

Impact of Dental Hospital Brand Building Strategies on Patient Satisfaction in Chengdu, China

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Abstract:

This study examines how dental hospital brand-building dimensions are associated with patient satisfaction in Chengdu, China. Based on 420 valid questionnaire responses collected between July and September 2025, the study analyzes six dimensions: hospital service level, service attitude, medical technology, medical nursing service, hospital culture, and brand image. The results show that hospital service level and brand image are significant positive predictors of patient satisfaction, while medical nursing service shows a significant negative association. Medical technology is not significant. Gender differences in patient satisfaction are not significant, whereas educational background differences are significant. The findings suggest that dental hospitals should improve service processes, communication, and brand consistency to strengthen patient satisfaction.

Keywords:

Dental Hospital, Brand Building, Patient Satisfaction, Chengdu, Service Quality

1. Introduction

China's healthcare market has become increasingly competitive, and hospitals are under growing pressure to improve service quality and strengthen their brand presence. In this context, dental hospitals compete not only through clinical capability but also through service experience, reputation, and organizational image [16,18,4].

Patient satisfaction is one of the most direct ways to evaluate hospital service performance. Satisfaction reflects the gap between expectations and perceived performance, and thus captures both service quality and perceived value [1,11,10,15]. In dental care, satisfaction is especially important because patients often evaluate the hospital through visible and experiential cues rather than through direct professional judgment of technical quality.

Brand building matters in hospital management because it connects organizational identity, service delivery, and public recognition. For dental hospitals, this connection is particularly salient. Patients are sensitive to waiting time, communication style, interpersonal attitude, treatment reassurance, environmental atmosphere, and reputation. These elements shape not only whether patients are satisfied after treatment, but also whether they perceive the institution as trustworthy before treatment begins.

Against this background, this study examines six dimensions of hospital brand building: hospital service level, service attitude, medical technology, medical nursing service, hospital culture, and brand image. The study examines how these dimensions are associated with patient satisfaction in Chengdu and whether patient satisfaction differs across gender and educational groups.

This research context also reflects the broader transformation of the Chinese medical market. As living standards improve and public expectations of health services rise, hospitals face not only stronger competition but also more demanding evaluations from patients. The growth of private medical institutions, the restructuring of public and private healthcare resources, and the increasing visibility of patient choice all make hospital brand building a strategic management issue rather than a purely promotional one [16,4].

Within this broader setting, dental hospitals occupy a distinctive position. Compared with some other medical specialties, dental services are more directly subject to patient choice, repeated visits, treatment anxiety, and comparison across providers. Patients do not judge dental hospitals only by technical outcomes. They also respond to convenience, communication, atmosphere, perceived professionalism, and overall confidence in the institution. Patient satisfaction surveys can therefore serve as a practical way to diagnose service problems, understand the effects of service methods, and improve both work efficiency and institutional performance.

The purpose of the study is therefore not only to identify which dimensions are statistically related to patient satisfaction, but also to clarify how hospital brand building can be translated into actionable service improvement in Chengdu. In this respect, the study has both theoretical and practical significance: theoretically, it combines customer satisfaction theory and continuous quality improvement in a dental hospital context; practically, it seeks to provide a reference for improving brand-building strategies and patient experience in dental hospitals.

2. Literature Review and Analytical Framework

2.1. Customer Satisfaction and Continuous Improvement

Customer satisfaction theory treats satisfaction as an evaluation formed after comparing prior expectations with perceived performance [1,11]. In healthcare settings, satisfaction is shaped not only by treatment outcomes but also by communication, process convenience, environmental conditions, and trust [10]. This makes patient satisfaction a multidimensional judgment rather than a narrow reaction to clinical results alone.

Continuous quality improvement emphasizes ongoing service optimization based on user needs and process performance. Applied to hospitals, it supports the idea that patient satisfaction should be improved through systematic service redesign rather than through publicity alone [3]. In other words, if dissatisfaction is rooted in waiting, communication, coordination, or uncertainty, hospital management must address those operating processes directly.

Taken together, customer satisfaction theory and continuous quality improvement provide a suitable framework for this study. Satisfaction theory explains why patient judgment depends on comparison and perceived experience, while continuous quality improvement explains why hospitals should treat patient feedback as a basis for repeated process improvement.

The theoretical discussion in the literature also places customer satisfaction in a broader management context. Satisfaction is not treated only as an emotional reaction to service use, but also as a management indicator that can be observed through survey data and used to diagnose where service value is not being delivered effectively. In this sense, patient satisfaction reflects how expectations, service effort, perceived performance, and overall relationship quality are brought together in actual service encounters. This interpretation is especially relevant in hospitals, where patient experience includes both functional evaluation and emotional reassurance.

