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Measuring Service Quality of Public Dental Health Care Facilities in Kelantan, Malaysia

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Abstract
This study investigates patients’ expectations and perceptions of service quality in public dental health care and measures their “satisfaction gap.” This descriptive study involved 481 dental outpatients in Kelantan, Malaysia. A modified SERVQUAL 20-item instrument was used to assess patients’ expectations before and perceptions after receiving dental treatment. The “satisfaction gap” was then measured. Results showed that patients visiting for management of dental pain were more satisfied (P = .007) than those visiting with appointment. The most significant service quality dimensions were related to responsiveness, assurance, and empathy of the dental health care providers. There was a significant difference between the patients’ expectations and their perceptions of service provided (P < .01) with regard to all dimensions. In conclusion, dental service providers should give emphasis to the compassionate and emotional aspects of care and to remember that they are integral components of quality service.

Keywords
patient satisfaction, SERVQUAL, oral health care, expectation, perception, quality of life

Introduction
In today’s era of global competitiveness, the quality of service provided plays a critical role in customer satisfaction, regardless of the type of service rendered. Satisfactory service quality can be achieved when the service provided meets or exceeds the customers’ expectation about the service. There are 2 forms of quality that are relevant to service providing organizations—namely, technical quality and functional quality.1 In the health care environment, technical quality is defined on the basis of the technical accuracy of the diagnoses and procedure and this information is generally only accessible to the health care providers. Functional quality refers to

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the manner in which the health care service is delivered to the patient and this becomes the primary determinant of patients' quality perception.²

Patients' views become an important tool in the process of monitoring and improving quality of health care services. Health care is finely individualized, meaning it is not a standardized product directed at customers with identical needs, whereby the patient characteristics determine the nature of the health care provided.³ Dental service quality also consist of (a) ensuring oral health, (b) fulfilling the patients’ desires, (c) satisfying their needs, and (d) providing optimal solutions regarding function, esthetics, and maintenance in a most acceptable procedure that would cause the least possible harm or inconvenience to the patients.⁴ Several research studies note that the quality, satisfaction, and dissatisfaction with health services are determined by variables such as good relations between doctor and patient, availability of basic infrastructure, time spent for consultation and information given during consultation, and waiting time.⁵,⁶ It is also important that the service provided is appropriate in a sociocultural context.⁷ Service quality, therefore, as perceived by customers, is the extent of discrepancy between the customers’ expectations and their perception.

SERVQUAL was originally developed to be used in the marketing industry.⁸ It is a tool used to perform gap analysis based on the difference between expectations and perceptions of service quality. The authors suggested that SERVQUAL is suitable, with some adaptation, in a variety of situations, and indeed, it has been used in a wide range of services including hotels, travel, higher education, accountancy, architecture, construction, hospitals, and also in dentistry. Carman⁹ replicated the original study in 3 separate situations and concluded that it is acceptable to add or omit SERVQUAL items if these are not relevant to a particular service. Babakus and Mangold¹⁰ modified the 22-item SERVQUAL tool into a 15-item questionnaire to suit hospital services. Furthermore, the results from the study using SERVQUAL on dental care by Baldwin and Sohal¹¹ demonstrate the instrument’s strength in the areas of scale reliability and validity. It was again modified, translated, and validated to suit Malaysian health care environment by Roslan.¹² In this modification, there were 20 items, classified under 9 dimensions. The 9 dimensions included the 5 dimensions of the original SERVQUAL instrument: tangibles, reliability, responsiveness, assurance, and empathy. In addition, service outcome and 3 other dimensions set as the core values of the Ministry of Health (MOH) corporate culture, namely, caring service, teamwork, and professionalism, were also included. Because the corporate culture defines the “character of an organization” and embodies the vision and mission of the organization, it was imperative that it be included in a study conducted by the MOH. The instrument followed the conceptual model of service quality,¹³ where perceived service quality is defined as the difference between consumer expectations and perceptions, which in turn depends on the size and direction of the other gaps associated with the delivery of service quality on the marketer’s side.

The dental health care system in the private sector in Malaysia is largely on a fee-for-service basis. There are few third party payment schemes, and there is no national health insurance scheme.¹⁴ As the services rendered in the public sector are heavily subsidized by the government, a large number of the population use the public dental health care system. For this reason, the MOH, reflected by its 3 corporate culture core values, continuously strives to define, monitor, and improve the quality of services provided. Furthermore, with the “health consumerism,”¹⁵ patients are now more dentally aware and demanding, and to be successful, service providers must keep pace with the expectations of their patients.

