

Assessing Patient's Satisfaction on Dental Service Quality using Modified SERVQUAL Model

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Abstract

A quality dental service is crucial for ensuring oral health, fulfilling patient desires, satisfying needs, and providing optimal solutions regarding function, aesthetics, and maintenance of oral health. This study offers insight into patient satisfaction with the service quality at the students' polyclinic, Kulliyah of Dentistry (KOD), IIUM. This study aims to investigate the satisfaction level of patients with the dental services provided at the students' polyclinic. This cross-sectional study was conducted at the students' polyclinic, KOD, using modified SERVQUAL questionnaires. The SERVQUAL model includes five dimensions, which were expanded by four additional dimensions aligned with the Ministry of Health corporate culture. A total of 212 patients were selected using convenience sampling. Data were analyzed using IBM SPSS 28 through the Wilcoxon Signed Rank test. The analysis revealed significant differences across the nine dimensions of service quality among patients. The patients' perceptions of the services provided exceeded their expectations in all nine domains. These positive gaps indicate overall satisfaction with the dental services at the students' polyclinic. In summary, patients at the students' polyclinic, KOD expressed a higher satisfaction level than expected. This underscores the importance of passionate and dedicated delivery of dental treatments to meet patient expectations. Continuous evaluation and targeted improvements, especially in tangibles and reliability, are essential for sustaining and enhancing patient satisfaction.

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Introduction

According to the International Organization for Standardization (ISO), quality is defined as the entirety of the features and characteristics of a product or service that pertain to its capability to satisfy customer needs. Quality is a critical concept not only in manufacturing organizations but also in service organizations, including healthcare. Dopeykar *et al.* (2018)¹ highlight that the quality of health services is a multidimensional concept, with patient

satisfaction being one of its most crucial aspects. While assessing the quality of a product or service can focus on its features and characteristics, it is undeniable that patient satisfaction plays a vital role in defining the quality of the service². Therefore, patient satisfaction is a key indicator of quality in healthcare organizations.

SERVQUAL is a model designed to measure service quality as perceived by the customer. Initially created to evaluate the service quality of general businesses, it is now widely used to analyze service quality in healthcare. Quality evaluation in this context is not solely measured by the outcomes of the services but also by the delivery process. Thus, service quality is assessed through the expectations and perceptions of customers across various dimensions. Perceptions refer to patients' evaluations of the services provided, while expectations are viewed as patients' desires. The

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difference between these evaluations along the quality dimensions determines the service quality gap³.

Kaliannan *et al.* (2014)⁴ have interpreted each dimension of the SERVQUAL model in their studies. They describe reliability as the ability to perform the promised service dependably and accurately, while assurance is defined as the knowledge and courtesy of employees and their ability to inspire trust and confidence. Additionally, tangibles refer to the physical facilities, equipment, and appearance of personnel. Moreover, empathy is the provision of caring, individualized attention to patients, and responsiveness is the willingness to help customers and provide prompt service.

Furthermore, the Ministry of Health (MOH) introduced additional dimensions to the SERVQUAL model. Service outcome refers to the result of the healthcare service provided, while caring services involve the degree of care and concern shown by healthcare providers. Additionally, teamwork is the collaboration and cooperative effort among healthcare providers, and professionalism is the professional behavior and competence demonstrated by healthcare providers⁵. These items were added because corporate culture defines the "character of an organization" and embodies its vision and mission, making their inclusion in a study conducted by the MOH using the modified SERVQUAL model imperative⁶.

To our knowledge, there is currently no publication evaluating patient satisfaction with dental services at the students' polyclinic, Kulliyah of Dentistry, IIUM. Thus, this study aims to assess patients' expectations and perceptions of the quality of dental services across nine dimensions at the students' polyclinic using a modified SERVQUAL instrument, and to determine the satisfaction gaps towards service quality.

Materials and methods

Study design and population

This cross-sectional study involved patients attending the students' polyclinic at the Kulliyah of Dentistry, IIUM Kuantan Campus, in Kuantan, Malaysia. Participants were patients aged between 12 and 71 years who were present at the students' polyclinic to answer the questionnaires. Patients below 12 or over 71

years old, or those lacking the ability to perceive the quality of the service provided, were excluded from the study.

