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Factors Influencing Inpatient Satisfaction and Loyalty Based on the SERVQUAL Model: The Moderating Effect of Family and Friends' Recommendations

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Abstract

This study is based on the service quality model and the National Center for Medical Management Inpatient Satisfaction Questionnaire. The study surveyed 415 inpatients at a tertiary hospital from January to May 2024 to understand their perceived experience with medical service quality, satisfaction, loyalty and advice. Objective To explore the factors that affect their medical experience and loyalty, and provide a basis for improving hospital service quality. Methods: This study used the SERVQUAL model to classify patients' perspectives, and applied SPSS 26.0 and AMOS 24.0 for data analysis, including descriptive statistics, reliability and validity tests, correlation analysis, confirmatory factor analysis and structural equation modeling. The results showed significant correlations between service quality (tangibility, reliability, responsiveness, assurance, empathy), satisfaction and loyalty dimensions. Notably, the moderating effects of family and friend recommendations have a positive impact on the impact of service quality on both satisfaction and loyalty. Conclusion: Inpatient satisfaction and loyalty, as key indicators for measuring hospital performance evaluation and service quality, have received increasing attention. This study aims to conduct an in-depth analysis of the intrinsic link between inpatient satisfaction and loyalty, and innovatively considers recommendations from family and friends as a moderating variable, in order to reveal its unique role in the influencing path.The effectiveness of the service quality gap model in analyzing inpatient satisfaction is highlighted, and the importance of increasing the tangibility and reliability of healthcare facilities to improve patient experience is highlighted. In addition, the study recommends strengthening nurse-patient communication, optimizing medical procedures, and reducing waiting times to further improve patient satisfaction and loyalty.

Keywords: Inpatients; SERVQUAL model; satisfaction; loyalty

Introduction

Enhancing healthcare service capabilities is a key initiative for promoting the development of a Healthy China and advancing the high-quality growth of the healthcare service industry, significantly improving the public's healthcare experience and sense of well-being. In recent years, this area has been a focal point of government attention. Patient satisfaction, as the "gold standard" of modern hospital quality management, directly reflects the overall quality and effectiveness of healthcare services and hospital management. According to policy documents such as the Action Plan for Further Improving Medical Services (2018-2019) and Key Work Plan for Further Improving Medical Services, enhancing healthcare service capabilities, promoting high-quality development of the health industry, and ensuring public health have become essential goals in health work (NHFPC, 2017).

Patient satisfaction is a relatively subjective indicator for measuring healthcare services. Although it helps hospitals understand which services are recognized by patients and which areas need improvement, it lacks specific and actionable measures for improvement in medical management. In contrast, patient experience, as a standard for evaluating healthcare service quality, not only has objectivity and quantifiability but can also trace the deficiencies in the healthcare service process, allowing for a more accurate grasp of patients' actual needs (Berry, 1988). Therefore, evaluating healthcare services from the perspective of patient experience is of great significance for improving the quality of healthcare services and optimizing the medical management mechanism in China.

According to data released by the National Health Commission's Statistical Information Center, from January to November 2021, the number of discharged patients from medical and health institutions nationwide reached 2.22 billion (NHC, 2021). The large number of inpatients has created an urgent need to explore the relationships between patient experience, satisfaction, loyalty, and recommendation rates, to enhance healthcare service quality and management efficiency. Hence, this study, based on the service quality model, scientifically quantifies inpatients' experiences and analyzes their associations with satisfaction, loyalty, and family and friends' recommendations, with the aim of providing data support and decision-making references for the high-quality development of hospital services.

Research Motivation

Patient satisfaction is an outcome-based indicator of patient perception, reflecting their overall evaluation of healthcare services. As it encompasses multiple aspects, the determinants of patient satisfaction include not only the quality of medical services but also multi-dimensional factors such as patient demographics (Andaleeb, 2001). Due to its complexity and broad scope, both domestic and international scholars have conducted extensive research on patient satisfaction and established validated scales and key dimensions through empirical studies (Otani

et al., 2012). These studies provide a theoretical foundation for analyzing patient satisfaction and help hospitals identify specific areas in need of improvement.

