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Bibliometric analysis of papers on mild cognitive impairment nursing in China

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ABSTRACT

Purpose: To supply further references by analyzing the status of research on mild cognitive impairment nursing in China.

Methods: Papers on mild cognitive impairment nursing published between 2005 and 2014 were collected from China National Knowledge Infrastructure, Wanfang Data, and China Biological Medicine database, while their publication dates, journals, and types were subjected to a bibliometric analysis using NoteExpress and Excel.

Results: A total of 68 papers were collected from the selected databases. The number of papers on mild cognitive impairment nursing increased annually. The selected papers were published in 44 journals, 55.88% of them were published in core journals, 35.29% received funding support, 35.29% were published by hospitals affiliated to colleges, 47.06% were published by other local hospitals, author collaboration is 2.66, and 66.18% showed co-authorship. These papers covered a wide range of topics, but were only conducted based on clinical interventions. Around 29.41% of these papers had a citation frequency of over 5, the highest citation frequency was 29, and the highest h-index was 23.

Conclusion: Beijing and Shanghai established core author groups for mild cognitive impairment nursing research. These studies should focus on the community and psychological nursing of such impairment. Targeted nursing interventions on different types of mild cognitive impairment should be adopted, new avenues for research should be opened, and various research methods should be introduced.

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1. Introduction

Mild cognitive impairment (MCI) refers to a transition state between normal aging and dementia; accordingly, patients with MCI have been classified into a broad and varied cognitive group that excluded patients with dementia and normal cognitive functions [1]. These patients have high risks of suffering from dementia in their later life [2], and their impairment lacks an effective medication [3]. To delay the conversion of MCI into dementia, several non-drug interventions have been proposed, including acupuncture,
nursing, and rehabilitation. Bibliometrics is a branch of library and information science that uses mathematical and statistical methods to describe, evaluate, and predict the status quo and trend of scientific studies [4]. Our study analyzes the status of research on MCI nursing and provides references for future work.

2. Materials and methods

2.1. Source of literature

Papers on MCI nursing published between January 1, 2005 and December 31, 2014 were obtained from the Chinese National Knowledge Infrastructure (CNKI), Wanfang Data, and China Biological Medicine database (CBMDisc). “Mild cognitive impairment,” “mild cognitive disorder,” and “nursing” were used as search terms.

2.2. Inclusion and exclusion criteria

Reviews, investigative reports, and observational and intervention studies on topics related to MCI nursing were included in the analysis, while science papers, news articles, conference papers, theses, duplicate publications, and papers irrelevant to MCI nursing were excluded.

2.3. Methods

NoteExpress was used for the data extraction, a database for statistical analysis was constructed using Excel, and the publication dates, journals, and study types of the selected papers were subjected to a bibliometric analysis. Two researchers independently performed the analysis, discussed the differences in their results if necessary, and consulted an expert to resolve any remaining disputes.

3. Results

3.1. Amount and publication date

A total of 121, 34, and 55 papers were collected from CNKI, Wanfang Data, and CBMDisc, respectively. We selected 68 of these papers after applying the exclusion criteria. An average of 6.8 MCI nursing papers were published annually over the last decade, and this amount evidently increased after 2009. Table 1 presents detailed data.

3.2. Journals

The 68 selected papers were published in 44 journals. Specifically, 7.35% of these papers were published in “Chinese Journal of Modern Nursing,” 5.88% were respectively published in “Chinese Nursing Research” and “Medical Information,” and 52.92% were published in 12 other journals. Table 2 presents detailed data.

We further classified the journals by their level. Around 55.88% of the selected papers were published in core journals, 13.24% were published in the Chinese Core Journal Criterion of Peking University (CSCD), 42.65% were published in the China Core Periodicals of Science and Technology (CSTPCD), and 44.12% were published in common journals.

3.3. Funding

In terms of funding, 24 (35.29%) of the selected papers were funded, among which 4 (5.88%) were supported by national funds, 11 (16.18%) were supported by provincial funds, and 9 (13.24%) were supported by other funds. The other 44 (64.71%) papers either had no funding or had no funding information. Table 3 presents detailed data.

