Evaluation of outpatient service quality in Eastern Saudi Arabia

Patient’s expectations and perceptions

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ABSTRACT

Åhlund: نماذج هذه الدراسة تصورات وتوقعات المرضى لمجتمع المستشفى. وذلك بدراسة نموذج الفجوة في جودة الخدمات والتعامل المؤثر بتلك الفجوة.

الطريقة: هذه الدراسة المشروعة والتي أجريت في منتصف أكتوبر وحتى منتصف نوفمبر عام 2014 بمجال الخدمات الخارجية للمستشفى. تم اختيار عينات من مرضى بالطريقة. تم جمع المعلومات باستخدام نموذج معيّن (SERVQUAL) وalfen (4.7 ± 0.5) للمرضى وalfen (3.7 ± 0.8) للمرضى. الفجوة كانت أكبر في الفجوة بين الأعراض والمرض، ومعظم الأعراض على مدار الفجوة كانت في بناء القاعدة. نماذج الفجوة المتغيرة على نماذج الفجوة على مدار الفجوة كانت كبيرة بالنسبة للفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة.

التالي: النتائج: النموذج المقترح نماذج الفجوة لجودة الخدمات، مع كمية كبيرة من الصور. نماذج الفجوة في AES (2.6 ± 0.3) للمرضى وalfen (3.2 ± 0.8) للمرضى. الفجوة كانت أكبر في الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة بين الفجوة.

Conclusions: The proposed model is valid and reliable and significant service quality gaps of all 5 dimensions need to be prioritized and addressed by focused improvement efforts of hospital management.
Healthcare management is under increasing pressure to demonstrate that their services are patient focused and directed to providing the best possible medical care for their patients. Therefore, it has become prudent for hospital management to understand and measure the patient’s perspectives, so that any perceived gap in delivery of service is identified and suitably addressed with constrained resources. A number of studies have been conducted to measure the service quality from the patient’s perspectives. Marković et al’s study conducted in a specialty hospital for rehabilitation in Croatia using 34 statements in each section of the service quality (SERVQUAL) questionnaire revealed that the patient’s expectations were higher than perceptions in all statements grouped in 4 service quality dimensions by exploratory factor analysis. Al-Borie and Damanhouris’ study conducted on inpatients in private and public hospitals identified that the association between demographic factors, except age, with service quality was satisfactory. Yesilada and Direktor’s showed that the service quality gap in all 3 service quality dimensions in a private hospital is narrow as compared with public hospitals in Cyprus, as people are more satisfied with the services provided by private hospitals. Brahmbhatt’s study used 41 paired questions to measure service quality gaps and observed that patient’s expectations were not met and they were not satisfied with the services provided by private and public hospitals. Bowling’s et al study conducted in outpatients and general practices in the UK showed that older, British females were more satisfied with general practices compared with hospital outpatient services. Kumaraswamy’s study using a service quality model in corporate and non-corporate healthcare centers revealed that patients are more satisfied with 4 service quality factors; physician attitude, supportive staff, environment, and service provision provided in corporate healthcare centers. Kayral’s study used 6 service quality dimensions including 34 questions to determine the provision of service quality in private and public hospitals and observed that the patients perceived quality at higher levels in public hospitals; however, physical quality was better in private hospitals. Li et al’s study related the service quality of hospitals not considering the service quality gaps in 9 Chinese cities. Empathy and reliability emerged as strong perception predictors of service quality in Li et al’s study. However, perceptions of service quality varied between cities. Gronroos’s defined service quality as clinical management including diagnosis and treatment (technical quality), and the mode of delivery of services to patients, such as professional staff attitude, emotional support, and cleanliness of environment (functional quality). Parasuraman et al defined service quality as the difference between expectations and perceptions of patients along the 5 dimensions of quality. These studies were conducted in different places using different criteria and different settings for measuring the service quality. The outpatient department is the patients’ first point of contact in the hospital, and the service quality provided by this department establishes the hospital image. A quality outpatient service can be cost-effective by reducing the workload on the inpatient services. Based on the notion that the patients are often unable to accurately evaluate technical quality of care, this study focuses on functional quality, namely, what the patient is receiving. Unfortunately, data on patient’s perceptions and expectations on quality of outpatient services in the hospital studied, are scarce and there is a lack of studies to determine the gap in quality of service. The service quality model of Parasuraman et al, that defines the quality of outpatient service is best assessed by identifying the quality gap obtained from patients’ expectations and perceptions, is used for our study. The objective of this study was to define service quality gaps in outpatient services by assessing the patient’s expectations and perceptions and to determine the factors affecting such service quality gaps.

