

# Reliability and Performance of SEVQUAL Survey in Evaluating Quality of Medical Education Services

Mohammadkarim Bahadori<sup>1</sup>, Seyyed Meysam Mousavi<sup>2,3</sup>, Jamil Sadeghifar<sup>4,5</sup>, Mehdi Haghi<sup>6</sup>

<sup>1</sup> Health Management Research Center, Baqiyatallah University of Medical Sciences, Tehran, Iran <sup>2</sup> Health Management and Economics Research Center, School of Health Management and Information Sciences, Iran University of Medical Sciences, Tehran, Iran <sup>3</sup> Health Policy, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran <sup>4</sup> Research Center for Modeling in Health, Institute for Future Studies in Health, Kerman University of Medical Sciences, Kerman, Iran <sup>5</sup> School of Health Management and Information Sciences, Iran university of Medical Sciences, Tehran, Iran <sup>6</sup> Research Center for Health Services Management, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran

## Abstract

**Background and Objectives:** Considering the importance of medical education quality in achieving a healthy community, there is a need for the development of valid and reliable tools for efficient measurement of quality of medical education services. SEVQUAL is a popular services quality measuring framework used in assessment of quality in various service sectors. The purpose of this study was to examine the reliability and performance of this measurement model in the context of medical education.

**Methods:** This study is a cross-sectional study conducted in 2012 in Kermanshah University of Medical Sciences, situated in western Iran. A sample of 383 students of medical sciences participated in this survey. SEVQUAL services quality framework was used as the measurement tool, which assesses quality of services in five relevant dimensions, including Tangibles, Assurance, Responsiveness, Reliability, and Empathy. The survey was adjusted to the medical education environment, before being administered. Validity of the construct was confirmed by a panel of independent experts. The internal consistency reliability of the survey was measured using Cronbach's alpha. Data were summarized using descriptive statistical methods. T-test and ANOVA were used to compare the mean values.  $P < 0.05$  was considered to represent statistical significance.

**Findings:** While a reliability of 0.88 was obtained for the overall construct, the reliability of all individual dimensions was marginally (less than 0.1) below the threshold of 0.7. All items and dimensions showed a negative gap. A total gap of -1.58 was identified for the entire construct. The largest gap in medical education dimensions was identified for Responsiveness (-1.76), whereas the smallest gap was related to Reliability (-1.33). No significant difference in the total gap was identified between different demographic groups. Tangibles dimension showed a significantly wider gap as perceived by female students compared to their male counterparts ( $P = 0.034$ ). In addition, the Tangibles gap dimension was significantly different among students in different disciplines ( $P = 0.004$ ).

**Conclusions:** Cronbach's alpha coefficients indicated an adequate reliability for the entire construct and a marginally inadequate reliability for the individual dimensions. This observation calls for further large-scale studies to achieve certain conclusion about the reliability of SERVQUAL use in the context of medical education services. Observation of an absolute negative gap in all items and dimensions, highlights the need for immediate investigation of causative factors, followed by devising and implementing improvement strategies.

**Keywords:** SERVQUAL, Medical Education Services, Quality, Gap Analysis

## Background and Objectives

Students of medical sciences are the future workers of the health system; hence, the quality of health systems would be directly dependent on the quality of medical sciences education [1]. The emergence of new health challenges, population growth, and limitation of resources has urged policy makers in several countries to develop reform strat-

egies aiming to adjust the health system to the emerging needs [2]. In addition, the ever-increasing growth of general medical information in the community has raised and diversified the demand for quality health services [3]. This situation requires medical education institutes to continuously assess and improve quality of their services in order to introduce efficient experts into the health system [4].