Sampling design

Convenience sampling was employed in this study. Patients attending the students' polyclinic were informed about the study and invited to participate while they were at the clinic.

Sample Size

A power analysis for a paired t-test was conducted using G*POWER equivalent to Wilcoxon paired signed rank test to determine the sufficient sample size. Using an alpha of 0.05, a power of 0.80, and a small effect size ($dz = 0.2$), the minimum required sample size was calculated to be 199⁷. This study included a total sample of 212 patients.

Instrument

The SERVQUAL scale, developed by Parasuraman *et al.* (1985)⁸, measures five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. The questionnaire used in this study was adapted from John *et al.* (2011)⁹ and included four additional dimensions from the Ministry of Health (MOH): service outcome, caring services, teamwork, and professionalism.

The questionnaire consisted of two parts. The first part included a consent form and demographic questions regarding age, gender, education level, marital status, occupation, and the number of attendances to the clinic. The second part contained twenty items assessing the nine dimensions of service quality, divided into sections on expectations and perceptions. A five-point Likert scale was used to measure patients' expectations and perceptions, where one referred to strongly disagree, two to disagree, three to uncertainty, four to agree, and five to strongly agree.

Statistical Analysis

IBM SPSS Statistics Software version 28 was used for data analysis. Descriptive analysis summarized the sample characteristics by frequency (n) and percentage (%). The median and interquartile range were used for the scores of patients' expectations and perceptions.

The Wilcoxon signed ranks test was employed to compare the significance of the differences between expectations and perceptions for each question and dimension. Ethical approval for the study was obtained from the International Islamic University Malaysia

Research Ethics Committee with ID 2023-028.

Results

The demographic data from Table 1 indicates that the patient population primarily falls into two age ranges: those in their 20s (42.7%) and individuals aged 40 and above (52.9%). Female patients (57.1%) outnumber male patients (42.9%). The marital status distribution shows a higher prevalence of single and divorced individuals or those classified as others (55.1%) compared to married patients (44.9%). Educationally, a significant proportion of patients have attained tertiary-level qualifications (77.6%), reflecting a high level of academic attainment within the patient pool.

Variables	n (%)
Age (years)	
<19	19 (9.2)
20-29	88 (42.7)
30-39	25 (12.1)
>40	74 (35.9)
Gender	
Male	91 (42.9)
Female	121 (57.1)
Marital Status	
Married	96 (44.9)
Others	115 (55.1)
Education Level	
No formal education	1 (0.5)
Primary education	5 (2.4)
Secondary education	41 (19.5)
Tertiary education	163 (77.6)
Occupation	
Government	38 (18)
Private	36 (17.1)
Self employed	17 (8.1)
Unemployed	26 (12.3)
Student	79 (37.4)
Retired	11 (5.2)
Others	4 (1.9)
Number of attendances	
First time	29 (13.7)
Second time	32 (15.2)
Third time	25 (11.8)
More than 3 times	124 (58.8)

Table 1. Demographic Characteristics and Satisfaction Level of Respondents.

Occupationally, a considerable segment of the patients are students (37.4%), indicating a potential familiarity with the academic environment of the polyclinic. Additionally, a substantial number of patients make frequent visits, with more than three visits (58.8%), suggesting a preference for and trust in the services provided at the polyclinic.

The reliability for the expectations and perceptions of the respondents is illustrated in Table 2. The internal consistency for the separate dimensions ranged between 0.87 and 0.97 for expectations and between 0.75 and 0.96 for perceptions. This indicates that the internal consistency was good to excellent for all the dimensions measured.

Expectation

Based on the results shown in Table 3 and Table 4, the respondents' highest expectations were associated with the statement "students inform patients exactly when services will be performed" (Q1). This was followed by high expectations for "students give clear information about the patient treatment" (Q12), "students provide effective treatment" (Q16), "students give patients personal attention" (Q7), and "students work as a team when providing treatment" (Q17). Among the various dimensions of service quality, the respondents considered assurance (D4) and tangibles (D1) as the most critical dimensions. The assurance dimension encompasses several aspects: students being polite, knowledgeable regarding patient treatment, and providing clear information about the treatment. The tangibles dimension includes visually appealing physical facilities, the presence of up-to-date equipment, students always appearing neat, and toilets always being clean.