Methods. A cross-sectional descriptive study was conducted between October and November 2014 in the outpatient waiting areas of a hospital in the Eastern Province of Saudi Arabia. The study population was made up of patients who had visited the hospital at the time of the study. Patients who were willing to participate, visiting once or more, and >16 years of age were included and any accompanying visitor with the patient and inpatient discharged on the day of data collection and waiting for medicine from the pharmacy were excluded. Inpatient discharged on the day of data collection and waiting for medicine from the pharmacy were excluded. The convenience sampling technique was used. Probability sampling was difficult to use due to time, availability and effort needed, and presumed the higher response rate with convenience sampling technique. The decision to meet the patients in the outpatient department enabled on the spot data collection particularly from those who were in the process of receiving healthcare or those who just received care waiting for medicines from the pharmacy.

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Approval for conducting this study was received from the Research and Ethics Committee of the hospital. A total of 306 survey questionnaires were randomly distributed to patients who attended the outpatient services during the hospital working hours between 8:00 and 11:30 am in the morning shift and from 1:00 to 4:00 in the afternoon shift during this period. According to SERVQUAL, a sample size of 200 is sufficient. The following formula was used to calculate the sample size with 5% margin of error:

\[ Z^2 \frac{pq}{e^2} \]

\[ N = \frac{Z^2 \cdot pq}{e^2} \]

Z - level of confidence (1.96), N - required sample size, pq - estimated proportion of attribute in population, e - desired level of precision estimated at 95%. The SERVQUAL instrument by Parasuraman et al was adapted to collect the data for our study. The SERVQUAL instrument was reliable and the instrument has a concurrent validity. The questionnaire was first translated into the Arabic language as the majority of Saudi citizens are native speakers of Arabic. The questionnaire was piloted on 20 subjects not included as study participants. Some of the sentences were rephrased after the pilot study, and the final questionnaire was administered to the target sample through trained healthcare workers on site. Verbal informed consent was taken before giving the questionnaire to respondents. The aim of the study was explained by the healthcare workers, and confidentiality and anonymity of participants were guaranteed, and they were requested to complete the survey while at the hospital and not to take home. All questionnaires were directly collected from respondents by the trained healthcare workers after completion. Three hundred and 6 completed the questionnaires; thus, the overall response rate was 100%.

The required data collected comprised of 2 parts. The first part included questions regarding patients’ demographic characteristics such as age, gender, marital status, education level, and type of visits. The second part included 22 items representing the 5 dimensions: 1) Tangibles: physical facilities, equipment and appearance of personnel; 2) Reliability: ability to perform the promised service dependably and accurately; 3) Responsiveness: willingness to help consumers and provide prompt service; 4) Assurance: competence, courtesy and security; 5) Empathy: caring and individualized attention.

Each statement appeared twice and in the expectations section patients answered questions on the desirable status of services, and in the perception section they answered the questions related to the current status of services. The simultaneous expectations and perceptions measurement was consistent with the previous study. A 5-point Likert scale was used to measure the patients’ expectations and perceptions of service quality whereby one referred to strongly disagreed and 5 referred to strongly agreed. The score for the quality of service was calculated by computing the difference between the ratings that patients assigned to paired perception and expectation statements according to the formula: SERVQUAL score was provided by the equation:

\[ SQ = P - E \]

Wherein SQ means overall service quality, P means performance perception, and E means service quality expectations.

A positive gap score would indicate that expectations were met or exceeded, and perceptions on the outpatient services are very high if the gap score was negative it would indicate that the provided services did not meet their expectations and perceptions regarding services are low. If no quality gap is observed, it would indicate that the expectations are met and the quality of outpatient services is satisfying. The gap score for each individual paired statement was calculated and summed up to provide an overall gap score for each dimension. The effect size (strength of association) was calculated by Eta squared statistics. The guidelines proposed by Cohen for interpreting the effect size were as follows: 0.01 small effect, 0.06 moderate effect, and 0.14 large effect.