There are several approaches for evaluating quality of services [5-8]. A particular and frequently used approach is to estimate the gap between expectations and perceptions of customers concerning the quality of services they receive [9-12]. The rationale behind this

\*Corresponding author: Jamil Sadeghifar, Research Center for Modeling in Health, Institute for Future Studies in Health, Kerman University of Medical Sciences, Kerman, Iran. Tel: +98 912 4474770, Fax: +98 21 88883334, E-mail: jamil.sadeghifar@gmail.com

approach is that the magnitude of such a gap would represent the level of customer dissatisfaction with the quality of services delivered. In addition, and from another perspective, this gap would indicate the amount of work that need to be done to match the expectations of customers from the education services quality with their corresponding perceptions [13]. A popular measurement tool developed based on such a concept is SERVQUAL [14]. The basic assumption behind the development of SERVQUAL has been that the quality of services provided by a firm could be assessed by comparing perceptions of customers with their expectations.

The SERVQUAL framework measures the quality of services in the following five dimensions:

- Reliability: Ability to dependably and accurately deliver the specified services;
- Assurance: Knowledge and friendliness of employees and their ability to transfer their trust and confidence to patients;
- Tangibles: Appearance of equipment, facilities, personnel, and communication materials;
- Empathy: Fostering an individualized attention to customers, and
- Responsiveness: Eagerness in aiding customers and providing expeditious service [15].

SERVQUAL is described as “the most complete attempt to conceptualize and measure service quality” and a standard tool that can be used in a wide variety of activities in services sectors such as healthcare and education [16].

Despite these positive aspects, the tool has received criticism with regard to statistical reliability, content validity of the construct, and universality of the quality dimensions [17-18].

Given the importance of medical education quality in achieving a healthy community, there is a need for developing valid and reliable tools, enabling assessment of both strengths and weaknesses of medical education services. Despite the use of SERVQUAL in numerous fields of service, the performance of this tool in measuring the quality of medical sciences education is less explored. This study aimed to examine the reliability and performance of SERVQUAL in quantifying the gap between students' expectations and perceptions of medical education services.

## Methods

### Study Design and Sample

This study is a cross-sectional quantitative study conducted in 2012 in Kermanshah University of Medical Sciences situated in western Iran. A target sample of 520 students

was randomly selected, and the questionnaire was distributed among them.

### Ethics

An approval for conducting this study was obtained from the ethical committee of Kermanshah University of Medical Sciences. The verbal consent of all respondents to participate in this study was obtained before administering the questionnaire. All respondents were assured of the confidentiality of their responses.

### Measurement Instrument

Data were collected using SERVQUAL standard questionnaire [21]. The questionnaire measures quality of services in five dimensions, including Tangibles, Assurance, Responsiveness, Reliability, and Empathy. The questionnaire contains 28 items on both expectations and perceptions of the respondents concerning quality of the services they receive. All questions are scored on a six-point scale, where 1 = ‘Very high expectation/perception’, 2 = ‘High expectation/perception’, 3 = ‘Relatively high expectation/perception’, 4 = ‘Relatively low expectation/perception’, 5 = ‘Low expectation/perception’, 5 = ‘Very low expectation/perception’. An independent panel of experts confirmed content validity of the measurement tool.

### Data Analysis

Gap finding was carried out by comparing scores of current quality of educational services (perceptions of the respondents) with scores of ideal situation (expectations of the respondents). A negative differential score for a particular aspect of medical education service indicated that the current quality of the service in question is below students' expectations, and vice versa. A neutral response was considered to representing existence of no gaps. Data were summarized using descriptive statistical methods. Two-sample t-test and ANOVA were used to compare mean values.  $P < 0.05$  was considered to represent statistical significance. All analyses were carried out using IBM SPSS Version 18 Software .

## Results

### Demographic Data

From the 520 distributed questionnaires, 383 valid questionnaires were returned (response rate = 73%). Table 1 shows the demographic characteristics of the respondents.

Of the total participants, 53.2% were female, 29.2% were students of paramedical disciplines, 66.1% possessed a bachelor degree, and 34.2% were in the first year of college.

## Reliability Analysis

The internal consistency reliability of the total survey was assured by obtaining a Cronbach's alpha of 0.88. The reliability of all individual dimensions was marginally (less than 0.1) below the threshold of 0.7 (Table 2). Despite that, we analyzed and reported the survey results considering the closeness of reliability values to the accepted threshold.

