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Assurance and empathy: Key drivers of patient satisfaction and loyalty in public-insured dental services

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Abstract

Objective: This study aimed to analyze the impact of dental healthcare service quality on patient satisfaction and loyalty among Social Health Insurance Administration Body (BPJS) participants at the Dental Clinic of Dr. Sumantri Hospital, Parepare, Indonesia, one of main referral hospital in South Sulawesi, Indonesia

Material and Method: A cross-sectional quantitative study was conducted involving 160 patients selected through convenience sampling. Data were collected using an Indonesian-adapted SERVQUAL questionnaire that assessed five dimensions of service quality (tangibility, reliability, responsiveness, assurance, and empathy), patient satisfaction, and loyalty. Descriptive statistics, reliability analysis, and multiple linear regression were used for data analysis.

Results: Service quality significantly influenced patient satisfaction ($p < 0.001$) and loyalty ($p < 0.001$). Assurance was the strongest predictor of satisfaction ($\beta = 0.296$), and empathy had the greatest effect on loyalty ($\beta = 0.284$). The majority of patients perceived the service quality as good (98.1%), were satisfied (98.8%), and demonstrated strong loyalty (97.5%). The regression model explained 72.2% of the variance in patient loyalty, with the remaining 27.8% attributable to other factors.

Conclusion: Dental service quality significantly affects satisfaction and loyalty among BPJS patients. Enhancing assurance, empathy, and communication is crucial for strengthening patients' trust and long-term commitment.

Keywords: Alginates, Biocompatibility, Characterization, Chitosan, Fucoidan
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Introduction

Oral health is an essential component of overall health, as oral diseases can significantly affect the quality of life, chewing function, speech, and even systemic health. Therefore, providing high-quality dental care services is a priority in modern health systems.[1,2] The World Health Organization (WHO) emphasizes that improving access to and quality of oral health services contributes substantially to community health outcomes.[3] However, in Indonesia, oral health problems remain highly prevalent and are often neglected. According to the National Basic Health Research (RISKESDAS) 2018, the prevalence of oral health issues reached 57.6%, yet only 10.2% of the population received treatment from a dental professional. South Sulawesi, in particular, ranks among the highest nationally, with prevalence rates between 60% and 70%.[4] This substantial gap between the high burden of disease and low utilization of professional care highlights an urgent need not only to improve access but also to ensure that the quality of dental services meets patient expectations, especially within the context of the Social Health Insurance Administration Body (BPJS) system. Challenges such as long waiting times, limited equipment, and communication gaps persist, driving the necessity for this research.[11,12]

Service quality is widely acknowledged as one of the most critical determinants of patient satisfaction with healthcare services. The SERVQUAL model developed by Parasuraman et al. has been frequently adapted in healthcare research, highlighting five key dimensions: tangibility, reliability, responsiveness, assurance, and empathy. These dimensions help explain how patients perceive and evaluate the quality of healthcare. Contemporary studies affirm that high-quality service delivery enhances patient satisfaction and strengthens trust in healthcare providers.[5,6] Furthermore, patient satisfaction serves as an important indicator in evaluating healthcare quality, as satisfied patients are more likely to return for care, whereas dissatisfied patients tend to seek alternatives elsewhere.[7,8]

Furthermore, specific to dental and public health settings, previous research has consistently highlighted the strong connection between service quality, satisfaction, and long-term commitment. Studies by Baan (2020) affirmed that the various dimensions of service quality strongly influence patient satisfaction and subsequent loyalty.[7] In the context of dental services, the ability of the provider to deliver accurate, timely, and empathetic care significantly influences the patient's overall experience.[13] In addition, patient loyalty is a critical outcome, reflecting a patient's commitment to repeatedly use a service despite the presence of competing alternatives, which contributes to the hospital's reputation and sustainability.[9,10]

While previous studies in Indonesia and internationally have established a general link

Table 1. Demographic characteristics of respondents.

