

RESEARCH COMMUNICATION

Cancer Nursing Research Output and Topics in the First Decade of the 21st Century: Results of a Bibliometric and Co-word Cluster Analysis

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Abstract

Objective: Many countries carry a high cancer burden and comprehensive cancer nursing is becoming increasingly complicated and difficult. Summarizing the recent research focus on cancer nursing may provide a snapshot of this field for those nurses or nurse educators who are in need of a quick overview of the research and its utilization. **Methods:** Candidate publications from January 1st 2001 to March 31st 2011 were collected by searching PubMed with the MeSH word 'oncologic nursing' and without language restriction. Bibliometric techniques used in this study included a statistical analysis of publication counts by authors, countries and journals and a co-word cluster analysis of highly-frequent MeSH words. **Results:** A total of 2933 publications about cancer nursing from 246 journals were indexed in PubMed, with Oncology Nursing Forum identified as the top contributing journal in the field. The United States, the United Kingdom and Canada were the largest three producer countries about cancer nursing. A total of 34 highly-frequent MeSH words for more than 100 times' occurrences in the papers about oncologic nursing were extracted for cluster analysis. These words were classified into 3 aspects: (1) nursing practice; (2) nursing evaluation and education; (3) nursing-related social support. **Conclusions:** Stable growth has occurred in the research field of cancer nursing. The limited amount of the publications from developing countries indicates that the field is still under-developed. Emerging topics of nurse-patient relations and social support provide some hints of the need to provide more target training for the nurses and nurse students in the field of cancer nursing.

Keywords: oncologic nursing – bibliometrics – cluster analysis

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Introduction

Many countries carry a high cancer burden (Jemal et al., 2011) and comprehensive cancer care is becoming increasingly complicated and difficult (Al-Jauissy, 2010; Noble & Jones, 2010; Hébert & Fillion, 2011; Nelson, 2011). As an important discipline of clinical medicine, high quality nursing contributes greatly to the outcome of different kinds of therapies for cancer patients, and nurses always play a key bridging role between the doctors and the patients (Gemmill et al., 2011; Grant et al., 2010). However, there is clear evidence that nurse is a stressful occupation with many challenges (McCarthy et al., 2010; McCloskey & Taggart, 2010), oncology nurses often face several challenges in pursuing specialization, due to individual and system issues such as limited time and resources (Rashleigh et al., 2011). More attention has been paid to the field of nursing and some suggestions arise about the provision of state-of-the-art ongoing staff education for the nurses (Brixey & Mahon, 2010; Vachani et al., 2011).

Generally, most nurses care for a major proportion

of treatment related care, disease monitoring and health education. If the nurses do further target training in their chosen speciality to gain professional qualification of Specialist Nurse, they may have more involvement in advising nursing staff about caring for patients with critical conditions and/or in teaching nurses (Caulfield, 2011). For nurses who are not directly involved in scientific research, absorbing and incorporating the updates on the nursing practice or the trend in this field is becoming the important aspects of care delivery (Jones et al., 2011). Thus it is important to investigate resources related evidence or knowledge seeking and utilization among nurses.

In the context of the above situation, a bibliometric method (Estabrooks et al., 2004) was employed to trace the core production, the content of publications, and motivations of the researchers in the form of published literature to map the features of the cancer nursing field. The main purpose of the present study is to summarize the recent research focus on cancer nursing and provide a snapshot of this field for the nurses, nurse supervisors or nurse educators who are in need of a quick overview of the research and its utilization.

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Materials and Methods

Data from January 1st 2001 to March 31st 2011 was retrieved from PubMed, the National Library of Medicine on the web (<http://www.ncbi.nlm.nih.gov/PubMed>), with the MeSH word 'oncologic nursing' and without language restriction. According to the PubMed MeSH Database, the MeSH word 'Oncologic Nursing' was introduced in 1985, it means 'Nursing care provided cancer patients. It includes aspects of family functioning through education of both patient and family. The specialty of oncologic nursing focuses on cancer as a major health care problem'. Each publication downloaded from PubMed included the following key eligibility items, title, author, institution, country, source, publication year and MeSH word. These data was saved as a text file in the format of Medline.

Highly-produced and co-word cluster analysis

Bibliographic Item Cooccurrence Mining System (BIOCOMS) provided by professor Lei Cui (China Medical University) was adopted to determine the core journals, highly-produced authors and countries. The MeSH/subheading words were ranked, and highly-frequent MeSH words with co-words matrix were gotten from the literature database by setting a proper threshold value. Then, the above co-words matrix was used for further hierarchical clustering by using software R 2.10 (R Foundation for Statistical Computing, Vienna, Austria) with default options. Dendrogram was drawn for assessing the cohesiveness of the clusters formed and providing information about the appropriate numbers of clusters to keep.