At the same time, the concept of loyalty has been introduced into healthcare management and is increasingly recognized by healthcare providers. Research shows that medical institutions focusing on patient loyalty can reap multiple benefits, such as reducing patient attrition, lowering the cost of acquiring new patients, and enhancing hospital brand image (Zeithaml et al., 1996). Loyal patients are more likely to adhere to medical advice, improving the effectiveness of healthcare services and overall health outcomes (Choi et al., 2004). Therefore, this study integrates satisfaction and loyalty, specifically examining how recommendations from friends and family moderate the relationship between these two factors, aiming to provide valuable insights for hospital management practices.

Research Objectives

Given the differences between China's healthcare system and those in Western countries, inpatient treatment at large general hospitals remains the main avenue for medical care for most patients (Cui et al., 2020). Experiences and perceptions during hospitalization often directly influence patients' overall satisfaction with the hospital, and further affect the hospital's reputation through word-of-mouth. So far, domestic research on inpatient satisfaction has primarily focused on measuring and analyzing the satisfaction of discharged patients. However, due to the relatively short length of hospital stays, it is challenging to establish systematic sampling points for surveys. Additionally, localizing satisfaction scales from large international general hospitals poses certain challenges due to national differences.

Therefore, this study focuses on the evaluation of inpatient satisfaction in large general hospitals, aiming to provide a scientific method for modeling patient satisfaction. The specific research goals are as follows: Based on domestic and international theories and evaluation methods of customer and patient satisfaction, this study aims to refine and optimize satisfaction evaluation tools and indicators, and innovate evaluation methods for patient satisfaction in large general hospitals (Hu et al., 2020). By constructing a patient satisfaction index model, this research aspires to establish a more scientific and reasonable patient satisfaction evaluation system for large general hospitals, providing specific references for improving service quality and formulating development strategies.

Research Significance

The main significance of this study lies in using the SERVQUAL model to analyze areas for improving healthcare service quality, and through a survey of inpatient satisfaction, gaining a deep understanding of their healthcare experience and satisfaction, ultimately providing decision-making support for improving healthcare service quality. Additionally, this study presents several innovative points:

- Innovative research subjects: The study focuses on the satisfaction evaluation of inpatients in large general hospitals, filling a gap in domestic research on this subject.
- Innovative research variables: The study introduces recommendations from friends and family as a moderating variable, exploring its impact on satisfaction and loyalty.
- Innovative research methods: Structural equation modeling (SEM) is used for data analysis, providing more precise statistical inference results.
- Innovative research perspective: The study explores the formation mechanism of satisfaction from the interaction between service quality and word-of-mouth recommendations, offering new ideas for hospital management.

Literature Review

SERVQUAL Model

SERVQUAL, short for "Service Quality," was first proposed by American marketing scholars Parasuraman, Zeithaml, and Berry（Berry, 1988) in 1988 to measure service quality in the service industry (Parasuraman et al., 1988). The model divides service quality into five key dimensions: tangibility, reliability, responsiveness, assurance, and empathy (Zeithaml et al., 1996). The SERVQUAL model is based on the expectation-perception gap theory, which states that service quality depends on the difference between customer expectations and their actual perceptions (Grönroos, 1984). The formula is: SERVQUAL score = perception score - expectation score (Oliver, 1980). This model employs 22 specific evaluation items to quantify customers' expectations and actual experiences, using surveys to assess service quality (Cronin Jr & Taylor, 1992). SERVQUAL has been widely applied in various service industries, especially in healthcare, where it provides robust theoretical support for improving hospital service quality (Babakus & Mangold, 1992).

Patient Loyalty

The concept of patient loyalty originates from customer loyalty theories in business management, referring to a customer's preference for a particular brand or company and their repeat purchase behavior (Dick & Basu, 1994). When applied to healthcare management, patient loyalty is defined as patients' positive attitudes toward a specific medical institution and their willingness to choose that institution for future treatments (Gremler & Brown, 1999). Patient loyalty can be divided into attitudinal loyalty, which refers to the patient's sense of affiliation with the hospital, and behavioral loyalty, which refers to the patient's actual repeat usage of hospital services (Bloemer & De Ruyter, 1998). As a key indicator of healthcare service quality, loyalty is directly related to maintaining patient relationships and the sustainable development of medical institutions (Nesset & Helgesen, 2009).

