Dental Research Journal

Original Article

Assessing the quality of dental services using SERVQUAL model

Nooredin Dopeykar[1], Mohammadkarim Bahadori[2], Parisa Mehdizadeh[2], Ramin Ravangard[3], Mahmood Salesi[2], Seyed Mojtaba Hosseini[4]

[1]Research Center for Prevention of Oral and Dental Diseases, Baqiyatallah University of Medical Sciences, [3]Health Human Resources Research Center, School of Management and Medical Information Sciences, Shiraz University of Medical Sciences, Shiraz, [4]Department of Health Services Management, North Tehran Branch, Islamic Azad University, [2]Health Management Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran

ABSTRACT

Background: The measurement of service quality had an important role in managing service provided, diagnosing the problem, and assessing service performance. Patient satisfaction is one of the key indicators of quality in health-care organizations. This study aimed to measure the service quality gap of patients' perceptions and expectations in five dimensions at a military Specialized Dental Clinic in Iran using SERVQUAL tool.

Materials and Methods: This was a cross-sectional and descriptive-analytical study conducted at a Specialized Dental Clinic affiliated to the Armed Forces of Islamic Republic of Iran in Tehran in 2013. All 385 patients referring to the studied clinic during two working shifts of morning and evening in one month, August, were selected. The required data were collected using the modified SERVQUAL questionnaire. The collected data were analyzed using SPSS 20.0 through statistical tests including Mann–Whitney and Kruskal–Wallis tests. $P < 0.05$ was considered statistically significant.

Results: The results showed that the quality of services provided to patients was significantly lower than their expectations and the quality gaps were statistically significant in all studied dimensions ($P < 0.001$). Furthermore, the highest and lowest quality gap was related to empathy (−1.16) and reliability (−0.61), respectively.

Conclusion: According to the results, the managers of this clinic should take steps toward improving the quality of services in all dimensions, especially responsiveness and empathy, through planning properly, prioritizing services, and reviewing processes with regard to the patients' expectations.

Key Words: Dental services, expectation, patient, perception

Received: April 2016
Accepted: September 2017

Address for correspondence:
Dr. Mohammadkarim Bahadori,
Health Management Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran.
E-mail: bahadorihealth@gmail.com

INTRODUCTION

In today's competitive world, paying attention to quality and improvement of services provided is one of the basic principles for the organization's survival. This has become a major challenge in the health-care organizations because the importance of health-care services and the demand for quality control and quality management in such organization is growing.[1] Although the traditional approaches consider the quality assessment of the products and services' features and characteristics as the component of quality measurement, based on the new approach, it is the customer's demand that defines quality.[2] Quality is to meet the needs and demands of

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How to cite this article: Dopeykar N, Bahadori M, Mehdizadeh P, Ravangard R, Salesi M, Hosseini SM. Assessing the quality of dental services using SERVQUAL model. Dent Res J 2018;15:430-6.

the customers, and it is the customer who determines the service quality.[3]

Quality of health services is a multidimensional concept which one of its most important aspects is patient satisfaction. Patient satisfaction is one of the key indicators of quality in health-care organizations.[4] Health service providers in the world consider patient satisfaction as a major concern in providing health services.[5] Measuring patient satisfaction is one aspect of a comprehensive evaluation of service quality. In addition, patient satisfaction is an important outcome indicator to assess the quality of care provided.[6,7] The high level of service quality leads to high customers' satisfaction, maintaining existing customers, attracting new customers, reducing costs, and ultimately, increased organization's profits.[8]

The lack of direct communication with customers helps decision makers and planners to encounter the errors in properly identifying the priorities. Problems related to service quality are more evident in organizations that focus on identifying and meeting their customers' needs and expectations.[9] Health-care managers can improve the structures, processes, and outcomes of health care using patient satisfaction.[10]

There are several measurement models for assessing and evaluating the quality of services including Kano, Fornel, Scamper, EFQM, and SERVQUAL[11,12] among which the most common and widely used tool is SERVQUAL developed by Parasuraman *et al*. on the basis of service quality gap theory.[13] Parasuraman defined quality gap as the difference between expectations and perceptions.[14] This tool has been widely used in service industries such as banking, hospitality, transportation, higher education, accounting, architecture, building, hospital services, as well as dental care.[15]

Paying attention to the quality of dental services and the satisfaction of patients receiving such services is very important. Oral diseases are considered as the major health problems due to their high incidence and prevalence throughout the world.[16] The effects of oral diseases on the individuals and communities, as a consequence of the pain and suffering, impaired function, and reduced quality of life, are significant and remarkable, and despite the major advances in the field of oral health, there are still many people in the world, especially in the low social and economic classes both in developed and developing countries, suffer from dental problems. The use of health-care services by children and adults often is associated with the existence of pain, and this is more common in people with low socioeconomic level.[17] Unmet needs in health care are very great in dental care.[18] Employment status, geographical location, and socioeconomic status are three main variables affecting access to and use of dental services. Patients usually seek dental treatments to reduce pain, perform regular and periodic checkups of oral health, and receive beauty and rehabilitation services of oral functions.[19]