Word cloud Visualization

A recent study highlighted that visualizing data in innovative ways is an integral part of the scientific process as it allows patterns and trends to be analyzed (McGee & McGee, 2011). Thus, we incorporated the idea of 'word cloud' from that study, and aimed at illustrating the hot topics in the field of cancer nursing. Major steps were as follows: (1) all the titles of the collected literature were extracted; (2) enter these title articles into an online word cloud generator 'tagcrowd' (<http://tagcrowd.com/>); (3) set the maximum number of words and exclusion criteria; (4) Visualize

Results

Core countries, journals and authors

A total of 2933 publications about oncologic nursing were indexed in PubMed, within the range of 207 to 343 publications each year (see Figure 1). Totally, 28 countries were included, USA, the United Kingdom and Canada were in order the largest three producer countries about oncologic nursing (see Table 1). Altogether, 246 journals have been involved in the field of cancer nursing, Oncology Nursing Forum, Clinical Journal of Oncology Nursing, Seminars in Oncology Nursing, ONS news, ONS Connect, European Journal of Oncology Nursing, Cancer Nursing, Journal of Pediatric Oncology Nursing were identified as the core journals in the field, they all

Table 1. Total Number of Publications Retrieved with the MeSH Word 'Oncologic Nursing' by Country, from PubMed from January 1st 2001 to March 31st 2011

Rank	Country	Record Count	Percentage
1	United States	2065	70.41
2	UK	537	18.31
3	Canada	115	3.92
4	France	69	2.35
5	Australia	26	0.89
6	Brazil	18	0.61
7	Germany	15	0.51
8	Switzerland	14	0.48
9	Ireland	12	0.41
10	Japan	9	0.31
11	New Zealand	8	0.27
12	Italy	7	0.24
13	Hungary	6	0.20
14	Poland	5	0.17
15	Korea (South)	4	0.14
16	India	3	0.10
17	Netherlands	3	0.10
18	Portugal	3	0.10
19	P.R. China	2	0.07
20	Greece	2	0.07
21	Spain	2	0.07
22	Sweden	2	0.07
23	Bulgaria	1	0.03
24	Denmark	1	0.03
25	Finland	1	0.03
26	South Africa	1	0.03
27	Thailand	1	0.03
28	United Arab Emirate	1	0.03
	Total	2933	100

Table 2. Major Journals of Publications Retrieved with the MeSH word 'Oncologic Nursing' from PubMed from January 1st 2001 to March 31st 2011

Journal	Record Count	Percentage
Oncology Nursing Forum	465	15.85
Clinical Journal of Oncology Nursing	375	12.79
Seminars in Oncology Nursing	239	8.15
ONS news	186	6.34
ONS Connect	174	5.93
European Journal of Oncology Nursing	166	5.66
Cancer nursing	156	5.32
Journal of Pediatric Oncology Nursing	136	4.64
Canadian Oncology Nursing Journal	91	3.10
Nursing Times	58	1.98
Nursing Standard	45	1.53
Oncology (Williston Park, N.Y.)	38	1.30
Soins; la revue de reference infirmiere	38	1.30
International Journal of Palliative Nursing	37	1.26

published more than 100 articles during the study period (see Table 2). Among all the 6694 authors involved in this topic, there were 8 authors who produced more than 15 documents (see Table 3).

Co-word cluster analysis of highly-frequent MeSH/subheading words

The major MeSH words were extracted from the included publications with 38,079 times' occurrences for 2933 MeSH words. A total of 46 highly-frequent MeSH words for more than 100 times' occurrences in the papers

Table 3. The Major Producer Authors of Publications Retrieved with the MeSH Word ‘Oncologic Nursing’ from PubMed from January 1st 2001 to March 31st 2011

Rank	Author	Record Count
1	Hinds, PS	28
2	Wujcik, DM	22
3	Becze, E	18
4	Johnson C RM	18
5	Miaskowski, C	17
6	Schulmeister, L	16
7	Fitch, MI	15
8	Grant, M	15

Table 4. The Major MeSH Words Extracted from Publications Retrieved with the MeSH Word ‘Oncologic Nursing’ from PubMed from January 1st 2001 to March 31st 2011

MeSH word	Frequency of occurrence	Percentage (%)
Nurse’s Role	795	2.09
Oncologic Nursing/methods	551	1.45
Oncologic Nursing		
/organization & administration	536	1.41
Attitude of Health Personnel	359	0.94
Questionnaires	353	0.93
Patient Education as Topic	321	0.84
Nursing Assessment	312	0.82
Adaptation, Psychological	303	0.80
Nurse-Patient Relations	283	0.74
Nursing Methodology Research	270	0.71
Social Support	267	0.70
Risk Factors	260	0.68
Attitude to Health	249	0.65
Quality of Life	241	0.63
Practice Guidelines as Topic	237	0.62

