Evaluation Index System of Surgical Tourism Service Organizations in China: An Empirical Research

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Research

Keywords: Medical tourism, Evaluation system, Access criteria, Surgical service, Safety and Quality

Posted Date: January 10th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1226845/v1

Version of Record: A version of this preprint was published at Global Health Research and Policy on August 16th, 2022. See the published version at https://doi.org/10.1186/s41256-022-00262-2.

Abstract

Background: Healthcare tourism is an emerging economy with the most potential in China's health industry before the COVID-19 pandemic. Surgical medical health tourism accounts for a large part of medical tourism services in China, which has higher requirements for quality and safety. By contrast, measurement tools and theoretical research are insufficient in China. The aim of this study was to develop a set of reliable and feasible indicators by augmenting the original Donabedian's quality model to evaluate surgical tourism services' quality.

Methods: Literature review and focus group interview were used to generate indicators for surgical tourism services' quality. The basic framework of the evaluation system was based on the structure-process-outcome Donabedian model. The screening and weight setting were conducted through analytic hierarchy process (AHP) and a two-round Delphi consultation with 13 panelists. Validity and reliability of experts were tested by the experts' positive coefficient, authority coefficient, and coordination coefficient. Reliability of the questionnaire was assessed by a pretest distributed within an international medical department of a public hospital in China.

Results: Based on the Donabedian's quality theory, the novel evaluation system of surgical tourism service institutions with 3 dimensions, 9 first-level items and 39 second-level items was constructed. The three dimensions consist of structure (0.315), process (0.287), and outcome (0.398), with each dimension set several indicators and each indicator given a weight. Of the two rounds of Delphi consultation, the response rates were 86.67% and 100%. The coordination coefficient of expert opinions in the two rounds of consultation were 0.49 and 0.65 ($p<0.05$). For the empirical study, the self-evaluation score of a public hospital was 86, which could obtain a rating of two stars.

Conclusions: The established evaluation system identified three different dimensions of surgical tourism services' quality which fit for practical healthcare improvement in safety and quality. It can reflect the access criterion of surgical tourism institutions, provide references on better choices of surgical services for tourists, and can be applied by healthcare managers and policy makers to allocate resources more efficiently and promote more surgical tourism services to international standards.

1 Introduction

Medical tourism has become a new industry with the most growth potential before the COVID-19 pandemic. The current global health and medical tourism market was about 60 billion US dollars, and the annual market consumption was about 21 billion US dollars, with an annual growth rate of 20%-30% [1]. Compared with traditional tourism projects, surgical tourism tourists have a longer stay time and higher medical consumption, which can effectively promote the development of hospitals, hotels, translation, transportation, tourist attractions, shopping and other related industrial elements. Therefore, developing medical tourism has gradually become a new highlight of tourism economy, which also meets people's demand for healthcare and the pursuit of leisure and entertainment.

Surgical tourism institutions refer to those providing medical services mainly for physical examination and surgical treatment like cardiac diseases, cancers, and diabetes mellitus and light procedures [3], which need to meet higher safety standards. Surgical tourism institutions providing surgical services have higher requirements for safety and quality. Due to the late start of China's medical tourism, the surgical tourism market is in an initial state, inconsistency and unsafety in quality of care is a major problem. At the same time, surgical tourism involves many departments such as medical treatment, tourism, transportation, exit and entry management, forming a situation of

decentralized management, which affects the healthy and sustainable development of China's medical tourism industry. Therefore, this study takes surgical tourism institutions with high demands for disease treatment as the research object, and developed the access criterion and evaluation standards of surgical tourism service institutions.

China has long been an important source country of international medical tourism. In 2017, 600,000 medical tourists went abroad, with an average spending of 50,000 RMB per person, which was about 10 times that of outbound tourists. China is a big country of various tourism resources, and has a very rich medical and surgical resources featuring traditional Chinese medicine. Facing the continuous growth of the world medical tourism market, how to standardize and develop China's surgical tourism industry has become the focus of attention in China and even the world. Asia has become one of the world's most potential surgical tourism markets, such as Thailand, India, Malaysia, Singapore and other countries have developed into world powers in the area of medical tourism [2].

