Visualization analysis of research “hot spots”: self-management in breast cancer patients[†]

Original article

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Abstract: **Objective:** To identify the research on “hot spots” and frontiers of self-management in patients with breast cancer.
Methods: We searched the Web of Science database for articles associated with keywords, and used CiteSpaceIII to analyze the data.
Results: A total of 958 documents were included. High-frequency keywords covered “quality of life (QOL),” “randomized controlled trial,” “depression,” “fatigue,” and “meta-analysis.” Research on self-management by patients with breast cancer has mainly been conducted in the United States of American (USA) and other western countries, whereas the Asian country, China ranked eighth among the top 10 countries.
Conclusions: The analysis revealed research on “hot spots” particularly research on psychological health and QOL. Promoting clinical research, encouraging evidence-based practice, and developing nursing specialization may improve research on self-management interventions for patients with breast cancer.

Keywords: breast cancer • evidence-based practice • psychological health • quality of life • self-management

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1. Introduction

Breast cancer is the leading cause of cancer among women in China, and there is an upward trend in its morbidity and mortality.¹ Given the increased cure rate and survival time of patients with breast cancer, the World Health Organization (WHO) has classified it as a chronic disease and regards it as a chronic life condition.² How to improve the quality of life (QOL) of patients with breast cancer, particularly through self-management,

has become the focus of worldwide research. Self-management refers to the ability to manage symptoms, treatment, physiology, and psychology, and to make lifestyle changes in response to chronic disease.³ Numerous studies⁴ have confirmed that there is a positive correlation between the level of self-management and QOL. Although effective self-management is essential for the long-term survival and QOL of patients with breast cancer, research on self-management by patients with breast cancer in China is in its infancy stage.⁵ We used

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CiteSpaceIII in this study to analyze and integrate the worldwide literature, contained in the Web of Science database, on self-management by patients with breast cancer. The aim of the analysis was to identify frontiers and “hot spots” (i.e., particularly active topics of study) in research on self-management by patients with breast cancer to provide more information for researchers.

2. Methods

2.1. Data collection

The data were obtained from the “Web of Science Core Collection” database on March 27, 2017. The inclusion criteria: The topic search phrase was “(breast cancer) AND (self-management)” and the document types were “Article OR Review.” The exclusion criteria: Repeated publications and unrelated articles were excluded. The search identified a total of 958 documents. The flow-chart shows this process in Figure 1. Information about the documents was recorded, including their titles, authors, keywords, abstract, and references. Then, we downloaded and saved each one as a plain text file, with the extension “txt.”

2.2. CiteSpace III

CiteSpace III is a software based on a Java platform and was developed by Dr. Chen of Drexel University. This tool provides visual-knowledge maps that researchers can use to discover core institutions, authors, “hot spots,” and trends in a research field.⁶ This study used a yearly

time-slice and the threshold was TOP = 50. We imported the 958 records into CiteSpace III for analysis, choosing “country (region)” and “keyword” as the network nodes.

3. Results

3.1. Region

Figure 2 illustrates that using “country (region)” as a network node produced an image with 53 nodes, 17 lines, and a 0.0123 density. That is, a total of 53 countries (regions) had made contributions to the research field of self-management by patients with breast cancer. The size of the nodes in the figure represents the number of the documents (articles or reviews) while the color of the outer rings represents the year.

Figure 2 and Table 1 show that the United States of America (USA) was the country with the largest number of articles and reviews on research about self-management by patients with breast cancer, followed by UK, Australia, and Canada; China ranked eighth. This finding indicates that research on self-management in patients with breast cancer was mainly conducted in developed countries. Although China ranked in the top 10, the quantity of research in China is very less and lagged far behind that of the USA.

3.2. High-frequency keywords

This paper chose high-frequency keywords (top 20) to identify the research “hot spots” of studies on self-management by patients with breast cancer.⁷

Figure 1. The flow diagram of illustrating literature search and selection.

Figure 2. Network of co-countries (regions) publishing research papers on self-management by patients with breast cancer (one-year slices).

Country (region)	Frequency	Year
USA	407	2003
UK	90	2003
Australia	87	2003
Canada	73	2003
Netherlands	41	2003
France	31	2003
Germany	31	2003
China	27	2004
Korea	21	2008
Italy	19	2004

Table 1. The top 10 countries (regions) publishing research on self-management by patients with breast cancer.