Category	Sub-Category	Frequency (n)	Percentage (%)
Gender	Male	67	41.9
	Female	93	58.1
	Total	160	100.0
Age	≤ 35 years old	97	60.6
	>35 years old	63	39.4
	Total	160	100.0
Last Education	$\le$ High School	92	57.5
	University Degree	68	42.5
	Total	160	100.0
Visit Frequency	Single Visit (Once)	55	34.4
	Repeat Visits (More than Once)	105	65.6
	Total	160	100.0

Table 2. Distribution of patient responses on service quality, satisfaction, and loyalty.

Variable	Dimension / Indicator	Category	Frequency (n)	Percentage (%)
Service Quality	Tangibility (Facilities & Equipment)	Good–Very Good	122	76.3
	Reliability (Accuracy of Service)	Good–Very Good	118	73.8
	Responsiveness (Promptness & Helpfulness)	Good–Very Good	115	71.9
	Assurance (Competence & Trust)	Very Good	130	81.3
	Empathy (Care & Understanding)	Very Good	128	80.0
Overall Service Quality		Good–Very Good	127	79.4
Patient Satisfaction	Treatment outcome satisfaction	High	124	77.5
	Communication and staff friendliness	High	129	80.6
	Waiting time & efficiency	Moderate	42	26.3
Overall Satisfaction		High	121	75.6
Patient Loyalty	Intention to revisit	Yes	115	71.9
	Willingness to recommend	Yes	120	75.0
	Preference for continued care	Yes	118	73.8
Overall, Loyalty		High	118	73.8

Table 3. Characteristics of respondents.

Gender	n	%
Male	64	40.0
Female	96	60.0
Age Category	n	%
<18 Years	9	5.6
18-25 Years	42	26.3
26-35 Years	63	39.4
36-45 Years	25	15.6
>45 Years	21	13.1
Treatment Type	n	%
Root Canal Treatment	75	46.9
Restoration	60	37.5
Extraction	23	14.4
Scaling	2	1.3
Total	160	100

Table 4. Distribution of patient responses to service quality.

Statement	Answer Choices							
	Strongly Agree		Agree		Disagree		Strongly Disagree	
	n	%	n	%	n	%	n	%
Nurses use easy-to-understand language.	118	73.8	39	24.4	3	1.9	-	-
The hospital is easily accessible.	104	65.0	50	31.3	6	3.8	-	-
Transportation from home to the hospital is affordable.	97	60.6	54	33.8	7	4.4	2	1.3
Transportation from home to the hospital is readily available.	105	65.6	45	28.1	10	6.3	-	-
The registration process is fast.	99	61.9	56	35.0	5	3.1	-	-
The registration process is straightforward.	100	62.5	53	33.1	6	3.8	1	0.6
The registration staff provides highly skilled patient care.	102	63.8	55	34.4	3	1.9	-	-
The registration staff treats patients with great care.	100	62.5	55	34.4	5	3.1	-	-
The registration staff are neatly dressed.	110	68.8	45	28.1	5	3.1	-	-
The registration wait time is fast.	82	51.3	61	38.1	13	8.1	4	2.5
The doctor arrives on time.	88	55.0	55	34.4	15	9.4	2	1.3
Patient files are prepared quickly.	85	53.1	70	43.8	5	3.1	-	-
The wait time from registration to admission is relatively short.	77	48.1	70	43.8	13	8.1	-	-
There are sufficient chairs in the waiting room for patients.	87	54.4	54	33.8	18	11.3	1	0.6
The waiting room is not stuffy.	94	58.8	56	35.0	8	5.0	2	1.3
Trash cans are available.	111	69.4	45	28.1	4	2.5	-	-
The waiting room is clean.	114	71.3	42	26.3	4	2.5	-	-
The waiting room is comfortable.	112	70.0	43	26.9	4	2.5	1	0.6
The waiting room is organized.	109	68.1	47	29.4	4	2.5	-	-
The doctor serves you politely.	123	76.9	33	20.6	4	2.5	-	-
The doctor treats you with respect.	122	76.3	34	21.3	4	2.5	-	-
The doctor listens to your concerns.	127	79.4	30	18.8	3	1.9	-	-
The doctor speaks with you attentively.	117	73.1	37	23.1	6	3.8	-	-
The doctor explains your health problem clearly.	116	72.5	40	25.0	3	1.9	1	0.6
The directions to the clinic are clear.	98	61.3	48	30.0	11	6.9	3	1.9
The names of each clinic room are clearly displayed.	105	65.6	44	27.5	10	6.3	1	0.6
Opening and closing times are available.	96	60.0	55	34.4	9	5.6	-	-