The Outline of Healthy China 2030 Plan issued in 2016 clearly stated that the medical and surgical tourism industry standards and norms should be formulated, the international competitive medical and surgical tourism destinations should be built, and the integrated development of tourism and health industry should be accelerated. In 2017, according to the Guidelines on Promoting the Development of Medical Tourism, China government set up 13 demonstration bases, represented by the Boao in Hainan Province as a Medical Tourism Pilot Zone. Encouraged by policies, a large number of surgical service institutions have emerged, which were varied in forms and levels. However, due to the lack of relevant access and evaluation standards, the services of surgical tourism service institutions are disordered, so the quality are uneven, which affects the reputation of China's international medical tourism.

Research on the evaluation system of surgical tourism service institutions at home and abroad is decreased by the COVID-19 pandemic and restricted traffic. In terms of research content, the existing studies mainly focus on the evaluation status of medical tourism institutions, the theoretical framework of quality standards, the service quality index system, etc. Evaluation index system can improve the quality of services provided by surgical tourism institutions, but surgical tourism has not been especially studied. In terms of research methods, the existing studies mainly use qualitative description and analysis, few use quantitative analysis and other methods [1–7]. Therefore, it is imperative to study the evaluation index system of surgical tourism service institutions.

2 Methods

2.1 Research design

This study adopted mixed methods. The research status and latest research progress at home and abroad were learned through literature analysis, the evaluation system was based on the Donabedian’s quality theory of structure quality, process quality and outcome quality [1–3]. The empirical data has been extracted from an International medical department of a public hospital in China through self-evaluation.

2.2 Data collection and processing

This study collected evaluation indexes through literature analysis, and extracted relevant evaluation items by referring to tourism industry standards. CNKI, Wanfang Data, and CQVIP were used to collect Chinese papers. Springer Journal Database, SCI (Science Citation Index) Database and Wiley Online Library were used to collect

English papers. The search terms included medical tourism, surgical services, market access criterion, and evaluation indexes. Some papers irrelevant to the topic were removed by browsing the abstract. The literatures with high correlation were classified and managed, and finally 13 valuable literatures related were obtained. In addition, evaluation indexes were also extracted by referring to standard documents such as Hainan Province Health Tourism Base Construction Standard and National standard GB/T17775-2003.

The two-round Delphi method was used to screen the evaluation indicators and determine the evaluation index system. According to the primary indicators, we designed an Expert Consultation Table. A total of 15 front-line experts from universities, medical institutions and industry associations who have been engaged in the relevant fields for a long time were invited for consultation, and the questionnaire was sent to the experts by email. The reliability of experts was verified by an empirical case research. The data was input and sorted by SPSS23.0 and Excel software. The indicators were organized into a three-level questionnaire, and pretest and distributed within an International medical department of a public hospital in China, to assess its reliability and validity.

2.3 Analysis and rating

The Analytic Hierarchy Process (AHP) was used to analyze all kinds of indicators and determine the weight of each index. According to the selected indicators, the Questionnaire on Evaluation Index Weight Assignment of Surgical Tourism Service Organizations was formulated, and a total of 13 experts were invited to fill in the questionnaire. The AHP was calculated and analyzed by using Expert Choice 2007, an AHP analysis software.

After evaluation, the grades of different surgical tourism service institutions were classified by star rating. Only when meeting all the corresponding standards can institutions be awarded the corresponding star rating. Only those who pass all the core indicators can compete for the three-star rating. See Table 1 for the scoring criteria of each star surgical tourism institution.

Table 1
Star rating standard

Grade	Borderline
3 stars	90
2 stars	80
1 star	70
Pass	60

3 Results

3.1 The results of literature analysis and the construction of preliminary indicator system

The evaluation indicators were collected and sorted to form an index database, the nine first-level items were the organization structuring, institutional improvement, and service assurance in the structure dimension; the operations management, service supervision, and service project in the process dimension; and the service effectiveness, service efficiency and effectiveness, and discipline development and influence in the outcome

dimension. The evaluation indicators were preliminarily screened according to the principles of reliability, timeliness, systematic and hierarchy.

