Chinese Nursing Research 4 (2017) 117–123

Contents lists available at ScienceDirect

Chinese Nursing Research

journal homepage: http://www.journals.elsevier.com/chinese-nursing-research

Original article

A bibliometric analysis of research on nursing models in countries other than China☆

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ARTICLE INFO

Article history:
Received 3 February 2017
Received in revised form
9 March 2017
Accepted 8 April 2017
Available online 7 June 2017

Keywords:
Nursing models
Bibliometrics
Two-way clustering analysis
Information visualization

ABSTRACT

Objectives: To deepen our understanding of the status quo and to identify the hot topics and developmental trends of research on nursing models in countries other than China in the most recent decade.
Methods: The study subjects were the publications retrieved from the PubMed database using the MeSH terms of "Models, Nursing". Bibliographic item co-occurrence mining system (BICOMS) software was used for conventional bibliometric analysis of publications during two time periods, 2005–2009 and 2010–2014. The number of published journal articles, journal distribution, authors of publications, country of origin of journals, and language of publications were analyzed to establish a high-frequency keyword profile and co-occurrence matrix. Graphical clustering toolkit (gCLUTO) software was applied for two-way clustering analysis and visualized analysis.
Results: A total of 1472 journal articles with a key theme of nursing models were retrieved for final analysis, including 771 published during 2005–2009 and 701 during 2010–2014. The bibliometric analysis revealed that publications other than China concerning nursing models were mostly concentrated in the United States and the United Kingdom and that the number of relevant publications has been continuously decreasing. The two-way clustering analysis showed that there were mainly four types of research themes in the relevant publications in countries other than China during 2005–2009, i.e., nursing education and theoretical research, clinical nursing and psychological care, nursing administration, and models of nursing education, whereas there were five types during 2010–2014, i.e., nursing theories and clinical nursing practice, nursing administration models and assessments of nurses' knowledge and skills, community nursing administration models, nursing human resource management, and nursing education models and approaches.
Conclusions: Research on nursing models in countries other than China is relatively mature and stable with a broader view, but it has shown a declining trend in recent years. It emphasizes both theory and practice, with research content tending to be structured into four modules, i.e., nursing education, administration, clinical practice, and theoretical research. Community nursing models may become a key research direction in the international research on nursing models in the future.

1. Introduction

Nursing models, the early form of nursing theories and products resulting from history, are developed under the impact of contemporary medical models and evolve along with social, political, and economic changes. Moreover, the models vary among different cultures.[1] In 1977, Engel proposed a biopsychosocial (BPS) model and claimed that "to provide a basis for understanding the determinants of disease and arriving at rational treatments and patterns of health care, a medical model must also take into account the patient, the social context in which he/she lives, and the complementary system devised by society to deal with the disruptive effects of illness, that is, the physician role and health care system".[2] This proposal has provided a reference for the theoretical construction of nursing models. Model formation in a disciplinary field

☆ This project was supported by Shanxi Provincial Health Department (No. 201201031).
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Peer review under responsibility of Shanxi Medical Periodical Press.

http://dx.doi.org/10.1016/j.cnre.2017.04.002

symbolizes the maturing of this field. Therefore, exploring the past, present, and future developmental trend of nursing models under a modern nursing context is of great theoretical and practical significance. In addition, deepening our understanding of the development and research history of nursing models in countries other than China and updating our nursing concepts will enable us to learn from advanced foreign models and concepts, thus illuminating nursing theoretical research and promoting the development of nursing care in China. From the bibliometric perspective, this paper presents the results from two-way clustering analyses of publications concerning nursing models in countries other than China during the 2005–2014 period, aiming to identify the developmental trends and hot topics in this research field in countries other than China in the most recent decade.

2. Materials and methods

2.1. Data sources

The literature-related data of countries other than China were retrieved from the PubMed database. The MeSH terms used for searching were “Models, Nursing”. Only the articles published during 2005–2014 were included, and they were retrieved on November 25, 2015. The final results were derived from three repeated searches.

