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AHP기법을 이용한 중국 동부지역의 요양원 경쟁력 비교연구

초정*, 심재연**
절강 중의약대학교 부교수*, 세한대학교 경영학과 교수**

A Comparative Study of Nursing Homes Competitiveness in China's Eastern Areas Based on Analytic Hierarchy Process Method

Ting Chu*, Jae-Yeon Sim**
Associate Professor, The School of Nursing, Zhejiang Chinese Medical University*,
Professor, Department of Management, Sehan University**

요 약 본 연구는 중국 동부지역 11개 성의 요양원 경쟁력을 비교분석하기 위하여 산업 경쟁력 이론에 근거한 평가지표체계를 설정하고, 계층분석법(AHP)을 이용하였다. 자료는 "중국민정통계연감 2020"의 데이터를 이용하였고, 그 결과 장쑤성은 중국 동부의 11개 성 중 요양원의 경쟁력이 가장 높고 하이난성은 가장 낮은 것으로 나타났다. 경쟁력은 중국 동부의 11개 성에서 차이가 있었다. 요양원 산업 전반에 걸쳐 '의료인력 대비 병상 비율', '요양원 비율', '요양시설 1인당 고정자산', '와상 노인의 수' 등이 크게 영향을 미치는 4대 요인으로, 요양원의 경쟁력에 영향이 있는 것으로 나타났다. 요양원 산업이 합리적으로 발전하고 요양원의 효율성 그리고 서비스의 질이 향상될 수 있도록 지역마다 차별화된 전략을 세워야 한다.

주제어 요양원, 경쟁력, AHP기법, 중국 동부지역, 비교연구

Abstract This work aims to use the analytic hierarchy process (AHP) tool to develop the model of industrial competitiveness in the nursing homes of eleven provinces in east China. The original data is from China Civil Affairs Statistical Yearbook 2020. The results show that Jiangsu province has the highest competitiveness in the elderly care industry among the eleven provinces in east China, and Hainan province has the lowest competitiveness. The competitiveness of the elderly care industry varies among the eleven provinces in east China. The ratios of beds to medical staff, the ratio of nursing homes, per capital fixed assets in nursing homes, and the number of unable self-care elderly are the four main influential factors across the competitiveness of the elderly care industry and indicates that the nursing homes competitiveness is affected by multiple factors from multiple levels. A differentiated strategy should be taken according to the circumstances in different provinces to rationally develop the elderly care industry, improving efficiency, the level, and quality of services in the nursing homes.

Key Words nursing homes, competitiveness, analytic hierarchy process method, china's eastern areas, comparative study

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Corresponding Author: Jae-Yeon Sim
(Sehan University)
Email: simjy@sehan.ac.kr
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1. Introduction

It is reported that there are 253.88 million people (accounting for 18.1% of the total population) who are 60 years old or older and 176.03 million people (accounting for 12.6% of the total population) who are 65 years old or older, at the end of 2019 in China (Ministry of Civil Affairs of the People's Republic of China, 2019). With the acceleration of population aging process, the reduction of family size and the rapid transformation of society, the demand for care or rehabilitation care for elderly (especially disabled elderly) in China has increased rapidly. Nursing homes ushered in a golden age of development, and the demand for elderly care services has also grown explosively.

Based on the data from *the Research report on the development of China's elderly care institutions* issued by the China Aging Science Research Center in 2015, it is observed that the vacancy rate of nursing homes beds is as high as 48% in China. Among the 257 nursing homes interviewed, only 19.4% have profit surpluses, 48.1% have no profit surplus, and 32.5% suffered losses (China news, 2015). It is hard to obtain a bed in nursing homes with a high competitiveness, and even needs to wait in line for a long time. However, the occupancy rate is very low in nursing homes with weak competitiveness. Therefore, the competitiveness and service quality of nursing homes play a vital role in the sustainable development of elderly care industry (Wang & Zhu, 2018).