between SERVQUAL dimensions, satisfaction, and loyalty, a specific gap remains regarding the simultaneous analysis of specific SERVQUAL dimensions and their hierarchical effect (direct and mediated) on patient loyalty among BPJS participants in a high-burden region such as Eastern Indonesia. Our preliminary data indicate that specific dimensions, such as Assurance and Empathy, play dominant yet distinct roles in driving satisfaction and loyalty outcomes. Thus, the novelty of this study lies in empirically identifying which specific SERVQUAL dimension acts as the strongest predictor of satisfaction and loyalty within this unique BPJS dental setting and testing the mediating role of patient satisfaction to provide actionable evidence for targeted quality improvements at the local institutional level. Furthermore, Ratnawati et al. (2021) explored factors influencing BPJS patient satisfaction in dental services, pointing out that affordability, effective communication, and clarity of treatment information serve as significant determinants of both satisfaction and loyalty within the public insurance framework. pointing out that affordability, effective communication, and clarity of treatment information serve as significant determinants of both satisfaction and loyalty within the public insurance framework.[14]

Based on these gaps, this study aims to analyze the impact of dental healthcare service quality (measured by the five SERVQUAL dimensions) on patient satisfaction and loyalty among BPJS participants at Dr. Sumantri Hospital, Pare-Pare. The research questions were as follows: whether dental service quality significantly affects patient satisfaction and loyalty, and further, whether patient satisfaction mediates the relationship between service quality and patient loyalty. This study offers empirical evidence and practical recommendations for hospital management and policymakers to continuously improve the quality of public dental services, enhance patient trust, and ensure long-term sustainability and institutional reputation within Indonesia's National Health Insurance system.

Material and Methods

Study Design

This study employed a cross-sectional quantitative design, with the reporting structured according to the STROBE guidelines. The study was conducted from July to November 2024. This design was chosen to analyze the relationships among dental healthcare service quality (independent variable), patient satisfaction (mediating variable), and patient loyalty (dependent variable) among BPJS participants at one point in time.

Study Setting

The study was conducted at the Dental

Outpatient Clinic of Dr. Sumantri Hospital in Parepare, South Sulawesi, Indonesia. Dr. Sumantri Hospital is a Type D military-affiliated referral hospital operating under the Indonesian National Armed Forces (TNI) that provides comprehensive oral healthcare services to military personnel and the general public, including participants of the National Health Insurance Program (BPJS Kesehatan).

Participants

The participants were BPJS patients aged 18 years or older who sought dental care at the hospital's clinic and provided written informed consent. The inclusion criteria also required that the participants be registered in the BPJS system. Patients aged < 18 years, those unable to read or comprehend the questionnaire, and those receiving emergency dental care were excluded. A total of 160 patients were invited to participate in the study.

Variables

The primary independent variables of the study were the five dimensions of service quality based on the SERVQUAL model: tangibility, reliability, responsiveness, assurance, and empathy. Patient satisfaction was the mediating variable, and patient loyalty was the dependent variable. Demographic factors such as age, sex, and visit frequency were also collected and controlled for in the multiple regression analysis to account for potential confounding effects.

Data Sources/Measurement

Data were collected using a structured self-administered questionnaire. The instrument was an Indonesian-adapted version of the SERVQUAL questionnaire, supplemented with additional items for patient satisfaction and loyalty, adapted from previously validated empirical studies. All responses regarding service quality, satisfaction, and loyalty were rated on a 5-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. The questionnaire was reviewed by a panel of five experts to ensure content validity, clarity, and relevance.

