Visual analysis of shared medical appointments based on CiteSpace

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Abstract

Objective: Analyze the research hotspots and frontiers of shared outpatient service, and provide a reference for researchers in this field to carry out follow-up research. Methods: Search the Web of Science core collection database until 2022 and visually analyze keywords in this field through CiteSpace5.8.R3 software. Results: A total of 261 literatures were included. The research focuses mainly on advanced care planning, diabetes care, and group prenatal care. The research trend tends to be telemedicine and nursing provided by specialized nurses. Conclusion: Scholars can learn from the research hotspots of foreign shared medical appointments, pay attention to the research trend, expand its application scope in combination with China’s national conditions, and further promote the development of shared medical appointments in China.

Keywords: shared medical appointment; group medical visit; CiteSpace; research focus; research frontier; visual analysis
**Background**

Shared medical appointments (SMA), also known as group medical visits, are a patient-centered appointment model [1]. As a new medical model, SMA can significantly increase patients’ access to medical care and improve their health management results; At the same time, it can improve the work efficiency of medical staff and reduce the level of job burnout [2, 3]. At present, there are many studies related to SMA abroad, which have been applied in the fields of chronic disease management, prenatal care and obesity intervention, and have achieved good results. However, the research on shared outpatient services in China is still in its infancy. It is essential to understand the current situation and trend of foreign development for its development direction in China. This study applies CiteSpace5.8.R3 software to analyze the application literature of the web of science core collection database in the nursing field from the establishment of the database to 2022, analyzes its research hotspots and cutting-edge trends in the form of a visual scientific knowledge map, and combs and summarizes the research in this field at home and abroad, in order to provide reference and reference for follow-up research.

**Data and methods**

**Data source and retrieval strategy**

Literature search: in the web of science core collection database, take (“shared medical appointments” or “group office visit” or “group appointment” or “shared medical clinic” or “group medical appointment” or “cluster visit” or “group visit” or “shared medical visit” or “group medical clinic”) as the subject word, language (English) and literature type (article or review). The retrieval time is limited to the period from the establishment of the database to 2022, with a total of 280 articles detected. Through reading the title and abstract, the literature irrelevant to this study is excluded, and finally, 261 articles are included. The title information of the included literature is exported in plain text format and saved.

**Research methods**

Using CiteSpace5.8.R3 carries out a visual analysis on the keywords included in the literature. The software can show the knowledge base, research status, development trend and future research frontier of a discipline field through the map of scientific knowledge. Use CiteSpace5.8.R3 to export the title information exported from Web of Science visually analyzes the keyword co-occurrence and clustering of the obtained literature. The basic settings of the software are as follows: the time zone span is set as 1999–2022, the time slice is 1 year, the threshold is selected as top 20, and the analysis results generate a map of scientific knowledge for visual presentation.

**Results**

**Keyword co-occurrence analysis**

In the CiteSpace software interface, the time interval is 1999–2022, the default value of time slice is “1”, the node type of analysis is “keyword”, and the threshold is set to 30. Finally, a keyword co-occurrence map with 399 nodes, 2,167 connections and a network density of 0.0273 is generated. Because this research belongs to a new research field, the number of documents that can be retrieved is less. A total of 399 keywords were obtained, among which the top 20 high-frequency keywords in the shared outpatient field, with frequency and centrality as shown in Table 1. These keywords reflect the hot topics in the development of shared outpatient services.

**Keyword hotspot analysis**

Research hotspot is a research topic that has attracted extensive attention of researchers in specific fields in a certain period of time. The frequency of keywords can be effectively grasped and econometric statistics and cluster analysis can demonstrate the research value. Using CiteSpace5.8.R3 software analyzes the subject and keyword of literature data, executes the clustering operation command at the same time, clusters in the form of keyword, and outputs 8 clustering labels, as shown in Figure 1. The eight categories represent the eight principal directions of shared outpatient research abroad, including #0 advance care planning, #1 diabetes mellitus, #2 chronic care clinics, #3 group prenatal care, #4 blood glucose control, #5 quality improvement, #6 type 2 diabetes, #7 intervention, #8 health maintenance organization.

**Discussion**

This study uses CiteSpace5.8.R3 software to study 261 documents included in the web of science core collection database from the establishment of the database to 2022 and makes a visual analysis from keywords and other aspects.