According to the data from the *China Civil Affairs Statistical Yearbook 2020*, only 1,020 nursing homes with 500 beds or more in China, and among of them, 610 (accounting for 59.8%) in the eastern area of China, 231 (accounting for 23.8%) in the central area of China, and 167 (accounting for 16.4%) in the western area of China (Ministry of Civil Affairs of the People's Republic of China, 2020). Hence, we decided to select nursing homes in the eastern area of China as the research objects to evaluate the nursing homes competitiveness, and hope to warrant the scientificity, reliability and feasibility of this study (Chu & Sim, 2021).

2. Literature review

In this era of fierce competition and unpredictable changes in environmental conditions, competitiveness is crucial (Suabate et al., 2021). Industrial competitiveness or industrial international competitiveness, refers to an industry competitiveness of one country or region compare with that of other countries or regions in terms of production efficiency, meeting market demand, and continuous profitability (Momaya, Bhat & Lalwani, 2017). A well-known scholar of Harvard Business School, Professor Michael Porter put forward the *Theory of Industrial Competitiveness*. In his book *National Competitive Advantage*, the basic principles of global competition have been described as the follows: the question is no longer why a country is competitive, but why a country is particularly competitive in a certain industry, and then the *Diamond Theory* of national competitive advantage is proposed (Porter, 1998).

The comparative productivity of an industry is the essence of industrial competitiveness. The so-called comparative productivity refers to the comprehensive ability of a company or industry to continuously produce products that consumers are willing to accept in a more effective manner than other competitors, and thereby obtain satisfactory economic benefits. The comparison of industrial competitiveness is mainly reflected in the industrial competitive advantage, while the industrial competitive advantage is mainly reflected in the market liquidity of products, enterprises and industries. Poor service quality and weak competitiveness of nursing homes is a very common phenomenon in the United States of America (USA) (Starkey, Weech-Maldonado & Mor, 2005), and the survival and development of nursing homes has been affected by competition or influence from

noninstitutional long-term care (LTC) and assisted living (AL) in USA (Gruneir et al., 2007). Therefore, improving the service quality and competitiveness of nursing homes is the key for the survival and sustainable development of nursing homes. Wang XF et al suggest that the competitiveness is a valuable indicator to reflecting the operational capability of nursing homes, which has been adopted by the government and used to evaluate nursing homes. The competitiveness of nursing homes is reflected in the three aspects such as market ability, management ability and basic ability (Wang & Zhu, 2018). Guo et al., (2014) conduct a comparatively analysis on the competitiveness evaluation system between enterprises and nursing homes. Zhang et al., (2019) using Delphi method to construct four evaluation indicators for nursing homes such as organization management, service resources, service content, and service benefits, and provide a theoretical basis for studying the competitiveness of nursing homes. Through reviewing the literature, Huang et al., (2021) put forward some new opinions on how to improve the nursing quality index system. It is essential to developing a national-level nursing quality index data platform of nursing homes, and to provide national-level support to enhance the competitiveness of nursing homes.

Therefore, through quantitative analysis of the competitiveness of nursing homes in eastern China, we can clarify the advantages or disadvantages, and propose a new direction for the future development of nursing homes in China. This study uses the AHP method to establish an evaluation indicator system to evaluate the competitiveness of nursing homes in 11 provinces in eastern China. Through comparing and analyzing the main factors affecting the competitiveness of nursing homes in eastern China, it is expected that reasonable and feasible countermeasures or suggestions can be provided for improving the competitiveness of nursing homes in China.

3. Analytical Methods

3.1 Analytic Hierarchy Process

The analytic hierarchy process (AHP) is a qualitative and quantitative decision-making method proposed by Professor Saaty (1980) in 1970s, which is suitable for solving complex multi-dimensional problems. AHP is a multi-criteria decision making (MCDM) technique, and is particular value when subjective, abstract or non-quantifiable criteria are involved in the decision-making (Saaty, 1988). The decision-making elements include three aspects: aims, standards and plans, AHP can conduct qualitative and quantitative analysis of the indicators in the above three dimensions (Frei & Harker, 1999).

The key of AHP method is to compare the weighted standards or indicators in pairs. The advantage of this method is that it allows researchers to perform multiple checks on the consistency of all interviewees' judgments during the pairwise comparison process. Before applying weights, its inconsistency ratio must be evaluated, because it is meaningful to derive weights from a matrix that meets or is close to consistency (Ishizaka & Labib, 2011).

