Modern Management Science & Engineering
ISSN ISSN 2052-2576
Vol. 7, No. 1, 2025
www.scholink.org/ojs/index.php/mmse

Original Paper

Research on the Construction of a Doctor Service Quality Evaluation System for Online Medical Platforms

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Received: October 23, 2025 Accepted: December 08, 2025 Online Published: December 31, 2025

doi:10.22158/mmse.v7n1p88 URL: http://dx.doi.org/10.22158/mmse.v7n1p88

Abstract

This study develops an evaluation system for doctor service quality in online medical communities. Based on the SERVQUAL theoretical model, in-depth interviews were conducted with 10 experts from this domain. Using grounded theory for qualitative analysis, a preliminary framework for the evaluation system was constructed. Subsequently, questionnaire surveys designed according to the Kano model were administered to collect and analyze data from online medical community users, leading to further refinement of the evaluation indicators. The Analytic Hierarchy Process (AHP) was then employed to determine the weight values for each indicator, finalizing the construction of the evaluation system. Furthermore, based on the research findings, constructive strategies are proposed for assessing doctor service quality in online medical communities.

Keywords

evaluation system construction, online medical community, doctor evaluation, grounded theory, Kano model

1. Introduction

In recent years, online medical platforms have gradually become an important channel for patients to consult doctors for health services. However, information asymmetry remains a widespread issue in the doctor-patient relationship. Patients typically have limited understanding of medical professional knowledge and the service quality of doctors, placing them at an informational disadvantage when selecting a physician and making it difficult to accurately assess a doctor's competence (LU & ZHANG, 2019). Currently, some doctor evaluation modules and ranking systems provided by online medical platforms serve as a reference for patients' choices. Yet, these ratings primarily rely on professional achievements and patient feedback, often suffering from issues such as simplistic evaluation criteria,

underutilization of information, and insufficient categorization (MA, 2016). A comprehensive assessment of a doctor's capabilities should address these existing problems by encompassing multiple dimensions, including reputation, professional expertise, service quality, and patient feedback. Such an assessment can enhance the transparency of information about doctors on platforms, alleviate information asymmetry between doctors and patients, and be key to the effective management of high-quality physician resources (JIANG, BAI, WANG, ZHAO, & LIU, 2020; ZHOU & WANG, 2022).

2. Literature Review

Liu Shuaibing et al. constructed a doctor evaluation model based on the ISS-DE model to review and determine the competency criteria for doctors on online medical platforms. Gao et al. (2018) discussed the application of the MULTIMOORA theory in evaluating doctor services within the medical field. Through their research, they proposed a novel model capable of identifying the optimal doctor while simultaneously considering two dimensions within the indicator system and balancing the evaluation results of both dimensions. Geng et al. (2023) initially constructed a framework for the evaluation indicator system using the literature analysis method, then invited experts to screen and assess these indicators. Finally, they assigned weights to each level of evaluation indicators using the AHP, establishing a comprehensive evaluation indicator system for doctor competency on online medical platforms. Jin et al. (2021) assessed doctor service quality from the perspectives of patient perception and expectation using a CFDS quality evaluation scale based on the perceived service quality model. Morselli et al. (2018) aimed to improve the service quality of plastic surgeons by understanding patient emotions and expectations, thereby enhancing the doctor-patient relationship. This study selected 90 plastic surgery patients of different types for interviews, employing three methods:traditional interviews, shared decision-making interviews, and expectation questionnaires. The authors then analyzed and discussed the results. Bin et al. (2023), following the guidelines from the UK's *Public Health* journal entitled “Evaluating Digital Health Products” and considering Brazil's specific context, conducted a patient satisfaction survey within a defined region. Based on the survey results, they discussed doctor evaluation indicators. Li et al. (2023), based on the iceberg model, used literature analysis and a modified Delphi method to construct an evaluation indicator system for the competency of doctors engaged in internet-based diagnosis and treatment, and analyzed related influencing factors. Their study provides a reference for enhancing the competency of doctors involved in internet-based healthcare. Gu et al. (2024) employed methods such as purposive sampling, the Delphi method, and AHP to construct a general practitioner consultation competency evaluation indicator system applicable to China's primary healthcare practice environment, offering a reference model for objectively assessing the clinical abilities of primary care general practitioners.