To the knowledge of the author, there are no publications on satisfaction with public dental services in Kelantan, Malaysia. The purpose of this study was to investigate (a) expectation of patients with regard to public dental health care and their perception of the care provided, (b) their “satisfaction gap” measured using the modified SERVQUAL instrument,¹² and (c) to measure the public response to various dimensions of service quality and the MOH corporate culture core values among patients attending public dental health care facilities in Kelantan, Malaysia.
Methods

The present study was part of a national survey assessing satisfaction among patients attending public dental clinics in Malaysia using Roslan’s modification of the SERVQUAL instrument. This study reports the findings from Kelantan, a northeastern state of Malaysia, from where the principal author was responsible for data collection.

A total of 500 dental patients (177 male, 35.4%; 323 female, 64.6%) aged 12 to 71 years, who visited 2 randomly selected government dental clinics in Kelantan during a 2-month period in 2005 for dental treatment, participated in this study. The respondents included in the study were those who received dental treatment on the day the questionnaire was distributed. As the questionnaire was self-administered, patients less than 12 years of age and those not Malaysian citizens were excluded from this study.

The study participants were asked to complete a self-administered questionnaire and were guaranteed anonymity during the course of data collection. The first section of the questionnaire addressed the respondents’ demographic characteristics. The second section contained the modified SERVQUAL scale according to Roslan, which has been described earlier in this article. There were 20 statements relating to respondents’ expectation of the quality of service that should be offered and 20 corresponding items relating to performance perception of the quality of service actually delivered. A 5-point scale ranging from “strongly disagree” (1) to “strongly agree” (5), with no verbal labels for scale points 2 through 4, was adapted. The term service in this study referred to all services provided at a dental health care facility, which included dental treatment and nondental services such as cleanliness, waiting time, and quality of physical environment. The term staff in the questionnaire referred to all dental staff, including dental operator and all support staff in the dental health care facility. The respondents were not aware of the dimensions and their groupings. All the statements and dimensions included in this study are presented in the appendix.

The respondents’ expectation before and their perception after receiving dental treatment were recorded and the difference determined their satisfaction. This difference is also termed as quality gap or satisfaction gap. The quality of service along each of the 9 dimensions was also assessed across all respondents by adding the scores on the statements pertaining to the dimension and dividing the sum by the number of statements making up the dimension. Those who scored 4 and 5 were considered satisfied, whereas the others were considered dissatisfied.

All analysis was carried out using the Statistical Package for Social Sciences (SPSS) for Windows, version 13, software package at the Institute of Health Management, MOH. For the categorical data analysis, comparing 2 or more proportions, Pearson’s \( \chi^2 \) test was performed. Cronbach’s \( \alpha \) was calculated to estimate how consistently the subjects responded to the separate statements within each domain, with \( \alpha \) values of .70 or higher considered to be sufficient.16 A principal component factor analysis was performed to explore the construct validity of this modified questionnaire. Varimax rotation and factors with eigenvalues greater than 1 were retained, whereas conservative factor loadings greater than 0.40 were considered significant at the .05 level.17 Wilcoxon signed ranked test was used to compare the distributions of the respondents’ expectation and perception. Statistical significance was considered achieved with a \( P \) value of less than .05.

Results

Demographic Characteristics

Completed, usable questionnaires were received from 481 respondents from a total of 500 distributed (96.2% response rate). The average age of the respondents was 26 years (range = 12-71).
A prominent feature of the sample characteristics was that a majority of the respondents were females (65%), and 34% of the respondents were aged less than 19 years. The ethnic distribution representative of the country is not reflected in this study because of the predominant Malay population in this state. Although nearly all the respondents have formal education, only a quarter of them have tertiary education.

An analysis of the respondents’ demographic characteristics is presented in Table 1. There appeared to be a significant association between patient satisfaction with level of education ($P = .002$) and dental visit for pain management ($P = .007$). There was a small but statistically insignificant difference where dissatisfaction was higher among those aged less than 19 years (64%), female (65%), and those in the “not salaried” category (65%), which include housewives and students. An interesting observation was that those employed in the private sector (46%) are more satisfied with the services when compared with those in the public sector (34%).
Reliability (Table 2) and Validity (Table 3)

Internal consistency for the separate dimensions was between .63 and .89 for expectation and between .69 and .92 for perception (Table 2), which implies that internal consistency was sufficient for all the dimensions. The difference between the 2 assessments illustrated the variability in expectation and perception of the respondents.
The factor analysis for the Satisfaction statements produced a factor matrix of 5 separate factors with an eigenvalue of 1 or more, which accounted for 68.5% of the total variance. However, items from the tangible, responsiveness, reliability, and assurance dimensions were split between 2 of the extracted factors as were also the MOH corporate culture dimensions. Only items under empathy exhibited convergent validity.