3.2 Index screening and index system construction

3.2.1 Consultation with experts

In this study, 15 experts from different fields were selected for Delphi expert consultation, and 13 questionnaires were completely collected. Among them, 1 person was under 45 years old, 7 people were between 46 and 55 years old, and 5 people were over 56 years old. Experts who mainly engaged in hospital management, clinical diagnosis and treatment, scientific research, were respectively 10 (76.9%), 2 (15.4%), 1 (7.7%). All experts are above the title of deputy high. 11 experts (84.6%) were from the hospital, with senior experience and research in hospital management. There are 11 employees (84.6%) who have been working in related fields for more than 10 years and have good working experience. The detailed basic information of experts is shown in Table 2.

Table 2
Basic information for experts

Items	Category	Frequency	Proportion
Age	Under the age of 45	1	7.7%
	Between 46-55	7	53.8%
	Between 56-65	5	38.5%
Education Background	Bachelor degree or below	3	23.1%
	Master Degree Candidate	3	23.1%
	Doctoral candidate	7	53.8%
Mainly engaged working field	Clinical diagnosis	2	15.4%
	Hospital management	10	76.9%
	Scientific research	1	7.7%
	Others	0	0%
Professional title	Middle rank	0	0%
	Sub-high	3	23.1%
	High	10	76.9%
Working organization	Hospital	11	84.6%
	Universities/research institutions	1	7.7%
	Industry association	1	7.7%
Years of working	Under 10 years	2	15.4%
	Between 11-20	6	46.2%
	Between 21-30	3	23.1%
	More than 30 years	2	15.4%
Time spent directly serving patients	Without or < 10%	7	53.8%
	10%~24%	4	30.8%
	25%~49%	0	0%
	50%~74%	1	7.7%
	>75%	1	7.7%

3.2.2 Expert advice

According to the experts' scores on the indicators, the boundary value method is adopted to screen the indicators according to the full marks rate, rank sum, weighted average and coefficient of variation.

The first round of expert advice: After calculation, the inclusion criteria of indicators were determined as follows. Full mark rate >0.65, weighted average >8.37, coefficient of variation <0.21. In the end, a total of 1 second level indicators and 12 third-level indicators were deleted. One second level indicators, four third level indicators were added, two second level indicators were modified. Experts also put forward to divide all evaluation indexes into core index, necessary index and extra score index. This study also applied the corresponding third-party review and evaluation results (such as performance evaluation results) at home and abroad.

The second round of expert advice: the inclusion criteria were full mark rate >0.85, equal-weighted average >8.51, coefficient of variation <0.19. Finally, 11 second-level indicators were modified. In general, because the index system is targeted at surgical tourism institutions, experts believe that relevant indicators can be set more stricter, such as bed protection ratio, proportion of senior title of professional doctors, patients' satisfaction, employee satisfaction, social satisfaction index. But indicators such as technical error rate, incidence of hospital feeling should be set lower. In addition, for the indicators of medical service center, medical equipment, and centralized construction, experts suggested that it should be determined according to the strategic positioning and business scope of different institutions.

3.2.3 Final evaluation index system of surgical tourism service organizations

The evaluation system was further modified and the indexes were finally determined based on the experts' scores, modifications and supplementary opinions. The evaluation system is consisting of 3 dimensions, including 9 first-level indicators, 39 second-level indicators, including 1 "one-vote veto" indicator, 10 core second-level indicators, 27 necessary indicators and 12 bonus indicators. The necessary indicators mean one vote against resulting in veto, see Table 3 for details.