AHP is a three-step process. First of all, it is necessary to determine the objectives to be studied, the evaluation criteria to be adopted, and to formulate alternative plans, and organize the above content into a hierarchical structure. Secondly, it is necessary to compare the elements of each level in pairs, and then obtain the "solving algorithm using the results of the pairwise comparison of all levels". Finally, the relative importance of evaluation criteria calculated from step two are used to establish the relative performance of alternatives (Troutt & Tadisina, 1992; Schniederjans & Wilson, 1991).

The steps of AHP are listed as follows:

3.1.1 Constructing structural model

(1) The highest level. There is only one element at

this level, which is usually the predetermined goal or result of analyzing the problem. Hence, it is called the goal level.

(2) The Intermediate level. This is the intermediate link involved in achieving the goal. It consists of multiple levels of factors, mainly including evaluation standards or sub-standards of related indicators. Hence, it is called the criteria level.

(3) The lowest level. This level mainly includes various measures and decision-making procedures that can be used to achieve goals. Hence, it is called the measure or program level.

3.1.2 Constructing judgment matrix

The basis of using the AHP method is to construct a judgment matrix, and to invite multiple experts to score the importance of each evaluation indicator. The comparison result b_{jk} (j,k =1,2,⋯,n) can be obtained by $B=(b_{jk})_{n*n}$. The b_{jk} represents the importance degree of the j indicator compared with the k indicator, which can be obtained by b_{jk}= $1/b_{jk}$ (j,k =1,2,⋯,n).

3.1.3 Calculation of indicator weight

The weight of each indicator can be obtained by following formula:

(1) Normalize the columns of the judgment matrix B.

$$\overline{b_{jk}}=\frac{b_{jk}}{\sum_{j=1}^{n} b_{jk}}(j,k=1,2,.....,n) \quad (1)$$

(2) Get the all elements sum of the judgment matrix.

$$\overline{\omega_j}=\sum_{k=1}^{n}\overline{b_{jk}}(j,k=1,2,.....,n) \quad (2)$$

(3) Normalize $\overline{\omega_i}$.

$$\omega_j=\frac{\overline{\omega_j}}{\sum_{j=1}^{n}\overline{\omega_j}}(j,k=1,2,.....,n) \quad (3)$$

Then, $\omega=(\omega_1, \omega_2, \cdots, \omega_j, \omega_n)$ T is the weight vector corresponding to the n indicators in question, and $\omega_1+\omega_2+\cdots\cdots+\omega_n$=1.

3.1.4 Consistency test of judgment matrix

Judgment matrix consistency test can be carried out using the following formula:

(1) The maximum eigenvalue of judgment matrix can be obtained through $B_\omega=\lambda_{\max\omega}$.

$$\lambda_{\max}=\frac{1}{n}\sum_{j=1}^{n}\frac{B_j\omega}{\omega_j}(j=1,2,.....,n) \quad (4)$$

(2) To determine the rationality weight coefficients, the consistency test should be conducted. Consistency index was calculated by $CI=\frac{\lambda_{\max}-n}{n-1}$($n$ is the number of evaluation indicators) or by $CR=\frac{CI}{RI}$(RI is an average value of random consistency index at the corresponding order), respectively. The smaller the RI value, the better the judgment matrix consistency. There is a good consistency when RI value is no more than 0.1, and the average value of random consistency index at each order is shown in Table 1.

Table 1. Average random consistency index of order 1–9

Order	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45

Judgment matrix cannot meet the requirements of random consistency index when CR≥0.1, and fail to pass the consistency test. In this case, it is necessary to seek expert opinions again, adjust the judgment matrix, re-determine the judgment matrix, and then implement the above calculation steps several times, and check the obtained results until CR<0.1.

