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The impact of healthcare delivery configuration on patients' perceived service quality: The mediating role of patient trust and the moderating effect of secular rationality in Nanning

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Abstract: This study investigates how Healthcare Delivery Configuration (HDC) impacts Patients' Perceived Service Quality (SQ) in smart healthcare environments, specifically examining the mediating role of Patient Trust (PT) and the moderating influence of Secular Rationality (SR). A cross-sectional survey yielded 465 valid responses from tertiary hospital patients in Nanning, China. Data were analyzed using SPSS and AMOS, employing Confirmatory Factor Analysis (CFA) for validation and Structural Equation Modeling (SEM) with bootstrap sampling to test mediating and moderating effects. Results indicate that HDC significantly and positively predicts SQ. Patient Trust serves as a partial mediator, explaining approximately 20% of the total effect. However, the moderating effect of Secular Rationality was not statistically significant, suggesting that institutional efficiency builds trust across diverse individual value orientations. The study confirms a synergy between "hard" technical configuration and "soft" psychological trust. In high-stakes public healthcare, robust institutional design possesses a universal capacity for trust-building that transcends individual rational orientations. Hospital administrators should prioritize optimizing intelligent resource scheduling and transparency. Since individual rationality did not significantly moderate outcomes, implementing standardized, equalized smart healthcare strategies is essential for enhancing regional service quality.

Keywords: *Healthcare delivery configuration, Patient trust, Perceived service quality, Secular rationality.*

1. Introduction

In contemporary society, where healthcare services are increasingly specialized and technologically driven, patients' perceived service quality has become a critical benchmark for measuring the operational effectiveness and competitiveness of healthcare systems [1]. Unlike objective evaluations that focus solely on clinical outcomes or technical accuracy, perceived service quality emphasizes the overall impression patients form throughout the care process, including their recognition of professional expertise, their experience of communication, and the level of emotional support received [2]. In public healthcare systems, patients often face information asymmetry and uncertainty. Thus, their subjective perception of service quality directly influences their level of trust, compliance, and long-term impression of the institution. However, despite the continuous increase in medical resources, patient evaluations of service quality have not shown a steady, corresponding improvement [3].

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As a regional medical center in Guangxi, Nanning has made significant strides in recent years regarding healthcare infrastructure, cross-regional service capacity, and the advancement of smart healthcare. Nevertheless, patient perceptions of service quality have exhibited noticeable fluctuations. On the one hand, tertiary hospitals operate under long-term, high-volume conditions, leading to compressed consultation times. Consequently, some patients feel the diagnostic process is overly procedural and mechanical, lacking sufficient humanistic care. On the other hand, while primary healthcare institutions have introduced information systems and intelligent tools during their digital transformation, patient evaluations of their reliability and professionalism remain low. This phenomenon is regarded in smart healthcare research as a typical manifestation of the decoupling between technical investment and patient-perceived value [4].

Fundamentally, this issue arises from the gap between the configuration of healthcare delivery and patient expectations. Today, as information technology and intelligent systems are increasingly integrated into clinical workflows, healthcare is no longer provided through a single dimension but has evolved into a complex system of collaboration among institutional design, technical systems, and professionals [5]. While such configurations are typically designed to improve efficiency and optimize processes, they do not necessarily enhance the patient's perception of quality. Existing research indicates that when service adjustments primarily focus on institutional efficiency, patients may become confused due to unclear accountability or the increased cognitive effort required to process information, thereby lowering their evaluation of service quality [6].

In fact, the patient's perception of service quality depends on treatment outcomes and is gradually constructed through continuous interaction, information exchange, and emotional responsiveness during the medical encounter [7]. When healthcare delivery relies too heavily on standardized procedures and systematic operations without clear, coherent, and accessible communication, patients often struggle to form a definitive judgment of quality. Studies show that in high-pressure public hospital environments, procedural information transfer can leave patients feeling there is a lack of communication, reducing their overall assessment of professional competence and personalization [8]. In this process, patient trust is considered a vital psychological bridge connecting the configuration of healthcare delivery and perceived service quality. Trust encompasses both the rational recognition of professional competence and the emotional security formed during interaction [9]. In regional medical centers like Nanning, patients usually have a high baseline of institutional trust in public hospitals. However, their evaluation of specific service quality relies more heavily on actual communication experiences and interaction processes [10]. If the configuration of services does not provide sufficient support for the continuous establishment of trust, the efficiency advantages at the institutional level often fail to translate into positive perceptions of service quality. Furthermore, a patient's understanding and evaluation of healthcare are influenced by their individual cognitive orientations. Research suggests that when diagnostic processes rely heavily on professional systems and technical judgments, some patients may experience anxiety due to difficulties in comprehending medical logic, which in turn affects their subjective judgment of service reliability and safety [11]. This discrepancy does not necessarily stem from a lack of service quality itself but reflects the heterogeneity of patients' values and cognitive styles.

However, existing research on healthcare service quality has generally overlooked the role of cultural and value factors when explaining this heterogeneity, particularly lacking a systematic examination of secular rationality as a cognitive orientation. Secular rationality emphasizes scientific explanation, procedural justice, and rational decision-making. Its role in the acceptance of medical technology and the formation of trust has been preliminarily validated in social cognition research [12]. Patients with varying levels of secular rationality may form trust and quality evaluations through distinct pathways [13]. Based on this background, this study focuses on Nanning as the research context to systematically explore the mechanism by which Healthcare Delivery Configuration (HDC) affects Perceived Service Quality (SQ). This study develops a multilevel analytical framework to address

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the theoretical gap in how the mechanisms of configuration, trust, and quality interact, providing a clearer foundation for optimizing public hospital services within smart healthcare.