**Hot spot analysis of SMA research**

**Analysis of keyword co-occurrence.** The high-frequency keywords of SMA mainly focus on the research population, research direction and research methods, and the research hotspots have traces to follow. The research population of SMA mainly involves “adult” and “adolescent”, indicating that SMA has a wide range of applications and has deep guiding significance for primary health care. In the research direction, “education”, “management”, “quality of life”, “health” and other keywords frequently appear, which shows that researchers in this field are mainly concerned about the impact of SMA on the quality of life and health by carrying out health education for patients and changing their self-management ability. The key words “risk”, “disease” and “depression” indicate that SMA research focuses on disease prevention and is more applied to improve patients’ health maintenance organization.
Research shows that women are prone to adverse health outcomes during pregnancy, and maternal stress, mood and anxiety disorders during pregnancy will increase the risk of medical complications such as preeclampsia and other adverse health outcomes and then affect their activities of daily living [9]. The application of SMA to maternal prenatal care is called group prenatal care. Group prenatal care combines clinical care with peer support and education, provides complete prenatal care in a group environment, and integrates pregnancy health assessment and nutrition education, potential problems of pregnancy or delivery, child care, disease prevention or detection and peer support to improve the health outcomes of pregnant women and newborns [10].

A systematic review showed that group prenatal care was associated with maternal mental health outcomes, and women participating in group prenatal care reported reduced symptoms of postpartum depression, stress and anxiety [11]. Another systematic evaluation showed that the pregnancy outcomes of women receiving group prenatal care were improved compared with those receiving traditional prenatal care, which was manifested in the decrease of the incidence of low birth weight of newborns, the increase of prenatal knowledge and the low incidence of preterm birth [12]. However, the impact of existing studies on newborns is not clear. Danylo et al. found that group prenatal care has a low incidence of adverse outcomes for newborns, but there is no significant difference compared with routine care [13]. Future studies can adopt a strict randomized trial design and extend the follow-up time to determine its long-term impact.

Application of advance care plan (ACP). Through keyword clustering, this study found that “advance care planning” is the largest cluster. Pre-nursing plan is a vital part of hospice care, which helps hospice patients choose appropriate and high-quality nursing plans. Scholars at home and abroad have been committed to exploring the obstacles to the implementation of ACP, such as limited time, cognitive factors and the lack of communication ability of medical staff [14]. As an effective means of providing ACP education, SMA uses group trends and peer guidance to promote education and personal goal-setting so as to realize patients’ participation in pre-care plan [15, 16]. Sangeeta et al. evaluated the impact of ACP group visits on the elderly with heart failure [17]. The results showed that group visits improved the patient’s sense of self-efficacy and had a short-term effect on the outcome of ACP. Continuous group visits can maintain ACP for a long time. Lum et al. conducted a randomized trial on elderly primary care patients [16]. The results showed that ACP group visits increased the participation rate and better promoted the behavior change of patients participating in ACP. Hillary et al.

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Figure 1  Keyword clustering map
developed a group visit on the pre-care plan for the elderly [18]. The analysis found that the group visit can promote patients’ discussion on the pre-care plan and increase patients’ participation. SMA helps advance care planning actions by providing a safe and supportive environment for patients to share personal values and challenges and ask a series of questions related to advance care planning. Domestic research shows that the development of ACP is not optimistic, which suggests that Chinese researchers can learn from foreign practical experience, establish ACP group visits, and promote the development of pre-care plans.