3.4. Sources of papers

In terms of publication, 10 of the selected papers (14.71%) were published by colleges, 24 (35.29%) were published by hospitals affiliated to colleges, 32 (47.06%) were published by other local hospitals, and 2 (1.47%) were published by research institutions and companies.

3.5. Author cooperation, co-authorship rate, and core authors

Author cooperation and co-authorship rate reflect the quality of research and the inter-infiltration and intersection among studies [5]. Author cooperation can be computed as the number of authors divided by the number of articles. The 68 selected papers were written by 181 authors, with each paper having one author at least and 10 authors at most. Forty-five of these papers were completed through author cooperation. Therefore, the author cooperation in the selected papers is equal to 2.66, which suggests that each selected article was finished by an average of two to three authors.

The co-authorship rate is an important index used in bibliometric analysis that reflects the degree of cooperation in a study. This index is computed as the number of multi-author papers divided by the number of papers published at a certain period, published in certain journals, and discussing certain subjects. A higher co-authorship rate indicates the better reliability and quality of a research. Co-authorship rate is represented by DC, which is expressed as DC = 1 – F/N, where DC is the co-authorship rate, F is the number of single-author papers, and N is the total number of papers [6]. Given that 45 of the selected papers were completed by two or more authors, the DC was equal to 66.18%. Table 4 presents detailed data.
### Table 3 – Funded papers.

| No. | Paper no. | Source of funds | First author | Title                                                                 |
|-----|-----------|-----------------|--------------|----------------------------------------------------------------------|
| 1   | 8         | National funds  | J.P. Liang   | Influence of different nursing intervention on diabetic patients with mild cognitive impairment |
| 2   | 14        | National funds  | S. Yang      | The effect of nursing intervention on cognitive function of patients with mild cognitive impairment |
| 3   | 58        | National funds  | X.C. Wang    | Improvement of seamless home care for cognitive function of elderly diabetes patients |
| 4   | 67        | National funds  | Y.C. Qiao    | The effect of Orem self-care theory in nursing intervention on the cognitive function of patients with mild cognitive impairment |
| 5   | 5         | Provincial funds| X.L. Cheng   | The application of syndrome nursing on mild cognitive impairment |
| 6   | 13        | Provincial funds| B. Liu       | A survey and analysis of mild cognitive impairment in the aged from Luohu District of Shenzhen City |
| 7   | 19        | Provincial funds| Y.G. Peng    | The effect of nursing intervention on elderly people with mild cognitive impairment |
| 8   | 22        | Provincial funds| T.P. Guo     | The effect of nursing intervention on cognitive function of elderly people with mild cognitive impairment |
| 9   | 38        | Provincial funds| Y. Lei       | Effects of cognitive intervention on cerebral infarction patients with mild cognitive impairment |
| 10  | 52        | Provincial funds| F.J. Yang    | Investigation and analysis of mild cognitive impairment for community senior citizen |
| 11  | 54        | Provincial funds| Q.R. Guo     | Intervention effect of senile people with memory disorders in community |
| 12  | 55        | Provincial funds| S.H. Wang    | The quality of life and related factors of patients with mild cognitive impairment in community |
| 13  | 56        | Provincial funds| W. Liu       | Correlation between serum lipid levels and mild cognitive impairment in patients with cardiovascular diseases |
| 14  | 62        | Provincial funds| Y.Y. Jiang   | Effect evaluation for treatment of mild cognitive impairment by extended nursing |
| 15  | 63        | Provincial funds| Y. Zeng      | The effect of early rehabilitation nursing on cognitive function after stroke |
| 16  | 12        | Other funds     | L.J. Huang   | The study and analysis on mild cognitive impairment of the elderly in communities |
| 17  | 24        | Other funds     | L.D. Zhang   | The influence of memory training to mild cognitive impairment patients |
| 18  | 33        | Other funds     | Z.L. Xue     | The status quo of community nursing for senile people with mild cognition dysfunction and its countermeasures |
| 19  | 35        | Other funds     | H.X. Zhu     | Investigation and analysis on mild cognitive impairment among the elderly in communities |
| 20  | 40        | Other funds     | C.K. Jia     | Sleep disorders in very elderly patients with cognitive impairment |
| 21  | 44        | Other funds     | Z.L. Xue     | The status quo of community nursing for senile people with mild cognition dysfunction and its countermeasures |
| 22  | 50        | Other funds     | H.X. Zhu     | The effect of cognitive training on quality of life in elderly people with mild cognitive impairment |
| 23  | 57        | Other funds     | J.J. Yang    | The analysis of the characteristics and relative factors in elderly people with mild cognitive impairment in Nursing Home Shanghai suburbs |
| 24  | 61        | Other funds     | C.H. Zhang   | Research on affection of sequential care of nursing intervention on the elderly with mild cognitive dysfunction |