2. Literature Review and Hypotheses

2.1. Healthcare Delivery Configuration and Patients' Perceived Service Quality

Perceived Service Quality (SQ) is a comprehensive subjective evaluation formed by patients throughout the entire medical encounter and is widely regarded as a critical metric for measuring the operational performance and core competitiveness of healthcare systems [14, 15]. Unlike objective indicators focused on clinical efficacy or technical accuracy, SQ emphasizes the patient's holistic assessment of professional competence, communication experience, and emotional support throughout the diagnostic and treatment process. In medical contexts characterized by high information asymmetry and significant risk, patients often find it difficult to directly evaluate the technical quality of care. Instead, they rely more on service structures and procedural cues to form quality perceptions. With the profound application of smart healthcare and information technology, medical services are no longer dominated by a single physician but have gradually evolved into a Healthcare Delivery Configuration (HDC) comprising institutional arrangements, technical systems, and professional personnel.

From the Resource-Based View (RBV), healthcare institutions can develop inimitable service capabilities by effectively integrating human and technical resources, thereby enhancing patients' overall perception of service quality. Simultaneously, Signaling Theory posits that in highly uncertain service contexts, an organization's structural arrangements and process designs serve as vital signals that help service recipients infer quality attributes that are not directly observable. In recent years, practices aimed at optimizing China's healthcare delivery system have provided robust support for this theoretical logic. Chen et al. [16] observed that in the construction of smart hospitals in regions such as Shanghai and Zhejiang, the integration of Multi-Disciplinary Team (MDT) configurations and AI-assisted diagnostic systems significantly reduced patient waiting times and improved diagnostic transparency; such structural optimizations translated directly into high patient ratings for professional expertise and efficiency. Furthermore, Wang and Chen [17] found that the implementation of "at-the-clinic" settlement and "one-stop" service center configurations in regional medical hubs like Nanning reduced patients' physical transit within hospitals and lowered communication costs for medical staff; this allowed patients to experience procedural convenience while developing a stronger positive perception of the overall reliability of medical services. Based on the aforementioned theoretical analysis and empirical observations, this study contends that scientific healthcare delivery configurations can directly improve patients' final quality assessments by increasing service efficiency and signaling professionalism.

H_1: Healthcare Delivery Configuration (HDC) has a significant positive impact on patients' Perceived Service Quality (SQ).

2.2. Healthcare Delivery Configuration with Patient Trust

Patient trust is a core psychological mechanism in the healthcare service relationship, playing a pivotal role, especially in high-risk and high-uncertainty clinical environments. Scholarly work typically follows McAllister's [9] classic classification, which views patient trust as a two-dimensional construct comprising cognitive and affective trust. The former stems from a patient's rational assessment of the healthcare provider's professional competence, predictability, and reliability, while the latter is rooted in experiences of emotional resonance, care, and benevolence generated during the interaction process [9]. From the perspective of Social Exchange Theory (SET), trust is formed incrementally through continuous interaction and reciprocal exchange. When Healthcare Delivery Configuration (HDC) demonstrates behavioral stability and altruism, patient trust levels increase significantly. In modern healthcare systems, service configuration directly shapes patients' psychological expectations of the system by optimizing communication channels, enhancing information transparency, and clarifying

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decision-making logic. A well-structured, clearly defined service configuration helps reduce uncertainty during the medical process, providing an institutional safeguard for establishing trust [18].

However, in the context of smart healthcare, technology-intensive configurations exert a dual influence on trust formation. While standardized and systematized processes enhance patients' perception of diagnostic reliability, establishing cognitive trust remains challenging, particularly when the interpretability of algorithmic logic is limited [19]. Research has found that even when objective technical indicators are superior, patients' trust in highly automated configurations is sometimes lower than in traditional expert-led models. This is often due to algorithm aversion stemming from unfamiliarity with technology, data privacy concerns, or ambiguity about legal accountability [20]. In contrast, service configurations that emphasize interpersonal interaction possess unique advantages in enhancing affective trust. Affective trust arises from the warmth, empathy, and care shared between doctors and patients. In such configurations, service providers establish emotional bonds through face-to-face communication, body language, and personalized narratives, signals that afford patients a sense of security and respect [21]. In comparison, purely technical configurations lacking genuine empathy often fail to provide psychological compensation at the emotional level. Consequently, in high-emotional-load situations, configuration models emphasizing humanistic interaction remain the primary source of affective trust. In summary, as a vital structural antecedent influencing patient trust, healthcare delivery configuration shapes trust through both the manifestation of rational competence and the construction of emotional connections.

H_2: Healthcare Delivery Configuration (HDC) has a significant positive impact on Patient Trust (PT).

2.3. Patient trust and perception of Patients' Perceived Service Quality

Patient trust is widely recognized as a critical psychological link connecting the service process with the evaluation of service outcomes. According to Social Exchange Theory, trust can reduce an individual's psychological costs during interaction, making them more inclined to interpret the service experience positively [22]. In a medical context, once patients develop a stable sense of trust in healthcare providers or the system, they are more likely to provide a positive evaluation of service quality, even when resources are strained or communication is limited. Existing empirical studies have demonstrated a significant positive correlation between patient trust and perceived service quality, satisfaction, and medical compliance behavior [23]. Trust could influence patients' judgments of professional competence and shape their overall perception of service attitude and the level of care received. Therefore, in the process through which healthcare delivery configuration affects perceived quality, patient trust plays an irreplaceable mediating role.

H_3: Patient Trust (PT) has a significant positive impact on patients' Perceived Service Quality (SQ).

2.4. The Mediating Role of Patient Trust

From the perspective of the Stimulus-Organism-Response (SOR) theoretical framework, the healthcare delivery configuration acts as an external environmental stimulus that first operates on the patient's internal psychological state as the organism. This process triggers changes in the patient's rational validation of systemic competence and emotional resonance with the experience of care, ultimately manifesting as a perceptual or rational response in the form of a service quality evaluation. This implies that the configuration of medical resources does not directly influence quality perception; rather, it does so by reshaping the patient's internal trust structure [17].