The collected data were analyzed using the Statistical Package for Social Sciences (Armonk, NY: IBM Corp.) Version 20.0 for Windows and SPSS Analysis of Moment Structures (AMOS) Version 22 (IBM Corporation, Armonk, NY, USA). Data was first analyzed descriptively by computing the means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Confirmatory analyses was carried out to examine the measurements of the study and their reliability and validity. Paired t-test was used to asses the gaps in service quality dimensions. Confirmatory factor analyses is estimated by means of structural equation model through SPSS AMOS version 22. Univariate analysis including analysis of variance was performed to examine the relationship between patients’ characteristics and mean gap score of expectations and means of individual items along 5 dimensions of scale. Cronbach’s alpha analysis was used to reveal the reliability of scale used.
in the study. The coefficient of 0.70 or higher indicated good to excellent internal consistency as recommended by George and Mallery.\(^\text{17}\) 

**Results.** The proposed service quality model of 5 dimensions is shown in Figure 1. Confirmatory factor analysis was performed to evaluate the proposed quality service model for the modeled constructs that are quality dimensions based on the collected samples. Each subscale consisting of multiple items was converted to single construct that reflected the quality dimension and it was carried out separately for expectation and perception scales for this analysis. Structural equation modelling evaluated the fitness of data with the theoretical model. The maximum likelihood method of estimation was used to estimate the CFA model.

A comparative fit index (CFI)\(^\text{18}\) of 0.95 and factor loading values of more than 0.70\(^\text{19}\) from established scales were achieved providing strong evidence of unidimensionality (how closely individual items represent the same construct) after running the CFA for all constructs. The goodness of fit indices shows a good fit between data and the model, and accepts the structural model. The overall fit measures, Chi square=143, degree of freedom=36, \(p=0.000\), a sample size of more than 200 (300 in this study) could affect Chi-square test to indicate a significant \(p\)-value, CMIN/df (negative minimum discrepancy divided by its degrees of freedom): 3.9, goodness of fit index (GFI): 0.91, normed fit index (NFI): 0.94, comparative fit index (CFI): 0.95, Tucker Lewis index (TLI): 0.94, and Root Mean Square Error of Approximation (RMSEA): 0.08, achieved the criteria values\(^\text{19,20}\) and indicated that proposed model fit the data.

In the next step, convergent validity, composite reliability, and discriminant validity were evaluated to examine the quality of the final measurement model. The results in Table 1 shown that the value of average variance extracted (AVE)\(^\text{20}\) was greater than 0.50, and the factor loading of each item on the construct was more than 0.70.\(^\text{19}\) The composite reliability for each construct was more than 0.8, above the recommended value.\(^\text{19}\) The results revealed that the discriminant validity of the SERVQUAL measurement model is valid. The correlation between 2 sub-constructs was 0.17 and below 0.90,\(^\text{19,21}\) confirming discriminant validity of the instrument. It is evident from the results that the 2 factors with 10 composite sub-constructs achieved the psychometric value.

Outpatient characteristics from the analyzed sample (\(N=306\)) are as follows: 61.8\% of the patients were male, whereas 38.2\% were female. The mean age of male was 40 ± 11.6 years, and for females was 30 ± 10 years. Table 2 summarizes the demographic profile of patients measuring the out-patient service quality.

The reliability coefficient (Cronbach’s coefficient alpha) values ranged from 0.89 for patients’ perceptions scale and 0.95 for patients’ expectations scale. None of reliability alphas for each dimension were below 0.7.\(^\text{17}\) The paired sample t test in Table 3 shows that there is a statistically significant difference between total

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**Table 1 - Results of convergent validity and composite reliability.** \((n = 306)\)

| Sub-construct | Internal reliability Cronbach alpha \((>0.70)\) | Factor loading \((>0.70)\) | CR \((>0.70)\) | AVE \((>0.50)\) |
|---------------|---------------------------------|-----------------|-------------|-------------|
| SQP           | Tangible P                       | 0.89            | 0.71        | 0.84        | 0.62        |
|               | Reliability P                    |                 | 0.84        |             |             |
|               | Responsiveness P                 |                 | 0.78        |             |             |
|               | Assurance P                      |                 | 0.84        |             |             |
|               | Empathy P                        |                 | 0.76        |             |             |
| SQE           | Tangible E                       | 0.95            | 0.83        | 0.93        | 0.77        |
|               | Reliability E                    |                 | 0.88        |             |             |
|               | Responsiveness E                 |                 | 0.89        |             |             |
|               | Assurance E                      |                 | 0.91        |             |             |
|               | Empathy E                        |                 | 0.90        |             |             |