Frontiers and trends of SMA research

SMA based on telemedicine. After combing the literature, it is found that with the “Internet+” going deep into the medical industry, SMA research is not only limited to offline but also online diagnosis and treatment modes such as teleconference have been added to the research, which has enhanced the interaction between medical treatment and science and technology, making the development of SMA burst out with strong influence and vitality. The combination of telemedicine and SMA has promoted young people with chronic diseases to participate in the follow-up care of the disease and strengthened the control of the disease. Wen Wan et al. applied the combination of home telemedicine and SMA to young people with type 1 diabetes [19]. The results showed that the nursing model improved patients’ attendance rate and appointment satisfaction, thus increasing the participation of young people in nursing. Elizabeth et al. compared the effects of comprehensive nursing and routine nursing of telemedicine SMA on glycosylated hemoglobin [19]. The results showed that the glycosylated hemoglobin of patients in the comprehensive nursing group of telemedicine SMA decreased significantly. Research shows that this combination can meet the transitional nursing needs of patients with type 1 diabetes from adolescence to adolescence [20]. In addition, telemedicine has the function of more convenient access to medical treatment, which can solve the shortage of medical care. Research shows that during the COVID-19 pandemic, telemedicine combined with SMA has solved the problems of traffic obstacles and time conflicts in offline medicine [21]. Jacob and other scholars pointed out that the virtual shared outpatient service is expected to become a primary healthcare service tool for the management of chronic diseases [22]. However, this study found that the combination of telemedicine and SMA is only widely used in diabetes, and there are not enough studies to apply it to other chronic diseases, suggesting that researchers need larger-scale experiments to determine the research of telemedicine on other diseases.

Nurse-led SMA. At present, the nurse-led intervention model has been applied in the nursing of a variety of diseases to form a certain scale. The research shows that the team led by nurses provides a set of patient-centered holistic nursing methods for patients with chronic diseases who need education and training by providing continuous and organized health care [23]. Generally speaking, nurses have solid disease knowledge and nursing experience and act as managers, researchers, educators, communicators and other roles in clinical practice. Therefore, SMA provided by nurses can bring better medical and nursing experience to patients. SMA led by nurses has been successfully implemented in chronic diseases such as diabetes and heart failure. Sage et al. studied patients with diabetes and found that SMA led by nurses can enhance patients’ self-management ability [24]. Chen Beibei et al. conducted a randomized controlled experiment on patients undergoing cardiac surgery [25]. The experimental group took SMA led by nurses, and the control group took routine care. The results showed that the incidence of postoperative delirium in the experimental group was significantly lower than in the control group. The study found that nurse-led SMA improved access to care for patients with gastrointestinal diseases, improved resource utilization, and did not increase the risk of gastrointestinal outcomes [26]. In addition, studies have shown that nurse-led SMA can improve patients’ knowledge and confidence in participating in shared decision-making [27]. In conclusion, SMA led by nurses has unique nursing advantages, which can improve patients’ mastery of disease knowledge, enhance patients’ self-management ability, and save medical resources. This suggests that the hospital should strengthen the training of nurses, implement training related to health education ability, management ability, communication ability and other skills, and give full play to the advantages of nurses in SMA.

Promote the construction of SMA in China

Foreign SMA has obtained a lot of evidence in chronic disease management and preventive health care and has been widely used in health promotion and disease-focused treatment [28]. Due to the large population base and the shortage of medical resources in China, SMA has a large development space in China, and studies have proved that SMA is suitable for the health management of diabetes patients under the cultural background in China. Li Doudou et al. established SMA for type 2 diabetes led by specialized nurses [29]. The results showed that SMA could effectively improve patients’ self-management behavior and self-management efficacy and improve patients’ quality of life. However, currently, SMA research in China mainly focuses on patients with diabetes, and the disease type is single [30]. It is not clear whether patients with other chronic diseases can also benefit. It is suggested that Chinese scholars increase the disease type. In addition, SMA, as a new diagnosis and treatment method, is different from the traditional one-to-one diagnosis and treatment. Therefore, the following research can conduct a qualitative study on the attitude of outpatient patients and medical personnel in China to understand the acceptability, driving factors and obstacles of SMA implementation in China to determine whether this diagnosis and treatment mode can meet their needs and reduce the shortage of medical resources. At the same time, China should learn from foreign advanced development experience and develop SMA as one of the effective methods of primary health care in China.

Conclusions

SMA is of great significance in promoting peer interaction, improving self-management and compliance, increasing patients’ access to high-quality health care, improving clinical outcomes, improving quality of life, and improving the ability of patients’ and medical workers’ satisfaction. This study summarizes the hot issues of SMA, discusses its research hotspots and development trend, and provides some help for developing SMA in China in the future. Chinese scholars are expected to carry out more SMA related research according to foreign hot spots, optimize and improve methods and practical contents, and promote the development of SMA. However, because the literature of this study is only included in the core collection database of web of science and does not search other databases, it has certain limitations.

References