Patient Satisfaction

Patient satisfaction is an indispensable indicator in evaluating healthcare service quality, reflecting the degree to which a patient's needs align with their actual healthcare experience (Press & Irwin,2003). With the widespread adoption of "patient-centered" healthcare service concepts, patient satisfaction has become a core factor in assessing healthcare institutions' service quality (Otani et al., 2009). Satisfaction not only represents patients' subjective evaluations of the quality of care but also reflects the actual improvement in health outcomes as a result of healthcare services (Andaleeb, 2001). Research shows that patient satisfaction is closely related to the quality of healthcare services, and many countries have made it a key indicator for controlling healthcare service quality, integrating it into performance evaluation systems for medical institutions (Bleich et al., 2009).

Research Methodology

This study employs surveys and empirical research as its primary methods. Based on a literature review, key variables were identified, and a questionnaire was designed around five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. This questionnaire serves as the foundation for constructing the research model, laying an important groundwork for drawing conclusions and guiding future research directions.

Research Framework

The theoretical framework of this study is based on a literature review that explores the relationships between service quality, recommendations, satisfaction, and loyalty. Synthesizing existing literature, the study examines the mechanisms of these relationships, their formation, development, and mutual influence. Specifically, the study proposes five hypotheses. The following figure illustrates the model:

Questionnaire Design

The questionnaire design follows four steps: exploratory research, drafting the initial version, testing, and finalizing. Based on the literature review, an initial version of the questionnaire was developed, covering five main tables corresponding to the five dimensions of service quality: tangibility, reliability, responsiveness, assurance, and empathy. It also extended to questions related to loyalty, word-of-mouth recommendations, and service satisfaction. Each question was rated on a 5-point Likert scale, ranging from "very dissatisfied" to "very satisfied."

The questionnaire design was based on the SERVQUAL model, with specific questions derived from the inpatient satisfaction survey published by the National Medical Management Center. The questionnaire was distributed via platforms such as WeChat, email, and Questionnaire Star, collecting a total of 415 valid responses.

Sampling Plan

The sample for this study was selected from patients hospitalized in the study hospital,from January 2024 to May 2024,covering major departments such as nephrology, gastroenterology, cardiology, and neurology. The sample selection criteria were as follows: (1) age over 18 years; (2) no intellectual or mental disability; (3) informed consent and voluntary participation. A total of 415 valid questionnaires were collected, meeting the sample size recommendations proposed by DeVellis for questionnaire testing(DeVellis & Thorpe, 2021).

Data Analysis Methods

After data collection, SPSS 26.0 and AMOS 24.0 will be used for data analysis. Data processing will mainly include descriptive statistics, reliability and validity analysis, correlation analysis, confirmatory factor analysis (CFA), and structural equation modeling (SEM) analysis.

Research Hypotheses

Based on the research framework, this study proposes the following hypotheses:

- H1: Service quality has a significant positive impact on satisfaction.
- H2: Service quality has a significant positive impact on recommendation.
- H3: Recommendation has a significant positive impact on satisfaction.
- H4: Satisfaction has a significant positive impact on loyalty.
- H5: Recommendation mediates the relationship between service quality and satisfaction.

Research Results

Reliability Analysis

Reliability analysis was conducted to evaluate the internal consistency of the questionnaire items. Cronbach's alpha was used as the main reliability measure. According to Nunnally (1978), a Cronbach's alpha value greater than 0.7 indicates acceptable reliability, while a value above 0.8 suggests good reliability. In this study, the reliability of each construct, including service quality, recommendation, satisfaction, and loyalty, was tested.

The results of the reliability analysis for each dimension are as follows:

- Tangibility: The Cronbach's alpha for the tangibility dimension is 0.886, indicating good reliability.
- Reliability: The Cronbach's alpha for the reliability dimension is 0.954, indicating good reliability.
- Responsiveness: The Cronbach's alpha for the responsiveness dimension is 0.944, indicating acceptable reliability.
- Assurance: The Cronbach's alpha for the assurance dimension is 0.964, indicating good reliability.
- Empathy: The Cronbach's alpha for the empathy dimension is 0.98, indicating good

reliability.