Table 3

Evaluation index system of advanced medical health tourism service organizations

Dimension	I Level Indicators	II Level Indicators	Comment
1. Structure quality	**1.1 Organization structuring**	1.1.1 Qualifications and Practices	Necessary item
		1.1.2 cultural construction	Necessary item
		1.1.3 architecture and environment	Necessary item
		1.1.4 Organizational management structure *	Necessary item
		1.1.5 Discipline and specialty construction	Necessary item
		1.1.6 Health Travel Service Centre *	Necessary item
		1.1.7 Location and surrounding environment *	Necessary item
		1.1.8 Hospitalization Service Settings	the extra point column
		1.1.9 Outpatient Service Setup	the extra point column
	1.2 Institutional improvement	1.2.1 Service planning and positioning	Necessary item
		1.2.2 Rules and procedures *	Necessary item
	1.3 Service assurance	1.3.1 Staffing base *	Necessary item
		1.2.2 Infrastructure and equipment	Necessary item
		1.2.3 Medical environment	Necessary item
		1.3.4 Medical service center	the extra point column
		1.3.5 Medical equipment	the extra point column
		1.3.6 Logistic support service	the extra point column
2. Process quality	**2.1 Operations management**	2.1.1 Management and Certification	Necessary item
		2.1.2 Capacity building	Necessary item
		2.1.3 Emergency and Complaint	Necessary item
		2.1.4 Information construction *	Necessary item
		2.1.5 Marketing and Publicity	the extra point column
	2.2 Service Supervision	2.2.1 Core healthcare systems and patient safety goals *	Necessary item
		2.2.2 Personal privacy and health records management	Necessary item

Dimension	I Level Indicators	II Level Indicators	Comment
		2.2.3 Dispute prevention and settlement	Necessary item
		2.2.4 Nosocomial infection control *	Necessary item
		2.2.5 Provide necessary continuous service	Necessary item
		2.2.6 Medical ethics management	Necessary item
	2.3 **Service Project**	2.3.1 Multiplicity of service*	Necessary item
		2.3.2 Prices and Charges	Necessary item
		2.3.3 Personalized service	the extra point column
		2.3.4 Other services	the extra point column
3. **Outcome Quality**	**3.1** **Service Effectiveness**	3.1.1 Performance and safety *	Necessary item
		3.1.2 Satisfaction	Necessary item
	3.2 **Service efficiency and effectiveness**	3.2.1 Efficiency of health tourism services	Necessary item
		3.2.2 Economic effectiveness	the extra point column
		3.2.3 Awards & Honor	the extra point column
	3.3 **Discipline development and influence**	3.3.1 Academic Impact and Achievements	the extra point column
		3.3.2Teaching and Training	the extra point column

Note: * is the core index, 10 core items in total.

3.2.4 Expert positive coefficient, authority coefficient and coordination coefficient

Expert positive coefficient: It is generally believed that the recovery rate of the consultation questionnaire of Delphi method reaches more than 70%, which means that the expert has high enthusiasm on the topic. The first round of the expert advice issued 15 consult tables, with 13 taken back, and are all the 13 tables were effective questionnaires, effective recovery rate was 86.67%. The second round issued 13 consult tables, with 13 copies of valid questionnaire back, effective recovery rate was 100%, the results showed the Delphi expert positive coefficient is high, which also means 13 Delphi consulting experts are concerned this research and have high participation.

Expert authority coefficient: This study adopted the method of self-evaluation, and considered the authority of experts from their familiarity with the issues represented by the indicators (CS) and the judgment basis for expert evaluation of the indicators (CA), which was reflected by the authority coefficient (CR), in which: Cr= $\frac{Cs+Ca}{2}$,0<Cr<,. The results showed that the average familiarity coefficient (CS) of each key index of the two rounds consultation is 0.83 and 0.86, respectively. It indicates that experts are familiar with this topic. The average value of Ca was 0.78 and 0.80 respectively, indicating that Ca had a high influence on experts. The average expert authority coefficient

(CR) of the two rounds consultation is 0.81 and 0.83 respectively, which indicates that the authority of experts is high.

Expert coordination coefficient reflects the consistency of evaluation of each index among different experts and it can also be used as an indicator to reflect the credibility of expert consultation. The coordination coefficient of expert opinions in the first round of consultation was 0.49. It can be seen that some experts had different judgments on the importance of evaluation indicators, and the overall coordination degree of their opinions was low. The result of the coordination coefficient of expert opinions in the second round of consultation was 0.65, which was greatly improved compared with the result of the first round, indicating that experts' understanding of the importance of indicators was gradually converging, and the coordination degree of expert opinions was relatively high. The $\chi 2$ test P values of the two rounds of coordination coefficient were all less than 0.05, indicating that the result had high confidence at 95% confidence.