### Table 2 – Leading journals.

| No. | Name                                           | Number | Percentage | Cumulative percentage |
|-----|------------------------------------------------|--------|------------|-----------------------|
| 1   | Chinese Journal of Modern Nursing              | 5      | 7.35%      | –                     |
| 2   | Chinese Nursing Research                       | 4      | 5.88%      | 13.23%                |
| 3   | Medical Information                            | 4      | 5.88%      | 19.11%                |
| 4   | Chinese Journal of Nursing                     | 3      | 4.11%      | 23.52%                |
| 5   | Chinese Journal of Health Care and Medicine    | 3      | 4.11%      | 27.93%                |
| 6   | Chinese Journal of Gerontology                 | 3      | 4.11%      | 32.34%                |
| 7   | Shanghai Nursing Journal                       | 3      | 4.11%      | 36.75%                |
| 8   | Journal of Nursing Science                     | 3      | 4.11%      | 41.16%                |
| 9   | Chinese Medicine Modern Distance Education of China | 2      | 2.94%      | 44.10%                |
| 10  | Journal of Qilu Nursing                        | 2      | 2.94%      | 47.04%                |
| 11  | Journal of Nurses Training                     | 2      | 2.94%      | 49.98%                |
| 12  | Journal of Nursing Administration               | 2      | 2.94%      | 52.92%                |
At most four of the selected papers were completed by one author. According to Lotca’s Law, \( m = 0.749 \times N_{\text{max}}^{0.749} \), where \( N_{\text{max}} \) is the number of the papers published by an author with the highest production in statistic years. Core authors are those authors who have published more than two papers. Eight core authors were identified from the selected papers. The Xuanwu Hospital Capital Medical University published six papers, while the Shanghai Sixth People’s Hospital published five papers. Therefore, Beijing and Shanghai are identified as core authors of papers on MCI nursing. Table 5 presents detailed data.

### 3.6. Types of papers

Among the selected papers, 8 (11.76%) were literature reviews, 42 (61.76%) were clinical studies, 14 (20.59%) were investigative papers, and 4 (5.88%) were theoretical discussions.

### 3.7. Contents

The papers were classified by counting the frequency of their keywords, reading their full content, and refining their themes. Some of these papers had intersecting themes. Specifically, three papers were classified under both diabetes and nursing intervention, while two papers were classified under both stroke and nursing intervention. A total of 21 papers were about nursing interventions, 7 were about cognitive functions, 6 were about the psychological nursing and risk (influencing) factors of MCI, 5 were about community nursing, 5 were about MCI-combined stroke, and 3 were about MCI-combined diabetes. Rehabilitation nursing, TCM nursing, home care, and health education each had three papers, while living quality, depression, and intravenous infusion each had two papers. Table 6 presents detailed data.

### 3.8. Highly cited papers

Citation frequency (CF) is an important indicator in bibliometric analysis and the most representative indicator in citation analysis that measures the degree of academic community display and academic influence [7–9]. H-index has become an important measurement tool in scientific and evaluation studies [10]. There are 12 papers’ CF values are 0, while another 56 papers’ total CF values are 290, among these 68 papers, 20 selected papers’ total CF are 213. Twenty (29.41%) of these papers had CF values of over 5, the highest citation frequency was 29, and the highest h-index was 23. Tables 7 and 8 present detailed data.