SQP - Service quality perception, SQE - Service quality expectation, CR - composite reliability, AVE - average variance extracted, P - perceptions, E - expectation.
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perceptions mean scores and total expectations mean scores \((t=26.3, p<0.000)\). The given Eta squared value of 0.69 for the difference between expectation and perception mean scores has a large effect. The negative gaps across all 5 dimensions indicated that patients’ expectations generally are not met, with the largest gap observed in tangible dimension and smallest gap in empathy. The Eta squared statistics for tangible (0.67), responsiveness (0.65), reliability (0.61), assurance (0.57), and empathy (0.41) indicated a large effect size. The highest and lowest means of patients’ perception were related to empathy, responsiveness, and tangibles dimensions. The highest and lowest means of patients’ expectations were related to empathy and responsiveness dimensions. All the dimensions are ranked according to mean scores gap between patients’ expectations and perceptions.

Table 2 - Demographic profile of patients measuring out-patient service quality \((n=306)\).

| Characteristics       | Frequency (%) |
|-----------------------|---------------|
| Gender                |               |
| Male                  | 189 (61.8)    |
| Female                | 117 (38.2)    |
| Marital status        |               |
| Single                | 55 (18.0)     |
| Married               | 243 (79.4)    |
| Divorced              | 4 (1.3)       |
| Widowed               | 4 (1.3)       |
| Age (years)           |               |
| ≤30                   | 102 (33.3)    |
| 31-44                 | 119 (38.9)    |
| 45-58                 | 73 (23.5)     |
| 59-72                 | 10 (3.3)      |
| >73                   | 2 (0.7)       |
| Mean age (±SD)        |               |
| Male                  | 40 ± 11.6     |
| Female                | 31 ± 10.1     |
| Education level       |               |
| Primary               | 12 (3.9)      |
| Elementary            | 27 (8.8)      |
| Secondary             | 156 (51.0)    |
| University            | 111 (36.3)    |
| Nationality           |               |
| Saudi                 | 304 (99.3)    |
| Non-Saudi             | 2 (0.7)       |
| Type of visit         |               |
| First visit           | 28 (9.2)      |
| Multiple visit        | 278 (90.8)    |


Table 3 - Service quality dimensions gap scores analysis.

| Quality dimensions | Perception | Expectation | Gaps     | t value | P value | Rank |
|--------------------|------------|-------------|----------|---------|---------|------|
| Tangible           | 3.2 ± 0.9  | 4.6 ± 0.56  | -1.42 ± 0.99 | 25.02 | 0.000   | 1    |
| Reliability        | 3.5 ± 0.82 | 4.6 ± 0.54  | -1.14 ± 0.92 | 21.7  | 0.000   | 3    |
| Responsiveness     | 3.2 ± 0.83 | 4.5 ± 0.6   | -1.32 ± 0.97 | 23.9  | 0.000   | 2    |
| Assurance          | 3.5 ± 0.83 | 4.6 ± 0.54  | -1.11 ± 0.95 | 20.2  | 0.000   | 4    |
| Empathy            | 3.9 ± 0.84 | 4.7 ± 0.53  | -0.76 ± 0.91 | 14.6  | 0.000   | 5    |
| Total              | 3.4 ± 0.71 | 4.59 ± 0.5  | -1.2 ± 0.8  | 26.3  | 0.000   |      |

Table 4 shows the mean gap scores in expectations and perceptions statements are ranked and displayed in the respected dimensions. Generally, patients’ expectations statistically significantly exceeded perceptions in all statements \((p<0.000)\). The patients had the highest expectations for toilet facilities that should be clean \((4.7 ± 0.7)\) followed by doctor should explain the condition to the patient \((4.7 ± 0.6)\), and treated with dignity and privacy \((4.7 ± 0.6)\). The least expectation was for waiting time should not be more than 30 minutes. The highest perceptions of patients they are treated with dignity \((3.9 ± 1)\) followed by privacy was observed during treatment \((3.9 ± 0.9)\). There was a low perception in terms of promptness of service at appointed time \((2.45 ± 1.3)\) and easy appointment system \((2.75 ± 1.4)\).