The literature also emphasizes that customer satisfaction management is not limited to external recipients of service. It also implies attention to internal service conditions, because failures in internal coordination, staff support, and process design can ultimately manifest as dissatisfaction on the patient side. This point fits well with continuous quality improvement, which treats process quality as something that must be monitored across all links of service delivery rather than only at the final outcome stage.

Similarly, the discussion of continuous quality improvement in the literature stresses that customer need is the most fundamental principle. The distinction between internal and external customers matters because hospitals do not produce patient experience through one isolated action. They produce it through connected service links involving reception, explanation, treatment, support, coordination, and follow-up. The question is therefore not only whether care is clinically complete, but whether it is delivered efficiently, effectively, and in a timely way. This process-oriented understanding helps explain why hospital brand building and patient satisfaction can be analyzed together in one framework.

2.2. Brand Building in Hospital Management

Brand building refers to the planning, design, communication, and management activities through which an organization forms a recognizable and trustworthy image [5,12]. In hospitals, brand building is not equivalent to external promotion alone. It is also rooted in service quality, organizational culture, service standardization, and patients' accumulated experience [18,4,16].

A hospital brand is therefore not simply a visual symbol or a publicity message. It is the broader set of expectations that patients form through repeated interactions with the institution. When patients see a hospital as professional, responsive, organized, and reliable, those perceptions become part of the brand. When the service process is slow, confusing, impersonal, or inconsistent, that experience also becomes part of the brand.

The six dimensions used in this study combine internal service quality with external perception. Hospital service level, service attitude, medical technology, and medical nursing service primarily describe service delivery, while hospital culture and brand image describe how the hospital is perceived and remembered. This structure is appropriate for a dental hospital setting because patient evaluations often emerge from the interaction of treatment experience and institutional image.

Brand building can also be understood as a system composed of positioning, identity, promotion, and brand equity. In that view, brand positioning differentiates the institution from competitors and clarifies the place of its services in the target market. Brand identity gives the organization a consistent set of concepts, behaviors, visual signs, and experience cues. Brand promotion externalizes these values through

communication, while brand equity reflects the accumulated value of patient recognition, loyalty, and trust. In a hospital context, these elements cannot be separated from actual service quality; they are sustained only when the service process consistently supports the projected brand image [12,18].

The conceptual discussion also links service quality, patient satisfaction, and organizational performance. In particular, service quality is described through hospital service level, service attitude, medical technology, and medical nursing service, while patient satisfaction is treated as a key evaluative response to these experiences. This logic is consistent with the argument that hospital brands are built not merely by messages but by repeated service encounters that patients interpret, remember, and compare [14,15].

2.3. Conceptual Definitions

The study provides explicit definitions for the main variables, and these definitions help clarify the interpretation of the questionnaire dimensions.

Hospital service level has both broad and narrow meanings. In a broad sense, it includes medical technology level, equipment level, service efficiency, patient satisfaction, and the reasonableness of medical costs. In a narrower sense, it refers to compliance with medical management systems and the timeliness, safety, and procedural quality of diagnosis and treatment. With the evolution of service concepts, hospital service level has become increasingly diversified and now also includes service attitude, environment, cost, and equipment.

Service attitude refers to the words, behavior, and demeanor expressed by service providers during the service process. Service attitude is treated as the foundation of service quality because it helps meet the psychological and emotional needs of the recipient, not merely the formal delivery of the service itself.

Medical technology refers to the diagnostic and therapeutic measures adopted by medical institutions and their staff for the purpose of diagnosing disease, reducing pain, improving function, extending life, and restoring health. In a patient-satisfaction framework, medical technology is therefore understood not simply as equipment ownership, but as perceived treatment capability.

Medical nursing service is described as medical-grade, systematic, continuous, and professional care support. Although the broader definition originally includes home-based care and elder-care language, the key point in the present context is that nursing service represents organized professional support during the treatment process and shapes how clearly and confidently patients experience care.

Hospital culture, corresponding to the original discussion of brand culture, refers to the shared values, rituals, norms, and traditions that give an institution distinct meaning. In a hospital setting, culture matters because it shapes atmosphere, internal cohesion, consistency of staff behavior, and the emotional tone perceived by patients.

Brand image refers to the traits displayed by an institution or brand in the market and in the minds of the public. It reflects public and consumer evaluation and constitutes the aggregate of all associations consumers hold about the brand. In this sense, brand image is the memory structure through which patients organize professionalism, positivity, and institutional trustworthiness.