In complex medical environments, patients are often limited by professional knowledge and find it difficult to directly evaluate the technical proficiency of diagnosis and treatment. Consequently, they rely more heavily on trust cues to form quality judgments. Empirical research indicates that different configuration models utilize distinct trust-building pathways. A highly automated configuration may successfully project technical reliability, thereby strengthening the cognitive trust pathway; however, a lack of necessary human-machine interaction may weaken affective trust [24]. In contrast, traditional practitioner-centric configurations bridge these two dimensions through interpersonal interaction. This

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psychological mediation mechanism explains why two service models with identical clinical outcomes can result in vastly different quality ratings. The configuration mode dictates the type and degree of trust established, which, in turn, determines the final perceived value of the service [21]. Therefore, if a healthcare configuration provides sufficient structural support for trust-building, its positive impact on perceived service quality will be significantly amplified. Based on this logic, this study contends that patient trust is the key transformation mechanism linking the structural features of medical models to subjective assessments of service quality.

H_4. Patient Trust (PT) mediates between Healthcare Delivery Configuration (HDC) and Patient Perceived Service Quality (SQ).

2.5. The Moderate Role of Secular Rationality

Secular rationality is derived from the theoretical framework of the World Values Survey (WVS) and refers to an individual's inclination to rely on scientific reasoning, institutional logic, and procedural justice rather than traditional authority or emotional attachment when evaluating social institutions and public services [25]. In a healthcare context, secular rationality manifests in patients' trust in procedural rationality, technical transparency, and institutional credibility. According to Social Cognitive Theory (SCT), an individual's cognitive orientation interacts with external environmental structures, influencing psychological outcomes [26]. Patients with higher levels of secular rationality are more likely to interpret systematized, technology-oriented healthcare delivery configurations as signals of professionalism and credibility, thereby strengthening the positive impact of configurations on trust. Conversely, patients with lower secular rationality may rely more heavily on interpersonal interaction and emotional care, making their trust formation relatively less sensitive to structural configurations. Based on this interaction between individual values and service structures, it is posited that secular rationality acts as a boundary condition that amplifies the efficacy of healthcare configurations in building trust.

H_5. Secular rationality moderates the indirect effect of healthcare delivery configuration on patients' perceived service quality through patient trust, such that the strength of the mediating role of patient trust varies across levels of secular rationality.

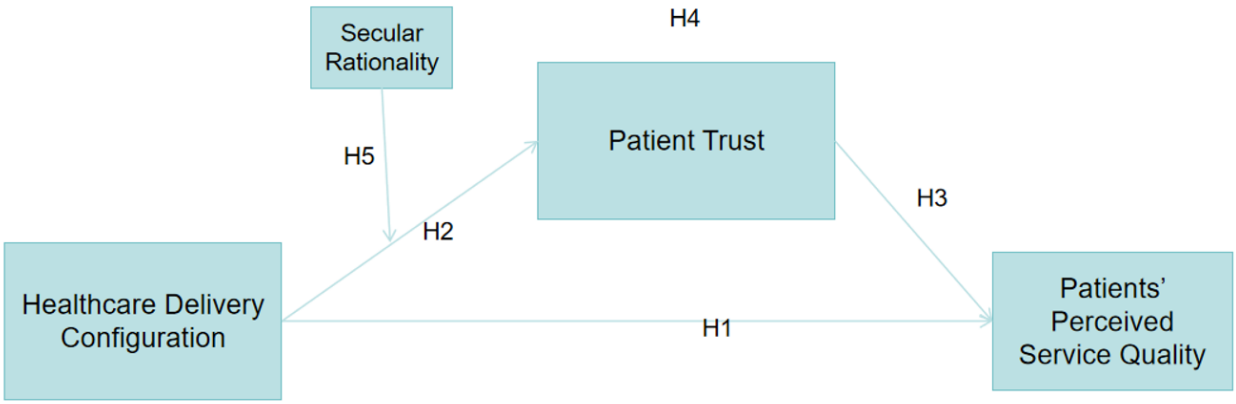

Figure 1.
Conceptual framework.

3. Methodology

3.1. Research Design

This study employs a quantitative research design, using cross-sectional data collected via structured questionnaires, to systematically examine the mechanisms by which healthcare delivery configuration influences patients' perceived service quality. Central to this analysis is the evaluation of

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the mediating role of patient trust and the moderating effect of secular rationality. The overall analytical framework is grounded in the logical pathways of Social Cognitive Theory (SCT), providing a robust theoretical basis for exploring the complex interactions between psychological and structural factors within the context of smart healthcare.

3.2. Measurement

3.2.1. Measurement Instruments

All the scales used in this study are derived from high-level international literature and have been moderately revised in combination with the medical context in China to ensure the theoretical rigor and contextual adaptability of the measurement tools. All items were evaluated using a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Medical service configuration is used to measure patients' overall perception of the organization and its operational structure. This study integrates and adapts the SERVQUAL model [14] and research on technology-embedded services, focusing on the systematicness of the diagnosis and treatment process, information transparency, and the degree of human-machine collaboration. This construct emphasizes the service structure itself as a quality signal. The measurement items for patient trust are mainly adapted from the trust scales of Mayer et al. [27] and McAllister [9], and the context is adjusted to align with the characteristics of medical services. This scale is widely used in organizational management and medical service research and has good cross-scenario stability. Perceived service quality is based on the SERVQUAL model as the core theoretical foundation, covering key dimensions such as reliability, responsiveness, assurance, and empathy [14, 15]. In the context of smart healthcare, some items have been added to describe the experience of technology-assisted services to enhance their practical applicability. Secular rationality is used to measure the extent to which patients rely on institutional rationality, procedural legitimacy, and technical logic during the medical evaluation process. The theoretical basis of this variable comes from the World Values Survey (WVS), and it has been localized and operationalized based on existing research [25]. The items mainly reflect whether patients tend to establish trust based on rational judgment rather than emotions or traditional authority.