Existing research has made some progress in evaluating the service quality of doctors in online medical communities, such as constructing evaluation indicators based on specific models (e.g., ISS-DE,

MULTIMOORA) or conducting satisfaction surveys. However, issues remain, including insufficiently comprehensive evaluation dimensions, limited applicability of indicators, and a lack of adequate integration of perspectives from both doctors and patients. Most studies focus on a single method or the opinions of a specific group, lacking a systematic mechanism for indicator screening and weight allocation, which undermines the scientific rigor and practical utility of the evaluation systems. To address these gaps, this paper builds upon the SERVQUAL theory, employs grounded theory to extract preliminary indicators, refines their classification through user surveys based on the Kano model, and applies the AHP to determine indicator weights. Through this approach, a multi-level and multi-dimensional evaluation system is constructed, aiming to enhance the systematicity, scientific rigor, and operational feasibility of evaluating doctor service quality in online medical communities.

3. Research Framework

Based on the SERVQUAL theoretical model and the current research status regarding the evaluation of doctor service quality in online medical communities, this paper proposes an evaluation framework for such service quality. This framework approaches the issue from two dimensions—service content and service process—to establish a four-part evaluative structure comprising service professionalism, service responsiveness, service experience, and service ethics. This provides theoretical guidance for the subsequent construction of the evaluation indicator system.

Within this framework, service professionalism is defined as the expertise, skills, capabilities, and accuracy demonstrated by doctors as service providers in their respective fields, assessing whether they possess sufficient professional knowledge and skill to meet patients' consultation needs. The proposal of this dimension draws on the reliability and tangibility dimensions of the SERVQUAL theoretical model. Service responsiveness is defined as the speed and efficiency with which doctors respond to patients' consultation needs and questions, as well as their ability to handle emergencies. This study draws on the responsiveness dimension of the SERVQUAL model to formulate the service quality evaluation criteria for this dimension, primarily focusing on the speed of doctors' reactions and their problem-solving ability when patients raise needs or encounter issues. Service experience is defined as the overall experience and perception felt by patients during the consultation process, including emotional and psychological satisfaction. The proposal of this dimension draws on the empathy dimension of the SERVQUAL model, focusing on patients' feelings during the service process. Service ethics is defined as the moral conduct and ethical standards demonstrated by doctors during the service process. The proposal of this dimension draws on the assurance dimension of the SERVQUAL model, used to evaluate whether doctors adhere to professional ethics and standards during service delivery.

4. Research Methodology

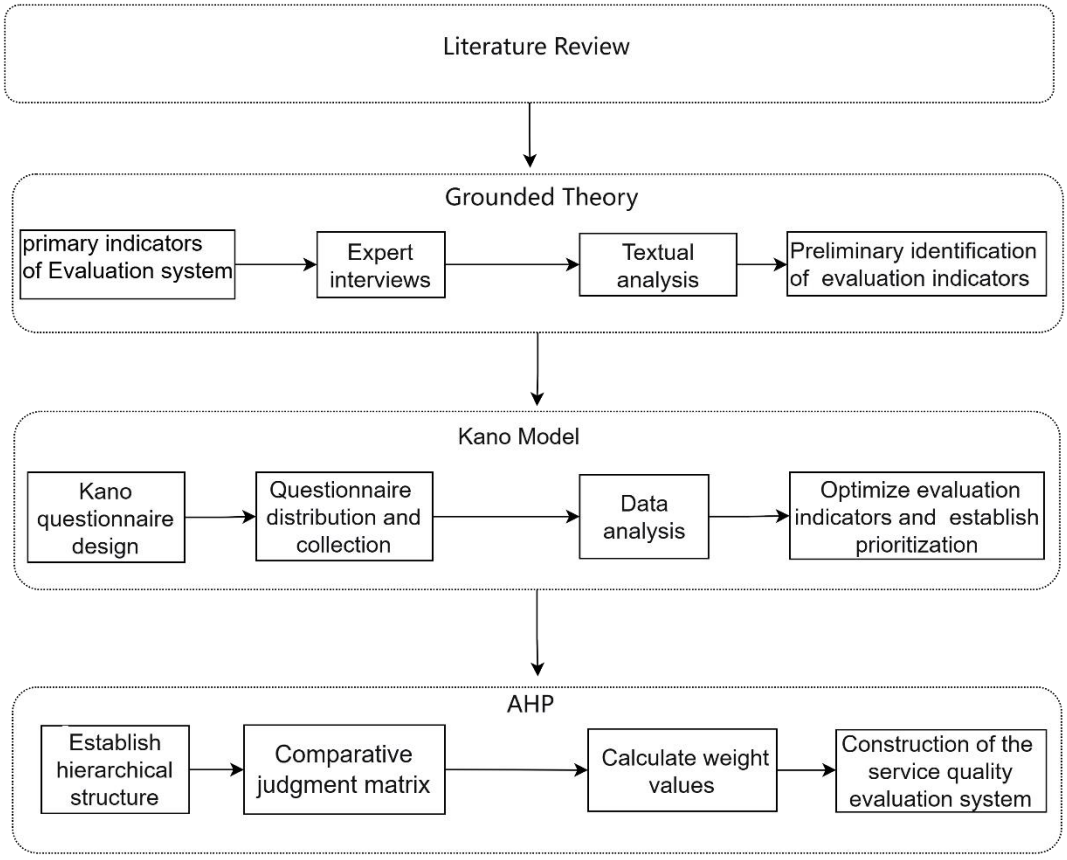

Figure 1. Construction Process of the Doctor Service Quality Evaluation System for Online Medical Communities