Satisfaction is treated as a psychological state formed after comparing prior expectations with perceived performance. Following Cardozo [1] and Oliver (1980), patient satisfaction can be defined as the degree of satisfaction formed through the comparison of expectations, effort, and actual experience.

2.4. Related Research

Chinese and international literature helps justify the analytical framework. In Chinese research, Liu [10] examined patient satisfaction improvement at Henan Saisi Dental Hospital and showed that hospital service level, service attitude, medical technology, nursing service, and related service factors could be studied through questionnaire data and multivariate analysis. Gao [2] evaluated outpatient satisfaction in a dental specialized hospital and argued that environment, service level, convenience, and process efficiency were all relevant to satisfaction assessment. Li and Zhao [7] found that patients' reasons for choosing hospitals included distance, medical standards, and service attitude, and they argued that hospital brand building is beneficial for improving service quality and patient satisfaction. Li [8] further emphasized that discipline construction, technology management, and information systems can strengthen hospital brand effects and improve patient satisfaction. Xu [14] also highlighted that customer satisfaction includes perceptual, conceptual, and expectation-based dimensions rather than a single reaction.

These Chinese studies support the view that patient satisfaction is not generated by one isolated factor. Instead, it is shaped by the joint effect of service processes, interpersonal contact, technical confidence, environmental experience, and broader organizational recognition. That logic is consistent with the multidimensional structure adopted in this study.

The international literature places stronger emphasis on brand strategy as a long-term management issue. Positioning theory argues that a brand must establish a clear place in the target audience's mind [12]. Strategic brand management further emphasizes that brands mature through sustained consumer recognition and loyalty rather than through isolated promotion [5]. The literature also points to empirical examples such as the Cleveland Clinic, where service quality, organizational capability, leadership, and sustained quality control were all treated as part of hospital brand construction.

Taken together, the reviewed literature suggests that hospital brands are built from repeated service experiences, that patient satisfaction is closely tied to service quality and expectation management, and that the relationship between branding and satisfaction is especially meaningful in competitive medical markets.

2.5. Research Hypotheses

Hospital service level is one of the most direct dimensions through which patients evaluate a hospital. It includes service efficiency, medical quality, and the reasonableness of the overall service process. Previous studies suggest that service quality is closely related to customer satisfaction and patient evaluation [7,10,15]. A higher hospital service level is therefore expected to improve patients' overall evaluations of the institution.

H1: Hospital service level is significantly associated with patient satisfaction.

Service attitude refers to the way medical staff interact with patients during the service encounter. Good service attitude can satisfy patients' psychological and emotional needs, and previous studies treat staff interaction as an important antecedent of satisfaction and loyalty [10,15]. Since dental care often involves discomfort, uncertainty, and repeated contact with staff, service attitude should be related to patient satisfaction.

H2: Service attitude is significantly associated with patient satisfaction.

Medical technology reflects patients' perceptions of the hospital's diagnostic and treatment capability. It is directly related to diagnosis, treatment, pain reduction, and recovery. Earlier research also includes medical technology as an explanatory variable in patient satisfaction research [10,7]. Strong medical technology should increase patients' trust in the hospital and strengthen their confidence in treatment outcomes.

H3: Medical technology is significantly associated with patient satisfaction.

Medical nursing service is closely related to patients' direct treatment experience. It involves systematic, continuous, and professional support that shapes communication and care during treatment. Prior studies also indicate that nursing and related service processes are important parts of patient satisfaction assessment [10,2]. In dental treatment, where procedural coordination and explanation matter, nursing service should be associated with patient satisfaction.

H4: Medical nursing service is significantly associated with patient satisfaction.

Hospital culture refers to the values, atmosphere, and organizational style perceived by patients. Prior literature suggests that hospital culture is an important part of brand construction and can shape patients' impressions of the institution [13,16]. Although culture is an internal organizational characteristic, it becomes visible to patients through staff behavior, service consistency, and environmental atmosphere.

H5: Hospital culture is significantly associated with patient satisfaction.

Brand image reflects the overall impression that patients form about the hospital. Previous studies indicate that brand image and brand value are related to patient recognition, loyalty, and market competitiveness [7,9,17]. In healthcare, a strong and positive brand image can shape expectations before treatment and reinforce favorable evaluations after treatment.

H6: Brand image is significantly associated with patient satisfaction.

In addition to brand-related dimensions, demographic characteristics may also influence patient satisfaction. Since different gender groups may show different expectations and service perceptions, it is important to examine whether male and female patients differ in their satisfaction evaluations.

H7: Patient satisfaction differs by gender.

Educational background may also affect how patients understand medical information, evaluate service quality, and form expectations about hospitals. Patients with different educational levels may apply different standards when judging service experience and institutional quality.