3.3. Sampling and Data Collection

The target population of this study consists of patients with actual medical experiences at tertiary hospitals or community health service centers in Nanning. To enhance the structural diversity and representativeness of the sample, a hybrid sampling approach combining stratified and convenience sampling was employed across several major institutions, including the First Affiliated Hospital of Guangxi Medical University, Guangxi Zhuang Autonomous Region People's Hospital, the First Affiliated Hospital of Guangxi University of Chinese Medicine, and Nanning First People's Hospital. During data collection, participants were invited to complete online questionnaires with on-site guidance. To ensure data quality and ethical standards, all respondents were informed of the research objectives prior to participation, and screening was conducted to confirm that they had authentic medical encounters within the past year. A total of 497 questionnaires were collected in this study. After data screening and invalid questionnaire elimination, 465 valid questionnaires were obtained, yielding an effective recovery rate of 93.6%. The sample size meets the statistical requirements for structural equation modeling and the bootstrap mediating effect test [28]. Data analysis was primarily conducted using SPSS 26.0 and AMOS 24.0. Firstly, descriptive statistical analysis and reliability tests were conducted in SPSS, and the internal consistency of each scale was evaluated using Cronbach's α. Then, a confirmatory factor analysis (CFA) was conducted in AMOS to test the measurement model's convergent and discriminant validity. In the structural model analysis stage, the structural equation model (SEM) was used to test the hypothetical path relationship. To examine the mediating effect of patient trust and the moderating role of secular rationality, this study further adopted the bootstrap sampling method to calculate the deviation-corrected confidence interval. The mediating effect of regulation is judged by comparing the significant differences in the indirect effect under different levels

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of secular rationality. This method is considered highly robust in testing complex psychological mechanisms [29].

4. Results

4.1. Descriptive Statistical Analysis

In terms of gender distribution, the sample for this study is balanced between male and female respondents, effectively eliminating the potential impact of gender bias on healthcare evaluations. Regarding the age distribution, the middle-aged and elderly group (aged 46 and above) accounts for nearly 60% of the sample; this characteristic accurately reflects the actual patient demographics of tertiary hospitals in Nanning, where older individuals are often more sensitive to the quality of healthcare delivery configurations and the transition toward smart healthcare. In terms of educational attainment, over 50% of respondents hold a junior college or bachelor's degree, providing the necessary cognitive foundation for understanding the orientation of secular rationality. Of particular note is the occupational background, as approximately 45% of respondents have experience in the Internet or information technology sectors, suggesting that the sample group possesses a high level of discernment regarding the technical logic embedded in smart healthcare configurations. Furthermore, more than 50% of patients rated their health as poor, and nearly 70% had two or more medical visits in the past year. This high-frequency, inelastic demand for medical services ensures that their evaluations of service configuration and trust-building are grounded in substantial experience, offering greater depth and reference value.

Table 1.
Demographic Information.

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	238	51.18
	Female	227	48.82
Age	18–30 years	77	16.56
	31–45 years	114	24.52
	46–60 years	149	32.04
	Over 60 years	125	26.88
Education Level	High school and below	151	32.47
	Junior college/Bachelor's degree	258	55.48
	Master's degree and above	56	12.04
Residence	Urban	329	70.75
	Rural	136	29.25
Medical Insurance Type	Urban Employee Basic Medical Insurance	185	39.78
	Urban and Rural Resident Basic Medical Insurance	252	54.19
	Commercial insurance/Self-pay	28	6.02
Monthly Disposable Income (RMB)	Below 3,000	101	21.72
	3,001–6,000	158	33.98
	6,001–10,000	134	28.82
	10,001–15,000	62	13.33
	Above 15,000	10	2.15
Occupational Background	Medical/Biomedical related	34	7.31
	Internet industry	110	23.66
	Information Technology (IT)	102	21.94
	Other industries	219	47.10
Self-rated Health Status	Very healthy	22	4.73
	Relatively healthy	57	12.26
	Average	133	28.60
	Relatively unhealthy	175	37.63
	Very unhealthy	78	16.77
Visits to Tertiary Hospitals in the Past Year	1 time	153	32.90
	2–3 times	179	38.49

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Variable	Category	Frequency (n)	Percentage (%)
	4–6 times	80	17.20
	7 times and above	53	11.40
Total		465	100.00

The descriptive analysis illustrates the distribution of 25 measurement items across four core variables: Healthcare Delivery Configuration (HDC), Patient Trust (PT), Secular Rationality (SR), and Perceived Service Quality (SQ). Based on the mean values, the scores for all items range between 2.94 and 3.08, indicating that respondents' evaluations of various dimensions of medical services in Nanning are currently at a moderate level, with significant room for improvement. The standard deviations range from 0.995 to 1.201, indicating a moderate degree of heterogeneity in perceived value across patients. Regarding the normality test, the absolute values of skewness and kurtosis for all items are well below the threshold of 2, fully meeting the normality criteria proposed by scholars such as Kline. This result demonstrates that the cross-sectional data collected in this study possess favorable statistical distribution characteristics. Such a foundation provides a robust prerequisite for the subsequent application of parametric statistical methods, such as Structural Equation Modeling (SEM) for mediation effect analysis, ensuring the validity of the empirical inferences.

Table 2.
Descriptive Statistics and Normality Test.