3.3 Evaluation method and process

3.3.1 Weight setting

A total of 13 expert questionnaires were sent out for the index weight assignment survey, with a recovery rate of 100%. The effective rate of the tested questionnaires was 100%. See Table 2 for the personal data of the experts. The judgment values of 13 expert questionnaires were input into the statistical software, and all the 13 questionnaires passed the consistency test after inspection. The geometric average method was used to integrate the average to obtain the final group judgment matrix. The consistency ratio of the model in this study was less than 0.1, indicating that the judgment matrix had a satisfactory consistency, and the weight of each factor calculated was credible. The software was used to analyze and calculate the weight of each items, and the final weight was shown in Table 4.

Table 4
Evaluation index weight and score table of surgical tourism service organizations

Evaluation dimensions	First level indicators	Second level indicators	Weight	Score	Evaluation method
1. Structure quality (0.315)	1.1 Organization structuring (0.095)	1.1.1 Qualifications and Practices	0.018	2	literature
		1.1.2 Cultural advancement	0.005	0.5	literature
		1.1.3 Architecture and environment	0.007	0.5	Site rating
		1.1.4 Organizational structure of compliance management	0.012	1	literature
		1.1.5 Discipline and specialty construction	0.004	0.5	literature
		1.1.6 Health Tourism Service Center	0.007	1	Site rating
		1.1.7 Location and surrounding environment *	0.012	1	Site rating
		1.1.8 Hospitalization Service Settings	0.015	1.5	Site rating
		1.1.9 Outpatient Service Setup	0.015	1.5	Site rating
	1.2 Institutional improvement (0.123)	1.2.1 Service planning and positioning	0.041	4	literature
		1.2.2 Rules and procedures	0.082	8	literature
	1.3 Service assurance (0.097)	1.3.1 Staffing basics	0.028	2.5	literature
		1.3.2 Infrastructure and equipment	0.013	1.5	literature
		1.3.3 Hospital Environments	0.013	1.5	Site rating
		1.3.4 Medical service center	0.023	2.5	Site rating
		1.3.5 Medical Equipment	0.007	0.5	Site rating
		1.3.6 Logistic support service	0.013	1.5	Site rating
2.Process Quality (0.287)	2.1 Operations Management (0.128)	2.1.1 Management and Certification	0.013	2	literature
		2.1.2 Capability building	0.033	3	literature
		2.1.3 Emergency and Complaint	0.021	2	literature
		2.1.4 Information construction	0.053	5	Site rating
		2.1.5 Marketing and Publicity	0.008	1	literature
	2.2 Financial Supervision (0.118)	2.2.1 Core healthcare system and patient safety goals	0.031	3	Data acquisition literature

Evaluation dimensions	First level indicators	Second level indicators	Weight	Score	Evaluation method
		2.2.2 Personal privacy and health records management	0.022	2	Site rating
		2.2.3 Dispute prevention and settlement	0.022	2	Site rating
		2.2.4 Infection control	0.031	3	Site rating
		2.2.5 Provide necessary continuous service	0.006	0.5	literature
		2.2.6 Medical ethics management	0.006	0.5	literature
	2.3 Service Project (0.041)	2.3.1 Multiplicity of service	0.007	1	Site rating
		2.3.2 Prices and Charges	0.007	1	Site rating
		2.3.3 Personalization of Service	0.025	2.5	Site rating
		2.3.4 Other services	0.002	0.5	Site rating
3.Outcome Quality (0.398)	3.1 Service Effectiveness (0.22)	3.1.1 Performance and Safety	0.108	11	Literature Data acquisition
		3.1.2 Satisfaction	0.112	11	Data acquisition
	3.2 Service efficiency and effectiveness (0.123)	3.2.1 Efficiency of health tourism services	0.062	6.5	Data acquisition
		3.2.2 Economic effectiveness	0.051	5.5	Data acquisition
		3.2.3 Awards & Honor	0.010	0.5	literature
	3.3 Discipline development and influence (0.055)	3.3.1 Academic Impact and Achievements	0.023	2	Data acquisition
		3.3.2 Teaching and Training	0.032	3	literature