H8: Patient satisfaction differs significantly across educational background groups.

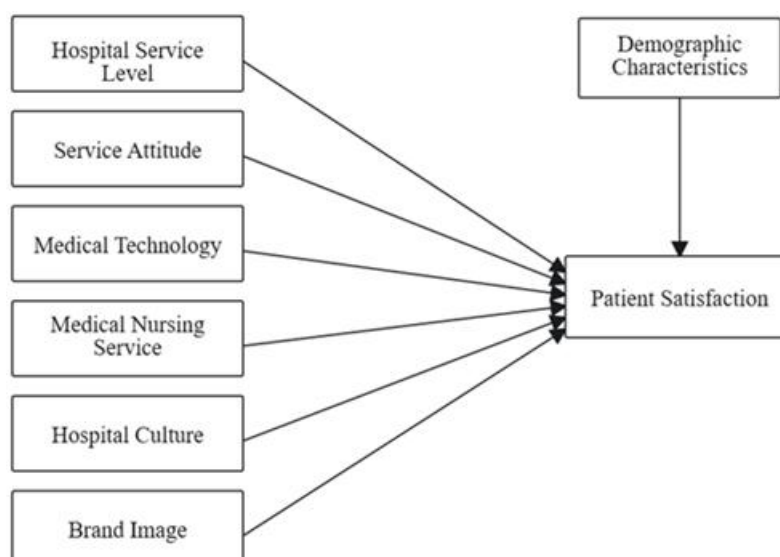


Figure 1. Theoretical Model of Dental Hospital Brand Building and Patient Satisfaction.

3. Methodology

3.1. Research Design

The study used a cross-sectional questionnaire design. Data collection was conducted through the Questionnaire Star platform and analyzed with SPSS 22.0. Cross-sectional survey research is common in service and management studies because it enables the collection of a relatively large sample efficiently and enables the researcher to test a structured set of hypotheses. At the same time, such a design is limited for causal inference and is better interpreted as evidence of statistical association within a single observation period.

The study used three specific research methods: literature analysis, synthesis, and questionnaire survey. Literature analysis was used to collect and review studies related to brand building and patient satisfaction. Synthesis was used to organize the research findings and connect the empirical results to management recommendations. The questionnaire survey provided the primary empirical data and was combined with SPSS analysis for reliability, validity, demographic description, descriptive statistics, correlation testing, difference testing, and regression analysis.

Literature collection relied on internet platforms, CNKI, and related academic sources in order to assemble the conceptual basis for analyzing dental hospital brand building and patient satisfaction. Synthesis was then used not merely to restate earlier studies, but to connect the empirical results of the questionnaire to broader strategic recommendations for hospital brand improvement. In that sense, the research design combines conceptual review and empirical testing rather than relying on survey data alone.

3.2. Sample and Data Collection

The research scope was Chengdu. Chengdu was selected as a representative regional healthcare market with a growing private dental sector. Sampling was carried out in two stages. A pilot study was conducted from July 1, 2025 to August 1, 2025, with a planned scale of 100 to 200 responses. The main survey was conducted from August 1, 2025 to September 1, 2025, with a planned scale of 400 to 500 responses.

In total, 450 questionnaires were distributed and 420 valid questionnaires were recovered, for an effective response rate of 82%.

The demographic structure of the sample was as follows: 153 men (36.5%) and 267 women (63.5%); 154 respondents under 24 years old (36.7%), 89 aged 25 to 34 (21.2%), 56 aged 35 to 44 (13.3%), and 121 over 45 (28.8%); 128 respondents with associate degree or below (30.5%), 142 with bachelor's degree (33.8%), 106 with master's degree (25.2%), and 44 with doctorate degree (10.5%). The sample therefore provides enough variation to test whether patient satisfaction differs across major social groups.

Table 1. *Sample Demographic Characteristics.*

Characteristic	Category	n	%
Gender	Male	153	36.5
	Female	267	63.5
Age	Under 24 years	154	36.7
	25-34 years	89	21.2
	35-44 years	56	13.3
	Over 45 years	121	28.8
Educational background	Associate degree or below	128	30.5
	Bachelor's degree	142	33.8
	Master's degree	106	25.2
	Doctorate degree	44	10.5

Note. $N = 420$ valid questionnaires.

The sample was geographically limited to Chengdu in order to keep the research scope manageable and consistent with available data-collection resources. This also means that the results should be interpreted as city-specific evidence rather than as a basis for national generalization.

3.3. Measurement Instrument

The questionnaire contained 37 items. Items F1 to F24 measured the six dimensions of hospital brand building, with four items for each dimension. Items F25 to F37 measured patient satisfaction. All items used a five-point Likert scale.