Based on the evaluation framework established earlier and incorporating relevant literature and expert interviews, this study first utilizes the grounded theory method to preliminarily identify the indicator items for the evaluation system. Subsequently, a user questionnaire survey based on the Kano model is employed to refine these indicator items. Finally, the AHP is applied to determine the weight values of the indicators, ultimately completing the construction of the doctor service quality evaluation system for online medical communities (see Figure 1).

4.1 Preliminary Establishment of the Evaluation System

4.1.1 Expert Interviews

This study conducted semi-structured interviews with "Utilizing the SERVQUAL Theoretical Model to Explore Key Indicators for Evaluating Doctor Service in Online Medical Communities" as the primary interview content. A convenience sampling method was employed, and potential experts were contacted through the following channels: (1) Professional Social Networks: Experts and scholars in the medical field were identified and contacted via professional social platforms related to healthcare to invite their participation in the interviews. (2) Academic Organizations: Medical schools, healthcare

research institutions, or academic associations were contacted to request their assistance in recommending suitable experts for the interviews. (3) Medical Institutions: Collaborations were established with hospitals, clinics, or online medical platforms to seek their support in recommending doctors or healthcare administrators for participation. During the convenience sampling process, deliberate efforts were made to consider samples from diverse groups, regions, and experiential backgrounds to ensure sample diversity and representativeness. Ultimately, a total of 10 experts participated in these interviews (numbered 1-10). After the audio recordings were transcribed, over 40,000 words of interview text were obtained. The specific information of the respondents is provided below (see Table 1). Nine interview transcripts were used as the initial data for open coding, while the remaining one transcript was reserved for theoretical saturation testing.

Table 1. Basic Information of Experts Participating in the Interview

Number	Title/Name	Professional Title	Department/Specialty
1	Dr. Chen	Associate Senior	Orthopedics
2	Dr. Chen	Senior	Cardiology
3	Dr. Jiao	Associate Senior	Orthopedic Surgery
4	Dr. Lin	Senior	Ophthalmology
5	Dr. Shen	Associate Senior	Pediatrics
6	Dr. Wang	Associate Senior	General Surgery
7	Dr. Wang	Associate Senior	Internal Medicine (TCM)
8	Dr. Wu	Senior	Gynecology
9	Dr. Wu	Associate Senior	Internal Medicine
10	Dr. Zhang	Senior	Neurology

4.1.2 Open Coding

In accordance with open coding principles, irrelevant statements were first removed from the nine interview transcripts. The remaining statements were then conceptualized. After concepts with low frequency and those exhibiting redundancy were eliminated, 30 initial concepts were extracted based on the four dimensions mentioned earlier (see Table 2, which presents a partial list). Since the four categorical concepts—the first-level indicators of the framework—have been predefined in the preceding sections of this study, and the indicator framework consists of two levels, the subsequent qualitative analysis steps of axial coding and selective coding within the three-level coding process were not conducted.

Table 2. Results of Open Coding

Categorization	Effective Concept	Sample Raw Statement
Service Professionalism	Professional Competence	First of all, I believe it's essential to have a very solid foundation. Whether in a real-world hospital setting or learning from senior doctors, one must possess a rich reservoir of medical knowledge.
	Simplification of Terminology	What patients need is for us to explain professional terms in a very understandable way—to express our specialized knowledge to them in simple language.
	Detailed Consultation	The consultation should be quite detailed, aiming to collect information as comprehensively as possible.
Service Experience	Follow-up	I think follow-up consultations are also very important. Doctors can ensure the patient's subsequent condition, and patients feel cared for, which increases their satisfaction.
	Communication Skills	Good communication makes the entire consultation process smooth for both the doctor and the patient.
	Empathy	Because when patients come for medical advice, it's not just a process of receiving treatment; sometimes, it's also a process of seeking comfort.
Service Ethics	Privacy Protection	On online platforms, some patients worry about information security, as certain platforms require registration of names and other personal details.
	Respect	Try to avoid introducing subjective emotions during the consultation, maintain an objective and neutral attitude, and make the other party feel respected.
Service Responsiveness	Personalized Needs	Reasonable personalized needs raised by patients should still be met to the best of our ability.
	Real-time Response	Because sometimes patients may feel anxious. If they don't receive a reply for a long time, they might choose another doctor or directly leave a negative review.

