

Original Article

Implementing the service quality gap model in the quality management of general surgery nursing

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Abstract: Objectives: Ongoing medical reform sparks increasingly intense competition among medical institutions. Meanwhile, the doctor-patient relationship (DPR) is always a major societal concern. Improving the quality of medical services hospitals provide can greatly moderate the incidence of doctor-patient conflicts. The purpose of this study is to investigate the gap between the expected service quality (SQ) and the perceived service quality (PSQ), thereby providing reference data for managers to formulate strategies to effectively improve the quality of medical services. Methods: 300 questionnaires were distributed to general surgery patients in our hospital. A total of 297 questionnaires were returned (a recovery rate of 99%), and 261 of these were valid questionnaires (a valid recovery rate of 87%). According to the patients' demographic characteristics, the gap between the expected SQ and the PSQ was measured using a multivariate regression analysis. Results: There were statistically significant differences between the expected SQ and the PSQ before and after the medical services were rendered ($P < 0.05$). In addition, there was a negative SQ gap in all dimensions. Generally, the expected SQ was superior to the PSQ. Conclusion: The study results show that the patients' perceived health care SQ is inferior to the expected one. Economic income remains the main factor in the general characteristics. Reactivity and tangibility in the nursing SQ model exert the most significant influence on general surgery. Hospitals should make adjustments according to their actual situations and should remain committed to continuously improving the medical SQ.

Keywords: Service quality gap model, nursing, medical services

Introduction

As the standard of living has been rising in China recently, the Chinese increasingly focus on the quality of products and services. Similarly, patients are increasingly concerned about medical service quality (MSQ). Through effective assessment of their MSQ, medical institutions can identify their competitive advantages and disadvantages and prevent the waste of resources [1]. Generally, MSQ is highly correlated with patients' satisfaction [2]. When patients receive satisfactory medical services, medical institutions can gain more trust and promote harmonious doctor-patient relationships (DPR) [3]. Therefore, it is crucial for medical institutions to accurately understand patients' needs and expectations for medical services and to determine the gap

between the expected medical services and the actual medical services, so as to improve the nursing service quality (NSQ) [4].

The concept of SQ was first proposed in the 1980s. At that time, Finnish scholars put forward the concept of customers' perceived service quality (PSQ). On this basis, scholars established the PSQ model. The comparison of SQ is equal to the comparison of customers' expected service and their perceived service, so SQ depends on a comparison of the customers' expectations of SQ (expected SQ) and their perceptions of the actual service quality (PSQ). In the mid-1980s, researchers investigated the factors affecting customers' SQ-related perceptions and decisions eventually proposing the "SQ Gap Model". Initially, the model had 10 dimensions, but these dimen-

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Table 1. The reliability analysis of the service quality questionnaire

Dimensions	Expectation	Perceptions
Tangibility	0.79	0.74
Reliability	0.80	0.71
Reactivity	0.76	0.86
Assurance	0.73	0.70
Empathy	0.70	0.76
Total	090	091

Table 2. Analysis of the patients' general conditions

Variables	Category	N	χ^2	P
Gender	Female	130	0.333	0.564
	Male	131		
Age (years)	≤ 20	15	2.123	0.63
	21-30	35		
	31-40	70		
	41-50	39		
	51-60	45		
Education level	> 60	57	1.586	0.178
	Postgraduate	12		
	Undergraduate	28		
	High school	70		
Mean income per month (yuan)	Junior and below	107	3.216	0.023
	≤ 2000	104		
	2001-4000	114		
	4001-6000	39		
	> 6001	4		

sions were reduced to the five currently-used dimensions [5]. Subsequently, "SERVQUAL", the assessment tool for the SQ gap model, was developed [6]. After numerous modifications, SERVQUAL now includes 22 items in five subscales, corresponding to the dimensions of the PSQ gap model [7]. Since it was developed, SERVQUAL has been extensively applied in multiple service fields, including medical services, telecommunications, health care, catering, enterprise, banking, tourism, and higher education [8].

Currently, many scholars use SERVQUAL to assess the MSQ [9-12]. For example, SERVQUAL was used to assess patients undergoing surgical treatment and the results confirm that the model is effective and reliable in the target population. In China, several scholars explored patients' perceptions of SQ. In 2004, the SERVQUAL assessment system was introduced

in China and implemented in the medical field. Based on SERVQUAL, the index system and assessment methods for the MSQ assessment scale were established. In this study, general surgery inpatients were recruited as the study cohort to compare the patients' SQ expectations and their perceptions of the actual SQ, and to discuss the factors leading to the differences in the comparison. Most hospitals should remain committed to improving their SQ, so as to meet the needs of patients.