The scale covers the main hospital-brand dimensions used in the study. The service-level block measures overall service quality and efficiency, the service-attitude block measures interpersonal responsiveness, the medical-technology block measures perceived technical capability, the medical-nursing block measures support and communication during treatment, the culture block measures atmosphere, and the image block measures professionalism and public perception. The satisfaction block is broader and includes overall evaluations, emotional reactions, and willingness to continue choosing the hospital.

According to the questionnaire design, the instrument also included control-variable questions for respondents' basic characteristics before the main Likert-scale items. The substantive measurement items were organized as follows: hospital service level (F1-F4), service attitude (F5-F8), medical technology (F9-F12), medical nursing service (F13-F16), hospital culture (F17-F20), brand image (F21-F24), and patient satisfaction (F25-F37). This structure closely follows the theoretical framework of the study.

The questionnaire was designed around the characteristics of dental medical consumers in Chengdu. A five-point Likert scale was used, with the response

categories ranging from disagreement to agreement. This arrangement is important because the measurement model was intended to transform broad concepts such as service level, hospital culture, and brand image into a form that could be evaluated systematically by respondents and then analyzed through reliability, validity, correlation, and regression procedures.

3.4. Data Analysis

The following statistical procedures were used: reliability analysis using Cronbach's alpha, validity analysis using KMO and Bartlett's test, descriptive statistics, Pearson correlation analysis, independent-samples t-test, one-way ANOVA, and multiple linear regression. The regression model used patient satisfaction as the dependent variable and the six brand-building dimensions as independent variables using the enter method.

This sequence is logically appropriate for the study. Reliability and validity tests justify the use of the scale, descriptive statistics show the level of evaluation across dimensions, group-difference tests examine whether background variables matter, and regression estimates the net contribution of each dimension after the overlap among predictors is controlled.

4. Results

4.1. Reliability and Validity

The reliability results are adequate for the purposes of this study. Cronbach's alpha based on standardized items was 0.763 for hospital service level, 0.715 for service attitude, 0.733 for medical technology, 0.716 for medical nursing service, 0.755 for hospital culture, 0.737 for brand image, and 0.722 for patient satisfaction. The overall standardized alpha for the 37-item scale was 0.733.

These values indicate that the scale has sufficient internal consistency to support the empirical analysis. They are not excessively high, which suggests that the measurement blocks are related but not redundant.

Validity results were also acceptable. KMO values were 0.713 for hospital service level, 0.633 for service attitude, 0.618 for medical technology, 0.713 for medical nursing service, 0.622 for hospital culture, and 0.638 for brand image. The overall KMO value was 0.697. Bartlett's test was significant in each case, and the overall Bartlett chi-square was 4213.137 with $p = 0.000$. These statistics indicate that the data were suitable for factor analysis.

Table 2. Reliability and Validity Test Results.

Construct	Items	Cronbach's alpha	KMO	Bartlett's test
Hospital service level	F1-F4	0.763	0.713	Significant
Service attitude	F5-F8	0.715	0.633	Significant
Medical technology	F9-F12	0.733	0.618	Significant
Medical nursing service	F13-F16	0.716	0.713	Significant
Hospital culture	F17-F20	0.755	0.622	Significant
Brand image	F21-F24	0.737	0.638	Significant
Patient satisfaction	F25-F37	0.722	not reported	not reported
Overall scale	F1-F37	0.733	0.697	chi-square = 4213.137, $p = 0.000$

Note. Individual Bartlett chi-square values were not reported. The manuscript reports significant Bartlett tests for each construct and the overall scale.

4.2. Descriptive Statistics

The descriptive statistics indicate meaningful variation across dimensions. Based on the reported item means, hospital service level had a mean of approximately 3.22, service attitude approximately 3.10, medical technology approximately 2.50, medical nursing service approximately 3.04, hospital culture approximately 2.63, brand image approximately 3.39, and patient satisfaction approximately 3.30.

Table 3. Descriptive Statistics of Main Constructs.

Construct	Mean
Hospital service level	3.22
Service attitude	3.10
Medical technology	2.50
Medical nursing service	3.04
Hospital culture	2.63
Brand image	3.39
Patient satisfaction	3.30

Note. Means are approximate values reported in the manuscript. Standard deviations were not reported.

The pattern suggests that patients evaluated brand image and service level more favorably than medical technology and hospital culture. This does not necessarily mean that the hospital lacks technical capability or culture. Rather, it indicates that patients perceived those dimensions less strongly than the more visible aspects of service performance and reputation.