Perception

The respondents' perception of the quality of service received was lowest for "cleanliness of the toilets" (Q20), followed by "waiting time" (Q3), "visually appealing physical facilities" (Q4), "polyclinic have up-to-date equipment" (Q5), and "students provide services at the promised time" (Q2). Their perception was highest for assurance (D4) and empathy (D5) among the SERVQUAL dimensions. The assurance dimension includes students being polite, knowledgeable regarding patient treatment, and providing clear information about the patient treatment. The empathy dimension involves students giving patients

personal attention, understanding patients' needs, and having patients' best interests at heart.

Satisfaction/Quality Gap

There was a statistically significant difference between the expectation of the patients compared with their perception of the service provided ($P < 0.01$) except for the statements "polyclinic have up-to-date equipment" (Q5), "students' knowledge about the treatment" (Q11), "students provide clear information about patients' dental problems" (Q12) and cleanliness of the toilets (Q20). The highest satisfaction was observed with "students always willing to help with sincere interest" (Q13), "students always understand patients' needs" (Q8), "students always appear neat" (Q6), "students are polite" (Q10) and "students start the treatment as soon as possible" (Q15). The lowest satisfaction gap was related to cleanliness of the toilets (Q20), polyclinic have up-to-date equipment" (Q5), "students' knowledge about the treatment" (Q11), "students provide clear information about patients' dental problems" (Q12) and "students provide effective treatments" (Q16). The patients' perceptions regarding the quality of services were above their expectations in all dimensions, and the gaps were positive. The respondents gave the greatest importance to tangible (D1) and reliability (D2) when receiving the dental service from the students.

The respondents are mostly satisfied with the corporate culture service provided in the students' polyclinic, Kulliyah of Dentistry, IIUM. The dimension of caring services (D7) received the highest satisfaction among the respondents, followed by professionalism (D9), teamwork (D8), and outcome (D6). This indicates that patients perceive a high level of care, professionalism, teamwork, and positive outcomes from the services provided at the polyclinic.

Discussion

The IIUM Student's Polyclinic of Kulliyah of Dentistry, established in 2007, has grown in popularity because of its extensive treatment options and reasonable prices¹⁰. Despite its achievements, little published research has been done to evaluate patient satisfaction specifically at this facility. Given the increasing public demand for quality healthcare services, as noted by Riaz *et al.* (2021)¹¹, and the critical dimensions of dental service quality identified by

John *et al.* (2011)⁹, this discussion employs the SERVQUAL model to assess various aspects of patient satisfaction at the IIUM Student's Polyclinic.

In this study, patient perceptions of the quality of services exceeded their expectations across all SERVQUAL dimensions, resulting in positive gaps. This indicates that the polyclinic is performing well above the baseline expectations of patients. However, there are variations in satisfaction levels among different dimensions, which provide insights into areas needing improvement especially in tangible and reliability. As we know that, the tangible aspects, which include the physical facilities, dental equipment, and general atmosphere, all play a significant role in influencing patients' opinions. From this study, the results indicate that patient satisfaction with the up-to-date dental equipment (Q5), visually appealing physical facilities (Q4) and cleanliness of the toilets (Q20) is notably lower. The lower levels of satisfaction observed in this domain highlight potential shortcomings in the provision of basic amenities, which can significantly impact overall patient experiences at the polyclinic. This is consistent with findings by John *et al.* (2011)⁹, Zun *et al.* (2018)¹², Akbar *et al.* (2018)¹³, Akbar *et al.* (2019)¹⁴ and Setijanto & Mirandani, (2022)¹⁵ where tangibles were identified as critical to patient perceptions of service quality.

Reliability, or the ability to deliver promised services received the second least satisfaction scores in this study, aligning with the findings by John *et al.* (2011)⁹ and Akbar *et al.* (2019)¹⁴. However, this study contrasts with Zun *et al.* (2018)¹², where reliability received the highest satisfaction score. The discrepancy can be attributed to the context of a student polyclinic, where students are bound by clinic timetables and cannot provide immediate treatment. This scheduling constraint can lead to delays and impact the perceived reliability negatively. While patients might have to wait for scheduled appointments, the structured nature of a teaching environment inherently differs from professional settings, where treatments are more readily available. Furthermore, assurance, which encompasses the knowledge and courtesy of staff and their ability to inspire confidence, showed the third least satisfaction scores. Patients may perceive a lack of confidence or competence among the dental students, possibly

due to their inexperience compared to experienced professionals where in line with the study by Akbar *et al.* (2019)¹⁴. However, this contrasts with the findings of John *et al.* (2011)⁹, where assurance was highly rated in a professional context.

