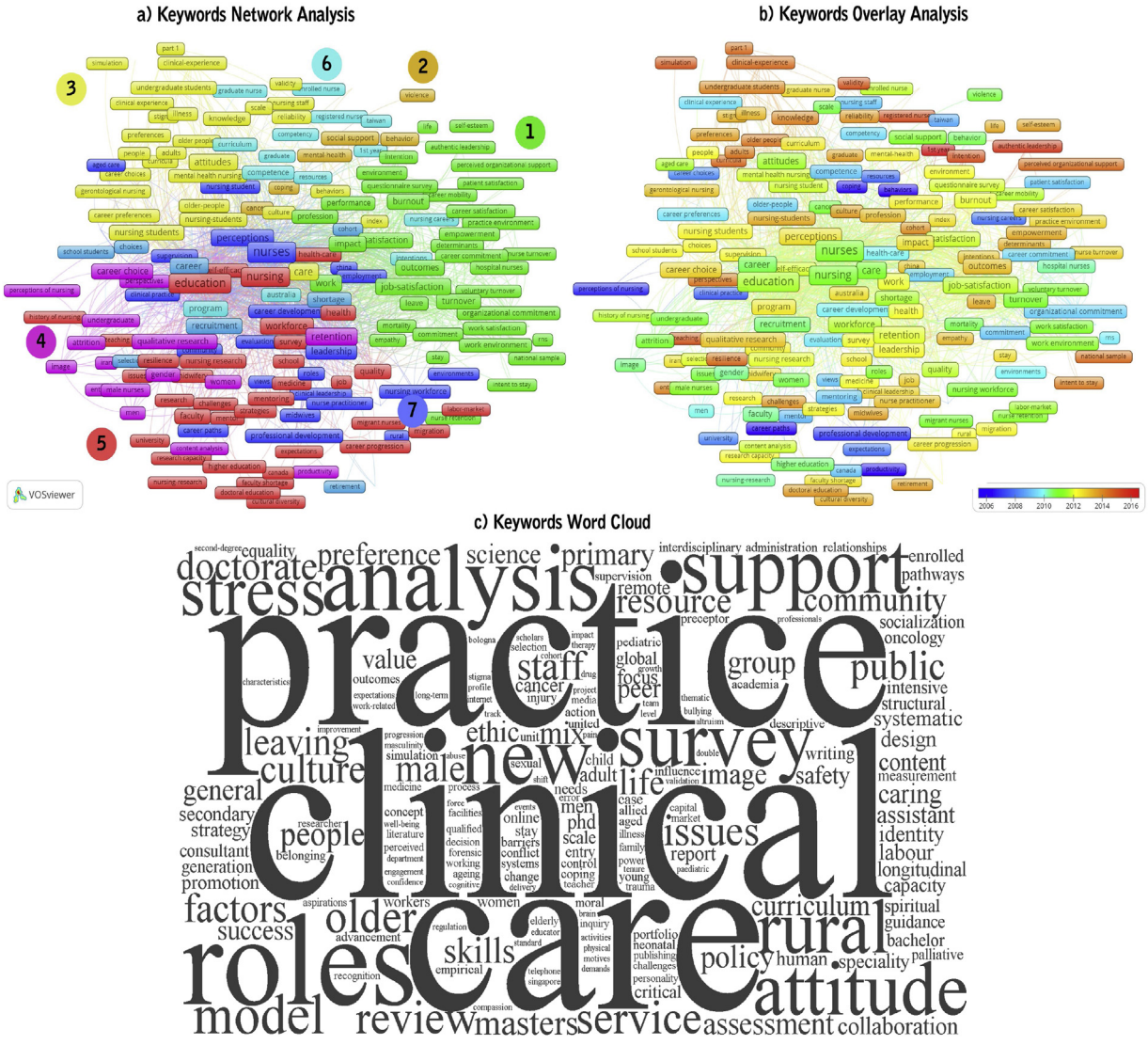


Fig. 4. Keyword analyses.

attribute definitions, and also overlapping publications. Attribute definitions may change according to the preferences of the data to be stored. For example, *Publisher Country* can be stored, based on the origin of the journal or based on where the journal is officially published. WoS database stores the latter, whereas the significant information for researchers is the former. The authors compared WoS, Scimago, and National Library of Medicine (NLM) Catalog regarding the publishers' countries, and found out that NLM provided the most relevant information for this study. Blažun, Kokol, and Vošner, (2015) also indicated the same issue, but suggested Shimago for the required information about the publishers' country.

6. Implications

Studies related to nursing as a career have critical prescriptions for nursing management and leadership literature in the field of health management. These studies support management, innovation, and leadership practice in healthcare. The complex and rapidly changing nature of global healthcare is continually creating new challenges. Shortage and aging in the nursing profession are essential issues that involve difficulties and questions that are experienced in this area. This study highlighted that the general characteristics of nursing career studies cover employment problems in the nursing profession, shortage, nursing professionals' job satisfaction and occupation difficulty, and occupational decision making. These issues have been examined under different headings in different countries. This study suggests that leaders and managers in the nursing field can evaluate these issues to develop and implement institutional policies. Bureaucrats can also take these into account to prepare health policies. Thus, this study is intended for nurses, their managers, researchers, decision makers, and policymakers, because it is critical for them to see the rhetoric of the debates in the literature and provide the best governance and quality services.

The second implication can be considered for academic purposes. Undoubtedly, the primary role of a contemporary scholar is to be able to disseminate information in an increasingly competitive market. While nursing researchers have many options regarding where to publish, choosing a journal is rarely a clear-cut decision. In the light of the findings of the analyses, the researchers and practitioners studying career and career management can find many useful pieces of information and insights about the current status of the literature and the recent trends, which may support them in their present and future research. It may also be advisable for future studies to analyze the same subject at a micro level, with niche careers in nursing, with different titles, such as researchers, nursing professional occupations (e.g., academia, burnout, satis-

faction, retention, and leadership), and pre-work (e.g., vocational decision making and training process).

7. Conclusions

This study identified tendencies and patterns in the literature of nursing as a career to discover the general structure and relationships regarding several dimensions (e.g., time, authors, citations, sources, keywords, and topics). To the best of the authors' knowledge, this study would be primary research in the scope of scientometrics and bibliometrics about career and career management in the field of nursing. The authors obtained many summary tables and graphs from the analyses they conducted on various platforms, such as the Oracle database, supporting programs coded in PHP, VOSviewer, RapidMiner, and the Java application for HLTA. The findings depicted characteristics of the current related literature in detail. Therefore, these findings provide insights and research opportunities for researchers and executives in nursing so as to investigate nurses' future and working lives. In the future, the scope of the dataset can be extended by adding other scientific databases (if data structures can be efficiently standardized and integrated).

Conflict of interest

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Ethical statement

Because the manuscript is data analysis, Ethical Statement is not applicable.

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