2.2. Research methods

Bibliographic item co-occurrence mining system (BICOMS) software[3] was applied to extract and organize the data, including the year of publication, the journals, first author, and keywords. The number of published journal articles, journal distribution, authors of publications, and country of origin of journals were analyzed using bibliometric approaches. High-frequency words were identified from the extracted keywords and used to establish a high-frequency keyword profile and co-occurrence matrix. In addition, the co-existence of any two high-frequency keywords in the same journal article underwent a frequency analysis. Using graphical clustering toolkit (gCLUTO) software, a two-way clustering analysis was conducted to establish a co-occurrence cluster view. Subsequently, in terms to the optimal clustering performance, the semantic relations among different categories of keywords were analyzed, and the descriptive articles in the cluster were interpreted. Combined with the relevant knowledge in the subject area, dual analysis of representative articles and keywords was conducted to identify hot topics in research on nursing models in countries other than China in the most recent decade. To avoid the limitation of high subjectivity that is inherent in the selection of keywords during co-word analysis, the threshold for high-frequency keywords was determined based on the g-index of word frequency.[4]

3. Results

3.1. Results from conventional bibliometric analysis

3.1.1. Number of journal articles pertaining to research on nursing models in countries other than China

A total of 1472 journal articles with a research theme of nursing models from countries other than China were included in the final analysis in this study, including 771 articles published during 2005–2009 and 701 during 2010–2014. Derek de Solla Price, an American bibliometric expert and information scientist, discovered the exponential growth pattern of scientific literature and plotted the well-known Price's curve. He proposed that the growth of scientific literature includes four phases, i.e., the initial slow growth, exponential growth, linear growth, and the final slow growth.[5] As shown in Table 1, the number of journal articles pertaining to nursing models remained stable in the range of 111–178 during 2005–2014, generating a changing curve basically parallel to the abscissa axis, even though it tended to slightly decline after 2008. Considering the current research status on nursing models in countries other than China, this result suggests that the relevant subject area was gradually maturing, resulting in the publication of fewer articles.

3.1.2. Distribution of the journals that published articles concerning nursing models in countries other than China

According to the “law of scattering” of publications developed by the bibliometric expert S.C. Bradford,[5] the top 33 journals identified in this study were considered the core journals in the research field of nursing models in countries other than China, as demonstrated by the fact that these journals published 47.24% of the relevant articles and showed a centered distribution. Among them, *Nursing Science Quarterly* published the largest number of articles (80, 5.39%) pertaining to research on nursing models in the PubMed database during 2005–2014, followed by *The Journal of Nursing Administration*, which published 68 relevant articles (4.58%). The articles in the two top journals together accounted for 10% of the total number, significantly more than that in the third journal, *Journal of Advanced Nursing* (36, 2.43%).

3.1.3. First authors of the articles concerning nursing models in countries other than China

During 2005–2014, both Sawatzky and McCormack published seven articles (0.47%) concerning nursing models, thus becoming the authors who published the highest number of relevant articles. According to Price's law, the number of articles from a core author who has the least publications is 0.749-fold that of the core author who has the most publications during the same time period.[5] In this study, because the highest number of publications on nursing models by the same author in countries other than China was seven in 2005–2014, the core authors were then defined as the authors who published more than two articles during this time period according to Price's law. There were 281 authors who published more than two articles, indicating that a core author group in research on nursing models has formed.

3.1.4. Country of origin of journals that published the articles concerning nursing models in countries other than China

The journals that published articles concerning nursing models in 2005–2014 in the PubMed database were mainly from Western developed countries, including the United States, the United

Table 1
Numbers of journal articles pertaining to nursing models published in countries other than China, 2005–2014.

No.	Year of publication	Publication quantity	Percentage (%)	Cumulative Percentage (%)
1	2005	138	9.3496	9.3496
2	2006	153	10.3659	19.7155
3	2007	170	11.5176	31.2331
4	2008	178	12.0596	43.2927
5	2009	132	8.9431	52.2358
6	2010	159	10.7724	63.0082
7	2011	155	10.5014	73.5096
8	2012	152	10.2981	83.8077
9	2013	124	8.4011	92.2088
10	2014	111	7.5203	100.0000

Kingdom, and Australia. Journals in the United States published 877 articles, accounting for 59.42% of the total number. This number is remarkably higher than that of any other country, fully proving the research strength of the United States and its leading role in this research area. The United Kingdom ranked second, publishing 308 relevant articles (20.87%), followed by Australia, which published 60 (4.06%). China published 12 relevant articles (0.81%) during the same time period, showing a significant gap between China and the Western developed countries noted above.