### 4. Discussion

#### 4.1. Status of research on MCI nursing in China

4.1.1. Analysis of the amount, publication dates, authors, and units of papers

A total of 68 papers on MCI nursing were published over the last decade, that is, an average of 6.8 papers were being published every year, while only six papers were published between 2005 and 2008. Therefore, the amount of papers on MCI nursing demonstrates an increasing trend. Although MCI has received increasing attention in the field of nursing, only few studies have examined such topic. Therefore, future studies are encouraged to focus on MCI nursing. Hospitals showed a higher degree of concern on this subject than journal organizations, colleges, research institutions, and companies. The Xuanwu Hospital Capital Medical University and the Shanghai Sixth People’s Hospital are identified as core authors of papers on MCI nursing. The former has established one of the startup foundations of neurology in China, thereby explaining its relatively high amount of studies on MCI nursing. By contrast, the latter is a large first-grade general hospital. Therefore, those hospitals affiliated to colleges have excellent clinical skills and high scientific research awareness that enable them to conduct effective MCI research.

#### 4.1.2. Analysis of the journals, funding, and author cooperation

Around 42.28% of the selected journals were published in Chinese Journal of Modern Nursing, Chinese Nursing Research, Medical Information, Chinese Journal of Nursing, Chinese Journal of Health Care and Medicine, Chinese Journal of Gerontology, Journal of Nursing Science, and Shanghai Nursing Journal, thereby indicating that these journals are the leading publishers of MCI nursing research in China. Around 55.88% of these articles were published in CSCD and CS TPCD, and the name and level of these journals indicate the medium quality of these papers. A reasonable proportion (35.29%) of these papers received funding support, which indicates that MCI is an emerging research topic that requires additional funding because such impairment has become both a nursing and social concern. A literature review also reveals that nearly all extant studies on MCI employed a small sample, which could be attributed to their limited funding.

Scientific research is characterized by author cooperation, a measure that is expressed by the number of authors in a single paper and indirectly estimates the depth and breadth of research. The selected papers had an author cooperation of 2.66, which was lower than the 3.43 statistical index of the Chinese Science Journals Citation Report [5]. Moreover, these papers had a co-authorship rate of 66.18%, which was lower than the 70% collaboration rate index of the Natural Science Journals, thereby suggesting that the extant research on MCI lacks depth and breadth. Accordingly, the collaboration in MCI nursing research must be improved, and the collaboration among researchers with nursing backgrounds must be promoted.

#### 4.1.3. Analysis of the types and directions of papers

Literature reviews, which comprised 11.76% of the selected papers, focused on MCI and its risk factors, cognitive

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**Table 4 — Cooperative situation of papers.**

| Situation   | Articles | Authors cooperation | Co-authorship rate |
|-------------|---------|---------------------|--------------------|
| Alone       | 23      | 23                  | –                  |
| Cooperation | 45      | 158                 | 2.66               | 66.18%             |
assessments, nursing progress, nursing difficulties, and community nursing. Four of the selected papers were theoretical discussions on pre-disease treatment, nursing features, nursing intervention, and community nursing. Surveys, which comprised 20.59% of the selected papers, focused on the screening and influencing factors of MCI as well as the sleep quality, family function, self-care ability, company, living quality, and characteristics of MCI patients. Clinical studies, including case studies, randomized controlled trials, and before–after studies, comprised 61.76% of the selected papers and mostly focused on psychological nursing, rehabilitation nursing, cognitive nursing, behavioral nursing, and care combined with other chronic diseases. The investigated intervention methods included community, home, continuous, comprehensive, and sequential nursing. Several papers introduced and compared the effects of these interventions on MCI patients. Psychological nursing was discussed in seven of the selected papers (10.29%), thereby suggesting psychological health has received increasing research attention along with the changes in the health model, and that the psychological problems of MCI patients cannot be ignored. The highest citation frequency and h-index in the sample were 29 and 23, respectively, which were lower than those of research in other disciplines, such as physics. Therefore, more high-quality nursing papers must be published by conducting evidence-based nursing research. The highly cited papers were published by the core authors of MCI research in Beijing and Shanghai as mentioned above.