3.2 Indicator System Construction and Weight Determination

According to the published data, an index system is constructed. To assure the scientificity and objectivity of weights, a questionnaire survey is conducted among seven scholars who have been engaged in nursing home research for many years. The relative importance of indicators at all levels in the competitiveness of nursing homes was sorted out. The judgment matrix, evaluation indicators, and weights used in this study are shown in Table 2. By the way, the values of CR were shown in Table 3 (all lower than 0.1). Therefore, there is good consistency of our results.

Table 2. Evaluation indicator and weight of nursing homes competitiveness

Level (A)	Level (B)	Weight	Level (C)	Weight	Total weight of each index	Sequence
A Nursing Homes competitiveness	B1 Human Resources	0.165	C1 Number of medical staff	0.067	0.011	19
			C2 Number of managers	0.133	0.022	17
			C3 Ratio of professional and technical personnel	0.2	0.033	12
			C4 Medical staff education	0.267	0.044	10
			C5 Educational ratio of employees	0.333	0.055	8
	B2 Material resources	0.065	C6 Nursing home construction area	0.333	0.022	18
			C7 Number of beds in nursing homes	0.167	0.011	20
			C8 Number of beds per capita	0.5	0.033	13
	B3 Financial resources	0.176	C9 Fixed assets of nursing homes	0.167	0.029	14
			C10 Per capita fixed assets in nursing homes	0.5	0.088	4
			C11 Resident disposable income	0.333	0.059	7
	B4 Service capabilities	0.33	C12 Number of self-care elderly	0.133	0.044	11
			C13 Number of partially self-care elderly	0.2	0.066	6
			C14 Number of unable self-care elderly	0.267	0.088	3
			C15 Rehabilitation and medical outpatient visits	0.067	0.022	16
			C16 Ratio of beds to medical staff	0.333	0.110	1
	B5 Sustainability	0.264	C17 Total income of nursing homes	0.3	0.079	5
			C18 Number of nursing home institutions	0.1	0.026	15
			C19 Ratio of nursing homes	0.4	0.106	2
			C20 Number of people aged 65 and over	0.2	0.053	9

Table 3. Consistency test results

B1-CR	B2-CR	B3-CR	B4-CR	B5-CR	A-CR	Total order sorting-CR
0.01	0	0.089	0.059	0.015	0.045	0.012

3.3 Data Sources and Research Objects

In this study, 20 evaluation indicators out of 5 factors, are designed and sorted from the statistical data of *China Civil Affairs Statistical Yearbook 2020, China Civil Affairs Development Statistical Bulletin 2019, and Statistics of the Ministry of Civil Affairs of the People's Republic of China.* The indicators of this work are the data of nursing homes in China's Eastern Areas in 2019. Because the different dimensions of competitiveness indicators for nursing homes, the 20 evaluation indicators should be standardized using formula (5). Eleven provinces in the eastern area of China are Beijing, Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin and Zhejiang. The results of standardized indicators were shown in Table 4.

Table 4. Standardized data of competitiveness indicators for nursing homes in China's Eastern Areas