Moreover, prompt service and willingness to assist patients received the highest satisfaction scores which was in line with the study Zun *et al.* (2018)¹² and Sharka *et al.* (2024)¹⁶ where the responsiveness was a high-performing dimension. This indicates that patients felt their concerns were promptly addressed and that there was a strong willingness from the student to assist them. This high score demonstrates the effectiveness of the polyclinic's approach in managing patient appointments and interactions, suggesting that students and staff successfully handled patient needs in a timely manner. However, maintaining this high level of responsiveness will require ongoing attention to appointment scheduling and patient communication to ensure sustained satisfaction. In addition, empathy received the second highest satisfaction score in this study. This indicates that patients felt cared for and that their individual needs were recognized and addressed by the dental students. This finding is encouraging and suggests that despite the constraints of a teaching environment, students are effectively providing empathetic care. Training students in empathy and patient interaction, similar to the professional development seen in experienced practitioners, should continue to be a focus to maintain and further improve this dimension.

For the MOH corporate culture value, caring service received the highest satisfaction score in this study. This is in contrast with the findings of John *et al.* (2011)⁹, where caring service was the dimension with the lowest satisfaction score. The high satisfaction with caring service at the IIUM students' polyclinic suggests that students are successfully embodying the MOH corporate culture value of providing attentive and compassionate care. This positive outcome could be attributed to the emphasis on patient-centered care in the training programs at IIUM, reflecting a strong alignment with the MOH values. Hence, to gain a more comprehensive understanding of the specific concerns within each domain, conducting detailed surveys, interviews, or focus groups with

patients could be beneficial. This qualitative approach can help to identify specific instances or aspects that contribute to dissatisfaction, enabling the polyclinic to implement targeted improvements and enhance overall patient satisfaction.

Conclusions

The findings of this study using the SERVQUAL model to measure service quality at the IIUM Student's Polyclinic reveal significant differences across the nine dimensions of service quality among patients. Patients' perceptions of the services provided exceeded their expectations in all nine domains, resulting in positive gaps and indicating overall satisfaction. Continuous evaluation and targeted improvements, particularly in the areas of tangibles and reliability, will be essential in maintaining and enhancing patient satisfaction. This study provides a valuable baseline for future research and quality improvement initiatives, contributing to the overall enhancement of dental health care services at the students' polyclinic. By addressing these areas and maintaining strengths, the IIUM Student's Polyclinic can continue to provide high-quality dental care that meets and exceeds patient expectations.

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Declaration of Interest

The authors declare that there are no conflicts of interest.

	Dimensions	Items	Cronbach's α	
			Expectation	Perception
D1	Tangibles	Q4, Q5, Q6, Q20	0.914	0.849
D2	Reliability	Q2, Q3, Q14	0.868	0.754
D3	Responsiveness	Q1, Q13, Q15	0.871	0.801
D4	Assurance	Q10, Q11, Q12	0.891	0.853
D5	Empathy	Q7, Q8, Q9	0.911	0.915
D6	Outcome	Q16	-	-
D7	Caring services	Q2, Q10, Q13, Q15	0.909	0.873
D8	Teamwork	Q11, Q17	0.870	0.816
D9	Professionalism	Q1, Q2, Q7, Q8, Q9, Q11, Q12, Q14, Q16, Q18, Q19	0.972	0.958

Table 2. Reliability Analysis for the Dimensions.