SERVQUAL has been used in several studies as a tool for assessing the quality of dental services.[20,21] Baldwin and Sohal in their study showed that SERVQUAL was a good model in the field of assessing the quality of dental services in terms of validity and reliability.[22] The results of Palihawadana and Barnes and White *et al*. studies have provided a good insight about the proper use of SERVQUAL as a tool for measuring the quality of dental services.[23] According to few studies conducted on the quality of dental care in Iran, particularly on the quality of military dental services, this study aimed to measure the service quality gap in dental health care and determine the factors affecting it. Its objectives also were to determine the means of patients' perceptions and expectations of dental services, as well as to investigate the associations between the studied patients' demographic characteristics and the service quality gaps.

MATERIALS AND METHODS

This was a cross-sectional and descriptive-analytical study conducted at a Specialized Dental Clinic affiliated to the Armed Forces of Islamic Republic of Iran in Tehran in 2013. In the present study, all 385 patients referring to this clinic during two working shifts of morning and evening in one month, August, were selected. The inclusion criteria were having at least the read and write literacy and willingness to participate in the study.

The required data were collected using the modified SERVQUAL questionnaire consisting of two parts. The first part of the questionnaire included items to determine the studied patients' demographic characteristics such as age, sex, education level, and the status of insurance coverage. The second part of the questionnaire consisted of thirty items to assess five dimensions of service quality including tangibility

(7 items), reliability (9 items), responsiveness (6 items), assurance (4 items), and empathy (4 items) in two sections of patients' expectations and perceptions. A five-point Likert scale was used to assess the patients' expectations and perceptions whereby 1 referred to strongly disagree and 5 to strongly agree.

To determine the quality gap, the mean score of patients' expectations of service quality (the status quo of services) is subtracted from the mean score of patients' perceptions (the desirable status of services). If the result is positive, the services provided to the patients will be higher than their expectations, and if the result is negative, the services will be lower than their expectations. Finally, if the result is equal to zero, it means that there is not any quality gap. The modified questionnaire's content validity was approved through getting the opinions of experts, including the faculty members of dentistry and health services management (content validity index = 0.75 and content validity ratio = 0.72) and its reliability was confirmed by the interitem consistency score and Cronbach's alpha coefficient (α = 0.93). To complete the questionnaires, the research team attended the clinic, and after explaining the purpose of the study and providing necessary training for completing the questionnaires, they were distributed among the studied patients.

The collected data were analyzed using SPSS 20.0 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.) through Kolmogorov–Smirnov test and nonparametric statistical tests (because of not normal distribution of studied dependent variable), including Mann–Whitney and Kruskal–Wallis tests. $P < 0.05$ was considered statistically significant.

This study was approved by the Baqiyatallah Medical University Ethics Committee. Furthermore, the following fundamental principles were taken into consideration as the ethical considerations: doing the required coordination with the clinic administrator through an introducing letter, providing the required explanations of the project and its objectives for the studied patients, and obtaining oral informed consent from them, voluntary participation in the project, anonymous responses to the questionnaire items, and confidential data analysis.

RESULTS

The results showed that most studied patients were male (53.2%), married (79%), in the 31–40 age group (32.5), and had academic degrees (53.8%) and medical insurance coverage (83.1%) [Table 1].

Furthermore, the results showed that the highest and lowest means of patients' expectations were, respectively, related to the assurance (4.71 ± 0.35) and tangibility (4.58 ± 0.4) and responsiveness (4.58 ± 0.48). Furthermore, the highest and lowest means of patients' perceptions were related to assurance (4.09 ± 0.6) and empathy (3.44 ± 0.8), respectively. The highest and lowest quality gaps also were related to empathy (−1.16) and assurance (−0.62), respectively. The quality gaps in all studied dimensions were statistically significant ($P < 0.001$) [Table 2].