Province / Indicators	Bei Jing	Fu Jian	Guang Dong	Hai Nan	He Bei	Jiang Su	Liao Ning	Shan Dong	ShangHai	Tian Jin	Zhe Jiang
C1	0.458	0.131	0.636	0.023	0.586	1.000	0.325	0.742	0.528	0.160	0.542
C2	0.345	0.245	0.795	0.022	0.593	1.000	0.705	0.839	0.951	0.158	0.777
C3	1.000	0.808	0.903	0.957	0.948	0.950	0.768	0.926	0.818	0.952	0.874
C4	0.309	0.111	0.543	0.016	0.317	1.000	0.235	0.822	0.282	0.138	0.340
C5	0.669	0.625	0.667	0.695	0.569	0.770	0.560	1.000	0.569	0.639	0.560
C6	0.298	0.210	0.550	0.019	0.540	0.952	0.280	1.000	0.342	0.202	0.654
C7	0.254	0.155	0.535	0.013	0.471	1.000	0.394	0.777	0.319	0.134	0.730
C8	1.000	0.386	0.523	0.136	0.455	0.795	0.545	0.477	0.795	0.682	0.864
C9	0.279	0.161	0.987	0.035	0.476	1.000	0.088	0.535	0.207	0.094	0.354
C10	0.375	0.379	0.679	1.000	0.326	0.321	0.060	0.230	0.156	0.227	0.174
C11	0.976	0.513	0.562	0.384	0.370	0.596	0.458	0.455	1.000	0.611	0.719
C12	0.109	0.099	0.323	0.008	0.352	1.000	0.451	0.628	0.185	0.080	0.704
C13	0.352	0.155	0.481	0.009	0.524	1.000	0.492	0.786	0.514	0.136	0.643
C14	0.433	0.204	0.817	0.023	0.695	0.989	0.475	1.000	0.948	0.269	0.532
C15	0.857	0.094	1.000	0.013	0.141	0.783	0.155	0.517	0.244	0.195	0.428
C16	0.412	0.879	0.625	0.410	0.598	0.743	0.901	0.778	0.449	0.621	1.000
C17	0.331	0.156	1.000	0.027	0.281	0.698	0.079	0.279	0.237	0.109	0.534
C18	0.232	0.222	0.733	0.009	0.594	1.000	0.761	0.808	0.279	0.149	0.694
C19	0.619	0.390	0.180	0.482	0.826	0.520	0.910	0.743	1.000	0.965	0.605
C20	0.154	0.249	0.619	0.055	0.626	0.762	0.434	1.000	0.055	0.118	0.514

$$Y_j(t) = \frac{X_i(t) - \min X_i(t)}{\max X_i(t) - \min X_i(t)} \quad (5)$$

Where i = 1,2,……,20; t = 1,2,……,11, $X_i(t)$ is the indicators value of the ith in t province, and Yi(t) is the dimensionless value.

4. Results

After standardizing the original data for constructing indicators, this study calculates the corresponding weights to obtain the evaluation results and rankings of the competitiveness of nursing homes in China's Eastern Areas, which are shown in Table 5 and Figure 1.

Data of Table 5 suggested that Jiangsu Province has the strongest competitiveness of nursing homes in China's Eastern Areas, with an evaluation score of 0.773; Shandong ranked second with a score of 0.696; Guangdong ranked third with a score of 0.63; Zhejiang ranked fourth with a score of 0.607. Three provinces ranked second to fourth have little difference in the evaluation scores of pension competitiveness. The remaining seven provinces are Hebei, Shanghai, Liaoning, Beijing, Tianjin, Fujian, and Hainan, with scores of 0.53, 0.527, 0.49, 0.472, 0.394, 0.363, and 0.292, respectively. The analysis results of the competitiveness of nursing homes in eastern China are shown in Figure 1.

Table 5. The evaluation results of the competitiveness of nursing homes in eastern China

Province / Indicators	Bei Jing	Fu Jian	Guang Dong	Hai Nan	He Bei	Jiang Su	Liao Ning	Shan Dong	Shang Hai	Tian Jin	Zhe Jiang
B1	0.096	0.072	0.115	0.071	0.096	0.151	0.086	0.148	0.097	0.078	0.098
B2	0.042	0.019	0.034	0.005	0.032	0.057	0.028	0.046	0.037	0.028	0.05
B3	0.098	0.068	0.122	0.112	0.064	0.093	0.035	0.063	0.078	0.058	0.068
B4	0.13	0.131	0.209	0.048	0.18	0.296	0.196	0.264	0.18	0.109	0.24
B5	0.106	0.073	0.15	0.056	0.158	0.176	0.145	0.175	0.135	0.121	0.151
A	0.472	0.363	0.630	0.292	0.530	0.773	0.490	0.696	0.527	0.394	0.607