How potential bias was anticipated

Potential bias was anticipated and addressed in several ways in this study. The risk of selection bias was partially mitigated by using a convenience sampling method to recruit patients from different demographic and visit categories. Nonresponse bias was addressed by increasing the calculated minimum sample size of 132 respondents by 20%, resulting in the invitation of 160 patients. To enhance reliability and minimize measurement bias, the instrument underwent an expert panel review for validity and a pilot test with 20 patients to check readability and response consistency, with minor wording adjustments made. Furthermore, demographic factors were controlled for in the regression model to account for the potential confounding effects.

Study Size

The minimum required sample size was determined using the Raosoft online sample-size calculator. Based on an estimated BPJS dental patient population of approximately 2,000, a 5% margin of error, a 95% confidence interval, and a 50% response distribution, the minimum recommended sample size was calculated as 132 respondents. To compensate for possible non-response, the sample size was increased by 20%, leading to a final targeted sample of 160 patients. All 160 distributed questionnaires were fully returned and valid for analysis, yielding a 100% response rate.

Quantitative Variables

The main quantitative variables were the scores for the five dimensions of service quality (tangibility, reliability, responsiveness, assurance, and empathy), patient satisfaction, and loyalty. These were measured on a 5-point Likert scale. Other quantitative variables included age and visit frequency. The internal consistency of all these quantitative measuress was assessed using Cronbach's alpha coefficients, with all factors showing excellent reliability (ranging from 0.754 to 0.982).

Statistical Method

Data analysis was conducted using IBM SPSS Statistics Version 29.0. Descriptive statistics (means, standard deviations, frequencies, and percentages) were used to summarize the participant characteristics and response distributions. Reliability analysis was performed using Cronbach's alpha. Prior to the inferential analysis, the dataset was examined for normality, linearity, and homoscedasticity. The main inferential technique was hierarchical multiple regression analysis to determine the relationship between service quality, patient satisfaction (mediating variable), and patient loyalty (dependent variable). Variance Inflation Factor (VIF) values were checked to assess multicollinearity. The statistical significance level was set at $p<0.05$.

Results

Participants

A total of 160 completed questionnaires were collected from patients at the Dental Outpatient Clinic of Dr. Sumantri Hospital, yielding a 100% response rate. The participants were predominantly female (58.1%), with the majority (60.6%) under 35 years of age. A significant proportion (42.5%) held a university degree. Most respondents (65.6%) reported visiting a dental clinic more than once, and 79.4% sought dental treatment or procedures.

Descriptive Data

The overall perception of dental service

quality was highly positive, with 98.1% of respondents rating it as good. Similarly, 98.8% of patients reported satisfaction. Strong patient loyalty was also demonstrated, with 97.5% of respondents showing strong loyalty. In the univariate analysis, the assurance dimension received the highest mean score (Mean=4.31, SD=0.52), reflecting strong confidence in the staff's competence. The Empathy dimension was also rated highly (mean =4.27, SD=0.56), indicating that patients felt cared for and attentive. The lowest mean score was for the tangibility dimension (mean =3.89, SD=0.61), suggesting that physical facilities and equipment were areas for potential improvement. The overall mean score for patient satisfaction was 4.25 (SD=0.48), and patient loyalty was 4.20 (SD=0.51).

Outcome Data

The internal consistency (reliability) of the measurement instrument was strong for all constructs. Cronbach's alpha (α) scores ranged from 0.754 to 0.982, indicating excellent internal reliability for all factors of service quality, satisfaction, and loyalty.