3.2. High-frequency keywords in the literature pertaining to nursing models in countries other than China

To more accurately elucidate the changes in hot topics in research on nursing models in countries other than China in the most recent decade, a statistical analysis of high-frequency keywords was conducted on the relevant literature during the two 5-year periods of 2005–2009 and 2010–2014. Based on the articles on nursing models in countries other than China during the two periods, 40 and 55 subject words were identified, with a cumulative percentage of approximately 34.69% and 33.63%, respectively, using a cut-off threshold approach for high-frequency keywords. The keyword "Nurse's Role" had the highest frequency in both periods, suggesting that it was a hot topic in research on nursing models in countries other than China. The details are presented in Tables 2 and 3.

Table 2
Distribution of high-frequency keywords in articles on nursing models in countries other than China, 2005–2009.

No.	Keywords	Frequency	Percentage (%)	Cumulative percentage (%)
1	Nurse's Role	382	2.9076	2.9076
2	Attitude of Health Personnel	340	2.5879	5.4955
3	Nurse's Role/psychology	276	2.1008	7.5963
4	Education, Nursing, Baccalaureate/organization & administration (OA)	183	1.3929	8.9892
5	Nursing Research/OA	166	1.2635	10.2527
6	Nursing Staff, Hospital/psychology	160	1.2178	11.4705
7	Nurse–Patient Relations	158	1.2026	12.6732
8	Clinical Competence	158	1.2026	13.8758
9	Nursing Staff, Hospital/OA	136	1.0352	14.9109
10	Clinical Competence/standards	122	0.9286	15.8395
11	Nurse Administrators/OA	118	0.8982	16.7377
12	Philosophy, Nursing	117	0.8905	17.6283
13	Leadership	114	0.8677	18.4960
14	Education, Nursing, Continuing/OA	113	0.8601	19.3561
15	Nursing Theory	107	0.8144	20.1705
16	Community Health Nursing/OA	107	0.8144	20.9849
17	Nurse Practitioners/OA	104	0.7916	21.7765
18	Models, Educational	103	0.7840	22.5605
19	Students, Nursing/psychology	101	0.7688	23.3293
20	Nurse Clinicians/OA	100	0.7612	24.0904
21	Nursing Staff/psychology	94	0.7155	24.8059
22	Psychiatric Nursing/OA	94	0.7155	25.5214
23	Attitude toward Health	88	0.6698	26.1912
24	Nursing Staff, Hospital/education	84	0.6394	26.8306
25	Cooperative Behavior	80	0.6089	27.4395
26	Interprofessional Relations	78	0.5937	28.0332
27	Professional Autonomy	75	0.5709	28.6040
28	Patient-Centered Care/OA	71	0.5404	29.1445
29	Education, Nursing, Graduate/OA	70	0.5328	29.6773
30	Evidence-Based Medicine/OA	67	0.5100	30.1872
31	Total Quality Management/OA	66	0.5024	30.6896
32	Empathy	66	0.5024	31.1920
33	Diffusion of Innovation	64	0.4871	31.6791
34	Models, Psychological	61	0.4643	32.1434
35	Adaptation, Psychological	60	0.4567	32.6001
36	Nursing, Supervisory/OA	58	0.4415	33.0416
37	Critical Care/OA	54	0.4110	33.4526
38	Holistic Health	54	0.4110	33.8636
39	Thinking	54	0.4110	34.2746
40	Geriatric Nursing/OA	54	0.4110	34.6856

3.3. Two-way clustering analysis of high-frequency keyword co-words in articles on nursing models in countries other than China

3.3.1. Hot topic extraction from the literature on nursing models in countries other than China during 2005–2009

Using the gCLUTO software program, a matrix (Fig. 1, partial) and three-dimensional (3D) mountain visualization (Fig. 2) were generated to visualize the literature on nursing models in countries other than China during 2005–2009. The research themes of the relevant journal articles during this period include four categories, i.e., nursing education and theoretical research, clinical nursing and psychological care, nursing administration, and nursing education models (Table 4).

Cluster 0 included nine high-frequency keywords, and it was denoted by the highest "mountain" with a red top in the 3D mountain visualization (from the clustering result) generated by gCLUTO, indicating the highest similarity among the cluster members and the best clustering performance of this cluster. Using the analysis algorithms in gCLUTO, five representative articles in Cluster 0 were identified, i.e., 16178168, 18232612, 16139394, 18054412, and 15896414. As indicated by the distribution table of high-frequency keywords, the top three keywords in terms of frequency were "Nurse–Patient Relations", "Philosophy, Nursing", and "Nursing Theory". Combined with the literature review, a matrix analysis revealed that Cluster 0 mainly included items related to the category of nursing education and theoretical research.