Figure 3. Network of co-words used in research papers on self-management by patients with breast cancer (one-year slices).

Figure 3 illustrates the results using “keyword” as the network node. The figure revealed there were 252 nodes, 130 lines, and a 0.0041 density. To make the mapping clearer, we excluded some keywords, such as “breast cancer” and “self-management.”

Table 2 clearly shows that except for “breast cancer,” the frequency (F) of “QOL” ($F = 301$) was the highest. This was followed in descending order by “management” ($F = 219$), “women” ($F = 191$), “cancer” ($F = 141$), and “randomized controlled trial” ($F = 135$).

3.3. Burst terms

Burst terms (i.e., a term that suddenly appears significantly more frequently or in a shorter amount of time) can reflect research frontiers. Table 3 shows that the burst terms for research on self-management among patients with breast cancer were “carcinoma,” “health status,” and “meta-analysis”; the bursting years were 1996, 2004, and 2015.

4. Discussion

4.1. China should strengthen research on self-management by patients with breast cancer

We know from the present results that research on self-management by patients with breast cancer has been conducted mainly in developed countries, such as the USA, England, and Australia. This may be because

Note: QOL, quality of life; RCT, randomized controlled trials.

non-randomized clinical trial divided 147 multi-ethnic survivors (stages I–III of breast cancer) into a usual care group ($n = 78$) and a 4-week, self-management intervention group ($n = 68$), which included managing medical, emotional, health, and role tasks. At follow-up, the QOL of the experimental group was greater than the control group, which demonstrates that self-management programs can help to increase patients' QOL.⁹ The results of the research in this field in China are basically identical to those from other countries, with Chinese studies finding that self-management is an important way to improve the QOL of breast-cancer survivors. Li Guoyuan¹⁰ found that medical staff had a positive effect on the QOL of breast cancer survivors by using a self-management intervention addressing symptoms, behaviors, emotions, and knowledge management.

Our review showed that national studies have demonstrated self-management can improve the QOL of breast cancer survivors. Although the intervention used in different studies included different content, they all involved management of disease, emotions, health-related knowledge, and behavioral roles. Clinical nurses can take advantage of self-management as an intervention to improve patients' participation in controlling their own disease and to enhance the ability of patients to take an active part in healthcare activities. This model can both save medical resources and improve the QOL of breast-cancer survivors.

4.2.2. Self-management is an effective way to improve the psychological health of patients with breast cancer

Our findings indicate that psychological status is another “hot spot” in research on self-management in patients with breast cancer. Due to the nature of the disease, breast-cancer survivors often suffer from anxiety, depression, and cancer-related fatigue before and after treatment. Research on self-management by patients with breast cancer has confirmed that the psychological well-being of breast-cancer survivors and self-management behaviors influence each other, such that patients who have good self-management behaviors also have good psychological health, including lower levels of negative emotions such as anxiety, depression, and cancer-related fatigue.¹¹

It has been suggested that researchers investigate practical self-management methods that include interventions based on cognitive behavioral therapy for patients. This could improve self-management behaviors and psychological health at the same time. Ultimately this research can achieve the goal of improving the QOL of breast-cancer survivors.

4.2.3. Advances in research on self-management in patients with breast cancer and promoting the development of specialization in nursing science

This study illustrated, based on “meta-analysis” combined with “randomized controlled trial,” that the evidence-based practice is a research trend and frontier in studies on the treatment of patients with breast cancer. The field of nursing has reached a consensus about evidence-based nursing that is consistent with the global field of evidence-based healthcare. The International Council of Nurses disseminated a white paper, called “Closing the gap: from evidence to action,” on the 100th International Nurses Day, which encouraged nursing staff all over the world to develop nursing research activity to support evidence-based practice and to abandon decision-making based on personal experience or professional traditions.¹² Opportunities have been identified to improve care through better implementation of existing evidence and advocacy for research that promotes the development of specialization within nursing science.¹³ Thus, we should develop research to investigate self-management by patients with breast cancer. To acquire the best evidence for improving self-management behaviors and the QOL of breast-cancer survivors, we need to conduct well-designed studies, introduce the evidence into practice, and encourage the clinical implementation and evaluation of the best evidence. We believe this will promote research on self-management by patients with breast cancer in the direction of standardization, scientization, and specialization.

Ethical approval

Ethical issues are not involved in this paper.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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