Overall, all dimensions exceeded the minimum threshold for Cronbach's alpha.

Table 1 Cronbach's Reliability Analysis - Simplified Format

□	Size	Item	Cronbach alpha coeff.
□	Tangibility	4	0.886
□	Reliability	3	0.954
□	Responsiveness	3	0.944
□	Assurance	5	0.964
□	Empathy	7	0.98
□	Willingness to Revisit	3	0.975
□	Word-of-Mouth	3	0.979
□	Loyalty Behavior	3	0.985
□	Waiting Time	3	0.979
□	Medical Communication	3	0.974
□	Treatment Outcomes	3	0.98
□	Social Media	3	0.958
□	Recommendations from Friends and Family	3	0.978
□	Online Reviews	3	0.979
□	Professional Recommendations	3	0.983
□	Media Reports	3	0.98
□	Size	3	0.982

1.Reliability Analysis

Reliability analysis, also known as consistency analysis, tests the stability, consistency, and reliability of measurement results. To ensure the accuracy of the measurement results, it is necessary to analyze the valid data in the questionnaire before conducting the analysis. Currently, Cronbach's alpha coefficient is commonly used for analysis in social science research. Generally speaking, if the reliability coefficient is above 0.9, it indicates excellent reliability; if it is between 0.8 and 0.9, it indicates very good reliability; if it is between 0.7 and 0.8, it indicates good reliability; if it is between 0.6 and 0.7, it indicates acceptable reliability; and if it is below 0.6, it suggests that modifications are needed.

From the table above, we can see that the reliability coefficient values are all above 0.8, which means that the reliability quality of the research data is very good.

2.Validity Analysis

KMO and Bartlett's Test

Table 2 Bartlett's Test of Sphericity

KMO value		0.974
Bartlett's Test of Sphericity	□ Approximate Chi-Square	51126.056
	□ DF Series (Degrees of Freedom Series)	1653
	□ p-value	0

Validity refers to the extent to which psychological and behavioral characteristics measured can be accurately assessed through tests or measurement tools, i.e., the accuracy and reliability of the test results. Generally, the smaller the significance level of Bartlett's Test of Sphericity ($p<0.05$), the greater the likelihood that there are meaningful relationships between the original variables. The KMO value is used to compare the simple correlations and partial correlations between items, and it ranges between 0 and 1. The standards for suitability of factor analysis are: greater than 0.9, very suitable; 0.7-0.9, acceptable; 0.6-0.7, fairly suitable; 0.5-0.6, not very suitable; below 0.5, to be discarded. Bartlett's Test of Sphericity value is used to test whether the correlations between items are significant. If the significance is less than 0.05, it indicates that each item is suitable for factor analysis.

From the table above, we can see that the KMO value is 0.974, which is greater than 0.8. The research data is very suitable for information extraction (indirectly reflecting good validity).

Confirmatory Factor Analysis

Table 3 Model Fit Indices

□ Common Indicators	Chi-Square to Degrees of Freedom Ratio $\chi 2 / df$	GFI	RMSEA	RMR	CFI	Non-Financial Index	TLI
□ Criteria for Judgement	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
□ Value	4.910	0.635	0.097	0.010	0.890	0.867	0.876

Most model fit indices did not meet the standards, indicating poor model fit.