3.3.2 Evaluation procedure

In terms of the setting of the review process, this study referred to the theory of "Peri-evaluation Period" and divided the evaluation process into the early evaluation period, the evaluation period and the late evaluation period. In the early stage, the evaluated health tourism institution carries out self-evaluation according to the criteria and reports it to the public. During the evaluation period, the agency in charge of the evaluation shall classify, number and register the relevant materials of the surgical tourism institution, and carry out document review and on-site evaluation; moreover, the agency should submit star rating evaluation opinions, write evaluation reports, and feedback the evaluation results to relevant organizations and the evaluated surgical tourism organizations. In the later stage of evaluation, the star evaluation results will be published, and the evaluated surgical tourism institution

will make continuous improvement according to the suggestions put forward in the evaluation report. Four years later, a new round of evaluation will be hosted [11–16].

3.3.3 Case of empirical research

The index system and evaluation procedure of surgical health tourism service institutions constructed in this study have been empirically studied in an International medical department of a public hospital in China through self-evaluation. The institution's overall score was 86, of the structure-process-outcome dimensions scored 31.5, 29.0, 39.5 points respectively, which could earn a two-star rating. The hospital performed well in some ways, the second-level items with full marks were qualifications and practices, cultural advancement, discipline and specialty construction, and so on. However, in addition to the above advantages, the hospital had few additional services that need to improve satisfaction. The empirical study proved that the index system constructed in this study has reliability and operability, but it still needs to be evaluated and perfected in more Chinese surgical medical institutions.

4 Discussion

4.1 Features of the indicator system

The quality connotation and safety of surgical services is the core of medical tourism evaluation. The evaluation system attempted to ensure that surgical tourism institutions meet basic safety standards and have appropriate medical equipment to perform the high-quality procedures offered. Therefore, this study used the Donabedian quality evaluation model for reference and constructed the evaluation index system of surgical service institutions from the three dimensions of structure, process and outcome. The structural dimension focuses on institutional setup, institutional construction and service guarantee, the process dimension focuses on institutional operation, service supervision and service projects, and the outcome dimension includes the evaluation of institutional service efficiency, service effect and benefit, discipline development and influence. After two rounds of expert consultation, the evaluation index system finally constructed consists of 3 dimensions, 9 first-level indicators, and 39 second-level indicators, including 1 "one-vote veto" indicator, 10 core second-level indicators, 27 necessary indicators and 12 bonus indicators. This index system includes both access indexes and development indexes. Necessary and core index can be used as the access conditions for medical institutions to carry out surgical tourism services, and the extra point index is the direction for future surgical tourism service institutions to make efforts for better improvement. The comprehensive and diversified indexes were setting to meet the needs of multiple users, so the tourists, healthcare managers, policy makers can all benefit from the indexes [17]. Evaluation system for managing service and infrastructure in surgical tourism industry, availing health, travel, and surgical related facilities.

It can be seen from the weight setting of the evaluation index system that in the three dimensions of structure, process and outcome, the weight of outcome quality is the highest, the weight of structure quality is the second, and the weight of process quality is the third. This indicates that, as surgical tourism service organization providing international high-quality medical services, it has high requirements for service efficiency, effect and benefit, among which satisfaction, performance and safety are the key factors for the evaluation of the organization. In addition, perfect system construction, service guarantee and other structural factors are important factors to ensure the institutions to provide high-quality medical tourism services. This index system constructed in this study has proved to be reliable and valid. Different institutions were divided into three grades by star rating system. Based on

the review process of "evaluation period", institutions with interests were set to form a long-term mechanism for continuous improvement. An empirical study was conducted on the international medical department of a tertiary.

This research built the evaluation index system is travel institution for surgical tourism institutions, security services, operations management, service, efficiency and so on various aspects of the basic requirements, and is based on the established surgical tourism services market access system, standardized the service behavior of surgical tourism services, maintain the legitimate rights and interests of consumers, to establish the surgical tourism services of fair competition market order to set up a set of evaluation index system, added to China's surgical tourism services evaluation class health research gaps.