Materials and methods

Study subjects

The data were collected between January 2017 and June 2018. Convenience sampling was performed. A total of 300 inpatients (or their relatives on their behalf) with hospital stays over three days were investigated using the questionnaires. With the approval of the hospital, the investigators entered the inpatient wards and obtained the informed consent from the patients or their families. The in-

vestigators distributed the questionnaires to the inpatients or their families in the ward. Upon the completion of the questionnaires by the inpatients or their families, the investigators recovered the questionnaires on the spot. A total of 300 questionnaires were distributed, of which 297 were returned (for a recovery rate of 99%), and 261 were valid questionnaires, (for a valid recovery rate of 87%). Before the investigation, we obtained the approval of the First People's Hospital of Wenling. In addition, all the participants voluntarily and anonymously participated in this study, and they signed the informed consent forms. The collected data did not include private information such as names or telephone numbers.

Inclusion criteria: patients who were hospitalized for more than 3 days, patients in a stable condition, patients with a clear consciousness and without any mental disorders, patients

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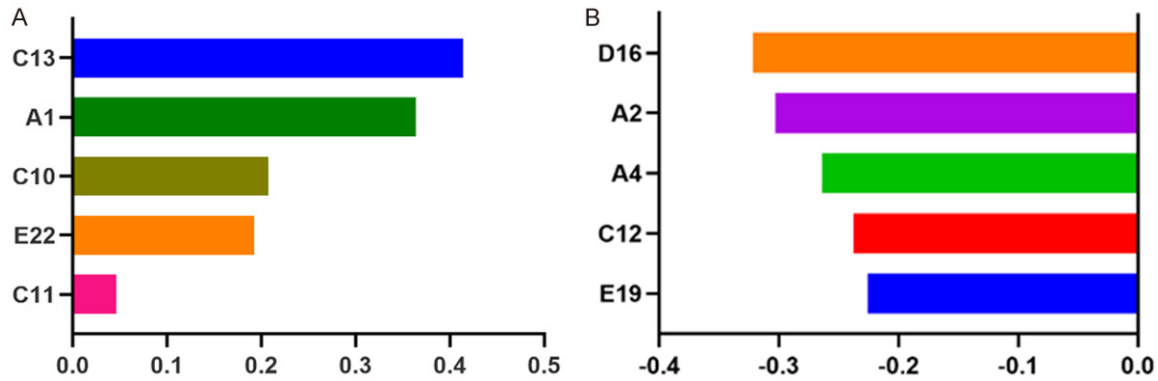


Figure 1. The first five items and the last five items of the SQ mean. Note: Among the 22 items of perceived service quality, the first five items were: C13, A1, C10, E22, and C11, and the last five items were: D16, A2, A4, C12, and E19.

able to communicate in language or writing, and patients willing to cooperate with the study were included.

Exclusion criteria: patients with a mental illness, cognitive impairment, severe cardiopulmonary or brain failure, and patients with serious complications were excluded.

Questionnaire design and development

The questionnaire was designed using the following procedures. First, we learned about the international standards of SERVQUAL [6] and the actual situation of medical service departments in China, and the questionnaire was modified properly. Then a preliminary investigation was conducted. During this investigation, a total of 40 general surgery inpatients were selected for the pre-investigation, and 75 questionnaires were distributed and returned, with a recovery rate of 100%. However, these 75 patients were not included in the formal study. After processing the preliminary data, the questionnaire was further revised, and relevant experts were consulted to further improve the questionnaire.

Based on a literature review, preliminary investigation, and expert consultation, the questionnaire was developed. The questionnaire covered general patient characteristics, such as age, gender, education level, and income, and 22 questions covered the patients' expectations and perceptions. The Likert scale included the five dimensions, namely, tangibility (items A1-A4), reliability (items B6-B9), reactivity (items C10-C13), assurance (items D14-D17) and empathy (items F19-F22). These dimensions were scored using the Likert scale

(strongly disagree, disagree, indifference, agree and strongly agree). A higher score on each dimension indicated a more positive expectation and perception of the MSQ.