**Expectation (Tables 4 and 5)**

Analysis of the findings show that the respondents’ highest expectation concerned “staff neatness” (Q3) followed by “staff politeness” (Q12), “staff work discipline” (Q19), and “staff commitment to their job” (Q20). The respondents expected little with respect to “waiting time” (Q5) and “cleanliness of public toilet” (Q17). The respondents considered responsiveness (D3) and assurance (D4) as the most critical SERVQUAL dimensions.

**Perception (Tables 4 and 5)**

The respondents’ perception of quality of service received was lowest for “cleanliness of the toilets” (Q17), “waiting time” (Q5), and regarding “receiving prompt service” (Q8). They gave high score for “staff neatness” (Q3), “staff work discipline” (Q19), “staffs’ teamwork” (Q18), and “staffs’ commitment to their job” (Q20). Their perception was highest for empathy (D5) and assurance (D4) among the SERVQUAL dimensions.
Table 5. Comparison of Distribution for Expectation, Perception, and Satisfaction for Each Dimension

<table>
<thead>
<tr>
<th></th>
<th>Expectation</th>
<th>Perception</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>Score</td>
<td>Score</td>
<td>Mean</td>
</tr>
<tr>
<td>4-5 (%)</td>
<td>4-5 (%)</td>
<td>4-5 (%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Median IQR</td>
<td>Median IQR</td>
<td></td>
</tr>
<tr>
<td>D1c</td>
<td>93.2</td>
<td>80.0</td>
<td>-0.50</td>
</tr>
<tr>
<td>D2c</td>
<td>89.7</td>
<td>78.0</td>
<td>-1.00</td>
</tr>
<tr>
<td>D3c</td>
<td>93.7</td>
<td>80.9</td>
<td>-1.00</td>
</tr>
<tr>
<td>D4c</td>
<td>93.6</td>
<td>82.1</td>
<td>-1.00</td>
</tr>
<tr>
<td>D5c</td>
<td>93.3</td>
<td>82.4</td>
<td>-0.67</td>
</tr>
<tr>
<td>D6d</td>
<td>94.6</td>
<td>83.2</td>
<td>-1.00</td>
</tr>
<tr>
<td>D7e</td>
<td>94.1</td>
<td>81.0</td>
<td>-0.75</td>
</tr>
<tr>
<td>D8e</td>
<td>94.3</td>
<td>83.8</td>
<td>-0.50</td>
</tr>
<tr>
<td>D9e</td>
<td>93.6</td>
<td>83.2</td>
<td>-0.64</td>
</tr>
</tbody>
</table>

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.

Satisfaction/Quality Gap (Tables 4 and 5)

There was a statistically significant difference between the expectation of the patients compared with their perception of the service provided (P < .01) with regard to all the statements analyzed. The highest satisfaction gap was observed with “receiving prompt service from staff” (Q8), “cleanliness of the toilets” (Q17), and “receiving service at promised time” (Q4). The lowest satisfaction gap was related to “neatness of staff” (Q3), “staff work discipline” (Q19), and “information provided by staff as to when services would be performed” (Q7). The respondents gave greatest importance to responsiveness (D3) and reliability (D2) when receiving the dental health care services.

Considering the perception of the respondents with regard to the performance of the public dental health care providers, only 2% were dissatisfied with the services, but when the satisfaction level was measured as the difference between the perception and expectation of the respondents, the satisfaction rate decreased to 37% (Figure 1).

MOH Core Values (Tables 4 and 5)

The respondents are generally satisfied with the corporate culture service provided in the public dental health care system except for caring services (D7), where the extent of discrepancy between respondents’ expectations and their perceptions was highest among all the dimensions measured. The respondents would also like to see improvement in service outcome (D6).

Discussion

Historically, Kelantan has been culturally, socially, and economically different, besides having a different dialect from the other states in Malaysia. The culture is viewed as uniquely traditional, and this has been attributed to the geographical isolation of Kelantan from the rest of Malaysia. These factors make the Kelantanese people uniquely different, and hence this study has been carried out in a sociocultural context.
Customer satisfaction is being recognized to play an essential role in the success and survival of any service provided in today’s competitive environment. Not surprisingly, considerable research has been conducted on what customer satisfaction comprises, and instruments have been developed to measure customer satisfaction. One of the most valuable elements of the SERVQUAL analysis is the ability to determine the relative importance of the various dimensions in influencing customers’ overall service quality perception. Studies have provided insights into the appropriateness of the SERVQUAL model as a tool for measuring service quality in the dental health care environment.