## Descriptive Statistics

Table 2 shows perception scores with expectation scores and the gap between them. While the highest mean expectation score was related to Assurance (4.13), the lowest mean score belonged to Responsiveness (3.99). Whereas the highest perception score was related to Reliability (2.75), Responsiveness earned the lowest score (2.22). Comparison of expectation scores with the scores of perception revealed existence of a gap between real and desirable situation. The largest gap was related to Responsiveness (-1.76), whereas the smallest gap was related to Reliability (-1.33). In addition, comparison of perceptions and expectations at the item level revealed that the largest negative quality gap is related to "Accurate registering and keeping student educational records" (in the tangible dimension), while "Appearance of physical equipment, facilities, personnel, and communication materials" corresponded to the smallest gap (in the assurance dimension) (Table 2).

## Inference Statistics

Comparison of the total gap between demographic groups identified no significant difference. Comparison of each services quality dimension between different demographic groups showed a significantly larger gap in Tangibles as perceived by female students compared with their male counterparts ( $t = -2.13$ ,  $df = 351.7$ ,  $P = 0.034$ ). In addition, ANOVA identified a significantly broader quality gap in Tangibles as perceived by students of paramedical sciences is comparison to the students of pharmaceutical sciences ( $F = 2.97$ ,  $df = 382$ ,  $P = 0.01$ ).

## Discussion

The purpose of this study was to examine the reliability and performance of SERVQUAL measurement model in estimating the quality gap in medical education services.

While a high reliability was identified for the overall construct, the reliability of all individual dimensions was marginally below sufficient level. The small magnitude of this insufficiency encourages further large-scale studies to enable robust decision-making about the reliability of the survey in the context of medical education.

**Table 1 Demographic characteristics of the participants**

Variable	Number	%
Gender ( $n = 376$ )		
Male	176	46.8
Female	200	53.2
School ( $n = 383$ )		
Medical	61	15.9
Paramedical	112	29.2
Nursing	62	16.2
Hygiene	105	27.4
Pharmacology	31	8.1
Dentistry	12	3.1
Degree ( $n = 383$ )		
Associate degree	25	6.5
Bachelor	253	66.1
Graduate	105	27.5
Academic year ( $n = 348$ )		
First year	119	34.2
Second year	100	28.7
Third year	73	21
Forth year	45	12.9
Fifth year or higher	11	3.2

Our results showed that students' expectations in all dimensions of education services quality are higher than their perceptions. Our observation is consistent with previous studies indicating existence of such a gap [19-21]. The largest gap was related to Responsiveness and the lowest belonged to Reliability. This result is consistent with some previous studies where the same pattern of scoring was identified [20-21]. In addition, Arbouny *et al.* identified the lowest quality gap to be related to the Reliability dimension [22].

The fact that the widest gap corresponded to Responsiveness indicates a lack of willingness in college authorities to help students and to provide quality services, as perceived by the students. The largest gap in the items of Responsiveness dimension was related to the ease of access to deans of schools. These observations show that the surveyed college has a communication problem, which is also reflected by the relatively large gap in the use of student feedback on educational issues.

Based on our results, only the Tangibles dimension was significantly different between some demographic groups. The fact that all other quality gap dimensions were not differently perceived by any demographic

**Table 2 Mean and Standard Deviation of Expectations, Perceptions, and Gaps in Quality of Medical Education Services as Expressed by the Students**