The item profile also helps explain the later regression results. Dimensions that are highly visible in the patient journey, such as service level and image, are easier for respondents to evaluate directly. By contrast, medical technology is less directly accessible to most patients, especially in a specialized service context where professional judgment is difficult for lay respondents.

The original item-level discussion provides several additional clues. In the service-attitude block, some items were evaluated positively while the item concerning service attitude as a hospital-choice factor was relatively weak. In the medical-technology block, all four item means fell below 3, indicating that respondents did not evaluate this dimension as strongly as the others. In the medical-nursing block, the item concerning clarity about treatment results was especially weak, suggesting that communication during care may be one of the most sensitive parts of the patient experience. By contrast, the brand-image items were all above 3 and included particularly positive evaluations of professionalism and positivity. These details are broadly consistent with the higher overall standing of brand image in the descriptive results.

The hospital-service-level items also show an internal pattern worth noting. In the original statistics, respondents evaluated the role of service level in hospital choice and quality perception more positively than the broader statement about attaching importance to service level. This suggests that service level is not merely an abstract idea to respondents; it is tied to concrete comparison and decision-making. The same is true of brand image, where professionalism and a positive overall image both received relatively favorable evaluations. These item-level patterns help explain why

service level and brand image later appear as more stable positive predictors in the regression model.

The hospital-culture items provide the opposite pattern. Their item means were consistently lower, especially for statements concerning whether the hospital culture was strong or whether it created an efficient and comfortable feeling. This does not prove that the hospital lacks culture as an organization, but it does suggest that culture was not strongly perceived by respondents during the service encounter. In satisfaction research, a dimension that is weakly perceived may have less stable explanatory power, particularly when other, more visible dimensions already capture much of the evaluative experience.

The patient-satisfaction items themselves also reveal that satisfaction was not one-dimensional. Some items fell below 3, including overall satisfaction and the pleasantness of the hospital experience, while other items exceeded 3. This indicates that respondents did not simply offer uniformly favorable or unfavorable responses. Instead, they differentiated among aspects of their satisfaction experience. That variation supports the usefulness of the model because it shows that the dependent variable still contains meaningful differences for the independent variables to explain.

4.3. Correlation Analysis

Pearson correlation analysis was used to test the association between patient satisfaction and the six dimensions of hospital brand building. The reported correlations show that hospital service level, service attitude, medical technology, medical nursing service, hospital culture, and brand image are all significantly associated with patient satisfaction at the bivariate level, with correlation coefficients ranging from $r = -0.117$ to $r = 0.221$.

These results suggest that each dimension has some relationship with patient satisfaction before the predictors are considered simultaneously. At the same time, the pattern also suggests collinearity among the predictors, which is why the multiple regression results are more important for identifying the relatively stronger and weaker dimensions.

4.4. Group Differences

The independent-samples t-test shows no significant gender difference in patient satisfaction. Under the equal-variance assumption, the result was $t = -1.738$, $df = 409$, $p = 0.096$.

The one-way ANOVA shows significant differences in patient satisfaction across educational background groups. Levene's test was acceptable ($F = 1.192$, $p = 0.324$), and the ANOVA result was $F = 3.821$, $p = 0.010$.

Table 4. Group Difference Tests for Patient Satisfaction.

Grouping variable	Test	Statistic	df	p	Result
Gender	Independent-samples t-test	$t = -1.738$	409	0.096	Not significant
Educational background	Levene's test	$F = 1.192$	not reported	0.324	Homogeneity acceptable
Educational background	One-way ANOVA	$F = 3.821$	not reported	0.010	Significant

Note. The gender result is reported under the equal-variance assumption. ANOVA degrees of freedom were not reported.

Accordingly, H7 is not supported, while H8 is supported. The education effect is modest, but it suggests that patient satisfaction is not perfectly uniform across social groups.

4.5. Multiple Regression Analysis

The regression model summary shows $R = 0.758$, $R \text{ square} = 0.574$, adjusted $R \text{ square} = 0.574$ standard error of estimate = 0.75325, and Durbin-Watson = 1.930. The ANOVA table shows $F = 14.302$ with $p = 0.000$, indicating that the overall model is statistically significant. The total degrees of freedom in the regression table suggest that complete-case regression analysis was based on 407 observations rather than the full 420 valid questionnaires.

Table 5. Multiple Regression Model Summary.

R	R square	Adjusted R square	Std. error of estimate	Durbin-Watson	F	p
0.758	0.574	0.574	0.75325	1.930	14.302	0.000

Note. Dependent variable: patient satisfaction. Complete-case regression analysis appears to be based on 407 observations.