The effectiveness test results showed that all the items met the minimum effectiveness requirements. The Cronbach coefficient was used for the validity assessment, and the expected value of alpha was 0.7-0.8 in the whole range. The values of the five dimensions were over 0.8. In order to improve the PSQ, the alpha value of Cronbach was 0.933, and the Cronbach coefficients of the five dimensions were over 0.7 (**Table 1**).

Statistical analysis

Initially, EpiData was used for the data input, and then SPSS Statistics 20 was used for the statistical analysis. The descriptive statistics (the mean and standard deviation) were calculated based on the patients' expectations and perceptions of SQ. Paired sample *t*-tests were adopted for the intergroup comparisons to compare the patients' expectations and perceptions of SQ, so as to determine which services had the greatest quality gap. $P < 0.05$ indicated a statistically significant result. Multivariate regression analyses were used to investigate the relationships between the patients' expected and PSQ and the differences in the demographic characteristics.

Results

Patient characteristics

According to the impact of the patients on the difference assessment of the hospital SQ, anal-

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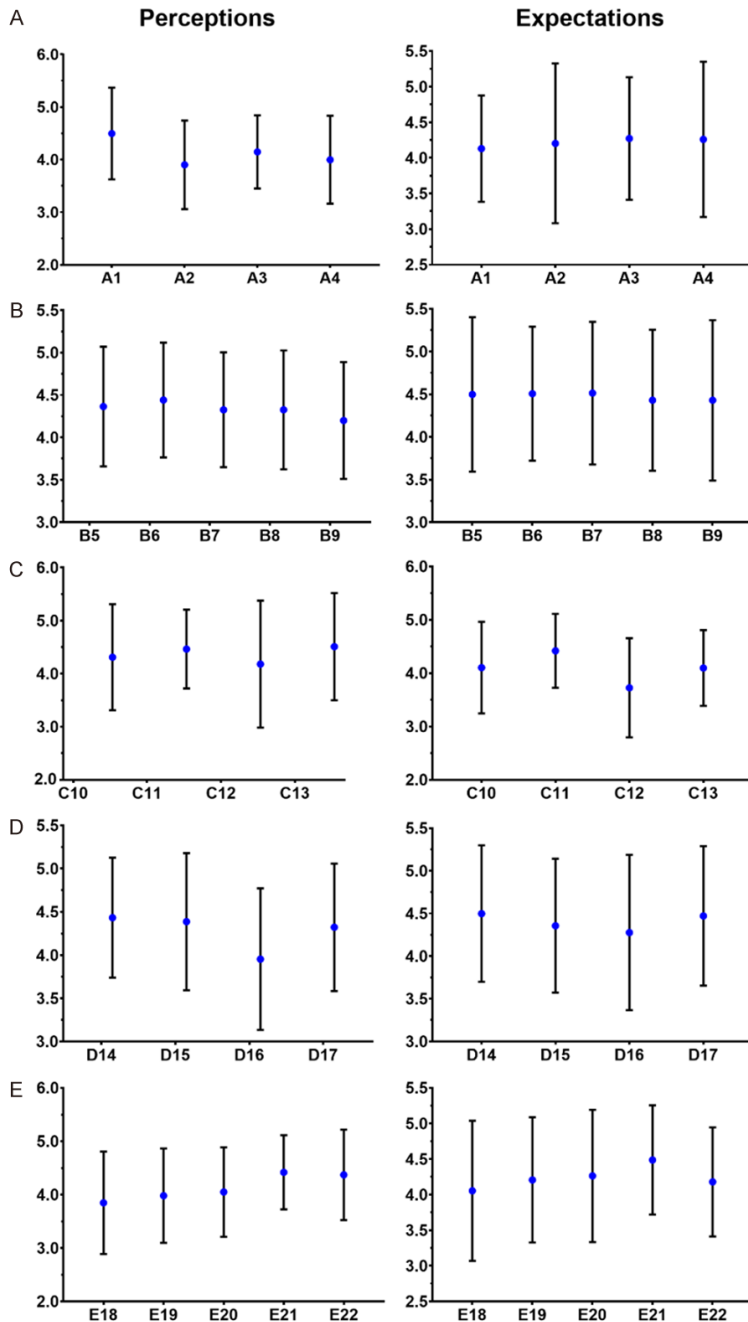


Figure 2. Survey results of the perceptions and expectations of the general patients. Note: A: Tangibility; B: Reliability; C: Reactivity; D: Assurance; E: Empathy.

yses of variance were performed for gender, age, occupation, education level, and income (Table 2). As shown in Table 2, there were statistically significant differences between the patients with economic income and the patients without economic income ($P < 0.05$), but there were no significant differences in the other items.