3.3.2. Hot topic extraction from the literature on nursing models in countries other than China during 2010–2014

The analysis with gCLUTO derived a matrix (Fig. 3, partial) and 3D mountain visualization (Fig. 4) of the literature on nursing models in countries other than China during 2010–2014. The research themes of the relevant journal articles during this period include five categories, i.e., nursing theories and clinical nursing practice, nursing administration models and assessments of nurses' knowledge and skills, community nursing administration models, nursing human resource management, and nursing education models and approaches (Table 5).

Cluster 1 included nine high-frequency keywords, and it was represented by a high "mountain" with a red top in the 3D mountain visualization generated by gCLUTO, indicating a high similarity among the cluster members and a satisfactory clustering performance of this cluster. Using the analysis algorithms in gCLUTO, five representative articles in Cluster 1 were identified, i.e., 21053858, 20210268, 20129588, 24937290, and 22228781. As indicated by the distribution table of high-frequency keywords, the top three keywords in terms of frequency were "3 Leadership", "14 Models, Organizational", and "16 Interprofessional Relations". Combined with the literature review, a matrix analysis revealed that Cluster 1 mainly included items in the category of nursing administration models and the assessments of nurses' knowledge and skills.

Cluster 2 included 11 high-frequency keywords, and it was denoted by the highest "mountain" with a red top in the 3D mountain visualization generated by gCLUTO, indicating the highest similarity among the cluster members and the best clustering performance of this cluster. Using the analysis

Table 3
Distribution of high-frequency keywords in articles on nursing models in countries other than China, 2010–2014.

No.	Keywords	Frequency	Percentage (%)	Cumulative percentage (%)
1	Nurse's Role	174	2.7462	2.7462
2	Nurse–Patient Relations	102	1.6098	4.3561
3	Leadership	101	1.5941	5.9501
4	Attitude of Health Personnel	95	1.4994	7.4495
5	Clinical Competence	89	1.4047	8.8542
6	Nursing Staff, Hospital/OA	78	1.2311	10.0852
7	Education, Nursing, Baccalaureate/OA	74	1.1679	11.2532
8	Nursing Staff, Hospital/psychology	58	0.9154	12.1686
9	Nursing Theory	55	0.8681	13.0366
10	Nurse's Role/psychology	54	0.8523	13.8889
11	Students, Nursing/psychology	52	0.8207	14.7096
12	Models, Educational	52	0.8207	15.5303
13	Philosophy, Nursing	47	0.7418	16.2721
14	Models, Organizational	46	0.7260	16.9981
15	Health Knowledge, Attitudes, Practice	42	0.6629	17.6610
16	Interprofessional Relations	42	0.6629	18.3239
17	Nurse Administrators/OA	39	0.6155	18.9394
18	Patient-Centered Care/OA	38	0.5997	19.5391
19	Cooperative Behavior	36	0.5682	20.1073
20	Education, Nursing, Continuing/OA	36	0.5682	20.6755
21	Education, Nursing, Baccalaureate/methods	35	0.5524	21.2279
22	Nursing Staff, Hospital/education	34	0.5366	21.7645
23	Adaptation, Psychological	29	0.4577	22.2222
24	Nursing Research/OA	29	0.4577	22.6799
25	Holistic Nursing/methods	28	0.4419	23.1218
26	Diffusion of Innovation	27	0.4261	23.5480
27	Faculty, Nursing/OA	27	0.4261	23.9741
28	Community Health Nursing/OA	27	0.4261	24.4003
29	Nursing Staff/psychology	26	0.4104	24.8106
30	Models, Psychological	25	0.3946	25.2052
31	Empathy	25	0.3946	25.5997
32	Evidence-Based Nursing	25	0.3946	25.9943
33	Professional Autonomy	24	0.3788	26.3731
34	Education, Nursing/OA	24	0.3788	26.7519
35	Nursing, Supervisory/OA	24	0.3788	27.1307
36	Neoplasms/nursing	23	0.3630	27.4937
37	Power (Psychology)	23	0.3630	27.8567
38	Job Satisfaction	23	0.3630	28.2197
39	Clinical Competence/standards	23	0.3630	28.5827
40	Patient-Centered Care/methods	22	0.3472	28.9299
41	Education, Nursing/methods	22	0.3472	29.2771
42	Continuity of Patient Care/OA	21	0.3314	29.6086
43	Nursing Care/OA	21	0.3314	29.9400
44	Nursing Care/standards	21	0.3314	30.2715
45	Psychiatric Nursing/OA	21	0.3314	30.6029
46	Advanced Practice Nursing/OA	21	0.3314	30.9343
47	Geriatric Nursing/methods	20	0.3157	31.2500
48	Curriculum	20	0.3157	31.5657
49	Evidence-Based Nursing/OA	20	0.3157	31.8813
50	Social Support	19	0.2999	32.1812
51	Nurse Practitioners/OA	19	0.2999	32.4811
52	Mental Disorders/nursing	19	0.2999	32.7809
53	Practice Guidelines as Topic	18	0.2841	33.0650
54	Pediatric Nursing/OA	18	0.2841	33.3491
55	Organizational Culture	18	0.2841	33.6332