Table 4 Factor Load Table

Question			Estimte	S.E.	C.R.	P	STD
Q1_Row1	<---	□ Tangibility	1				0.76
Q1_Row2	<---	□ Reliability	1.27	0.069	18.441	***	0.866
Q1_Row3	<---	□ Responsiveness	1.437	0.079	18.23	***	0.857
Q1_Row4	<---	□ Assurance	1.533	0.09	17.013	***	0.806
Q2_Row1	<---	□ Empathy	1				0.929
Q2_Row2	<---	□Willingness to Revisit	1.111	0.027	40.987	***	0.967
Q2_Row3	<---	□ Word-of-Mouth	1.202	0.034	34.869	***	0.926
Q3_Row1	<---	□ Loyalty Behavior	1				0.893
Q3_Row2	<---	□ Waiting Time	1.2	0.037	32.872	***	0.95
Q3_Row3	<---	□Medical Communication	1.329	0.042	31.994	***	0.941
Q4_Row1	<---	□Treatment Outcomes	1				0.854
Q4_Row2	<---	□Professional Recommendations	1.056	0.04	26.663	***	0.915
Q4_Row3	<---	□ Social Media	1.057	0.038	28.173	***	0.939
Q4_Row4	<---	□Recommendations from Friends and Family	1.063	0.037	28.413	***	0.942
Q4_Row5	<---	□ Online Reviews	1.1	0.039	28.239	***	0.94
Q5_Row1	<---	□ Media Reports	1				0.921
Q5_Row2	<---	□ Tangibility	0.979	0.027	36.528	***	0.943
Q5_Row3	<---	□ Reliability	1.018	0.028	36.653	***	0.944
Q5_Row4	<---	□ Responsiveness	1.052	0.029	36.892	***	0.945
Q5_Row5	<---	□ Assurance	1.008	0.026	38.053	***	0.953
Q5_Row6	<---	□ Empathy	1.017	0.026	38.665	***	0.957
Q5_Row7	<---	Willingness to Revisit	1.077	0.035	30.577	***	0.892
Q6_Row1	<---	□ Word-of-Mouth	1				0.958
Q6_Row2	<---	□ Loyalty Behavior	0.96	0.02	49.102	***	0.964
Q6_Row3	<---	□ Waiting Time	0.994	0.019	51.073	***	0.97

Q7_Row1	<---	□Medical Communication	1				0.975
Q7_Row2	<---	□Treatment Outcomes	1.012	0.017	59.956	***	0.971
Q7_Row3	<---	□Professional Recommendations	1.004	0.018	56.034	***	0.964
Q8_Row1	<---	□ Social media	1				0.979
Q8_Row2	<---	Recommendations from Friends and Family	0.996	0.016	62.959	***	0.972
Q8_Row3	<---	□ Online Reviews	1.043	0.015	70.163	***	0.982
Q9_Row1	<---	□ Media Reports	1				0.968
Q9_Row2	<---	□ Tangibility	1.025	0.016	62.639	***	0.984
Q9_Row3	<--	□ Reliability	0.919	0.018	52.173	***	0.962
Q10_Row1	<---	□ Responsiveness	1				0.969
Q10_Row2	<---	□ Assurance	1.024	0.017	59.167	***	0.977
Q10_Row3	<---	□ Empathy	1.029	0.022	46.9	***	0.946
Q11_Row1	<---	Willingness to Revisit	1				0.964
Q11_Row2	<---	□ Word-of-Mouth	1.021	0.018	55.33	***	0.973
Q11_Row3	<---	□ Loyalty Behavior	1.001	0.018	56.018	***	0.975
Q12_Row1	<---	□ Waiting Time	1				0.947
Q12_Row2	<---	□Medical Communication	1.003	0.027	37.697	***	0.924
Q12_Row3	<---	□Treatment Outcomes	1.064	0.025	42.122	***	0.948
Q13_Row1	<---	□ Online Reviews	1				0.959
Q13_Row2	<---	□ Media Reports	0.997	0.018	54.708	***	0.977
Q13_Row3	<---	□ Tangibility	0.995	0.019	52.011	***	0.971
Q14_Row1	<---	□ Reliability	1				0.962
Q14_Row2	<---	□ Responsiveness	0.987	0.019	51.523	***	0.965
Q14_Row3	<---	□ Assurance	1.047	0.018	58.939	***	0.982
Q15_Row1	<---	□ Empathy	1				0.971
Q15_Row2	<---	Willingness to Revisit	1.009	0.017	60.408	***	0.976

Q15_Row3	<---	□ Word-of-Mouth	0.987	0.016	63.374	***	0.981
Q16_Row1	<---	□Professional Recommendations	1				0.961
Q16_Row2	<---	□ Social media	1.014	0.019	54.518	***	0.974
Q16_Row3	<---	□Recommenda-tions from Friends and Family	1.009	0.018	54.778	***	0.975
Q17_Row1	<---	□ Loyalty Behav-ior	1				0.973
Q17_Row2	<---	□ Waiting Time	1.037	0.016	63.195	***	0.978
Q17_Row3	<---	□Medical Com-munication	1.024	0.017	58.7	***	0.971

"Regarding measurement relationships: For each measurement relationship, the absolute value of the standardized factor loadings is greater than 0.6 and significant, indicating a good measurement relationship."