The effective concepts within the aforementioned framework were refined and integrated, with each service component clearly defined, resulting in the evaluation framework for doctor service quality in online medical communities (see Table 3).

Table 3. Evaluation Framework for Doctor Service Quality in Online Medical Communities

Number	Primary Indicator	Secondary Indicator	Indicator Description
1	Service Professionalism	Tiered Diagnosis and Treatment	Doctors conduct consultations in accordance with the principle of tiered diagnosis and treatment, where patients are matched with medical professionals of appropriate expertise levels based on the complexity of their conditions.
2		Face-to-Face Consultation	Doctors conduct visual consultations during the process, such as via video call or photo examination.
3		Medical Theory	Doctors possess foundational knowledge of clinical medical theory.
4		Simplification of Terminology	Explaining medical professional terminology to patients using clear and understandable language.
5		Report Interpretation	Providing accurate and detailed explanations of the items and data in a patient's medical report.
6		Diagnosis and Treatment	Accurately assessing the patient's condition and proposing effective solutions.
7		Specialty Areas	The number of disease types within a doctor's area of specialization and expertise.
8		Doctor’s Qualifications	The doctor's educational background, professional title, etc.
9		Clinical Experience	The doctor's history and experience in treating specific diseases.
10	Service Responsiveness	Real-time Response	Providing prompt replies to patient inquiries.
11		Personalized Needs	Offering customized solutions tailored to the specific conditions of different patients.
12		Service Efficiency	Efficiently meeting patients' consultation needs within the shortest possible time.
13		Service Continuity	Providing continuous consultation services to the same patient without changing doctors midway.
14	Service Experience	Reasonable Pricing	Consultation fees are reasonable, with justifiable price differences for different services.
15		Follow-up	Conducting follow-up after the consultation to understand the patient's subsequent condition.

16		Communication and Guidance	Doctors can communicate smoothly with patients and guide them to share important information.
17		Service Attitude	Maintaining a friendly and approachable attitude towards patients during the consultation.
18		Empathy	Building patient confidence and demonstrating empathy towards patients.
19	Service Ethics	Privacy Protection	Not commenting on or disclosing patient privacy.
20		Responsibility	Taking consultation work seriously and actively communicating with patients.
21		Respect	Treating all patients equally with an objective, neutral, and respectful attitude.

4.1.3 Theoretical Saturation Test

This study invited a scholar specializing in library and information science to conduct a theoretical saturation test using the remaining interview transcript. After coding, it was found that the derived concepts could be categorized within the existing coding framework, with no new concepts or categories emerging. Therefore, it is concluded that the developed theoretical model has reached saturation.

4.2 Optimization of the Evaluation System

4.2.1 Questionnaire Design Based on the Kano Model

The Kano model is a user demand analysis method proposed by Japanese scholar Kano [13], primarily used for classifying and prioritizing user requirements. According to users'satisfaction levels and the degree to which quality functions are fulfilled, user demands are categorized into five types: attractive needs, one-dimensional needs (i.e., performance needs or expected needs), must-be needs, indifferent needs, and reverse needs. As a quantitative research method involving user participation, the Kano model effectively analyzes the impact of fulfilling service content on user satisfaction through data support (YANG, MA, XU, HUANG, & HU, 2019). Based on the evaluation indicator framework for doctor service quality on online consultation platforms derived from the aforementioned qualitative analysis, this paper designs a questionnaire targeting users of online consultation platforms using the Kano model.

According to the Kano model theory, a Kano model questionnaire was designed. The questionnaire consists of three parts: Part I provides a brief introduction, explaining the purpose and content of the survey; Part II collects basic demographic information of the respondents, including gender, age, educational background, and frequency of using online consultation platforms; Part III is the scale

section. For each service aspect measured, the questionnaire includes a pair of positively and negatively framed questions: one investigating user feelings when the service is provided and the other investigating user feelings when the service is not provided. Each question offers five response options: I am satisfied, It is expected, I am neutral, I can tolerate it, and I am dissatisfied.

4.2.2 Questionnaire Distribution and Collection

Questionnaires were distributed both online and offline. For the online component, the questionnaire was designed and published via the "Wenjuanxing" platform. For the offline component, paper questionnaires were distributed within three Grade-A tertiary hospitals in Guizhou Province, China. A total of 343 questionnaires were collected, of which 298 were valid. The basic demographic profile of the surveyed participants is presented in Table 4. Among the collected responses, questionnaires from users who indicated they had "never used an online consultation platform" in the usage frequency question were excluded as invalid.