Dimensions	Expectations		Perceptions		Gap	
	Mean	SD	Mean	SD	Mean	SD
<b>Assurance</b>						
• Discussions by professors	3.84	.96	2.36	1.07	-1.48	1.34
• Appropriate training of students	4.36	.86	1.97	1.32	-2.39	1.67
• Dedicating time to students outside of class	3.92	.91	2.44	1.22	-1.48	1.54
• Available research resources for students	4.21	.86	2.51	1.28	-1.69	1.49
• Having an expert faculty	4.35	.89	2.64	1.32	-1.70	1.53
Total	4.13	.62	2.38	.79	-1.75	1.01
<b>Responsiveness</b>						
• Availability of School advisors	4.03	.87	2.18	1.27	-1.85	1.57
• Facilitate student access to school chancellor	4.08	.82	2.36	1.38	-1.72	1.62
• Using Student feedback on educational issues	3.95	.88	2.02	1.24	-1.92	1.53
• Student presentations for further studies	3.96	1.01	2.55	1.25	-1.40	1.63
• Specifying certain hours for students to refer to professors	3.95	.95	2.03	1.36	-1.91	1.61
Total	3.99	.62	2.22	.84	-1.76	1.02
<b>Empathy</b>						
• Giving appropriate homework to the students	3.38	1.13	2.24	1.23	-1.13	1.59
• Flexibility of professors towards conditions	4.08	.88	2.04	1.29	-2.03	1.67
• Professors' respect for students	4.31	.75	2.89	1.21	-1.42	1.36
• Appropriate time for classes	4.02	.91	2.48	1.28	-1.54	1.64
• School officials' respect for students	4.19	.87	2.77	1.29	-1.42	1.56
• Having a suitable place to study in school	4.05	1.04	2.32	1.38	-1.72	1.71
• Teaching staff's respect for students	4.15	.87	2.65	1.36	-1.49	1.61
Total	4.02	.57	2.48	.77	-1.54	.92
<b>Reliability</b>						
• Providing regular and related course materials for students	3.98	.88	2.75	1.10	-1.23	1.24
• Informing students of assessment results	3.98	.92	2.59	1.19	-1.38	1.50
• Understandable presentations for students	4.17	.87	2.67	1.08	-1.50	1.43
• Delivery of what promised by professors to students	3.94	.93	2.74	1.10	-1.19	1.44
• Students get better grades if they make efforts on their studies	4.17	.88	2.75	1.41	-1.42	1.63
• Appropriate maintenance and registration of student records	4.09	.94	3.10	1.19	-.99	1.45
• Easy access to information resources available in the school	4.28	.82	2.68	1.38	-1.59	1.62
Total	4.08	.57	2.75	.75	-1.33	.85
<b>Tangibles</b>						
• Elegant appearance of school professors and staff	3.91	1.02	2.91	1.24	-1.00	1.68
• Visual aesthetics of the School facilities	4.15	.92	1.63	1.37	-2.52	1.83
• Updated educational equipment	4.27	.86	2.54	1.37	-1.73	1.62
• Physical aesthetics of devices used as teaching aids	4.01	1.01	2.46	1.26	-1.54	1.55
Total	4.08	.67	2.38	.87	-1.70	1.13
Total	4.06	.53	2.47	.67	-1.58	.81

groups indicates the generality of the existing deficiencies. This finding, however, contrasts with the study of Arbouny *et al.* where quality gap in all five dimensions, as perceived by female students, was significantly higher compared with their male counterparts [22]. In addition, our previous study identified such a difference in quality gap as perceived by female and male students of paramedical sciences [14]. The difference in the findings of different studies highlights the importance of college-specific assessment of quality gap in gaining insight into educational services inadequacies.

Studies show that deficiency in a particular dimension of educational services can negatively influence other dimensions [23]. Therefore, identifying and prioritizing existing gaps would help a more effective planning for educational services improvement [24]. Exploring the causative factors leading to the identified gaps was beyond the scope of this study. However, studies of this kind would help elucidate the most vulnerable dimensions of educational services for further in-depth causative analysis [14]. Barnes used the same survey to identify potential gaps in the quality of educational services as perceived by Chinese graduate students. Interestingly, no gap was identified in any of the dimensions [25]. Using the experiences of educational centers that have such a successful record in providing quality education services would inspire development of effective strategies to bridge the existing quality gap in low performance medical education systems.