Table 5 Convergent validity

	CR	AVE
□ Tangibility	0.894	0.678
□ Reliability	0.959	0.885
□ Responsiveness	0.949	0.862
□ Assurance	0.964	0.844
□ Empathy	0.98	0.877
□ Willingness to Revisit	0.975	0.929
□ Word-of-Mouth	0.98	0.941
□ Loyalty Behavior	0.985	0.956
□ Waiting Time	0.981	0.944
□ Medical Communication	0.975	0.929
□ Treatment Outcomes	0.98	0.942
□ Professional Recommendations	0.958	0.883
□ Social Media	0.98	0.941
□ Recommendations from Friends and Family	0.979	0.939
□ Online Reviews	0.98	0.941
□ Media Reports	0.984	0.952
□ Tangibility	0.982	0.949

"All AVE values are greater than 0.5, and all CR values are above 0.7, which means that the data analyzed has good convergent validity."

The bold numbers in the table represent the square roots of AVE. For certain factors, the square root of AVE is smaller than the largest absolute value of the correlation coefficients between factors, indicating that their discriminant validity is poor.

Descriptive Statistics

Table 6 Frequency analysis results

Name	Options	Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	202	48.675	48.675
	Female	213	51.325	100
Age	Under 20 years old	5	1.205	1.205
	20-29 years old	34	8.193	9.398
	30-39 years old	67	16.145	25.542
	40-49 years old	97	23.373	48.916
	50-59 years old	105	25.301	74.217
	60 years old and above	107	25.783	100
Education	Middle School or Below	142	34.217	34.217
	High School or Vocational School	112	26.988	61.205
	Bachelor's or Associate's Degree	147	35.422	96.627
	Graduate Degree	14	3.373	100
Payment method for medical treatment	Personal Payment	34	8.193	8.193
	Provincial Health Insurance	110	26.506	34.699
	Urban Medical Insurance	127	30.602	65.301
	New Rural Cooperative Medical Scheme	144	34.699	100
	Total	415	100	100

From the table, we can see that 51.33% of the sample chose "female," while 48.67% of the sample were male. 25.78% of the sample were "over 60 years old." The proportion with "undergraduate or junior college education" was 35.42%, and 34.22% of the sample had "middle school education or below." The percentage of the sample that chose "New Rural Cooperative Medical Scheme" was 34.70%, and 30.60% of the sample were from city hospitals.

Correlation Analysis we can observe that correlation analysis was conducted to examine the relationships among 16 items, including tangibility and reliability, responsiveness, assurance, empathy, willingness to revisit, word-of-mouth promotion, loyalty behavior, waiting time, medical communication, treatment outcomes, word-of-mouth transmission, social media, recommendations from friends and family, online reviews, professional recommendations, and media reports. The Pearson correlation coefficient was used to represent the strength of the correlations. The specific analysis shows that:

Tangibility and reliability, responsiveness, assurance, empathy, willingness to revisit, word-of-mouth promotion, loyalty behavior, waiting time, medical communication, treatment outcomes, word-of-mouth transmission, social media, recommendations from friends and family, online reviews, professional recommendations, and media reports—all 16 items—exhibited significant correlations. The correlation coefficient values were 0.664, 0.699, 0.734, 0.682, 0.721, 0.706, 0.720, 0.710, 0.742, 0.717, 0.719, 0.723, 0.707, 0.729, 0.711, and 0.723, respectively. All correlation coefficients were greater than 0, indicating a positive correlation between the 16 items, such as tangibility and reliability, responsiveness, assurance, empathy, willingness to revisit, word-of-mouth promotion, loyalty behavior, waiting time, medical communication, treatment outcomes, word-of-mouth transmission, social media, recommendations from friends and family, online reviews, professional recommendations, and media reports.