Moreover, the results showed that there were significant associations between sex and quality gap in the dimensions of tangibility (P = 0.045),

Table 1: Demographic characteristics of studied patients (*n*=385)

Variables	Frequency (%)
Sex	
Female	180 (46.8)
Male	205 (53.2)
Marital status	
Single	81 (21)
Married	304 (79)
Age (years)	
<20	24 (6.2)
21-30	99 (25.7)
31-40	125 (32.5)
41-50	73 (19)
>50	64 (16.6)
Education levels	
Read and write literacy	48 (12.5)
Diploma	130 (33.8)
Academic degrees	207 (53.8)
Insurance status	
Have	320 (83.1)
Not have	65 (16.9)

Table 2: The mean and standard deviation of patient's expectations and perceptions in each studied dimensions and total quality

Quality dimensions	Mean±SD		Perceptions-expectations	*P*
	Expectations	Perceptions		
Tangibility	4.58±0.4	3.92±0.45	−0.66	<0.001
Reliability	4.7±0.32	3.99±0.55	−0.71	<0.001
Responsiveness	4.58±0.48	3.46±0.73	−1.12	<0.001
Assurance	4.71±0.35	4.09±0.6	−0.62	<0.001
Empathy	4.6±0.47	3.44±0.8	−1.16	<0.001
Total quality	4.63±0.37	3.78±0.5	−0.85	<0.001

SD: Standard deviation

empathy (value = 0.002), and total quality (P = 0.034) so that these gaps were greater in the females; between marital status and quality gap in the dimensions of tangibility ($P < 0.001$), reliability ($P < 0.001$), assurance ($P < 0.001$), and total quality (P = 0.002) so that these gaps were bigger in the married patients; between education level and quality gap in the dimension of responsiveness ($P < 0.001$) so that this gap was greater in the patients with reading and writing education level; between age and quality gap in the dimensions of reliability ($P < 0.001$), responsiveness ($P < 0.001$), assurance ($P < 0.001$), and total quality (P = 0.034) so that the gaps in reliability and responsiveness were greater in the patients younger than 20 and older than 50 and the gaps in assurance and total quality were bigger in patients in the 20–30 age group; and between the status of having medical insurance coverage and quality gap in all studied dimensions except for assurance so that these gaps were greater in the patients without any medical insurance coverage [Table 3].

DISCUSSION

One of the objectives of dental service centers is access to the patients' satisfaction, which is one of the most important criteria for determining the organizational success and quality of the services provided.[5] Furthermore, a dimension of health promotion in dental services is considering the quality of dental care.[24] This study aimed to measure the quality gap in dental services provided at a military specialized dental center using SERVQUAL tool through receiving the viewpoints of patients referring to this clinic.

According to the results of the presents study, the highest mean of patients' expectations was related to the assurance, which are consistent with the results of Aghamolaei *et al.*'s study[1] and inconsistent with those of the Güllü *et al.*'s study which indicated that physical appearance was the most important factor of the service quality.[25] On the other hand, in assurance, the item of "confidence in the treating dentist's skills" had the greatest negative gap. Therefore, to increase patients' satisfaction and improve service quality, the studied clinic managers should try to inform patients about the employees' knowledge and capabilities and thereby, increase the patients' trust in employees and physicians. Moreover, respecting the patients' privacy, exhibiting friendly and respectful behavior toward them, and explaining medical

Table 3: The associations between the patient's demographic characteristics and quality gaps of studied quality dimensions

Patient's demographic characteristics	Tangibility	Reliability	Responsiveness	Assurance	Empathy	Total quality
Sex						
Male	−0.59	−0.68	−1.12	−0.54	−1	−0.79
Female	−0.73	−0.76	−1.13	−0.72	−1.33	−0.93
P	0.045	0.211	0.812	0.498	0.002	0.034
Marital status						
Single	−0.81	−0.92	−1.31	−1.02	−1.13	−1.04
Married	−0.62	−0.66	−1.07	−0.52	−1.16	−0.81
P	<0.001	<0.001	0.07	<0.001	0.872	0.002
Education level						
Reading and writing	−0.57	−0.87	−1.39	−0.46	−1	−0.86
Diploma	−0.72	−0.72	−0.91	−0.7	−1.03	−0.82
Academic degrees	−0.63	−0.69	−1.19	−0.62	−1.26	−0.88
P	0.383	0.071	<0.001	0.169	0.344	0.433
Age groups (years)						
<20	−0.52	−1.33	−1.44	−0.67	−1.33	−1.06
21-30	−0.72	−0.62	−1.03	−0.91	−1.14	−0.88
31-40	−0.58	−0.67	−0.98	−0.45	−1	−0.74
41-50	−0.7	−0.7	−1.21	−0.64	−1.3	−0.91
>50	−0.7	−0.76	−1.33	−0.5	−1.22	−0.9
P	0.499	<0.001	<0.001	<0.001	0.062	0.034
Insurance status						
Have	−0.62	−0.67	−1.08	−0.63	−1.09	−0.82
Not have	−0.84	−0.94	−1.32	−0.62	−1.43	−1.03
P	0.004	0.001	0.011	0.824	<0.001	0.001

conditions and diseases to the patients can increase assurance and their satisfaction and finally, improve the quality of services provided.[26]