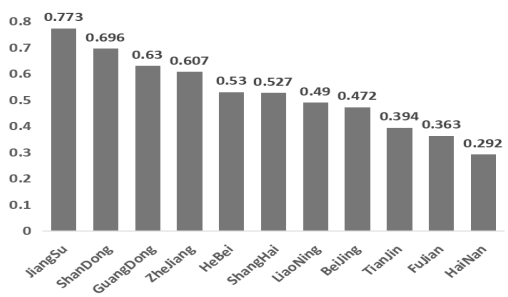

Figure 1. The results of the competitiveness of nursing homes in eastern China

From the perspective of five factors that constitute the competitiveness of nursing homes, the most influential factors are service capabilities and sustainable development capabilities. Jiangsu province ranks first in the competitiveness. The reasons why Jiangsu province ranks first are (1) Jiangsu province has demonstrated strong service capabilities in serving self-care elders, self-care elders, and cannot self-care elders. (2) Jiangsu province also has higher scores in terms of the number of technical personnel, proportion of personnel with a bachelor's degree or above, fixed assets and number of nursing homes. The three provinces of Shandong, Guangdong, and Zhejiang have high scorers in terms of technical manpower input, in the investment of medical staff education, have a higher proportion of medical staff with a bachelor's degree or above, have strong nursing capabilities for partly self-care or unable self-care elders, and ratio of beds to medical staff is also reasonable.

The proportion of technicians in Shanghai is high, however, the number of medical staff with bachelor degree and above is lower than Jiangsu province. In addition, Shanghai has the following characteristics: (1) the aging situation is very serious, (2) the number of people aged 65 and over is the largest in in Eastern Areas of China, (3) the number of beds per capita, and (4) the number of fixed assets per capita for the elderly are relatively lower. Therefore, the nursing homes competitiveness is ranked sixth in Shanghai.

The competitiveness of nursing homes in Hainan is the weakest in Eastern Areas of China, with a score of 0.292. The reasons for that are (1) the number of medical staff is smaller, (2) the number of medical staff with a bachelor's degree or above is smaller, (3) the number of beds per capita is smaller, and (4) the ability to serve self-care elderly and cannot self-care elderly is seriously insufficient.

The situation of competitiveness factors for nursing homes in Eastern Areas of China is shown in [Figure 2]. From the perspective of 20 evaluation indicators, the top four indicators are ratio of beds to medical staff, ratio of nursing homes, per capita fixed assets of nursing homes, and number of unable self-care elderly; which are the main factors that affects the competitiveness of nursing homes in Eastern Areas of China. These factors reported here should be taken into consideration when other regions formulating plans for elderly care industry or regional economic development.

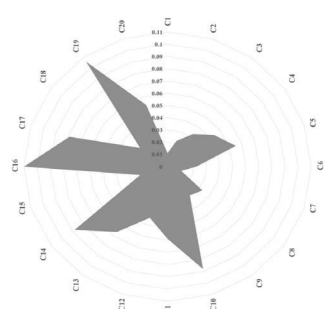

Figure 2. Situation of competitiveness factors for nursing homes in Eastern Areas of China

5. Discussion

This study indicated that the ratio of beds to medical staff, the ratio of nursing homes, per capital fixed assets in nursing homes, and the number of unable self-care elderly are the top four factors that determines the competitiveness of nursing homes in Eastern Areas of China. At present, the competitiveness of most nursing homes in China is relatively weak. Therefore, in order to promoting a healthy and sustainable development of nursing homes in China, national and local government should increase the investments of human, financial and material resources, continuously improve management and operation capabilities, and enhance the economic and social benefits of nursing homes. Only by doing that, the goal of enhancing the competitiveness of nursing homes can be achieved.

The nursing homes is a sunrise and resource-based industry. Number of senior citizens, number of nursing homes, service capabilities of nursing homes, strong support from human, financial, material resources and policy are the indispensable prerequisites for the sustainable development of elderly care industry (Wang & Zhu, 2018). Continuous stable input and efficient output are the two main factors that determines the competitiveness of nursing homes. From the perspective of nursing homes competition conditions, the provinces and cities with weak nursing homes competitiveness are all in the last echelon in the investment of human, financial and material resources, and the strength of nursing homes competitiveness is guaranteed by the investment of various resources and strong service capabilities (Guo et al., 2014). Therefore, the key to enhancing competitiveness of nursing homes is to give full play to the resource advantages of elderly care industry, improve the technical level and comprehensive quality of employees in elderly care industry, increase investment in elderly care industry, rationally allocate resource elements in elderly care industry, and to promoting the service capabilities and quality of nursing homes.