algorithms in gCLUTO, five representative articles in Cluster 2 were identified, i.e., 22074306, 24853796, 20546475, 22261899, 21403490, and 22380419. As revealed by the distribution table of high-frequency keywords, the top three keywords in terms of frequency were “Nurse's Role/psychology”, “Patient-Centered Care/OA”, and “Community Health Nursing/OA”. Combined with the literature review, a matrix analysis revealed that Cluster 2 mainly included items related to community nursing administration models.

4. Discussion

4.1. Nursing models had once been broadly used but no longer seem to be popular in recent years in countries other than China

Nursing models originated in the United States in the 1960s and have developed a unique nursing knowledge system, providing a framework for guiding nursing practice and education. The temporal changes in the number of articles on a specific topic can reflect the general developmental pattern and trends of the subject area. Combined with the current research status on nursing models, this study demonstrates that this subject area is maturing and that the number of relevant articles has gradually decreased in the most recent decade in countries other than China, showing that research on nursing models remains stable but tends to decline. In recent years, a number of studies have discussed the fate of nursing models.[6] Murphy et al[7] state that nursing models had once been broadly used but seem to have become unpopular in recent years. Research on nursing models has mostly been concentrated in Western developed countries, including the United States, the United Kingdom, and Australia, among which the United States has been the leading country in the world.

4.2. Research on nursing models in countries other than China has covered a large number of research themes and a broad scope

Research on nursing models in countries other than China has involved various perspectives, including nursing administration, education, psychology, and theoretical research. The role of nurses (Nurse's Role) has been remarkably emphasized in research on nursing models in countries other than China, as demonstrated by the fact that it was a hot topic in both research development phases. The key concerns of public and professionals have been the strengthening of nursing care and nurses' empathy (Empathy), which have been recognized as a standard for evaluating nursing quality from the patient perspective. Nursing models have guided nurses to focus on the overall evaluation of patient needs from the patient perspective. In addition, they have instructed nurses to provide care to meet individual needs in a systematic and organized manner. Moreover, nurses have been required to play their roles more flexibly, e.g., instead of direct physical bedside care, they might be required to provide technical care previously provided by other medical professionals.[8] Early research on nursing models in countries other than China was focused mainly on nursing theories and nursing education, and as a result, the related subject area was relatively more mature. The themes pertaining to basic concepts and theories of nursing have accounted for a considerable proportion of the research on nursing models. Basically, the nursing models consist of three parts: a series of relevant beliefs and values, a statement of goals that nurses seek to achieve, and the knowledge and skills that nurses are required to possess. The development of nurse-type thinking starts from establishing its core concept, which is the first key step, followed by the establishment of beliefs and values.[9] Talent training is critical for the development of nursing science[10]; therefore, there has been a considerable proportion of research concerning nursing education.

This study demonstrated that journal articles on nursing models in countries other than China mainly focused on nursing education and theoretical research, clinical nursing and psychological care, nursing administration, and nursing education models during 2005–2009. However, the focuses switched to nursing theories and clinical nursing practice, nursing administration models and