### Study Limitations

During the study period, there was a limited access to graduating students. Therefore, our results do not fully reflect the perceptions and expectations of this group. Our sample in this study was limited to a single medical college. Hence, caution must be exercised in generalizing the results of this study. In addition, despite a marginally inadequate internal consistency reliability of the measurement tool, we analyzed and reported the survey results considering the closeness of reliability values to the critical threshold. Our results should be interpreted considering these limitations.

### Conclusions

The present study aimed to provide insight into the reliability and performance of SEVQUAL survey in estimating the quality of medical education services. While a high reliability was identified for the overall construct, the reliability of individual dimensions was marginally below the sufficient value. Therefore, decision about the reliability of the construct in medical education context is still difficult based on the results of this study. However, our results encourage further large-scale studies to enable robust decision-making.

Our results indicated existence of a negative gap in perceptions and expectations of students in all dimensions of medical education services quality, including Tangibles, Assurance, Responsiveness, Reliability, and Empathy. In addition, all survey items showed a negative gap indicating that the expectations of the students are not met in any of the items in the current educational system. The Responsiveness dimension corresponded with the largest gap, whereas the smallest gap was related to the 'Reliability' dimension.

A more detailed review of the gap scores in Responsiveness dimensions revealed existence of a communication problem between students and the faculty members.

No significant difference in the average total gap was identified between different demographic groups. However, the gap in the Tangibles dimension was found higher as perceived by female students compared with their male counterparts. In addition, students of paramedical sciences perceived a larger gap in the Tangibles dimension as compared with the students of pharmaceutical sciences.

The perceived gap in other quality dimensions did not show a significant difference between any of the demographic groups indicating the generality of the existing deficiencies as perceived by students of both genders. The results of this study and similar research using reliable surveys can help identify the most serious inadequacies in the educational system and guide relevant quality improvement plans.

### Abbreviations

(SERVEQUAL): Services Quality

### Competing Interests

The authors' declare no competing interests.

### Authors' Contributions

MB designed the study. MB and JS jointly contributed to data analysis, interpretation of the results, and editing the draft manuscript. SMM and MH were involved in data collection and analysis. All authors read and approved the final manuscript.

### Acknowledgements

The authors would like to thank the authorities of Kerman-shah University of Medical Sciences for their cooperation, and all the students who participated in the research.