	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
HDC1	1	5	2.94	1.111	0.035	-0.553
HDC2	1	5	3.02	1.085	0.028	-0.477
HDC3	1	5	2.95	1.068	-0.025	-0.413
HDC4	1	5	3.00	1.075	-0.054	-0.455
HDC5	1	5	3.02	1.124	0.058	-0.579
HDC6	1	5	2.98	1.089	-0.003	-0.439
HDC7	1	5	2.96	1.121	0.012	-0.544
HDC8	1	5	2.96	.995	0.025	0.032
PT1	1	5	3.01	1.035	0.022	-0.316
PT2	1	5	2.97	1.130	0.028	-0.541
PT3	1	5	3.00	1.109	0.034	-0.501
PT4	1	5	2.98	1.139	-0.054	-0.624
PT5	1	5	3.00	1.076	-0.048	-0.404
PT6	1	5	3.03	1.125	0.022	-0.591
PT7	1	5	3.07	1.129	-0.077	-0.577
SR1	1	5	2.99	1.192	-0.026	-0.761
SR2	1	5	3.06	1.157	-0.088	-0.622
SR3	1	5	3.08	1.198	-0.078	-0.765
SR4	1	5	2.98	1.201	0.056	-0.781
SR5	1	5	2.95	1.195	0.015	-0.802
SQ1	1	5	3.04	1.162	0.020	-0.595
SQ2	1	5	2.95	1.108	-0.006	-0.538
SQ3	1	5	3.05	1.159	0.024	-0.737
SQ4	1	5	2.97	1.130	0.127	-0.547
SQ5	1	5	2.98	1.120	-0.040	-0.616
Valid N (listwise)						

4.2. Reliability Analysis

In this study, the internal consistency of the measurement scales was examined using reliability analysis. The results indicate that the Cronbach's alpha coefficients for Healthcare Delivery Configuration (HDC), Patient Trust (PT), Secular Rationality (SR), and Perceived Service Quality (SQ) reached 0.903, 0.889, 0.737, and 0.873, respectively. All these values exceed the widely accepted

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academic threshold of 0.7, demonstrating that the scales possess high stability. At the item level, the Corrected Item-Total Correlation (CITC) for all measurement items was significantly higher than the 0.4 threshold, with most items ranging between 0.6 and 0.72. This suggests that each observed variable effectively represents its corresponding latent construct. Furthermore, the Cronbach's Alpha if Item Deleted values were not significantly higher than the original alpha values, further confirming the retention value of the existing items. Regarding this study, although the reliability coefficient for SR (Secular Rationality) was slightly lower than that of other dimensions, it remained within a reasonable and acceptable range. This reflects the inherent complexity of value-orientation variables within a cross-cultural context.

Table 3.
Results of Reliability Analysis.

Items	CITC	Cronbach's Alpha if Item Deleted	Cronbach α
HDC1	0.696	0.891	0.903
HDC2	0.674	0.893	
HDC3	0.676	0.892	
HDC4	0.701	0.890	
HDC5	0.722	0.888	
HDC6	0.717	0.889	
HDC7	0.712	0.889	
HDC8	0.643	0.895	
PT1	0.627	0.879	0.889
PT2	0.704	0.87	
PT3	0.681	0.873	
PT4	0.673	0.874	
PT5	0.682	0.873	
PT6	0.698	0.871	
PT7	0.711	0.869	
SR1	0.49	0.694	0.737
SR2	0.483	0.697	
SR3	0.503	0.689	
SR4	0.548	0.672	
SR5	0.467	0.703	
SQ1	0.724	0.84	0.873
SQ2	0.677	0.851	
SQ3	0.716	0.842	
SQ4	0.712	0.843	
SQ5	0.668	0.853	

4.3. Validity Analysis

In this study, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were employed to evaluate the suitability of the measurement data for Exploratory Factor Analysis (EFA). The results indicate that the KMO sampling adequacy measure is 0.924, which is well above the excellent threshold of 0.8, suggesting a strong correlation between variables and that the sample data is highly suitable for factor analysis. Simultaneously, the approximate Chi-square value for Bartlett's Test of Sphericity is 5248.942 with 300 degrees of freedom, yielding a significance level (Sig.) of .000 ($p < 0.001$). This leads to the rejection of the null hypothesis that the measurement items are independent. These statistical results provide powerful evidence that the scale has a sound foundation for construct validity, indicating that the items covering healthcare delivery configuration, patient trust, perceived service quality, and secular rationality exhibit distinct structural clustering.

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Table 4.
Results of KMO and Bartlett's Test of Sphericity.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.924
Bartlett's Test of Sphericity	Approx. Chi-Square	5248.942
	df	300
	Sig.	0.000

4.4. Structural Equation Model (SEM)

4.4.1. Measurement Model

The chi-square-to-degrees-of-freedom ratio for the measurement model is 1.312, well below the 3 threshold, indicating an excellent fit between the model and the data. Furthermore, the GFI = .944, AGFI = .932, NFI = .934, IFI = .983, CFI = .983, and the TLI = .981 are all significantly higher than the standard requirement of 0.90. Additionally, the Root Mean Square Error of Approximation (RMSEA) is .026, which is far below the "excellent" threshold of 0.05. Collectively, these indices confirm a high degree of congruence between the theoretical model constructed in this study and the observed data.