The analysis of variance (ANOVA) results in Table 5 revealed the association between demographic factors and service quality dimensions. The female expectations are statistically significantly higher compared with male expectations in tangibility \((p=0.001)\) and reliability dimensions \((p=0.01)\). The Eta squared statistics was 0.04 for tangibility and 0.02 for reliability dimensions, which in Cohn’s terms would be considered a small effect size. Therefore, despite reaching statistical significance, the actual difference in expectation and perception mean scores between males and females was small. Age group >73 years of age had statistically significantly higher expectations compared with other age groups in 3 dimensions. The Eta squared statistics for these dimensions were 0.04 showing a small difference. University graduate patients’ have statistically significantly higher expectations compared with other age groups in 3 dimensions. The Eta squared statistics for these dimensions were 0.04 for tangible \((p=0.002)\) and reliability \((p=0.000)\) dimensions. The Eta statistics for this dimension was 0.02, which represent a small effect. Cross tabulation of marital status and nationality revealed no significant results in all dimensions.
Table 4 - Individual statements contributing to gap scores of service quality dimensions.

| Service quality attributes                  | Mean perception | Mean expectation | Gap       | Rank | t-value | P-value |
|---------------------------------------------|-----------------|-----------------|-----------|------|---------|---------|
| **Tangible**                                |                 |                 |           |      |         |         |
| Well maintained equipment                   | 4.6 ± 0.6       | 4.2 ± 0.6       | -0.4 ± 0.9| 4    | 17.5    | 0.000   |
| Clean waiting facilities                    | 4.6 ± 1         | 4.3 ± 1         | -0.3 ± 0.9| 3    | 18.6    | 0.000   |
| Neat professional appearance                | 4.6 ± 0.7       | 4.5 ± 0.7       | -0.1 ± 0.9| 2    | 20.5    | 0.000   |
| Comfortable room                            | 4.7 ± 0.7       | 4.4 ± 0.7       | -0.3 ± 0.9| 1    | 16.3    | 0.000   |
| Clean toilet                                | 4.6 ± 0.7       | 4.4 ± 0.7       | -0.2 ± 0.9| 1    | 16.1    | 0.000   |
| Prompt services                             | 4.6 ± 0.7       | 4.3 ± 0.7       | -0.3 ± 0.9| 3    | 15.01   | 0.000   |
| **Reliability**                             |                 |                 |           |      |         |         |
| Doctor/staff should be pleasant             | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 12.8    | 0.000   |
| Error free record                           | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 17.9    | 0.000   |
| Punctual at clinic                          | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 14.7    | 0.000   |
| Adequate medical examination time           | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 16.3    | 0.000   |
| **Responsiveness**                          |                 |                 |           |      |         |         |
| Easy appointment system                     | 4.6 ± 0.6       | 4.3 ± 0.6       | -0.3 ± 0.9| 3    | 15.01   | 0.000   |
| Prompt responsive to any query              | 4.6 ± 0.6       | 4.3 ± 0.6       | -0.3 ± 0.9| 3    | 15.01   | 0.000   |
| Waiting time not >30 min                    | 4.4 ± 0.9       | 3.9 ± 0.9       | -0.5 ± 0.9| 3    | 15.01   | 0.000   |
| Prompt service of OPD reception desk        | 4.4 ± 0.8       | 3.9 ± 0.8       | -0.5 ± 0.9| 3    | 15.01   | 0.000   |
| Easy and adequate medical information to patients | 4.7 ± 0.6       | 4.2 ± 0.6       | -0.5 ± 0.9| 1    | 12.8    | 0.000   |
| **Assurance**                               |                 |                 |           |      |         |         |
| Good professional knowledge                 | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 12.8    | 0.000   |
| Courteous OPD staff                         | 4.5 ± 0.7       | 4.0 ± 0.7       | -0.5 ± 0.9| 1    | 13.1    | 0.000   |
| Feel confident and safe                     | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 15.01   | 0.000   |
| Error free services                         | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 15.01   | 0.000   |
| **Empathy**                                 |                 |                 |           |      |         |         |
| Treated with dignity and respect            | 4.7 ± 0.6       | 4.2 ± 0.6       | -0.5 ± 0.9| 1    | 12.8    | 0.000   |
| Understand the specific need of patient     | 4.6 ± 0.6       | 4.1 ± 0.6       | -0.5 ± 0.9| 1    | 13.1    | 0.000   |
| Privacy should be observed                  | 4.7 ± 0.6       | 4.2 ± 0.6       | -0.5 ± 0.9| 1    | 13.1    | 0.000   |

Value are presented as mean ± standard deviation. OPD - outpatient department.