### 4.2. Suggestions for improving MCI nursing research in China

#### 4.2.1. Valuing the community and psychological nursing of MCI

People have started to age quickly, some advancement in the prevention and control of chronic diseases have been introduced, and the research emphasis on dementia has accentuated the importance of MCI nursing research. MCI patients suffer from a mild condition, infrequently visit their doctors, and stay hidden in their communities. To delay the conversion of MCI into dementia, we must change the conception of the disease and visit the patients in their communities. On the one hand, MCI must be diagnosed early, and MCI patients must be screened through community survey and examination as well as by organizing extensive health education and early prevention programs. On the other hand, through early MCI intervention, a health file for this impairment must be built, early systematic comprehensive nursing interventions must be practiced, regular follow-ups must be conducted, a scientific research mentality must be promoted, and a complete prevention and treatment pattern must be implemented in communities [11]. Five of the selected papers focused on community nursing and community survey, thereby indicating some areas for improvement in the research on MCI community nursing.

The mechanism of MCI is closely related to environmental, sociocultural, and mental factors. Most patients also demonstrate different degrees of abnormal mental activities [12]. Therefore, these patients must be offered individualized psychological nursing, behavioral guidance, and emotional support [9]. Psychological nursing not only improves the cognitive level of MCI patients, the benefits of various social activities [13,14]. Therefore, aside from improving the cognitive level of MCI patients, the benefits of psychological nursing must be acknowledged.

#### 4.2.2. Taking targeted nursing interventions based on MCI syndromes

Peterson et al. divided MCI into three types based on the characteristics of cognitive impairments [15]. First, amnestic MCI is the most common type of MCI that mainly involves memory disorders. Patients with amnestic MCI have relatively complete cognitive functions and are at high risk of developing Alzheimer's disease. Therefore, these patients must receive interventions on memory impairment, improve and maintain their memory, and enhance their quality of life. These patients must also undergo various memory exercises, including recalling their past, recognition training,
orientation training, and playing puzzle games for over six months. Lude [16] found that these exercises significantly improved the cognitive functions, state of mind, and survival of MCI patients, especially those aged between 60 years and 70 years. Second, single non-memory cognitive field impairment damages the cognitive functions of patients yet does not result in impairments in memory, language, attention, action, or function. Patients with this impairment require targeted nursing interventions based on the changes in their functions. In sum, amnestic MCI may be related to primary progressive aphasia, while single non-memory cognitive field impairment may be related to frontotemporal dementia. Third, patients with mild impairments in multiple cognitive fields (excluding memory) may not be at risk of developing dementia, but may develop Alzheimer’s disease, vascular dementia, and other non-dementia-related diseases in the future. These patients require comprehensive nursing interventions based on their specialty. However, China lacks comparative studies on these three types of MCI, and only few nursing studies have focused on the features of MCI. Therefore, future researchers must conduct investigative studies, intervention studies, and comparative research on the characteristics and types of MCI.

4.2.3. Importance of various research methods
The literature review underscores the lack of nursing studies on MCI in China and shows that these studies have mostly focused on nursing interventions, adopted a small sample, used hospitals as their intervention sites, and implemented ambiguous interventions that lacked empirical support. These studies also had limited author cooperation and were mostly single-center, short term care, based on interviews, and quantitative in nature. Qualitative studies observe, communicate, experience, understand, and explain the daily lives of individuals and operations of social organizations in natural settings [17], while quantitative studies offer credible information on psychology yet rarely focus on action and motion. Therefore, qualitative studies must be conducted to identify the experiences and nursing needs of MCI patients as well as help nurses make nursing diagnoses and interventions.

Evidence-based studies and meta-analyses on MCI are also lacking. These studies must be conducted in the future to improve the level of nursing research. As well as giving full play to our advantage in nursing of TCM to do some nursing studies related MCI. MCI screening adopts numerous scales that must be compared and combined in future research to improve the pertinence of nursing interventions and reduce assessment work.

5. Conclusions
Although the amount of papers on MCI nursing increases every year, these studies remain very few in China, while their author cooperation and co-authorship rate remain at low levels. Future studies must investigate the community and psychological nursing of MCI with excellent depth and breadth. Targeted nursing interventions on different types of MCIs must be conducted to open avenues for future research and introduce new research methods.
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Author contributions
Kaili Sun helped to build the database and complete the paper assessment; Professor Hui Hu gave some valuable suggestions for modifies and is responsible for this paper.

Conflict of interest
Authors declared no conflict of interests for this article.

Appendix A. Supplementary data
Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.ijnss.2016.10.005.

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