This modified SERVQUAL questionnaire had good to excellent reliability, and the questions within each dimension had desirable levels of internal consistency. This is in agreement with Babakus and Mangold, who in their study found the completed expectations and perception scales in hospital services met various criteria for reliability and validity. However, this instrument exhibited factor instability as its factor loading was inconsistent with the originally defined SERVQUAL model.

In this study, all dimensions have negative satisfaction scores, which imply that none exceeded patients’ expectations. A similar finding was noted in other studies using similar tools. Again, Hart, using SERVQUAL, found a very low level of satisfaction and attributed that finding as the width of gap between “expectations” and “perceptions.” A negative gap is usually anticipated because normally expectations of an ideal service are seldom fulfilled. According to the SERVQUAL model, the smaller the “quality gap” the higher the satisfaction.

Studies assessing satisfaction with dental services have found that different factors affect satisfaction, due to various approaches to assessment. Al-Mudaf et al found moderately high levels of satisfaction with 3 dental specialties using a specially designed questionnaire assessing satisfaction. Esa et al, using a nominal group technique, assessed the success of the oral health service by evaluating the degree of satisfaction and dissatisfaction among a group of
Non-Commissioned Officers in the Malaysian Armed Forces. Clow et al\textsuperscript{25} studied specific variables hypothesized to affect patient expectations directly or indirectly, because patient expectations affect the perceived service quality.

Satisfaction is multifactorial, and no individual factor contributes to satisfaction or dissatisfaction. In this study, there was a significant association between patient satisfaction and educational level, as well as dental visit for pain management. Dental treatment varies widely from simple scaling or cleaning of teeth to minor oral surgical procedures. A number of patients visit dental clinics on an appointment basis for treatment, because most dental treatments take considerable time. On the other extreme, patients visiting an outpatient clinic without appointment are more likely to have an acute problem, usually pain. Dental pain can be severe and has been described as excruciating. The nature of pain and its subsequent relief can be a cause for high satisfaction among patients with dental pain.

In contrast, there was no significant association between patient satisfaction and age, gender, marital status, or personal income. Researchers have investigated the satisfaction of patients at different age groups. Young et al\textsuperscript{26} found older patients to be more satisfied with health care services than younger patients. In contrast, Lahti et al\textsuperscript{27} found older patients to be less satisfied. They reasoned that the oral health status of the younger patients being better than that of older people may lead to better dental experience. In this study, although not significant, women were found to be more dissatisfied than men. Gopalkrishna and Mummalaneni\textsuperscript{28} identified women as being more satisfied than men, attributing greater exposure to dental services among women, a likely reason to moderate their expectations, which in turn, are more likely to be met. The authors in the study found the respondents from the “other” races were more satisfied, but their small numbers in this study is not representative of the population to make a conclusion. Another study\textsuperscript{29} found racial or ethnic minorities were more likely to report poor quality of care. The higher the educational level of patients in this study, more dissatisfaction was observed. This phenomenon is fairly well documented in other studies also. Hall and Dornan\textsuperscript{31} interpreted that a highly educated patient may objectively see that he or she is getting good-quality health care but, subjectively, may not be satisfied because of his or her higher expectation.

The patients’ responses in this study clearly show that the dental staff were perceived to do their job with high commitment, display good work discipline, always appear neat, and always be polite. Although the patients’ expectation regarding waiting time, cleanliness of public toilets, and promptness of service was low, the perception was also low, suggesting that considerable improvement is needed in these areas. The results of this study can assist the MOH in planning and directing resources specifically toward services that were neglected but are critical to patient satisfaction.

Patients’ expectations of service care providers are highest in relation to responsiveness, and patients ranked reliability as the lowest perceived among all the dimensions. The mean satisfaction score (Tables 4 and 5) was used to compute the satisfaction gap scores at different levels of detail: for each statement pair or for each dimension. By examining these various gap scores, the dental health care providers can assess overall quality of service as perceived by patients and also identify the key dimensions on which to focus quality improvement efforts. The results of this study, based on service quality model of Zeithaml et al,\textsuperscript{13} establish that responsiveness and reliability are the more serious problems facing public dental health care in Kelantan. On the whole, in addition to responsiveness and reliability, the care providers should also focus on service outcome and professionalism to improve quality of public dental health service.