Table 4. Demographic Profile of Respondents for the Kano Model Questionnaire

User Demographic	Questionnaire Options	Number of Responses	Percentage of Total Respondents (%)
Age	Under 20	21	7.05%
	21-35 years old	114	38.26%
	36-40 years old	72	24.16%
	Over 40 years old	91	30.54%
Gender	Male	169	56.71%
	Female	129	43.29%
Educational Background	Associate degree or below	117	39.26%
	Bachelor's degree	136	45.64%
	Master's degree	35	11.74%
	Doctoral degree	10	3.36%
Frequency of Using Online Consultation Platforms	Occasional use	152	51.01%
	Frequent use	100	33.56%
	Very frequent use	46	15.44%

The reliability and validity of the questionnaire results were tested using SPSS software. The Cronbach's α coefficient was 0.988 for the positively framed questions in the Kano questionnaire and 0.986 for the negatively framed questions, both exceeding 0.90, indicating good reliability of the survey and that the responses from the sample are authentic and reliable. Furthermore, based on the validity analysis, the overall KMO value for the Kano questionnaire was 0.985, with 0.988 for the positively framed questions and 0.985 for the negatively framed questions, and all p-values were less

than 0.05. This demonstrates that the questionnaire items are well-designed and that the results are valuable for reference.

4.2.3 Data Analysis and Optimization of System Indicators

The classification results and the Better-Worse coefficients derived from the Kano model are presented in the following table (see Table 5).

Table 5. Classification Results from the Kano Model Questionnaire Survey

Service Content	M (%)	O (%)	A (%)	I (%)	R (%)	Q (%)	Better (%)	Worse (%)	Classification Result
Tiered Diagnosis and Treatment	3.69	13.76	33.22	28.86	14.43	6.04	59.07	-21.94	Attractive
Face-to-Face Consultation	5.37	14.43	29.87	27.85	16.11	6.38	57.14	-25.54	Attractive
Medical Theory	22.82	19.8	22.15	15.1	15.44	4.7	52.52	-53.36	Must-be
Doctor's Qualifications	9,73	25.17	30.2	11.74	18.12	5.03	72.05	-45.41	Attractive
Simplification of Terminology	6.38	21.81	36.91	12.08	18.12	4.7	76.09	-36.52	Attractive
Report Interpretation	8.05	24.16	29.19	19.13	14.77	4.7	66.25	-40	Attractive
Diagnosis and Treatment	31.21	7.05	26.17	12.75	16.78	6.04	43.04	-49.57	Must-be
Specialty Areas	5.03	20.47	29.19	26.51	13.42	5.37	61.16	-31.4	Attractive
Clinical Experience	8.39	34.56	18.79	17.45	15.77	5.03	67.37	-54.24	One-dimensional
Real-time Response	8.39	29.19	21.81	19.8	15.77	5.03	64.41	-47.46	One-dimensional
Personalized Needs	10.4	20.47	30.54	16.78	16.78	5.03	65.24	-39.48	Attractive
Service Efficiency	4.36	25.84	31.88	16.44	16.44	5.03	73.5	-38.46	Attractive
Service Continuity	6.71	34.56	20.81	21.14	11.41	5.37	66.53	-49.59	One-dimensional
Reasonable Pricing	6.38	24.5	29.87	19.13	14.77	5.37	68.07	-38.66	Attractive
Follow-up	12.42	14.09	25.84	26.51	16.11	5.03	50.64	-33.62	Indifferent
Communication	27.85	16.44	27.18	11.07	12.75	4.7	52.85	-53.66	Must-be

and Guidance									
Service Attitude	10.07	24.5	22.82	23.15	14.77	4.7	58.75	-42.92	One-dimensional
Empathy	8.05	18.79	31.21	19.8	17.45	4.7	64.22	-34.48	Attractive
Privacy Protection	7.05	30.54	26.85	11.74	18.79	5.03	75.33	-49.34	One-dimensional
Responsibility	4.36	30.54	25.17	17.45	17.79	4.7	71.86	-45.02	One-dimensional
Respect	11.41	32.21	14.77	22.48	14.09	5.03	58.09	-53.94	One-dimensional

Must-be Quality refers to the fundamental requirements users have for a service. When these service elements are not met, user satisfaction significantly decreases. However, even optimizing such service content will not increase user satisfaction. In this study, the must-be quality elements include three items: mastery of basic medical theoretical knowledge, proficiency in diagnosing and treating conditions, and effective communication skills.

One-dimensional Quality (also referred to as Expected Quality) describes service elements for which user satisfaction increases proportionally with the degree of their fulfillment—the better the quality, the higher the satisfaction. For this category, it is essential not only to provide the service but also to focus on its quality. In this study, one-dimensional service elements include seven items: clinical experience, real-time responsiveness, service continuity, a friendly service attitude, confidentiality, sense of responsibility, and adherence to professional ethics.