Received: 21 January 2013 Revised: 9 February 2013 Accepted: 20 February 2013

## References

1. Aghamolaei T, Zare S. Quality gap of educational services in viewpoints of students in Hormozgan University of medical sciences. *BMC Med Educ* 2008, **8**(34):1-6.
2. Costa Font J, Sato A. Health systems futures: The challenges of technology, prevention and insurance. *Futures* 2012, **44**(7):696-703.
3. Masic I. Quality assessment of medical education at faculty of medicine of sarajevo university - comparison of assessment between students in bologna process and old system of studying. *Acta Informatica Medica* 2013, **21**(2):76-82.
4. Bahadori M, Sadeghifar J, Nejati M, Hamouzadeh P, Hakimzadeh M. Assessing quality of educational service by the SERVQUAL model: Viewpoints of paramedical students at Tehran university of medical science. *Tech Technol Educ Ma* 2011, **6**(4):1058-65.
5. Debata BR, Patnaik B, Mahapatra SS, Sreekumar. An integrated approach for service quality improvement in medical tourism: An Indian perspective. *Int J Serv Oper Manag* 2012, **13**(1):119-45.
6. Kumar A, Dash MK. Constructing a measurement in service quality for Indian banks: Structural Equation Modeling approach. *J Internet Bank Commerce* 2013, **18**(1):1-18.
7. Altuntas S, Dereli T, Yilmaz MK. Multi-criteria decision making methods based weighted SERVQUAL scales to measure perceived service quality in hospitals: A case study from Turkey. *Total Qual Manag Bus Excel* 2012, **23**(11-12):1379-95.
8. Da Silva CFD, De Araújo Batista D, De Medeiros DD. A proposed method to evaluate the quality of services using Fuzzy sets theory. *Quality and Quantity* 2012:1-15.
9. Vaz A, Mansori S. Malaysian private education quality: Application of SERVQUAL model. *Int Educ Stud* 2013, **6**(4):164-70.
10. Butt MM, de Run EC. Private healthcare quality: Applying a SERVQUAL model. *Int J Health Care Qual Assur* 2010, **23**(7):658-73.
11. Kumar M, Kee FT, Charles V. Comparative evaluation of critical factors in delivering service quality of banks: An application of dominance analysis in modified SERVQUAL model. *Int J Qual Reli Manag* 2010, **27**(3):352-78.
12. Kumar M, Kee FT, Manshor AT. Determining the relative importance of critical factors in delivering service quality of banks: An application of dominance analysis in SERVQUAL model. *Manag Serv Qual* 2009, **19**(2):211-28.
13. Siadat SH, Buyut VC, Selamat H (EDs). *Measuring service quality in E-retailing using SERVQUAL model*. International Symposium on Information Technology 2008; IEEE.
14. Bahadori M, Sadeghifar J, Nejati M, Hamouzadeh P, Hakimzadeh M. Assessing Quality of Educational Service by the SERVQUAL model: Viewpoints of Paramedical Students at Tehran University of Medical Science. *Tech Technol Educ Ma* 2011, **6**(4):1058-65.
15. Gorji H, Tabatabaei S, Akbari A, Sarkhosh S, Khorasan S. Using the service quality gap's model (SERVQUAL) in Imam Khomeini teaching hospital: 2012. *J Health Admin* 2013, **16**(51):7-18.
16. Haque A, Sarwar AA-M, Yasmin F, Anwar A. The impact of customer perceived service quality on customer satisfaction for private health centre in Malaysia: a structural equation modeling approach. *Info Manag Bus Rev* 2012, **4**(5):257-67.
17. Miranda FJ, Chamorro A, Murillo LR, Vega J. Primary health care services quality in Spain: A formative measurement approach using PLS path modeling. *Int J Qual Serv Sci* 2012, **4**(4):387-98.
18. Katircioglu ST, Mehtap-Smadi S, Kiliç C, Ünlücan D. Service quality and university students' satisfaction on the travel agencies: An empirical investigation from Northern Cyprus. *Int J Qual Serv Sci* 2012, **4**(3):299-311.
19. Zavar T, Behrangi MR, Asgarian M, Naderi E. Evaluating Service Quality in Educational Centers of University of Payam Noor in East and West Azarbayejan. *Quarterly J Res Plan Higher Educ* 2008, **13**(4):67-90.
20. Kebriaei A, Roudbari M, Rakhshani N, Mirlotfi P. Assessing quality of educational services at Zahedan University of Medical Sciences. *Tabib-e-Shargh* 2005, **7**(2):139-46.
21. Zare S, Abedini S. The quality gap of educational services from the point of view of students in Hormozgan University of Medical Sciences. *Stud Develop Med Educ* 2006, **3**(2):78-85.
22. Arbouni F, Shoghli A, Bardi S, Mohajeri M. The Gap Between Students' Expectations And Educational Services Provided for Them, Zanjan University of Medical Sciences. *Stud Develop Med Educ*. 2008, **5**(1):17-25.
23. Lamei A. Total Quality management in health care. In: Unit QI, editor. Tehran: Health Ministry of Iran 2000.
24. Campbell J, Ramsay J, Green J. Age, gender, socioeconomic, and ethnic differences in patients' assessments of primary health care. *Qual Health Care* 2001, **10**(2):90-5.
25. Barnes BR. Analysing service quality: the case of post-graduate Chinese students. *Total Qual Manag Bus Excel* 2007, **18**(3):313-31.

### Please cite this article as:

Mohammadkarim Bahadori, Seyed Meysam Mousavi, Jamil Sadeghifar, Mehdi Haghi. Reliability and Performance SEVQUAL Survey in Evaluating Quality of Medical Education Services. *International Journal of Hospital Research* 2013 **2**(1):39-44