Statistical results of the general surgery patients' PSQ

According to the formula, namely, SQ (service quality) = P (individual's PSQ) - E (individual's expected SQ), we calculated the PSQs of the patients we sampled. According to the results of the 22 questions, the patient's perceived and expected values were obtained, and the SQ score was calculated using the formula. After the data processing, the first five items and the last five items were obtained (Figures 1-3). Among them, C13, A1, and C10 had the highest SQ values, exhibiting a satisfactory NSQ. Meanwhile, some items were related to the patients' lower expectations of NSQ. C11 had a relatively higher SQ value, which may be related to the higher initiative of the nurses. By averaging the item scores of all the dimensions, we obtained the SQ of each dimension. Then we calculated the PSQ scores of the five dimensions. The calculation results showed that the overall NSQ of the hospital was unsatisfactory, and all the other items except reactivity revealed negative values (Table 3 and Figure 4).

Multivariate regression analysis

According to the calculation results of the standardized regression coefficients, the five dimensions were ranked by importance (Table 4). A greater absolute value of the coefficient indicated a higher corresponding importance. The order of importance from high to low was reactivity, tangibility, assurance, reliability, and empathy. This result showed that reactivity and tangibility were crucial for the general surgery patients. Therefore, hospitals should highlight the SQ of reactivity and tangibility.

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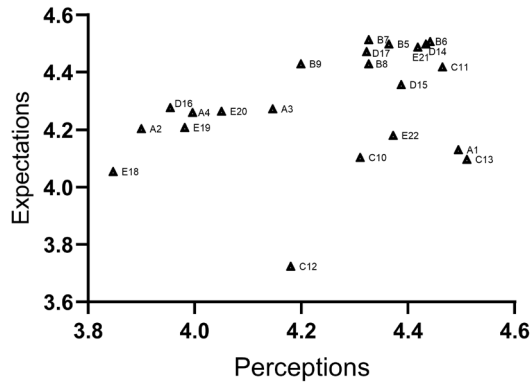


Figure 3. Distribution of the expectations and perceptions. Note: According to the distribution, the upper right area is the significant area with high expectations and high perceptions of service quality. The relevant indices in this area are very important for patients, and the area is the key area for maintaining and improving the patients' expectations and perceptions of service quality. The relevant indicators of the corresponding lower left area are areas with low performance and low importance, so no key improvements will be made for the time being. The corresponding lower left areas are the areas with insignificant relevant indices for patients. In this area, significant improvements will not be made for the time being.

Table 3. Service quality scores

Dimensions-SQ	Max	Min	Average	SD
Tangibility (A)	3.75	-2.50	-0.082	0.927
Reliability (B)	2.00	-2.80	-0.118	0.641
Reactivity (C)	2.75	-3.25	0.107	0.822
Assurance (D)	2.00	-2.75	-0.126	0.670
Empathy (E)	2.00	-2.40	-0.105	0.707

Discussion

From the perspective of serving patients, it is crucial to provide high-quality nursing services. Therefore, in this study, patients' expectations and perceptions of hospital SQ were assessed to measure the hospital SQ gap, thereby providing accurate reference data for improving medical services. Based on the five items before and after the assessment, the nursing quality requirements for general surgery patients were understood. Specifically, the general surgery patients had the highest expectations for appropriate and skilled nursing services and had relatively high expectations for the reliability and attention of the nursing staff [5, 6, 11, 13-15].

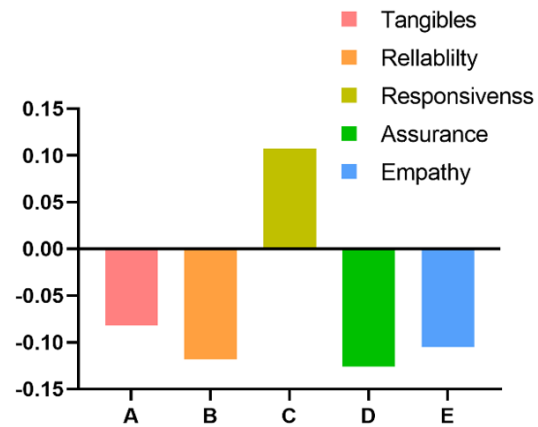


Figure 4. SQ means of the five dimensions. Note: Regarding the SQ scores of the five dimensions, the reactivity was positive, but the other four were negative, indicating that the overall service quality was unsatisfactory and needs to be improved.