Discussion. This study addressed the service quality gaps in all 5 dimensions after taking the views of patients on what they observed during a visit to the outpatient department during the study period. The study also defined the association between service quality gaps and demographic profiles of patients. The proposed quality model has shown strong evidence of unidimensionality and reliability. The 2 scales showed good validity as 2 separate measures, patients’ expectations, and perceptions of outpatient services. The study results identified that these 2 scales can be successfully implied to evaluate the extent of service quality gap. Therefore, all the 5 service quality dimensions of SERVQUAL appear to be highly suited for monitoring the expectations and perceptions of patients concerning the outpatient service quality in hospital. Chan et al’s study recommended 5-10 participants per estimated parameters. There were 19 estimated parameters in our study revealed by confirmatory factory analysis. Our study sample of 306 yielded meaningful and interpretable results. The present study using Parasuraman et al’s SERVQUAL showed that patients’ expectations (4.59 ± 0.5) were more than the perceptions (3.4 ± 0.7) of the provided services across all dimensions, possibly reflecting the new paradigm of increasing patients’ expectations and demand for good quality care. Butt and de Run, Anbari and Tabaraie, and Bahadori et al produced similar results in all service quality dimensions, in line with our results. Comparison of service quality gap scores suggested that the highest gap as far as patients’ assessment of service quality was in the tangibility dimension (-1.42 ± 0.99) followed by responsiveness (-1.32 ± 0.97), reliability (-1.14 ± 0.92), assurance (-1.1 ± 0.9), and empathy (-0.7 ± 0.9). Zarei et al’s study conducted in private hospitals in Iran showed the highest average score for tangible dimension (environmental quality) and lowest average score in empathy dimension (interaction quality). Ramez study ranked reliability as the highest and assurance the lowest service quality dimension. Abu Kharmeh identified responsiveness as the most important dimension, and reliability as the least important dimension. Adebayo et al study observed the highest service quality gap in assurance and positive gap in empathy dimensions, indicating expectations are met in this dimension among the patients attending the dental clinic. Bahadori et al mentioned the largest gap in empathy and smallest gap in tangibility in contrast to our study results.
## Table 5 - Patients’ demographic characteristics and gap scores of service quality dimensions.