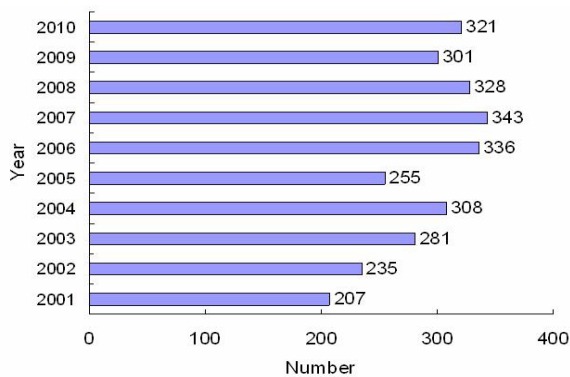


Figure 1. Number of Publications Retrieved with the MeSH Word ‘Oncologic Nursing’ by Year, from PubMed from January 1st 2001 to December 31st 2010 about oncologic nursing were extracted. After removing the 12 unspecific MeSH words ‘Humans’, ‘Female’, ‘Oncologic Nursing’, ‘Male’, ‘Adult’, ‘Middle Aged’, ‘Aged’, ‘United States’, ‘Child’, ‘Aged, 80 and over’, ‘Neoplasms/nursing’ and ‘Adolescent’, 34 frequent MeSH words were submitted to cluster analysis (See Figure 2), the top 15 MeSH words for more than 200 times’ occurrences are listed in Table 4. As shown in Figure 2, these top highly- frequent MeSH words were classified into 3 aspects: (1) nursing practice; (2) nursing evaluation and education; (3) nursing-related social support.

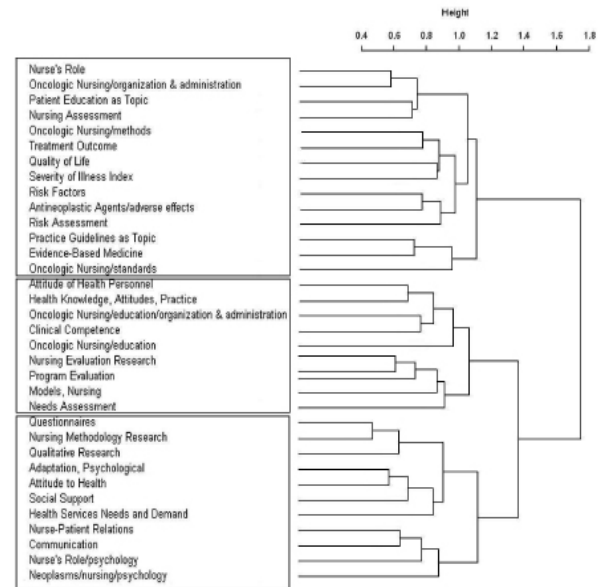


Figure 2. Co-word Cluster Analysis of the Highly-frequent MeSH Words. A total of 34 highly-frequent MeSH words extracted from publications retrieved with the MeSH word ‘oncologic nursing’ from PubMed from January 1st 2001 to March 31st 2011



Figure 3. A Word Cloud Created from the Titles of the 2933 Publications Retrieved with the MeSH word ‘Oncologic Nursing’ from PubMed from January 1st 2001 to March 31st 2011

Word cloud of the titles

The maximum number of words without shown the frequency was set as 50; ‘for’, ‘or’, ‘in’, ‘what’, ‘where’, ‘how’, ‘the’ and similar function words were excluded from the word cloud, and Figure 3 was then generated.

Discussion

In 1996, Giordano has already indicated that nursing research is a professional responsibility, not a necessary evil. Compared to the doctors and researchers, there are less resources for nurses, especially for those from undeveloped areas. However, the rapid improvements of science and technology in the field of clinical medicine and public health impose the same increasing challenges to nurses (Bassett & Bassett, 2003; Girard, 2006). Our study offers some insights into cancer nursing and provides a snapshot of this field during the last decade.

As expected, this study provided some hints of the recent research topics. Among the 34 MeSH words identified, psychological adaptation, nurse-patient relations and social support, suggested that there is growing concern about psychology, communication skills,

collaborative thinking, patient trust and social support in this field (Becker, 2011; McDonald et al., 2010; Murray, et al., 2011). These should be enhanced in the process of nurse education and clinical practice, a healthy work environment for the nurses should be emphasized to improve the job satisfaction (Hauck, et al. 2011; Newton, 2010; Niederhauser et al. 2010). From the aspect of producer countries, similar to the bibliometric analysis results in other field, the major contributions are from a small amount of developed countries (Glynn, et al., 2010; Kelly, et al., 2010). This may due to that, there is more awareness of nursing research in those countries, their higher level of nursing research and they have relative superiority in English.

The authors recognize that there are some limitations inherent in this bibliometric analysis. First, all the co-authors were included in the study without special focus on the first author and the corresponding author. Similarly, the equally contribution of the authors could not enter the analysis. The main focus of the present study just was to identify the active authors, compared to other subfield of clinical oncology, there are less publications about nursing. It would be difficult to rank the first or corresponding authors due to relatively less counts after stratified analysis. Second, the institution of these authors were not listed and ranked, because there were a proportion of the varied affiliations for the authors during the study period. Third, the quality of the included publications remained a potential source of bias which might affect the result. Fourth, due to the inclusion range of PubMed, those external publications about this topic could not be analyzed, these issues will be discussed in the future study and may depend on the progress of text data mining technique and more open access literature databases.

In conclusion, stable growth has occurred in the research field of cancer nursing. The limited amount of the publications from developing countries indicates that the field is still under-developed. Emerging topics of nurse-patient relations and social support provide some hints of the need to provide more target training for the nurses and nurse students in the field of cancer nursing.

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