Because the unbalanced development of resources and economic level, there is a significant regional differences in the competitiveness of nursing homes in Eastern Areas of China. The provinces with strong competitiveness are mainly concentrated in a few provinces with strong economic capacity. It is interesting that the volatility of factor score of each province is very common, which means that not all the strong provinces are strong in all factor score, not all the weak provinces are weak in all factor score, and the provinces with strong or weak competitiveness have their own advantages and disadvantages.

The elderly care industry is an important part of the national economy, and it is also a platform and carrier for the elderly to directly participate in the development of elderly care industry and to share the benefits of social progress (Zhao, 2016; Huang & Hirth, 2016; Forder & Allan, 2014). The development of regional elderly care industry relies on various resource advantages, and the competitiveness of elderly care industry depends on the economic and social benefits achieved, as well as its influence in elderly care industry.

Therefore, systematically enhancing the competitiveness of elderly care industry is very important for (1) promoting the full utilization of resources of elderly care industry, and (2) promoting the social and economic development in a healthy and sustainable manner. On the one hand, different regions should formulate development strategies for elderly care industry that suit their conditions according to their own resource endowments. On the other hand, the development of elderly care industry should follow the principle of combining "high quality" and "sustainability". It should not only conform to the situation and requirements of world development, but also pay attention to dislocation development and characteristic construction. In the end, a win-win

cooperation between society, nursing homes and the elderly will be realized, and the happiness and sense of gain of elderly will be continuously improved.

6. Conclusions

Due to China is rapidly entering an aging society, the evaluation of competitiveness of elderly care industry is conducive to promoting the adjustment and optimization of the resources of elderly care industry, thereby improving the service and development levels of elderly care industry, which has a strong practical significance. Through establishing the evaluation index system for the nursing home competitiveness, our study uses AHP method to assess the nursing home competitiveness in eastern China.

The results show that Jiangsu province has the strongest competitiveness in elderly care industry among the 11 eastern provinces, at the meantime, Hainan province has the weakest competitiveness. Moreover, the competitiveness of elderly care industry varies greatly among the 11 provinces in Eastern Areas of China.

The ratio of beds to medical staff, the ratio of nursing homes, per capita fixed assets in nursing homes, and the number of unable self-care elderly are the 4 main factors affecting the competitiveness of elderly care industry. These findings reported here suggest that the competitiveness of elderly care industry is affected by multiple factors at different levels. The elderly care industry has attracted more attention and will become a new growth point for social and economic development.

The results of this study indicate that, in order to enhance the competitiveness of nursing homes, each region should take measures according to local conditions, rationally develop elderly care industry, improving efficiency of elderly care industry, improving the level and quality of elderly care services. In the end, to help the nursing homes to win a sustainable development and a better future.

This study only conducts a comparative analysis of the competitiveness of elderly care industry in the economically developed provinces in Eastern Areas of China, and does not conduct a comparative analysis of the competitiveness of elderly care industry in (1) other underdeveloped provinces in China, and (2) other countries such as Japan and South Korea in Eastern Asian. This insufficiency needs to be done in future study.

In one word, if our findings reported here can be supported or confirmed by follow-up studies, this work will have an important and positive impact on the scientific development of global elderly care industry.

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초 정(Chu, Ting)

- 2021년~현재: 절강중의약대학교 부교수
- 2019년~현재: 세한대학교 경영학(경영학박사 재학)
- 2013년 6월: 종산대학교 간호학과(의학석사)
- 2007년 6월: 난화대학교 간호학과(의학사)
- 관심분야: 위생경제관리, 건강관리
- E-Mail: chueting2007@163.com

심 재 연(Jae-Yeon Sim)

- 1995년~현재: 세한대학교 경영학과 교수
- 1995년 2월: 조선대학교 대학원 경영학과 (경영학박사)
- 1990년 2월: 조선대학교 대학원 회계학과 (경영학석사)
- 1985년 2월: 조선대학교 회계학과 (경영학사)
- 관심분야: 회계정보시스템, 정부회계, 인적자원관리
- E-Mail : simjy@sehan.ac.kr