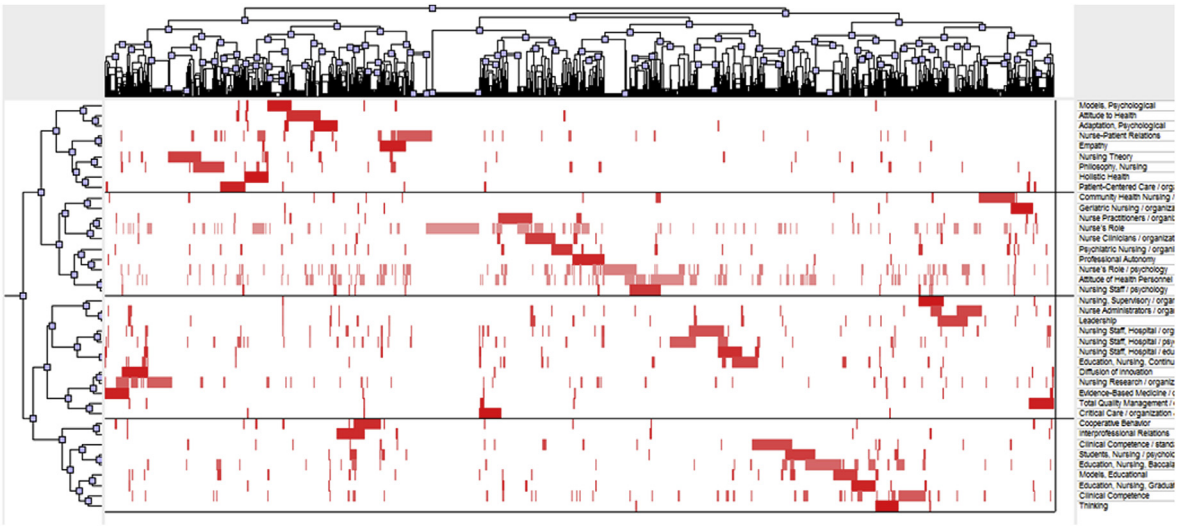

Fig. 1. The matrix visualization of the literature on nursing models in countries other than China, 2005–2009 (partial).

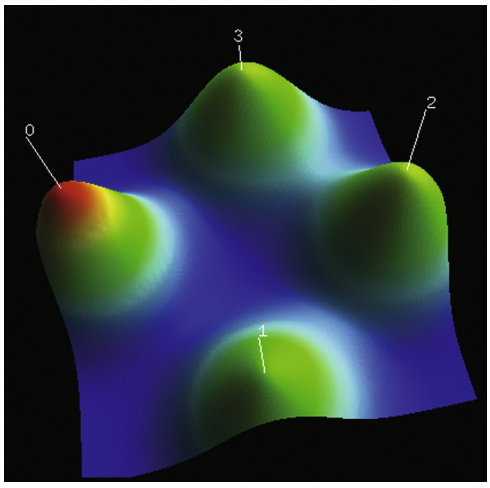

Fig. 2. The mountain visualization of the literature on nursing models in countries other than China, 2005–2009.

assessments of nurses' knowledge and skills, community nursing administration models, nursing human resource management, nursing education models and approaches, and community health nursing during 2010–2014. Due to the significant impact of community health nursing on economic, social, and political changes, the research on this aspect entered a rapid growing phase, and its growing trend remained with changes in the disease spectrum and the development of the health care system. The boom in research pertaining to community health care services indicates that this subject area may become a hotspot in research on nursing models in the future.[11] In addition, because the improvement of nursing quality relies on scientific and standardized nursing administration, publications on nursing administration account for a certain proportion in both research development phases.

4.3. Developmental trend of research on nursing models in countries other than China

In recent years, general nursing theory and conceptual models have gained little attention and have been buried by experience-derived nursing knowledge under the context of evidence-based practice.[6] Despite the limited success in introducing humanistic nursing theory, we believe that the structural and philosophical challenges are surmountable. The current solution that encourages critical thinking on a nursing theoretical basis may not be a panacea, but it may potentially improve nursing practice and promote the development of nursing science because it rationally responds to challenges from the constantly changing clinical environment.[12] A large number of basic concepts inherent in nursing models are closely related to modern nursing care, such as the nature of nursing, the clear role of nurses, individualized care, and patient authorization, which remain as the foundational elements that support the current nursing policy.

Table 4
Hot topics identified by the clustering analysis of high-frequency keywords in the literature on nursing models in countries other than China, 2005–2009.