The lowest mean of patients' expectations was also related to responsiveness and tangibility. The gap analysis of responsiveness and tangibility items showed that the greatest gaps were, respectively, related to "long interval between patients' visits by physicians and the start of their treatment," and "the lack of adequate parking space at the studied clinic." According to the importance of responsiveness in the increase of patients' satisfaction, reducing their waiting time for receiving services, training personnel on producing timely response to the patients' needs, and strengthening the sense of employees' responsiveness to the patients' rights should be considered. Furthermore, intersecting oral coordination with other organizations such as municipalities to provide adequate parking space, utilizing the high-quality goods and materials and modern medical equipment, and improving the cleanliness and neatness of personnel and clinic environment to reduce the quality gap in the dimension of tangibility can be recommended. According to the results of the current study, the highest and lowest means of patients' perceptions were, respectively, related to assurance and empathy, which are similar to the results of the Naqavi *et al*.'s and Bahadori *et al*.'s studies.[8,9] However, the results of another study conducted in Poland showed that the highest mean of patients' expectations was related to the equipment of and facilities for contacting the medical personnel.[27]

Based on the results of the present study, the greatest gap was related to empathy indicating that service providers had not paid enough attention to the patients' opinions and views. The negative gap implies that the patients' perceptions were lower than their expectations in all studied dimensions and it is far from gaining the satisfaction of patients referring to the studied dental clinic and reaching the desirable situation. The results of Bahadori *et al*.'s study showed that the patient-provider interaction was very important and had effects on the health-care quality.[24] If the quality gap between patients' perceptions and expectations in each dimension of dental service quality is very great, it indicates that the dimension has been paid less attention and it is required to plan and focus more on those dimensions which have larger gaps because the poor quality of a service quality dimension has a synergistic effect and can result in the reduced quality in other dimensions. In the current study, the largest gap was related to empathy. It seems that the high-quality gap in empathy is because of poor dentists, dental nurses, and other dental clinic employees' communication with the patients. Therefore, it is possible to reduce the quality gap in empathy through identifying and responding to the patients' needs and demands and developing good communication between employees and patients in the process of service delivery.[26] This result of the present study is consistent with the results of Bahadori *et al*.'s[8] and Huang and Li's[28] studies and is inconsistent with the results of Zarei *et al*.'s study in which the lowest gap was related to empathy.[29]

Kamarul *et al*. in their study conducted in Malaysia to compare the patients' satisfaction in medical services with that in dental services concluded that patients' satisfaction level in dental services was lower than that in medical services.[30] The results related to the associations between studied patients' demographic characteristics and the quality gap showed that there was a significant association between sex and quality gap so that the gap was greater in the females than males. The results of Zarei *et al*.'s[29] and Lin *et al*.'s[31] studies are similar to those of the present study. The results of John *et al*. study[32] also showed that the quality gap was greater in the females than males although this association was not statistically significant.

However, the results of Lahti *et al*. study showed that the elderly patients' satisfaction of services received was lower than young patients. They concluded that this could be due that the oral health status had been better in the younger patients.[33] Furthermore, there was a significant association between the status of having medical insurance coverage and quality gap so that the dissatisfaction was higher in patients without any medical insurance coverage. The results of the Zarei *et al*.'s[29] and Bakar *et al*.'s[34] studies confirm those of the present study. It seems that due to the high cost of dental services and the high out-of-pocket payments for receiving such services in patients who do not have any medical insurance coverage, their expectations of the dental service providers are more than the expectations in patients who have medical insurance coverage.

Study limitations

The present study had a number of limitations. It was a cross-sectional study, and the required data in this study were collected using a single method

(i.e., questionnaire). On the other hand, in this study, only the patients' perspectives on the quality of dental services were investigated, while it is also necessary to study the views of other stakeholders such as physicians, managers, and other service providers.

CONCLUSION

The studied clinic administrator should pay attention to the improvement of all service quality dimensions. Although service quality is a topic which should be studied from the perspective of all stakeholders, considering the patients' viewpoints and measuring their perceptions and expectations can help managers and policymakers to provide more desirable services. The results showed that, in general, the level and quality of service provided in the studied dental clinic was lower than the patients and service recipients' expectations. Therefore, the managers of this clinic should take steps toward improving the quality of services in all dimensions, especially responsiveness and empathy, through planning properly, prioritizing services, and reviewing processes with regard to the patients' expectations.

Financial support and sponsorship

The project was funded by Baqiyatallah University of Medical Sciences; grant No. 111-24-2014.

Conflicts of interest

The authors of this manuscript declare that they have no conflicts of interest, real or perceived, financial or nonfinancial in this article.

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