There can be a wide range of sources of error in any satisfaction research. This study was conducted by questioning about expectations and perceptions of the respondents in a single session. The nature of the assessment may have induced bias in the questionnaire response. Ratings may be influenced by the individual’s mood, past experience, tendency to rate with more or less
severity, influence of the mass media, the Hawthorn effect, or gratitude, which may explain the reasons behind high expectation and perceived outcome in this study. Together with these respondent-related factors, the accuracy of ratings may be affected by methodological factors, including sampling strategy, response rate, questionnaire format, and data collection procedure. Another key factor is the quality of the assessment instrument in terms of validity and reliability. A complete study of these factors, especially on the validity of the questionnaire, should be carried out at regular intervals. The statements representing the core values of the MOH corporate culture in this survey need to be reevaluated as they do not seem to be valid for their respective dimensions. Future researchers could also compare the efficacy of SERVQUAL between patients and health care providers. Further research could also measure which dental health care service is perceived to offer better service and their relative strengths and weaknesses.

Conclusion

The authors believe the findings of this study using SERVQUAL as an instrument to measure service quality can contribute to further enhancement of quality of the delivery of service in the dental health care system. The results of this study also form a baseline for further studies conducted in this area, thus monitoring the patient satisfaction over a period of time. With the trend of getting public dental clinics recognized through ISO certification, patient satisfaction plays a large role in quality management procedure. The important message from the patients of Kelantan to the public dental health care managers in this study is “be responsive, be empathetic, be reliable, have up-to-date equipment and facilities, ensure that they feel secure in receiving dental treatment, and most of all provide effective treatment.” Simply practicing dentistry with a high degree of technical expertise will not necessarily convince the patient that he or she has received high-quality dental care. Dental care providers should not lose sight of the compassionate and emotional aspects of care and keep in mind that they are integral components in providing quality treatment.

Appendix

Measurement Statements and Dimensions Concerning Patient Satisfaction Used in the Study

<table>
<thead>
<tr>
<th>Statements</th>
<th>Measurement Statements and Dimensions Concerning Patient Satisfaction Used in the Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Up-to-date equipment</td>
</tr>
<tr>
<td>Q2</td>
<td>Visually appealing physical facilities</td>
</tr>
<tr>
<td>Q3</td>
<td>Staff always appear neat</td>
</tr>
<tr>
<td>Q4</td>
<td>Staff provides services at the promised time</td>
</tr>
<tr>
<td>Q5</td>
<td>Waiting time is appropriate</td>
</tr>
<tr>
<td>Q6</td>
<td>Staff render the services right, every time</td>
</tr>
<tr>
<td>Q7</td>
<td>Staff inform patients exactly when services will be performed</td>
</tr>
<tr>
<td>Q8</td>
<td>Patients can expect prompt service from the staff</td>
</tr>
<tr>
<td>Q9</td>
<td>Staff always willing to help with sincere interest</td>
</tr>
<tr>
<td>Q10</td>
<td>Staff give clear information about the illness suffered by the patient</td>
</tr>
<tr>
<td>Q11</td>
<td>Staff are knowledgeable</td>
</tr>
<tr>
<td>Q12</td>
<td>Staff are polite</td>
</tr>
<tr>
<td>Q13</td>
<td>Staff always understand patients’ needs</td>
</tr>
<tr>
<td>Q14</td>
<td>Staff render patients personal attention</td>
</tr>
<tr>
<td>Q15</td>
<td>Staff have patients’ best interest at heart</td>
</tr>
<tr>
<td>Q16</td>
<td>Staff provide effective treatment</td>
</tr>
<tr>
<td>Q17</td>
<td>Public toilets are always clean</td>
</tr>
</tbody>
</table>

(continued)
Appendix (continued)

**Statements**

<table>
<thead>
<tr>
<th>Q18</th>
<th>Staff work as a team in rendering treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q19</td>
<td>Staff display good work discipline</td>
</tr>
<tr>
<td>Q20</td>
<td>Staff do their job with high commitment</td>
</tr>
</tbody>
</table>

**Dimensions**

**SERVQUAL dimensions**
- D1 Tangibles: Q1, Q2, Q3, Q17
- D2 Reliability: Q4, Q5, Q6
- D3 Responsiveness: Q7, Q8, Q9
- D4 Assurance: Q10, Q11, Q12
- D5 Empathy: Q13, Q14, Q15
- D6 Outcome: Q16

**Ministry of Health corporate culture core value dimensions**
- D7 Caring service: Q4, Q8, Q9, Q12
- D8 Teamwork: Q11, Q18
- D9 Professionalism: Q4, Q6, Q7, Q10, Q11, Q13, Q14, Q15, Q16, Q19, Q20

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**Declaration of Conflicting Interests**

The authors declared no conflicts of interest with respect to the authorship and/or publication of this article.

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