Cluster No.	Hot topic	Keywords/phrases
Cluster 0	Nursing education and theoretical research	34 Models, Psychological, 23 Attitude toward Health, 35 Adaptation, Psychological, 7 Nurse–Patient Relations, 32 Empathy, 15 Nursing Theory, 12 Philosophy, Nursing, 38 Holistic Health, 28 Patient-Centered Care/OA
Cluster 1	Clinical nursing and psychological care	16 Community Health Nursing/OA, 40 Geriatric Nursing/OA, 17 Nurse Practitioners/OA, 1 Nurse's Role, 20 Nurse Clinicians/OA, 22 Psychiatric Nursing/OA, 27 Professional Autonomy, 3 Nurse's Role/psychology, 2 Attitude of Health Personnel, 21 Nursing Staff/psychology
Cluster 2	Nursing administration	36 Nursing, Supervisory/OA, 11 Nurse Administrators/OA, 13 Leadership, 9 Nursing Staff, Hospital/OA, 6 Nursing Staff, Hospital/psychology, 24 Nursing Staff, Hospital/education, 14 Education, Nursing, Continuing/OA, 33 Diffusion of Innovation, 5 Nursing Research/OA, 30 Evidence-Based Medicine/OA, 31 Total Quality Management/OA, 37 Critical Care/OA
Cluster 3	Nursing education models	25 Cooperative Behavior, 26 Interprofessional Relations, 10 Clinical Competence/standards, 19 Students, Nursing/psychology, 4 Education, Nursing, Baccalaureate/OA, 18 Models, Educational, 29 Education, Nursing, Graduate/OA, 8 Clinical Competence, 39 Thinking

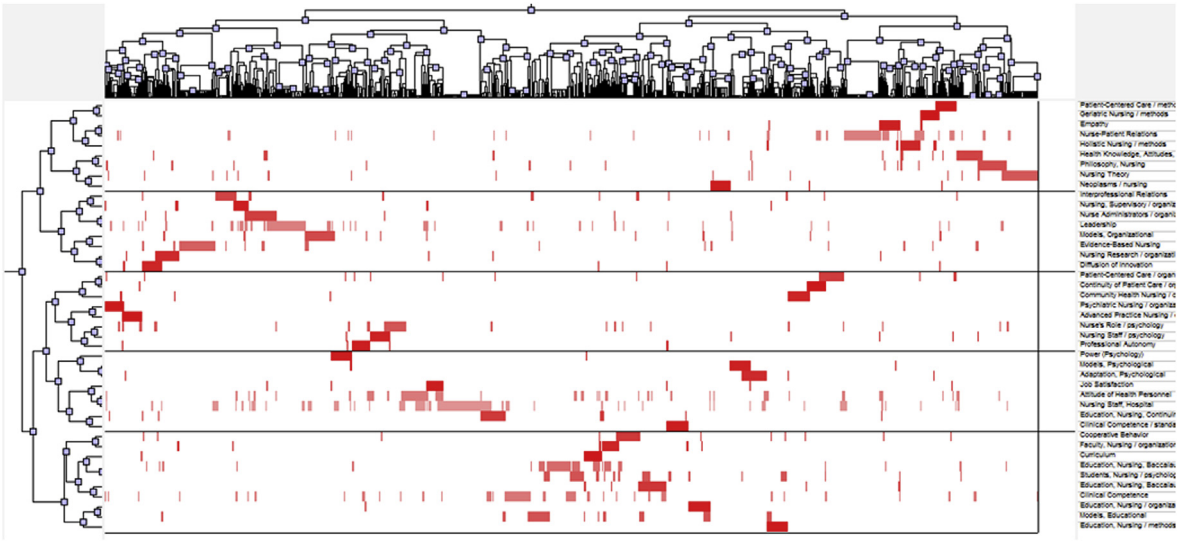

Fig. 3. The matrix visualization of the literature on nursing models in countries other than China, 2010–2014 (partial).

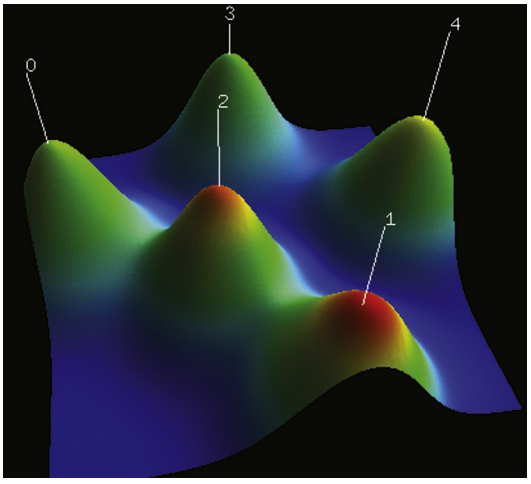

Fig. 4. The mountain visualization of the literature on nursing models in countries other than China, 2010–2014.