In terms of the demographic characteristics, gender is of great significance in responding to and ensuring the SQ gap, which means that hospitals should provide more detailed services and adequate safety for patients. There are differences in gender. As a vulnerable group in society, female patients are more physically and mentally vulnerable when suffering from diseases. Therefore, medical staff should pay more attention to the needs of female patients.

Regarding patients' expectations of SQ, the order of expectations from high to low is as follows: reactivity, tangibility, assurance, reliability, and empathy. There are differences between different studies, which may be caused by the differences in politics, economic conditions, and cultures among regions and the statistical methods adopted by the investigators. These regional differences lead to differences in the needs for medical services [16-19].

In terms of the patients' perceptions of SQ, the patients scored the lowest in the economic aspects. The results showed that 43.7% of the patients earned between 1,000 and 3,000 yuan, indicating relatively low-income levels for the patients in the region. Most rural patients are more sensitive to economic factors because they usually cannot afford excessive medical expenses.

The results of this study revealed that the PSQ was lower than expected with respect to the five dimensions of SQ. Specifically, the SQ gap

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Table 4. Multivariate regression analysis

Dimensions	Unstandardized regression coefficient	SD	Standard regression coefficient	t	P
Tangibility (A)	0.228	0.003	0.270	87.406	<0.001
Reliability (B)	0.226	0.003	0.243	83.809	<0.001
Reactivity (C)	0.183	0.002	0.285	103.023	<0.001
Assurance (D)	0.176	0.002	0.246	88.158	<0.001
Empathy (E)	0.185	0.002	0.208	75.024	<0.001

(from biggest to smallest) is as follows: reactivity, tangibility, assurance, reliability, and empathy. This may be related to the contradiction of “expensive medical treatment” and the reality of related issues [15, 20, 21]. In other words, this gap could be the result of the patients’ high medical expenses and low incomes, indicating that medical expenses are indeed burdensome for some patients [22]. The biggest gap was between item 13 (“medical staff are willing to help patients”) and item 21 (“hospitals give priority to your interests rather than those of medical staff”). This can be explained by Maslow’s hierarchy of needs [23]. Maslow’s hierarchy of needs indicates that people’s physiological, safety, and social needs must be gradually met. An excellent MSQ involves providing physical and psychological care for patients. Moreover, Chinese patients tend to believe that hospitals will not put patients’ interests first, as they need to pocket a large sum of money. Due to the government’s insufficient investment in health care, profitability is important for ensuring the normal operations of both public and private institutions [4]. However, from an ethical point of view, hospitals should give priority to patient safety, which requires hospital administrators to balance the needs of patients and hospitals. Regarding the SQ gap, assurance and reliability rank the fourth and the fifth respectively [24]. These results suggest that the patients tend to trust medical services and acknowledge that the MSQ they received is relatively satisfactory in comparison with their expected MSQ initially. Tangibility ranks second in the SQ gap, which is different from the ranking reported in most studies. This may be due to the fact that hospitals are the subjects in other studies. The limitation of this study is that only one method was used to ask patients to recall their own situations. Therefore, the results are biased. Due to convenient sampling, the selected samples are less representative. Subject to man-

power, material resources, and financial resources, there is an insufficient number of hospitals and patients.

Conclusion

The SERVQUAL model features certain applicability in the assessment of surgical NSQ. The overall SQ needs to be further improved. The income level serves as the principal influencing factor of the patients’ PSQs, but other factors, such as gender, age, and education level, reveal no differences in this study. Regarding the hospital SQ, reactivity and tangibility remain the two significant dimensions, mirroring that expensive medical expenses are required for the treatment of diseases in China. This remains an urgent issue to be resolved. In this study, we found that the five dimensions of NSQ are reactivity, tangibility, assurance, reliability, and empathy respectively. Hospitals should make adjustments based on their actual situations and should remain committed to continuously improving the MSQ.

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Disclosure of conflict of interest

None.

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