Attractive Quality refers to service elements that users have not explicitly anticipated but represent latent needs. The fulfillment of these service elements significantly enhances user satisfaction; however, their absence does not lead to user dissatisfaction. In this study, attractive quality elements comprise ten items: tiered diagnosis and treatment, face-to-face consultation, explanation of professional terminology, interpretation and judgment of medical reports, variety of specialty disease areas, doctor's qualifications, personalized needs, service efficiency, reasonable pricing, and providing emotional value to patients.

Indifferent Quality refers to service elements that have no significant impact on either improving user satisfaction or reducing user dissatisfaction. The traditional Kano model posits that indifferent quality elements increase costs and waste resources, and therefore suggests they should be appropriately reduced or eliminated. In this study, there is one indifferent quality element: follow-up after the service (e.g., post-consultation check-in).

The Better-Worse coefficients are primarily used to assess the impact of fulfilling service elements on enhancing user satisfaction (Better) and preventing user dissatisfaction (Worse). These coefficients

reflect the contribution of each service element's fulfillment level to overall user satisfaction and indicate the relative importance of each service quality dimension within the overall service quality framework [15]. The specific calculation formulas are as follows:

Better = (A + O) / (A + O + M + I).

This formula represents the effect of a service element on improving user satisfaction, with values ranging from 0 to 1. A higher value indicates a more significant contribution of that service to enhancing satisfaction. Conversely, Worse = (O + M) / (A + O + M + I) × (-1) represents the effect of a service element on preventing user dissatisfaction, with values ranging from -1 to 0. A value closer to -1 indicates better performance of that service in averting dissatisfaction.In this study, the Better-Worse coefficients for each service element are presented in Table 6.

According to the prioritization principle within the Kano model: Must-be service attributes > One-dimensional (expected) service attributes > Attractive service attributes > Indifferent service attributes. Within the same service attribute category, items with a higher Better coefficient take precedence over those with a lower Better coefficient, or items with a lower (less negative) Worse coefficient take precedence over those with a higher (more negative) Worse coefficient. Consequently, the prioritized order of service elements in this study is presented in the following table (see Table 6). The item "follow-up after service" from the indifferent attribute category has been excluded from the indicator set in accordance with the model's principle.

Table 6. Prioritization of Doctor Service Quality Evaluation Indicators for Online Medical Communities

Rank	Service Content	Service Attribute Category	Better Coefficient
1	Communication and Guidance	Must-be	52.85
2	Medical Theory	Must-be	52.52
3	Diagnosis and Treatment	Must-be	43.04
4	Privacy Protection	One-dimensional	75.33
5	Responsibility	One-dimensional	71.86
6	Clinical Experience	One-dimensional	67.37
7	Service Continuity	One-dimensional	66.53
8	Real-time Response	One-dimensional	64.41
9	Service Attitude	One-dimensional	58.75
10	Respect	One-dimensional	58.09
11	Simplification of Terminology	Attractive	76.09
12	Service Efficiency	Attractive	73.5

13	Doctor's Qualifications	Attractive	72.05
14	Reasonable Pricing	Attractive	68.07
15	Report Interpretation	Attractive	66.25
16	Personalized Needs	Attractive	65.24
17	Empathy	Attractive	64.22
18	Specialty Areas	Attractive	61.16
19	Tiered Diagnosis and Treatment	Attractive	59.07
20	Face-to-Face Consultation	Attractive	57.14

4.3 Indicator Weight Calculation

4.3.1 Construction of the Hierarchical Structure Model

Following the implementation principles of the AHP, and based on the finalized evaluation indicator system for doctor service quality in online medical communities, this study constructed the hierarchical structure model using Yaahp software. The evaluation of doctor service quality in online medical communities serves as the Goal Layer. The primary indicators correspond to the Criteria Layer, and the secondary indicators correspond to the Indicators Layer.