4.4. Implications for research on nursing models in China

Research on nursing models has been conducted from a much broader perspective in countries other than China; in particular, nursing science is comprehensive and integrated with multiple disciplines in the United States. In recent years, research on nursing models has emphasized both theory and practice in countries other than China. Nursing models are generated under the context of and take into account biological, psychological, social, cultural, environmental, political, and economical factors. The values, beliefs, and theories embraced within nursing models can be applied to guide the judgment, planning, implementation, and assessment of nursing care. In Western developed countries, particularly the United States, a large number of nursing theories have been proposed and established that maintain the independence and promotes the development of nursing science.[13] In comparison, research on nursing models in China still has a relatively large gap to be filled for further development in terms of research themes and content, although it has covered certain fields, including clinical nursing, nursing administration, and community health nursing. In China, the relevant research has mainly focused on

Table 5
Hot topics identified by the clustering analysis of high-frequency keywords in the literature on nursing models in countries other than China, 2010–2014.

Cluster no.	Hot topics	Keywords/phrases
Cluster 0	Nursing theories and clinical nursing practice	40 Patient-Centered Care/methods, 47 Geriatric Nursing/methods, 31 Empathy, 2 Nurse–Patient Relations, 25 Holistic Nursing/methods, 15 Health Knowledge, Attitudes, Practice, 13 Philosophy, Nursing, 9 Nursing Theory, 36 Neoplasms/nursing, 52 Mental Disorders/nursing, 53 Practice Guidelines as Topic, 54 Pediatric Nursing/OA
Cluster 1	Nursing administration models and nurses' knowledge and skills	16 Interprofessional Relations, 35 Nursing, Supervisory/OA, 17 Nurse Administrators/OA, 3 Leadership, 14 Models, Organizational, 32 Evidence-Based Nursing, 24 Nursing Research/OA, 26 Diffusion of Innovation, 49 Evidence-Based Nursing/OA
Cluster 2	Community nursing administration models	18 Patient-Centered Care/OA, 42 Continuity of Patient Care/OA, 28 Community Health Nursing/OA, 45 Psychiatric Nursing/OA, 46 Advanced Practice Nursing/OA, 10 Nurse's Role/psychology, 29 Nursing Staff/psychology, 33 Professional Autonomy, 43 Nursing Care/OA, 44 Nursing Care/standards, 50 Social Support
Cluster 3	Nursing human resource management	37 Power/Psychology, 30 Models, Psychological, 23 Adaptation, Psychological, 38 Job Satisfaction, 4 Attitude of Health Personnel, 6 Nursing Staff, Hospital/OA, 20 Education, Nursing, Continuing/OA, 39 Clinical Competence/standards, 1 Nurse's Role, 51 Nurse Practitioners/OA, 8 Nursing Staff, Hospital/psychology, 55 Organizational Culture
Cluster 4	Nursing education models and approaches	19 Cooperative Behavior, 27 Faculty, Nursing/OA, 48 Curriculum, 21 Education, Nursing, Baccalaureate/methods, 11 Students, Nursing/psychology, 7 Education, Nursing, Baccalaureate/OA, 5 Clinical Competence, 34 Education, Nursing/OA, 12 Models, Educational, 22 Nursing Staff, Hospital/education, 41 Education, Nursing/methods

clinical nursing practice, particularly the clinical application of nursing models for difference diseases, whereas theoretical studies, particularly studies on innovations in nursing theory, have been scarce.[14]

5. Conclusions

Nursing models can provide a set of frameworks to guide nursing practice and education. Combined with the consideration of actual nursing processes, a nursing model offers a patient-oriented assessment form and structure that can clearly identify the possible issues and the corresponding requirements of nursing care. Such a nursing framework can effectively guide the planning, implementation, and performance assessment of nursing.[15] No model can fit all nursing cases, and each model offers a different nursing solution. Learning from the experience of Western developed countries, research on nursing models in China should combine theoretical research and nursing practice to develop a nursing model theory that innovates on the basis of existing theories and that can be applied in nursing practice and education.[16–19]

Conflicts of interest

All contributing authors declare no conflicts of interest.

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How to cite this article: Han S-F, Zhu R-F, Chen L. A bibliometric analysis of research on nursing models in countries other than China. *Chin Nurs Res*. 2017;4:117–123. http://dx.doi.org/10.1016/j.cnre.2017.04.002