| Characteristics                          | Tangible | Reliability | Responsiveness | Assurance | Empathy |
|------------------------------------------|----------|-------------|----------------|-----------|---------|
| **Gender**                               |          |             |                |           |         |
| Male                                     | -1.27 ± 0.99 | -1.03 ± 0.92 | -1.32 ± 1 | -1.1 ± 0.95 | -0.7 ± 0.9 |
| Female                                   | -1.65 ± 0.94 | -1.31 ± 0.9 | -1.32 ± 0.91 | -1.15 ± 0.93 | -0.86 ± 0.8 |
| F-value                                  | 11.1     | 6.8         | 0.002         | 0.6       | 2.04    |
| P-value                                  | <0.001   | <0.01       | 0.96          | 0.44      | 0.153   |
| **Marital status**                       |          |             |                |           |         |
| Single                                   | -1.6 ± 0.9 | -1.31 ± 0.9 | -1.31 ± 0.9 | -1.2 ± 0.9 | -0.8 ± 0.8 |
| Married                                  | -1.4 ± 1  | -1.1 ± 0.93 | -1.33 ± 0.98 | -1.1 ± 0.9 | -0.7 ± 0.9 |
| Divorced                                 | -1.9 ± 1.2 | -1 ± 0.7    | -1.2 ± 0.86  | -0.2 ± 0.46 | 0.6 ± 0.4 |
| Widowed                                  | -1.3 ± 1.03 | -1.1 ± 0.6  | -1.2 ± 0.85  | -1.6 ± 1.2 | -0.7 ± 0.74 |
| F-value                                  | 1.1      | 0.8         | 0.04          | 1.7       | 0.24    |
| P-value                                  | 0.362    | 0.5         | 0.99          | 0.2       | 0.8     |
| **Age, years**                           |          |             |                |           |         |
| <30                                      | -1.46 ± 0.95 | -1.24 ± 0.9 | -1.24 ± 0.93 | -1.04 ± 0.91 | -0.75 ± 0.9 |
| 31-44                                    | -1.4 ± 1 | -1.45 ± 1   | -1.45 ± 1.04 | -1.22 ± 1.03 | -0.8 ± 0.9 |
| 45-58                                    | -1.3 ± 0.9 | -1.2 ± 0.8  | -1.2 ± 0.8   | -0.96 ± 0.8  | -0.6 ± 0.9 |
| 59-72                                    | -1.5 ± 1.1 | -1.34 ± 0.85 | -1.3 ± 0.8  | -0.8 ± 0.6 | -0.035 ± 0.7 |
| >73                                      | -2.2 ± 0.7 | -3 ± 0.8    | -3 ± 0.8    | -2.5 ± 0.0 | -1.8 ± 0.2 |
| F-value                                  | 0.47     | 2.9         | 2.7           | 2.3       | 3.1     |
| P-value                                  | 0.76     | 0.02        | 0.03          | 0.06      | 0.02    |
| **Education level**                      |          |             |                |           |         |
| Primary                                  | -0.7 ± 0.9 | -0.6 ± 0.8  | -1.3 ± 0.97  | -0.9 ± 0.1 | 0.7 ± 0.8 |
| Elementary                               | -1.5 ± 0.8 | -0.8 ± 0.7  | -1.25 ± 1    | -1.1 ± 0.9 | 0.6 ± 1 |
| Secondary                                | -1.3 ± 1  | -1 ± 0.9    | -1.2 ± 0.19  | -1 ± 0.9  | 0.7 ± 0.9 |
| University                               | -1.6 ± 0.96 | -1.45 ± 0.9 | -1.5 ± 0.9   | -1.3 ± 0.9 | 0.9 ± 0.9 |
| F-value                                  | 5.2      | 8.2         | 1.9           | 1.9       | 1.8     |
| P-value                                  | 0.002    | 0.000       | 0.13          | 0.13      | 0.14    |
| **Nationality**                          |          |             |                |           |         |
| Saudi                                    | -1.43 ± 1  | -1.14 ± 0.9 | -1.3 ± 0.97  | -1.1 ± 0.9 | -0.8 ± 0.9 |
| Non-Saudi                                | -0.3 ± 0.5 | -0.4 ± 0.5  | -1.14        | -0.9 ± 1.2 | -0.5 ± 0.7 |
| F-value                                  | 2.4      | 1.4         | 0.22          | 0.11      | 0.16    |
| P-value                                  | 0.121    | 0.239       | 0.64          | 0.74      | 0.7     |
| **Type of visit**                        |          |             |                |           |         |
| First visit                              | -1.4 ± 1  | -1.01 ± 0.97 | -1.13 ± 0.9 | -1 ± 1.1 | -0.4 ± 0.8 |
| Multiple visit                           | -1.42 ± 1 | -1.15 ± 0.9 | -1.34 ± 0.97 | -1.1 ± 0.9 | -0.8 ± 0.9 |
| F-value                                  | 0.09     | 0.52        | 1.15          | 0.3       | 4.8     |
| P-value                                  | 0.76     | 0.5         | 0.3           | 0.6       | 0.03    |

F - functional analysis of variance test, P<0.05 indicates significant level

The hospital physical environment plays an important role in improving the service quality, an attractive outpatient environment, and suitable outpatient services are considered one of the most important reasons for patients coming to the hospital. Previous studies\(^{23,26,30}\) reported that the highest expectations and perceptions were observed in the tangible dimension, as it is concerned with the physical infrastructure of care at private hospitals in Jordan, Saudi Arabia, Iran, and Malaysia. The statement 6, services should be prompt at appointment time achieved this highest quality gap score (-2.13 ± 1.5) among all the statements. Toilet cleanliness achieved the second priority in tangible dimension. Zarei et al’s\(^{26}\) study revealed that the quality of tangible factors have no significant influence on patients’ trust. Ramirez et al’s\(^{31}\) study observed the strong impact of physical environment on the service quality. The gap in the tangible dimension is a wake up call for hospital management to drastically improve the physical environment of outpatient services.