The coefficient table shows the following results. Hospital service level had a significant positive coefficient ($\beta = 0.291$, $t = 5.369$, $p = 0.000$), so H1 is supported. Medical technology was not significant ($\beta = -0.059$, $t = -0.779$, $p = 0.436$), so H3 is not supported. Medical nursing service had a significant negative coefficient ($\beta = -0.219$, $t = -3.808$, $p = 0.000$), so H4 is supported in the sense of a significant association, but the direction is negative rather than positive. Brand image had a significant positive coefficient ($\beta = 0.179$, $t = 3.367$, $p = 0.001$), so H6 is supported.

The table also shows service attitude with $\beta = -0.052$, $t = -0.863$, and $p = 0.001$, and hospital culture with $\beta = 0.031$, $t = 0.395$, and $p = 0.054$. Because these statistics are not fully consistent, H2 and H5 should be interpreted cautiously rather than treated as robustly supported.

Table 6. Multiple Regression Coefficients.

Predictor	Standardized beta	t	p	Interpretation
Hospital service level	0.291	5.369	0.000	Significant positive association
Service attitude	-0.052	-0.863	0.001	Reported statistics are inconsistent; interpret cautiously
Medical technology	-0.059	-0.779	0.436	Not significant
Medical nursing service	-0.219	-3.808	0.000	Significant negative association
Hospital culture	0.031	0.395	0.054	Marginal/not robust; interpret cautiously
Brand image	0.179	3.367	0.001	Significant positive association

Note. Only standardized beta coefficients, t values, and p values reported in the manuscript are shown. Unstandardized coefficients and standard errors were not reported.

Overall, the regression suggests that the strongest positive predictors in the model are hospital service level and brand image. Medical technology is not a significant direct predictor, while medical nursing service shows a significant but negative coefficient. The adjusted $R \text{ square}$ of 0.696 is high for a survey model and indicates

that the six dimensions together explain a substantial share of the variance in patient satisfaction.

Table 7. *Hypothesis Testing Summary.*

Hypothesis	Statement	Result
H1	Hospital service level is significantly associated with patient satisfaction.	Supported
H2	Service attitude is significantly associated with patient satisfaction.	Cautious interpretation
H3	Medical technology is significantly associated with patient satisfaction.	Not supported
H4	Medical nursing service is significantly associated with patient satisfaction.	Supported, but negative direction
H5	Hospital culture is significantly associated with patient satisfaction.	Cautious interpretation
H6	Brand image is significantly associated with patient satisfaction.	Supported
H7	Patient satisfaction differs by gender.	Not supported
H8	Patient satisfaction differs significantly across educational background groups.	Supported

Note. H2 and H5 are marked cautiously because the reported coefficient statistics are not fully consistent.

5. Discussion

5.1. Main Findings

The most robust finding in the study is the importance of hospital service level. It is positively related to satisfaction in both the correlation analysis and the regression model, and it has the largest positive standardized coefficient among the clearly interpretable predictors. This suggests that patients respond strongly to the overall quality, efficiency, and organization of service delivery.

Brand image is the second robust positive predictor. This result is consistent with the view that brand image in healthcare is not merely symbolic. It summarizes accumulated patient perceptions about professionalism, reliability, and trustworthiness. A stronger image may therefore reinforce satisfaction by shaping expectations and by influencing how patients interpret actual service experiences.

Medical technology did not show a significant direct effect in the reported model. This does not mean that technology is unimportant in hospital management. Rather, within this dataset, patient satisfaction appears to be more closely linked to service-level and image-level variables than to patients' direct evaluation of technical capability.

Medical nursing service showed a significant negative coefficient. This result should not be overgeneralized, but it deserves attention. It suggests that the nursing-service dimension, as measured in this questionnaire, may capture unmet expectations, communication difficulties, or dissatisfaction with treatment explanation and support during care.

5.2. Interpretation of Unstable Results

Service attitude and hospital culture cannot be interpreted confidently from the reported regression table. The reported coefficient information for these two variables

is not stable enough to support strong conclusions. The appropriate response is therefore to treat them as potentially important but not clearly identified in the present model.

One plausible explanation is that service attitude and hospital culture share variance with stronger and more visible dimensions such as service level and brand image. If the constructs are strongly correlated, their unique contribution in a multiple regression model may become difficult to estimate cleanly. Future studies could test these relationships with better-specified constructs or with models that allow indirect effects to be estimated more directly.

5.3. Theoretical Implications

The study supports customer satisfaction theory by showing that patient satisfaction in healthcare is strongly shaped by expectations, perception, and service comparison. Patients do not behave like passive recipients of treatment. They compare experiences, interpret cues, and form judgments about whether the hospital is worth returning to.