Structural Equation Modeling (SEM) Analysis

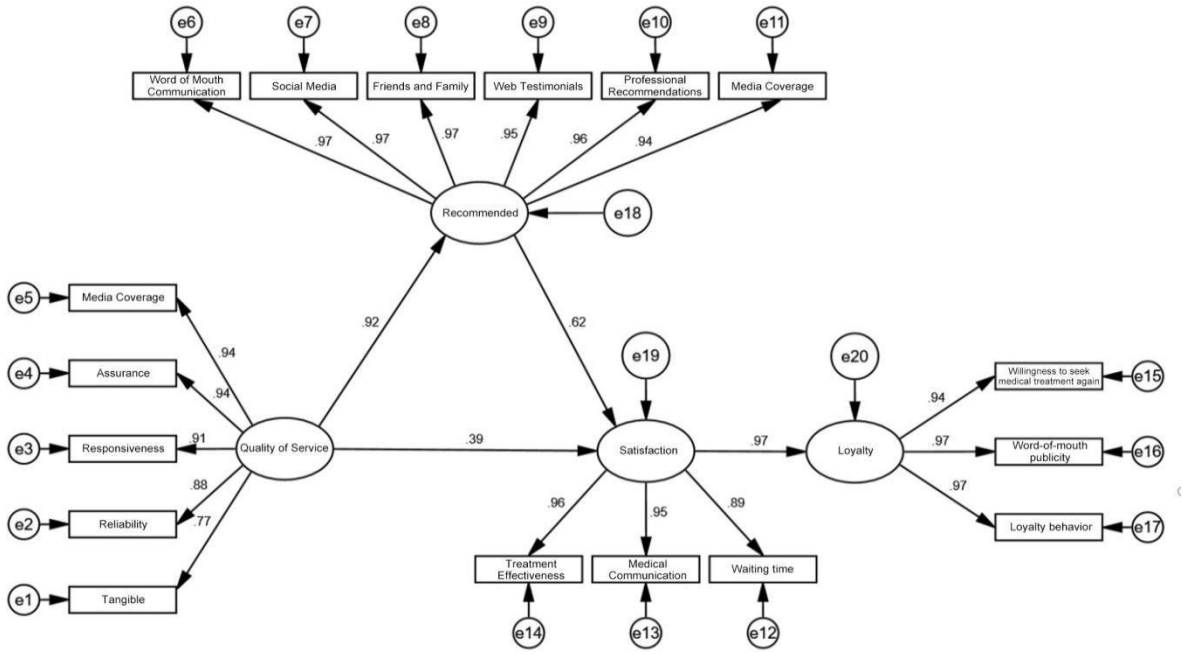

Figure 1 Structural Equation Modeling (SEM) Analysis

Table 8 Model Fit Indices

□ Common Indicators	Chi-Square to Degrees of Freedom Ratio $\chi 2 / df$	GFI	RMSEA	RMR	CFI	NFI	TLI
□ Criteria for Judgment	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
□ Value	5.203	0.853	0.101	0.010	0.963	0.955	0.956

Most model fit indices meet the standards, indicating that the model has good fit.

Table 9 Path Analysis

		PATH	Estimate	S.E.	C.R.	P	STD Estimate
□Recommendation	<---	□ Service Quality	1.059	0.052	20.486	***	0.921
□ Satisfaction	<---	□Recommendation	0.683	0.038	17.928	***	0.623
□ Satisfaction	<---	□Service Quality	0.497	0.045	10.96	***	0.394
Loyalty	<---	□ Satisfaction	0.831	0.028	29.788	***	0.965

When service quality affects recommendation, the standardized path coefficient is 0.921 (>0), and this path is significant (z=20.486, p<0.05), indicating that service quality has a significant positive effect on recommendation.

When discussing the effect of recommendation on satisfaction, the standardized path coefficient is 0.623 (>0), and this path is significant (z=17.928, p<0.05), which means that recommendation has a significant positive effect on satisfaction.

When service quality affects satisfaction, the standardized path coefficient is 0.394 (>0), and this path is significant (z=10.96, p<0.05), meaning that service quality has a significant positive effect on satisfaction.

When satisfaction affects loyalty, the standardized path coefficient is 0.965 (>0), and this path is significant (z=29.788, p<0.05), indicating that satisfaction has a significant positive effect on loyalty.