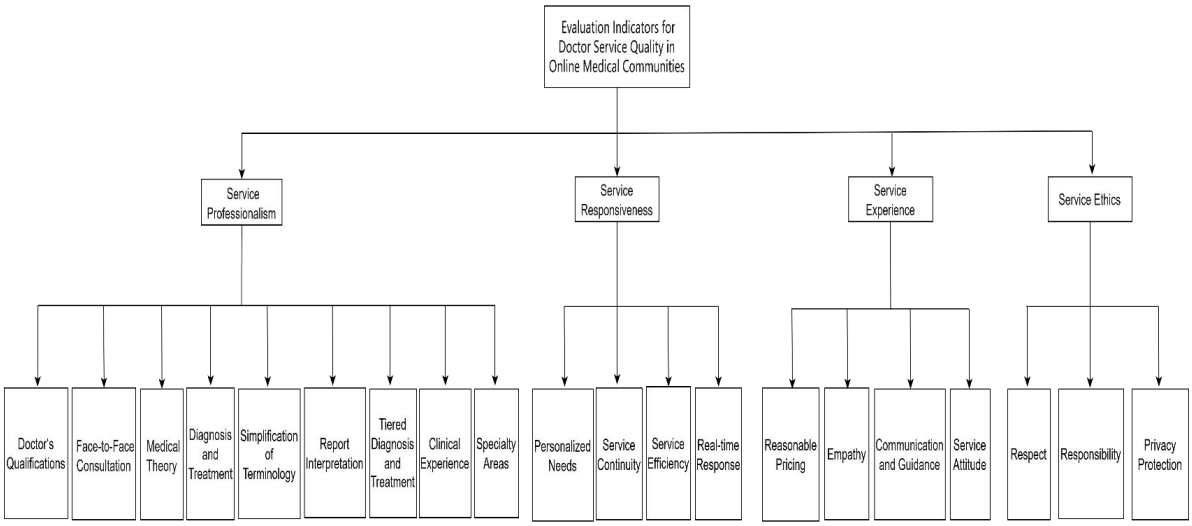

Figure 2. Hierarchical Structure Model of the Evaluation Indicators for Doctor Service Quality in Online Medical Communities

4.3.2 Weight Calculation and Consistency Check

This study invited five experts and scholars to evaluate the relative importance of the indicators in the structural model using T.L. Saaty's 1-9 scale method, thereby constructing pairwise comparison judgment matrices. The basic profiles of the five selected experts are shown in the table below (see

Table 7). All these experts possess a deep understanding of the service landscape in online medical communities, enabling them to make scientific and objective judgments and provide reasonable recommendations. Furthermore, due to the complexity and diversity of the evaluation indicators for doctor service quality in online medical communities, coupled with potential variations in the experts' comprehension and judgment regarding each indicator, the constructed judgment matrices might exhibit some degree of deviation. To avoid significant bias caused by subjective factors, the Analytic Hierarchy Process requires a consistency check for the judgment matrices.This study utilized Yaahp software to calculate the weight values and perform the consistency check. The final indicator weight values were obtained by calculating a weighted average of the results from the five experts. The calculations yielded the following results for the judgment matrices: λmax (maximum eigenvalue) = 4.2041; Consistency Ratio (CR) = 0.0870; Consistency Index (CI) = 0.0737; Random Index (RI) = 0.94. The CR value being less than 0.1 satisfies the consistency standard requirement, thereby completing the weight calculation for the indicator system. At this stage, the construction of the doctor service quality evaluation system for online medical communities is finalized (see Table 8).

Table 7. Basic Information of Experts Participating in AHP Scoring

Number	Gender	Age	Department/Specialty	Professional Title	Years of Experience in Online Medical Communities
1	Female	46	Thyroid and Breast Surgery	Senior	8 years
2	Female	38	General Surgery	Associate Senior	8 years
3	Male	53	Orthopedics and Traumatology	Senior	5 years
4	Female	41	Gynecology	Associate Senior	10 years
5	Male	36	Gastroenterology	Associate Senior	5 years

Table 8. Evaluation System for Doctor Service Quality in Online Medical Communities

Primary Indicator	Weight	Secondary Indicator	Relative Weight	Global Weight
Service Professionalism	0.5047	Tiered Diagnosis and Treatment	0.0448	0.0226
		Face-to-Face Consultation	0.0352	0.0178

		Medical Theory	0.2156	0.1088
		Simplification of Terminology	0.0799	0.0403
		Report Interpretation	0.0866	0.0437
		Diagnosis and Treatment	0.3203	0.1617
		Specialty Areas	0.0669	0.0337
		Doctor's Qualifications	0.0842	0.0425
		Clinical Experience	0.0666	0.0336
Service Responsiveness	0.2157	Real-time Response	0.1583	0.0341
		Personalized Needs	0.3769	0.0813
		Service Efficiency	0.3072	0.0663
		Service Continuity	0.1576	0.0340
Service Experience	0.1395	Reasonable Pricing	0.2373	0.0331
		Communication and Guidance	0.3340	0.0466
		Service Attitude	0.1405	0.0196
		Empathy	0.2883	0.0402
Service Ethics	0.1400	Privacy Protection	0.2924	0.0409
		Responsibility	0.3944	0.0552
		Respect	0.3132	0.0439