The study also supports continuous quality improvement logic. If patient satisfaction is tied to service level and brand image, then improving satisfaction is not only a matter of stronger promotion. It requires repeated, incremental adjustments to the service process itself, especially in the parts of the patient journey that are most visible to patients.

At the same time, the findings reinforce the distinction between objective capability and perceived quality. A hospital may believe that its technology is strong and its culture is healthy, but what matters in the satisfaction model is patients' actual perceptions and experiences.

5.4. Comparison with the Hospital Brand Literature

The findings are broadly consistent with the hospital brand literature that emphasizes reputation, service orientation, and patient trust [16,18,4]. They support the argument that hospital brand strength is built from accumulated service impressions rather than from isolated marketing activities.

The results are less consistent with any simple assumption that technical sophistication alone drives patient satisfaction. Instead, they align with a more mature view that clinical quality is necessary but not sufficient. Patients care about how the hospital behaves, how it communicates, and how it makes them feel during the service process.

5.5. Practical Implications

First, dental hospitals should prioritize service-level improvement. This includes smoother treatment processes, clearer guidance, better waiting-time management, and stronger patient-facing coordination.

Second, brand image should be built through consistent service delivery rather than through publicity alone. Public reputation, visual identity, and trust signals should support real service quality rather than substitute for it.

Third, the negative nursing-service coefficient suggests that hospitals should review communication during treatment, especially how patients are informed about procedures, results, and follow-up expectations.

Fourth, educational differences in satisfaction indicate that communication and service design may require adjustment for patients with different educational backgrounds. A single communication style may not be equally effective for all patient groups.

The study also points to a wider set of practice directions for hospital brand construction. First, to clarify brand market positioning and build a coherent brand identification system. Second, to strengthen distinctive specialties and discipline construction so that technical capability and brand recognition reinforce one another. The analysis further emphasizes improving the details of medical service, strengthening visual design and environmental image, promoting informationization and smart-hospital management, and refining hospital culture so that internal cohesion and external reputation develop together. These recommendations go beyond publicity and treat branding as an integrated management system.

Within the logic of the present findings, these recommendations can be interpreted in a more focused way. Improving service level corresponds to optimizing waiting, guidance, process coordination, and service efficiency. Strengthening visual and environmental design corresponds to making professionalism and reassurance more visible to patients. Informationization and process integration correspond to reducing confusion and improving continuity in the service journey. Cultural refinement corresponds to making internal values visible through consistent patient-facing behavior.

The analysis is also more detailed in how it links management actions to hospital development. It argues that brand construction should not be reduced to outward publicity, because a hospital's brand is at the same time a characteristic, an image, an expression of service quality, and a sign of market value. In that sense, brand construction is tied to core competitiveness. It therefore recommends not only promotional planning but also specialty construction, talent development, equipment upgrading, process refinement, visual design, information-system development, and cultural accumulation. These are presented as mutually supporting parts of one management system.

It also places strong emphasis on detail management in medical services. It argues that a hospital's reputation ultimately depends on medical quality and that brand positioning should be anchored in the principle of being patient-centered. From this perspective, technology matters, but it matters as part of a broader service system that patients can actually feel. Likewise, visual identity and environmental design are not treated as superficial decoration. They are described as tools for stabilizing patient emotions, strengthening institutional atmosphere, and making the hospital's image more coherent and reassuring during the treatment process.

5.6. Limitations and Future Research

This study has several limitations. First, the research design is cross-sectional and limited to one city, so it cannot establish strong causal claims or broad generalization. Second, the study relies on self-reported questionnaire data, which means the predictors and the outcome come from the same survey instrument.

Third, some reported regression statistics are not fully consistent for service attitude and hospital culture, which limits the confidence with which these two variables can be interpreted. Future research should therefore use a more refined factor structure,

larger and more geographically diverse samples, and models that separate direct, indirect, and mediated effects more explicitly.

Future studies could also combine questionnaire evidence with richer process, outcome, or interview data. Qualitative follow-up would be especially useful for explaining why medical technology did not emerge as a significant direct predictor and why medical nursing service showed a negative coefficient in this model.

6. Conclusions

Using questionnaire data from dental patients in Chengdu, this study examined how six dimensions of hospital brand building are associated with patient satisfaction. The most reliable findings are that hospital service level and brand image are positively associated with patient satisfaction, educational background shows significant group differences, and medical technology does not show a significant direct effect in the reported regression model.

Medical nursing service shows a significant but negative coefficient, which deserves careful managerial attention rather than omission. Service attitude and hospital culture remain inconclusive in the reported regression results and should therefore be interpreted cautiously.

Overall, the findings support a practical conclusion: dental hospital brand building should be anchored in service quality, trustworthy patient experience, and coherent brand image.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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