Responsiveness refers to the level of receptiveness, openness, sensitivity, and awareness of staff in the outpatient department. The highest quality gaps between expectations and perceptions were observed for the necessity of an easy appointment system (-1.87 ± 1.5) followed by OPD reception desk are not answering outside calls promptly (-1.5 ± 1.5). This dimension has the lowest perceptions compared with other dimensions, threatening the hospital’s ability to achieve patients’ satisfaction. Ali et al’s\(^{32}\) study observed
the lowest perception scores in this dimension similar to our study; however, high negative service quality gap scores rated this as the top dimension in contrast to our results that showed this dimension rated as second after the tangible dimension.

Reliability refers to dependability and steadiness of service. The highest gap observed that outpatient department is not maintaining an error-free record (−1.3 ± 1.3). This result is in contrast to Chakravarty’s study that showed zero gap in this statement indicating services are accurate and dependable. However, statistically significant quality gaps occurred across all the statements (p < 0.000).

Assurance refers to guarantee that outpatients will receive a particular level of service. The highest gap scores (−1.5 ± 1.3) observed that services are not carried out right at the first time. The gap between patients’ expectations and perceptions in other statements were statistically significant (p < 0.000). Adebayo et al.’s study reported highest service quality gap in this dimension contrary to our study results. Marzban et al.’s study revealed that assurance dimension was considered as the most significant dimension with highest scores in contrast to our study results.

Empathy refers to the level of understanding, sympathy, and compassion given by the staff in the outpatient department. The highest expectations (4.7 ± 0.53) and perceptions (3.9 ± 0.84) were observed across all the statements in this dimension. The smallest quality gap scores were identified in the statements indicating that patients’ expectations are nearly met as the patients’ perceived that they have been treated with full privacy and dignity, and the outpatient staff understood their needs. Anbari et al.’s study observed the highest perception scores in this dimension similar to our study; however, negative gap scores rated third compared with our results that rated this dimension last among other dimensions.

The results of our study showed a significant association between gender and mean scores gap in tangible and reliability dimensions. The female expectations were higher across these dimensions than the male. There was a significant association between age groups and reliability, responsiveness, and empathy dimensions. The age group >73 years has higher expectations in all dimensions, but a significant difference was observed in reliability (p = 0.02), responsiveness (p = 0.03), and empathy (p = 0.02) dimensions compared with other age groups. Bahadori et al.’s study showed no such association. The quality gap in patients’ expectations with university education was higher than other group in tangibility and reliability dimensions. The patients who made multiple visits to outpatient services have higher expectations related to empathy dimension, as to be treated with honor in contrast with Adebayo et al.’s study shows frequency of dental visit and gender had no statistically significant association to quality gaps analyzed. Kavitha’s study conducted in India to determine the factors influencing service quality gap observed no association between age, gender, education, and occupation in contrast to our results.

Study limitations. 1) study design is cross-sectional, longitudinal study evaluates better understanding of variables analyzed as the patient may change opinions over a period of time, 2) this study involves only outpatient services and sampling technique was convenient sampling, limiting the generalizability of results. We excluded inpatients and providers’ perspectives, 3) study was confined to a hospital serving a special population not the general or private public, and 4) the study did not determine the association between service quality dimensions, and overall satisfaction. Although our study was cross-sectional and based on one population, our findings have merit as we performed confirmatory factor analysis using large sample size and with a broad variety of indices to judge the fitness of model to the data and assessed its reliability for measuring service quality.

In conclusion, the analysis of our study results revealed areas in which outpatient services are close to achieving the patients’ expectations, and areas in which outpatient services are short of expectations. The 3 most significant service quality gaps of patients were related to outpatient environment, promptness of services, and reliability of outpatient services. In the present study, expectations are higher than the perceptions of provided service quality, suggesting room for improvement in all quality dimensions. A gap in one dimension can have a synergistic effect on other dimensions of service quality, and leads to a decrease in those dimensions. Therefore, aside from focusing on dimensions with the largest gap, hospital management the service providers should consider the improvement of other dimensions. This study can be further extended to include the association between overall satisfaction and service quality dimensions. The views of inpatients and service providers should also be considered in future studies. It should be kept in mind that the patients’ perceptions and expectations for service quality cannot be collected by one instrument; therefore, it is important to conduct qualitative research
along with quantitative method to better understand the complexity of service quality in future studies.

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