Main Results

Service quality significantly influenced patient satisfaction (p=0.000). Among the SERVQUAL dimensions, assurance was identified as the most dominant predictor of patient satisfaction (β=0.296). Both service quality and patient satisfaction had significant positive effects on patient loyalty (p=0.000). Specifically, the Empathy dimension of service quality was the strongest determinant of patient loyalty (β =0.284). The second regression model, which assessed the influence of loyalty, had a coefficient of determination (R2) of 0.722. This result indicates that 72.2% of the variation in patient loyalty can be explained by the combined effects of the service quality and patient satisfaction.

Discussion

The primary purpose of this study was to examine how patients perceived service quality influences their satisfaction and, subsequently, their loyalty to healthcare facilities. Employing a quantitative approach with a sample of 300 inpatient participants and analyzing the data using Structural Equation Modeling (SEM) with AMOS software, the key findings revealed that service quality has a strong and significant influence on both patient satisfaction and loyalty. This result confirms the central position of service quality as the main driver of patient behavior within the healthcare service context.

The finding regarding the positive influence of service quality on patient satisfaction is highly consistent with the existing literature and conceptual models such as SERVQUAL. Previous studies, such as those conducted by Parasuraman, Zeithaml, and Berry (1988), have established that dimensions of service quality—especially reliability and responsiveness—are crucial elements in forming the perception of satisfaction. When staff and facilities deliver on service promises accurately and promptly, it meets patient expectations, generates positive feelings, and directly enhances perceived quality.

Furthermore, the strong relationship discovered between patient satisfaction and loyalty intention ($p < 0.001$) is widely supported in service marketing theory and practice. This relationship aligns with the Expectancy-Disconfirmation Theory developed by Oliver (1997), which argues that satisfaction results from an experience that exceeds or meets initial expectations. Once patients feel satisfied, they tend to develop trust that encourages repeated behavior. Thus, satisfaction acts as a crucial psychological bridge, converting a single service experience into a long-term commitment (loyalty), including return visits and positive recommendations (word of mouth).

The most compelling and significant result is that Service Quality simultaneously and highly significantly influences both patient satisfaction ($p < 0.001$) and loyalty ($p < 0.001$). The strength of this dual influence can be attributed to the high perceived risk inherent in healthcare service use. Patients assess not only technical skills (clinical outcomes) but also interpersonal dimensions, such as empathy and assurance. In this high-risk environment, exceptional service quality creates functional satisfaction and cultivates deep-seated trust. This trust forms the foundation of loyalty, reassuring patients that they will receive the best possible care. This emphasizes that superior service quality is the core strategy for patient retention, surpassing mere considerations of price and location.

Theoretically, this study reinforces the validity of the Service Quality-Satisfaction-Loyalty mediation model within the Indonesian healthcare context. These findings suggest that hospital management should prioritize investment in staff training, particularly in the areas of communication, empathy, and assurance competence, as strategic tools for enhancing retention. The main limitation of this study was the use of a cross-sectional design, which restricted the ability to infer temporal causality. Moreover, sampling from Regional General Hospital X in Jakarta may limit the generalizability of the findings. Therefore, future research should adopt a longitudinal design to track changes in loyalty over time and broaden the sample scope to include various types of healthcare facilities.

Conclusion

The quality of dental healthcare services at Dr. Sumantri Hospital Dental Clinic plays a crucial role in shaping BPJS patients' satisfaction. Patients generally rated the service quality positively, particularly valuing effective communication, procedural accuracy, and the comfort of clinical facilities. Statistical evidence showed a robust and significant association between service quality and patient satisfaction, indicating that enhancements in service delivery translate directly to improved perceptions of care quality. Moreover, service quality was found to significantly influence patient loyalty, with most BPJS patients expressing strong intentions to return, recommend the hospital, and continue using it as their primary dental care provider.

To strengthen and broaden these insights, future research should incorporate larger, more diverse samples from public, private, and military dental institutions to improve generalizability. Additionally, further studies are warranted to address service improvement areas such as waiting times and efficiency, as well as to investigate other mediating factors like patient trust and perceived value to deepen the understanding of the service quality–loyalty relationship in Indonesia's public healthcare system

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Conflict of Interest

The authors report no conflict of interest.

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