4.2 Strengths and limitations

The first significant advantage of this index system lies in the emphasis of surgical quality and safety. Compared with the evaluation index system of other tourism institutions, the evaluation index system of medical surgical institutions lays more emphasis on quality and safety, and also on the supporting services in language, insurance, reimbursement and life service. In addition, it is necessary to conform to International patient practices on the basis of ensuring quality and safety, respecting culture in diversity and difference.

Secondly, the index system highlights the unique advantages of China's surgical tourism. This study provides a reference for the comparability of service quality for traditional Chinese medicine (TCM) medical institutions [18]. It also needs to highlight humanized services and create a TCM tourism brand to attract foreign tourists [19]. In order to improve the practicability of the index system, this study formulated an evaluation table, and evaluated institutions by percentage system.

Finally, it is valuable for multiple participants. The evaluation index system can help tourists make better choices of suitable service, and can help healthcare managers make clear the market access criterion and gain better outcomes, and can help policy makers to allocate resources more efficiently and guarantee higher levels of surgical tourism service in China.

However, further expansion of empirical samples is needed to improve the practicability of the evaluation index system. The practice of different regions would provide valuable reference for the improvement of the evaluation system. In addition, surgical tourism service agencies can also be further segmented to develop a more targeted evaluation index system. Thirdly, after the novel 2019 coronavirus outbreak, the international tourism situation was deeply affected, travel restrictions and border control measures have been enforced [20], affective risk perception could be a significant factor for tourists’ decisions [21], and safety regulations and procedures become more important for organizations [22]. Therefore, travelers' behavior needs for further study.

4.3 Applications

The evaluation index system of surgical tourism in this study has good validity and reliability and can be applied in various ways. For tourists in China, it can to make better choices of tourism service and destination, the uniform service evaluation standards ensure stable quality. Tourists don't have to worry about where to buy, what's the bottom line, are they getting the value they deserve. It can help the public to better choose the health tourism service agencies suitable for their own needs. Secondly, the evaluation index system can help organizations to clarify their own strengths, weaknesses and future improvement direction, and guide medical staff to improve service quality and increase cultural management skills [23]. The surgical tourism market access criterion also helps institutions to check themselves. Finally, it can also help the government promote the quality management

and supervision of medical tourism and surgical services [24]. In the future, more empirical studies are needed to promote the standardization of international tourism service models and the universality of entry settings of the index system [25].

5 Conclusion

In this study, the Donabedian quality evaluation model was adopted to construct the evaluation index system of surgical health tourism service institutions, including 3 dimensions, 9 first-level indicators, and 39 second-level indicators, which can give a relatively comprehensive evaluation of surgical tourism service institutions. At the same time, this study also defined the index weight, evaluation tools, methods and processes, with a certain degree of operability and generalization. Travel needs alignment with political economy factors, but this study plays a positive role in the development and supervision of surgical tourism service institutions, and is conducive to promoting the China's surgical tourism service to international standards.

Declarations

Ethics approval and consent to participate

Informed consent forms had been completed before the survey. Respondents' response was protected throughout the questionnaire. And participants had the right to refuse to answer questions or withdraw from the study whenever they want. The study had no privacy or ethical implications.

Consent for publication

Data only presented in aggregate format with no identifying information.

Availability of data and materials

The datasets supporting the conclusions of this article are part of included within the article and its additional files. The data are available upon reasonable request, and so are not publicly available.

Competing interests

The authors declare that they have no competing interests.

Funding

Financial support was received from the Humanities and Social Sciences Foundation of China Ministry of Education [Grant No. 19YJCZH239] and Youth fund of the National Natural Science Foundation of China [Grant No. 72004112]. This work was also a project of Shenzhen Key Research Base of Humanities and Social Sciences Social governance and Innovation Research Center of Tsinghua Shenzhen International Graduate School .

Authors' contributions

ZD and LTF supervised the study and designed the study. LMX collected and organized the data. YY analyzed the data. ZD, YY and LMX interpreted the results. ZD and YY wrote and revised the draft. All authors read and approved the final manuscript.

Acknowledgements

This research project (including supplies, travel funding, and other expenses) was supported by the Tsinghua University. The funders did not play any role in the research design, data collection, analysis or preparation of the manuscript.

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