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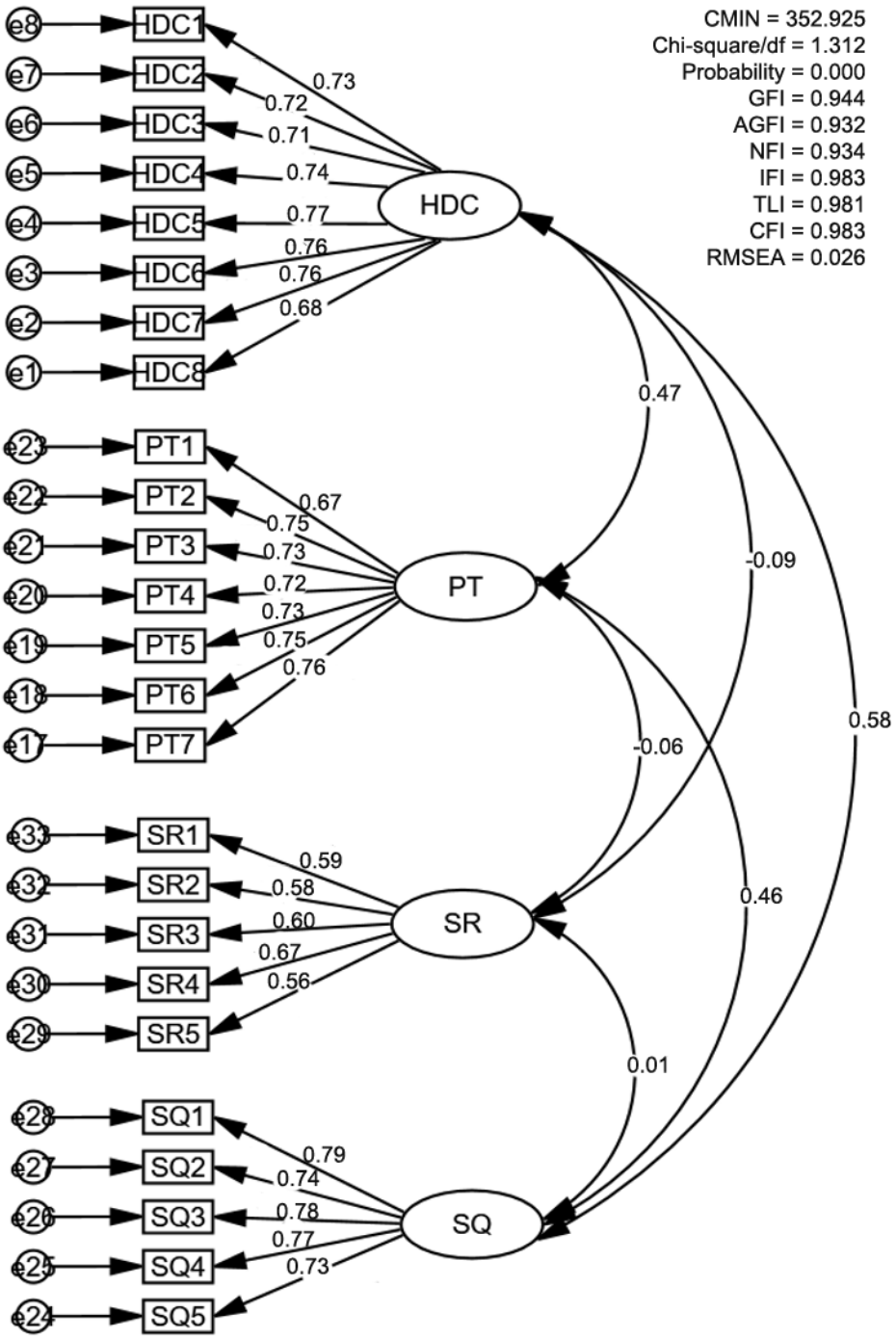

Figure 2.
Measurement Model.

The Composite Reliability (CR) for Healthcare Delivery Configuration (HDC), Perceived Service Quality (SQ), and Patient Trust (PT) ranges from 0.873 to 0.904, well exceeding the recommended threshold of 0.70. Furthermore, the Average Variance Extracted (AVE) for these constructs is consistently above 0.50, indicating excellent internal consistency and convergent validity.

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Vol. 10, No. 4: 672-689, 2026
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Regarding the Secular Rationality (SR) dimension, the AVE is 0.362, which is below the conventional threshold of 0.50. However, its Composite Reliability (CR) is 0.738. Its convergent validity remains acceptable for empirical research according to the logic proposed by Fornell and Larcker [30], which suggests that a construct's convergent validity is adequate if the CR is satisfactory even with a lower AVE. Additionally, all standardized factor loadings for the SR dimension range between 0.557 and 0.670 and are significant at the 0.001 level. Given the model's excellent overall fit, retaining this dimension is essential to maintaining the research framework's theoretical integrity.

Table 5.
Convergent Validity and Reliability.

Variables	Items	Standardized loading (λ)	AVE	CR
HDC	HDC1-HDC8	0.682~0.770	**0.542**	**0.904**
SQ	SQ1-SQ5	0.725~0.792	**0.579**	**0.873**
PT	PT1-PT7	0.675~0.757	**0.537**	**0.890**
SR	SR1-SR5	0.557~0.670	**0.362**	**0.738**

In terms of discriminant validity, the square roots of the AVEs for the four latent variables (HDC, SQ, PT, SR) are all greater than their correlations with other variables, indicating clear boundaries and strong independence among the measurement dimensions.

Table 6.
Discriminant validity analysis table.

Variable	HDC	SQ	PT	SR
HDC	**0.736**			
SQ	0.58	**0.761**		
PT	0.47	0.46	**0.733**	
SR	-0.09	0.01	-0.06	**0.602**

4.4.2. Structure Model

This study employed the Bootstrap resampling method for bias correction. The direct effect of medical service configuration on perceived service quality was significant (beta = 0.525, $p < 0.001$), and the 95% confidence interval did not include 0 [0.394, 0.657]. More importantly, the indirect effect through patient trust was also significant (beta = 0.131, $p < 0.001$), with a 95% confidence interval of [0.074, 0.198], confirming that patient trust partially mediated the relationship between medical service configuration and perceived service quality. The proportion of the indirect effect to the total effect (0.656) was approximately 20%. This result indicates that optimizing medical service configuration can not only directly enhance patients' quality evaluations but also generate incremental effects by strengthening patients' psychological trust, thereby establishing a more stable doctor-patient value co-creation relationship in the context of smart healthcare.