5. Discussion

5.1 Scientificity and Rationality of the Evaluation Indicators

In the preliminary stage of this research, a literature review was conducted to summarize and synthesize indicators related to online medical communities and doctor service quality. The expert interview method was employed to conduct in-depth interviews with hospital specialists. The ten invited experts possess extensive working experience in the field of online medical platforms, with an average tenure of ten years, and all hold the professional title of associate professor or higher. Their

years of practical experience on online medical platforms grant them strong representativeness. Building upon this foundation, a Kano model questionnaire was used to collect data from users of online medical platforms, optimizing the evaluation indicators by incorporating perspectives from both expert and user groups. This approach comprehensively considered the viewpoints of the two key stakeholders in online medical communities: doctors and users. The AHP was applied to determine the weight values. For the judgment matrices, the calculated values were as follows: λmax (maximum eigenvalue) = 4.2041; Consistency Ratio (CR) = 0.0870; Consistency Index (CI) = 0.0737; Random Index (RI) = 0.94. The CR value being less than 0.1 satisfies the consistency requirement. In summary, the doctor service quality evaluation indicator system constructed in this study demonstrates a reasonable degree of scientificity and reliability.

5.2 Analysis of Evaluation Indicator Content

5.2.1 Emphasis on Must-be Service Elements

Must-be service elements have a significant impact on patient satisfaction, and their absence directly leads to dissatisfaction. When evaluating doctor service quality, substantial emphasis should be placed on these service elements. Furthermore, must-be elements can serve as mandatory criteria. During service quality assessments, doctors who fail to meet these requirements may be considered for removal from the platform's consultation eligibility. If an online medical community aims to improve doctor service quality, it must ensure the provision of these must-be service elements.Based on the data analysis results from the Kano model, the must-be service elements identified in this study are: mastery of basic medical theoretical knowledge, proficiency in diagnosing and treating conditions, and effective communication skills. Two of these belong to the dimension of Service Professionalism. The professional competence of doctors is a critical factor in patients' choice of healthcare providers. Therefore, during doctor training and recruitment processes within online medical communities, a focus on enhancing service professionalism is essential to ensure the foundational level of user satisfaction. Communication skills fall under the dimension of Service Experience. Communication serves as the bridge for information exchange between doctors and patients. A doctor's strong communication skills can provide users with a superior service experience. The evaluation and training of doctors in online medical communities should therefore prioritize the improvement of communication skills.

5.2.2 Enhancement of One-dimensional Service Elements

The higher the degree of fulfillment and the quality of one-dimensional service elements, the greater the user satisfaction. Therefore, for this category, it is essential not only to provide the relevant content but also to focus on service quality. This study identified seven one-dimensional service elements: clinical experience, real-time responsiveness, service continuity, friendly service attitude, confidentiality, sense of responsibility, and adherence to professional ethics. Among these, two belong to Service Responsiveness, while all three elements related to Service Ethics fall into the expected category. This indicates that users place significant emphasis on doctors' ethical conduct and the

responsiveness of services. Online medical communities must not only ensure the provision of such services but also strive to enhance their quality. For example, this could involve conducting systematic confidentiality training for doctors or optimizing the patient triage and consultation workflow to ensure doctors are not arbitrarily changed during the normal course of a consultation.

5.2.3 Potential of Attractive Service Elements

Attractive service elements refer to service items that users have not explicitly considered but represent potential latent needs. Fulfilling these service elements can significantly enhance user satisfaction, yet their absence does not lead to user dissatisfaction. This study identifies ten attractive service elements: tiered diagnosis and treatment, face-to-face consultation, explanation of professional terminology, interpretation and judgment of medical reports, variety of specialty disease areas, doctor's qualifications, personalized needs, service efficiency, reasonable pricing, and providing emotional value to patients.Attractive service elements can serve as bonus indicators in service quality evaluations. That is, when a doctor meets such service elements, bonus points are awarded based on the corresponding weight value, with no penalty for non-fulfillment. Online medical communities can establish incentive mechanisms for attractive service elements to motivate doctors to actively provide them, while also paying attention to ensuring the quality of such services.

5.2.4 Comprehensive Consideration of Service Element Priorities

Based on the questionnaire analysis using the Kano model, this study derived the prioritization of doctor service elements in online medical communities. Service elements within the same attribute category exhibit different priority orders and weight values. In the practical evaluation of doctors, when exceptional circumstances arise or when direct scoring using weight values is not feasible, the established service priorities can provide a valuable reference for assigning scores. This significantly enhances the practical applicability of the doctor service quality evaluation system.

6. Conclusion

This study has constructed an evaluation system for doctor service quality in online medical communities, consisting of 4 primary indicators and 20 secondary indicators. This indicator system demonstrates a reasonable degree of scientific rigor and practical applicability, providing both theoretical support and a practical basis for assessing doctor service quality in online healthcare environments. A limitation of this research is the absence of further segmentation within the user population. Future related studies could explore differences based on factors such as medical specialty and consultation needs, thereby guiding the more refined development and improvement of subsequent evaluation tools.

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