7.Mediating Effect

Table 10 Mediating Effect

Effect Type	Parameter	Estimate	Lower	Upper	P
Total Effect	Service Quality → Satisfaction	1.221	1.097	1.37	0.000
Indirect Effect	Service Quality → Recommendation → Satisfaction	0.723	0.575	0.866	0.001
Direct Effect	Service Quality → Satisfaction	0.497	0.368	0.665	0.000

Discussion Research

The results of this study show that there is a significant positive correlation between inpatient satisfaction and loyalty, and the impact of service quality on patient satisfaction is of great significance. Through the study of path analysis, it is found that factors such as service quality, family and friend recommendations, and patient expectations have a significant effect

on the satisfaction of inpatients. Among them, service quality is considered to be the core factor affecting patient satisfaction, and the recommendation of family and friends plays a key role in patients' choice of hospital, which further verifies the importance of word-of-mouth effect in the field of medical services.

The study found that service quality had a significant positive impact on recommendation behavior, patient satisfaction and loyalty, which was consistent with existing related studies. The patient's medical experience is directly related to the quality of the hospital's service, and the high-quality service provided by the hospital can effectively improve patient satisfaction, thereby enhancing the loyalty of patients to the hospital. Despite the high level of patient satisfaction, the study also revealed low patient loyalty, which may reflect the high demand that patients place on hospital services during the actual treatment process, and patients may still choose to change hospitals due to their low dependence on other hospitals despite the quality of hospital services that meet these expectations.

In the analysis of loyalty, this study highlights the direct impact of patient satisfaction on loyalty. Through path analysis, we see that patient satisfaction plays a decisive role in the improvement of their loyalty. While improving patient satisfaction, hospitals should further strengthen the emotional connection between patients and hospitals, so that they can prioritize the hospitals they are familiar with in future medical treatment choices.

Improving the quality of service, valuing patient expectations, capitalizing on the referral effect of family and friends, and effectively managing patient satisfaction will be key to improving patient loyalty in hospitals. Based on the findings of this study, hospitals should further optimize the service process and environment to improve the overall medical experience of patients, so as to promote long-term patient loyalty and sustainable development of hospitals.

Conclusion

The results of this study indicate that tangibility is positively correlated with all dimensions of service quality and patient loyalty behavior. Specifically, there is a significant positive correlation between tangibility and 16 variables: reliability, responsiveness, assurance, empathy, willingness to revisit, word-of-mouth promotion, loyalty behavior, waiting time, medical communication, treatment outcomes, word-of-mouth transmission, social media, recommendations from friends and family, online reviews, professional recommendations, and media reports. Furthermore, the positive impact of service quality on recommendation is significant, and recommendation also shows a significant positive effect on satisfaction. The study results demonstrate that service quality has a significant positive impact on satisfaction, and satisfaction has a similarly significant impact on loyalty.

Suggestions

Based on the research findings, hospitals should design service processes with a patient-centered approach, adhering to the principle of "patient-first, sincere care." Efforts should be made to reduce or integrate unnecessary outpatient or inpatient procedures to shorten and save time for necessary processes, thus improving the timeliness and effectiveness of medical services. With the enhancement of modern living standards, patients and their families have increasingly high expectations for hospital environments and logistical services, making the impact of hospital environment and logistical services on patient satisfaction more significant than ever. Based on the survey results, it is recommended that hospitals invest more in hospital environment and logistical infrastructure, appoint dedicated personnel for area cleaning to ensure a clean treatment environment. Additionally, supervision and inspection of daily cleaning in key areas such as restrooms and elevators should be strengthened, dining quality in cafeterias should be improved, and personalized services should be provided based on patients' specific situations. Introducing information technology to offer convenient ordering services, enhancing observation of patient conditions, providing timely health education, maintaining good communication with patients' families, and adjusting educational plans as needed will contribute to offering more suitable nursing services. Healthcare personnel should learn to communicate effectively with patients using language that patients can understand and possess effective listening skills. Understanding patients' important concerns and patiently answering questions will make patients feel that their needs are valued, which is the foundation for establishing good communication.

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