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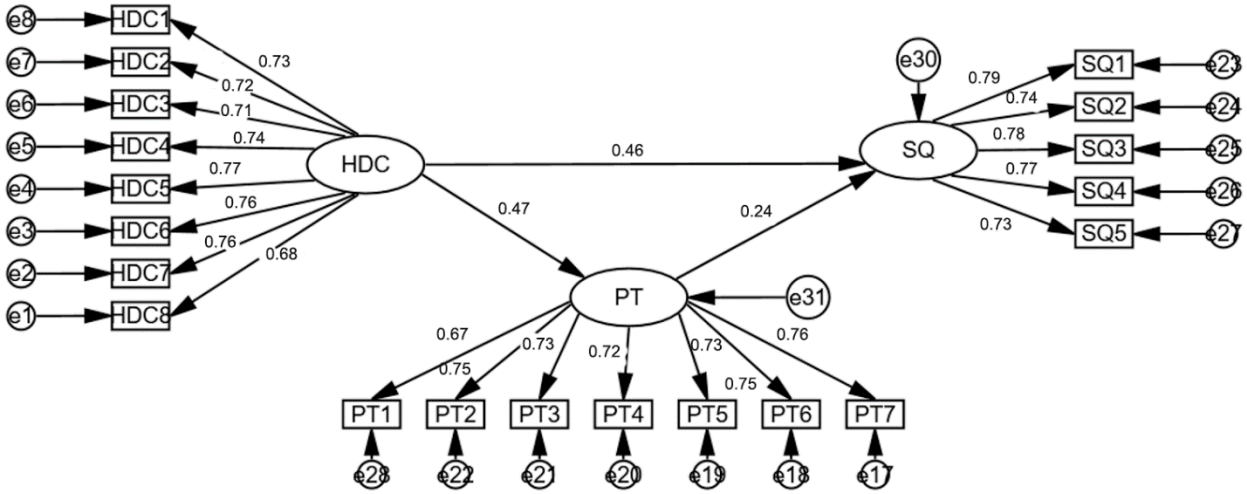

Figure 3.
Mediated Relationship Analysis.

Table 7.
Bootstrapping Results for Mediation Effects.

Effect Type	Beta (β)	Lower 95% CI	Upper 95% CI	P-value
Direct Effect	0.525	0.394	0.657	0.001
Indirect Effect	0.131	0.074	0.198	0.001
Total Effect	0.656	0.529	0.779	0.001

Figure 4 illustrates the structural model of the moderated mediation effect constructed in this study, along with its corresponding path coefficients. Within the context of smart healthcare, healthcare delivery configuration exerts a significant direct predictive effect on both patient trust (0.48) and perceived service quality (0.46).

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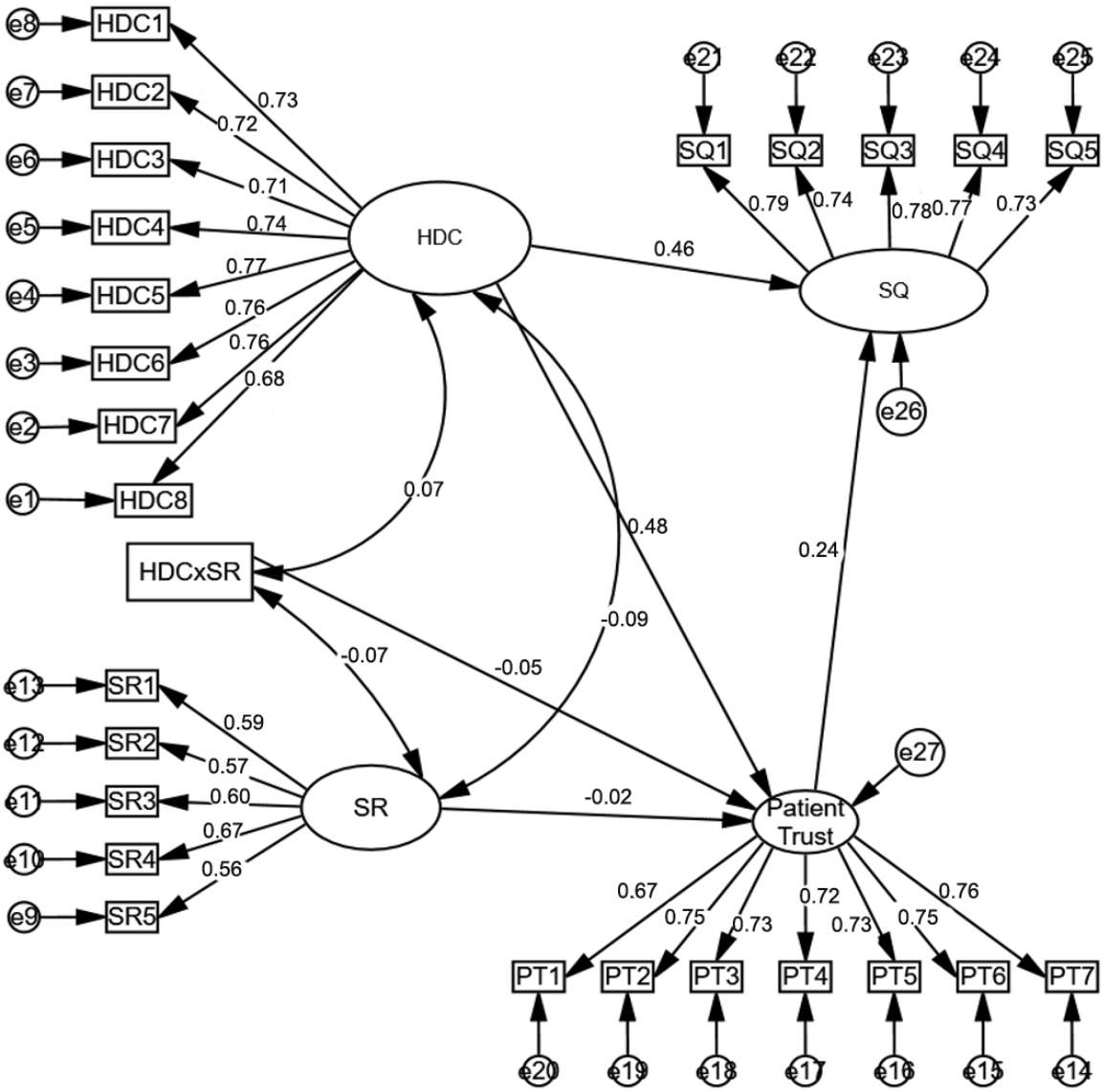

Figure 4.
Structural Equation Model of the Moderated Mediation Effect.