	Expectation			Perception			Satisfaction		Z-Statistics	P Value ^a
	Score 4-5 ^b (%)	Median	IQR	Score 4-5 ^b (%)	Median	IQR	Mean	95% CI		
Q1	98.2	5	1	98.6	5	0	0.121	0.047, 0.196	-3.173	0.002
Q2	97.2	5	1	97.6	5	0	0.127	0.054, 0.200	-3.314	0.001
Q3	92.4	5	1	94.8	5	0	0.099	-0.011, 0.208	-2.195	0.028
Q4	92.0	5	1	95.3	5	0	0.118	0.022, 0.214	-2.324	0.020
Q5	95.8	5	1	95.8	5	1	0.009	-0.083, 0.102	-0.088	0.930
Q6	95.8	5	1	99.0	5	0	0.239	0.156, 0.323	-5.589	0.001
Q7	97.6	5	1	98.5	5	0	0.146	0.070, 0.222	-3.756	0.001
Q8	97.1	5	1	99.1	5	0	0.380	-0.088, 0.848	-3.797	0.001
Q9	97.2	5	1	99.0	5	0	0.142	0.068, 0.215	-3.697	0.001
Q10	96.7	5	1	99.6	5	0	0.217	0.134, 0.300	-5.072	0.001
Q11	97.2	5	0	98.6	5	0	0.057	-0.016, 0.130	-1.467	0.142
Q12	98.1	5	0	97.7	5	0	0.057	-0.024, 0.138	-1.420	0.155
Q13	97.1	5	1	99.5	5	0	0.396	-0.073, 0.866	-4.242	0.001
Q14	97.2	5	1	98.1	5	0	0.100	0.021, 0.179	-2.434	0.015
Q15	92.0	5	1	98.1	5	0	0.198	0.111, 0.285	-4.366	0.001
Q16	98.1	5	1	98.1	5	0	0.080	0.005, 0.156	-2.025	0.043
Q17	97.6	5	1	99.0	5	0	0.142	0.066, 0.217	-3.677	0.001
Q18	96.7	5	1	99.6	5	0	0.185	0.111, 0.258	-4.878	0.001
Q19	96.7	5	0	99.5	5	0	0.123	0.054, 0.192	-3.436	0.001
Q20	95.2	5	1	92.9	5	1	-0.005	-0.101, 0.091	-0.251	0.802

Table 3. Comparison of Expectation, Perception, and Satisfaction for each question.

Abbreviations: IQR, interquartile range; CI, confidence interval, ^aWilcoxon signed ranks test, ^bRespondents giving scores 4 and 5.

	Expectation			Perception			Satisfaction		Z Statistics	P Value ^a
	Score4-5 (%) ^b	Mean ±SD	Median (IQR)	Score4-5 (%) ^b	Mean ±SD	Median (IQR)	Mean	95% CI		
D1 ^c	98.2	4.62±0.61	5.0(0.8)	98.2	4.71±0.46	5.0(0.5)	0.091	0.018, 0.164	-2.084	0.037
D2 ^c	96.7	4.64±0.57	5.0(0.7)	99.1	4.74±0.46	5.0(0.3)	0.107	0.038, 0.176	-3.078	0.002
D3 ^c	98.1	4.63±0.58	5.0(0.7)	99.0	4.79±0.39	5.0(0.3)	0.162	0.097, 0.227	-5.089	0.001
D4 ^c	98.2	4.70±0.55	5.0(0.7)	99.5	4.81±0.40	5.0(0.3)	0.110	0.044, 0.176	-3.374	0.001
D5 ^c	98.1	4.67±0.56	5.0(0.7)	99.5	4.81±0.41	5.0(0)	0.142	0.076, 0.207	-4.522	0.001
D6 ^d	95.8	4.69±0.57	5.0(1.0)	99.0	4.77±0.49	5.0(0)	0.080	0.005, 0.156	-2.288	0.043
D7 ^e	98.1	4.63±0.58	5.0(0.8)	99.6	4.81±0.38	5.0(0.3)	0.177	0.112, 0.241	-5.462	0.001
D8 ^e	98.1	4.69±0.55	5.0(0.5)	99.5	4.79±0.42	5.0(0.5)	0.099	0.034, 0.165	-2.980	0.003
D9 ^e	98.1	4.69±0.53	5.0(0.6)	99.6	4.80±0.38	5.0(0.2)	0.116	0.058, 0.175	-4.136	0.001

Table 4. Comparison of Expectation, Perception, and Satisfaction for each dimension.

Abbreviations: IQR, interquartile range; CI, confidence interval; MOH = Ministry of Health. ^aWilcoxon signed ranks test, ^bRespondents giving scores 4 and 5. ^cSERVQUAL dimension, ^dService outcome, ^eMOH core values.

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