Among the absolute fit indices, CMMIN/df is 1.255 (less than 3), and RMSEA is 0.023 (far below the standard of 0.08), indicating that the deviation between the model and the actual observed data is extremely small. Meanwhile, GFI and AGFI are 0.944 and 0.933, respectively, both significantly higher than the threshold of 0.90. In terms of relative fit, IFI, TLI, and CFI all reached a high level above 0.98. These data strongly prove that the theoretical framework constructed in this study has a very high fit with the survey data of patients in Nanning City.

Edelweiss Applied Science and Technology
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Vol. 10, No. 4: 672-689, 2026
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Table 8.
Model Fit Indices for the Structural Equation Model.

Category	Index	Criterion	Value	Result
Absolute Fit	CMMIN/df	<3	1.255	Good
	GFI	>0.90	0.944	Good
	AGFI	>0.90	0.933	Good
	RMSEA	<0.08	0.023	Good
Incremental Fit	IFI	>0.90	0.985	Good
	TLI	>0.90	0.984	Good
	CFI	>0.90	0.985	Good

Healthcare delivery configuration exerts a significant positive driving effect on both patient trust (beta = 0.476, $p < 0.001$) and perceived service quality (beta = 0.463, $p < 0.001$), thereby patient trust demonstrates a significant positive influence on perceived service quality (beta = 0.243, $p < 0.001$), which provides preliminary support for the mediating role of trust. Notably, however, the interaction term (HDC*SR) does not have a significant impact on patient trust ($p = 0.256$), indicating that the moderating effect of secular rationality is not directly supported within the current sample. This finding suggests that in the medical context of Nanning, the construction of trust through service configuration may be highly universal, largely unaffected by individual rational orientations; alternatively, the moderating effect may occur in the second half of the mediation pathway.

Table 9.
Path Coefficients and Hypothesis Testing Results.

Path	Estimate	S.E.	C.R.	P	Result
Patient Trust ←Healthcare Delivery Configuration (H2)	0.476	0.071	8.481	***	Supported
Patient Trust ← Secular Rationality	-0.022	0.066	-0.427	0.670	Not Supported
Patient Trust ← HDC *SR (Interaction)	-0.051	0.054	-1.135	0.256	Not Supported
Perceived SQ ← Healthcare Delivery Configuration (H1)	0.463	0.079	7.952	***	Supported
Perceived SQ ← Patient Trust (H3)	0.243	0.057	4.603	***	Supported

Note: *** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$.

5. Discussion

This study investigates the complex interplay between healthcare delivery configuration, patient trust, and perceived service quality within the context of smart healthcare in Nanning. The empirical results reveal a significant dual-path mechanism: optimized medical resource configuration not only serves as a fundamental driver that directly enhances patients' perception of service quality but also functions indirectly by fostering a stronger sense of trust. The validation of this mediating role confirms that in the digital transformation of healthcare, hard infrastructure and soft psychological bonds are inextricably linked. When hospitals effectively deploy smart configurations, it sends a signal of competence and reliability to patients, which in turn elevates their overall evaluation of the service experience.

However, a critical finding of this research lies in the non-significance of the moderated mediation model, specifically the role of secular rationality. Contrary to theoretical expectations that individual cognitive orientations would shift the strength of trust formation, the data suggest that secular rationality does not act as a boundary condition in the relationship between configuration and trust. This lack of support for the moderating effect invites a deeper reexamination of patient behavior in the current medical landscape. One plausible explanation is the universal necessity of healthcare services; in a high-stakes environment like a tertiary hospital, the need for reliable medical delivery is so fundamental that it transcends individual philosophical or rational predispositions. Whether a patient leans toward traditional values or secular-rational logic, their trust remains primarily anchored in the tangible efficiency and accessibility of the healthcare configuration itself.

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Vol. 10, No. 4: 672-689, 2026
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Furthermore, the failure of the moderation hypothesis may reflect the dominant influence of the institutional environment in Nanning. In a system where tertiary hospitals represent the pinnacle of regional medical authority, the institutional trust generated by the hospital's status and its smart healthcare upgrades might be powerful enough to overshadow the nuances of individual cognitive traits. In this scenario, the transition from configuration to trust is a robust, direct process that does not deviate significantly across different segments of the population. This implies that, for healthcare administrators, the priority should remain the consistent optimization of smart delivery systems, as these improvements yield universal benefits in trust-building and quality perception, regardless of the diverse rational orientations of the patient base.

6. Conclusion

The findings indicate that healthcare delivery configuration exerts a significant direct driving effect on enhancing perceived service quality, while also generating an indirect impact through the mediating path of patient trust. Although the moderating effect of secular rationality within this mediating path was not empirically supported, the model as a whole underscores the central role of resource configuration in the construction of doctor-patient relationships. At the theoretical level, this study expands the evaluation framework for smart healthcare quality by integrating resource configuration with psychological trust, confirming the critical mediating value of patient trust within a technological environment. While the moderating effect of secular rationality was non-significant, this finding offers a new perspective on universal laws within the public healthcare sector. In high-demand medical services, efficient institutional configuration often transcends individual value differences to become the core foundation for building trust.

From a practical and managerial standpoint, the research clarifies the priorities for smart healthcare investment. The deep optimization of technical configuration and resource scheduling provides the physical foundation for increasing patient satisfaction; however, managers must translate these technical advantages into intrinsic trust through transparent, efficient service processes, thereby enhancing trust across the entire service cycle. It is recommended that hospitals implement an undifferentiated, high-quality service strategy, focusing on providing standardized, equalized intelligent resource guarantees to ensure fairness and accessibility, rather than over-segmentation based on different rational orientations. Limited by geographical scope and a singular perspective on the moderating path, the generalizability of this study's conclusions across the country requires further validation. Future research could deepen the exploration of moderating mechanisms. For instance, by examining whether secular rationality plays a role in the latter half of the mediating path (from trust to service quality), or by introducing digital literacy as a moderating variable to analyze its impact on the direct path. Furthermore, conducting longitudinal tracking studies across different time points would have significant academic value for observing the dynamic evolution of the logic underlying patient trust as smart healthcare becomes more prevalent.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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