Review Article

Educational Quality of Services in Medical Universities of Islamic Republic of Iran: A Systematic Review and Meta-Analysis

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Abstract

Background: The comparison between customers' expectations and real provided services is defined as the quality of service. In medical education system, the negative quality gap can threaten the lives as graduates are probably not capable of managing the health condition of their patients. The aim of this study was to demonstrate a whole picture for educational quality of services in medical universities of the Islamic Republic of Iran.
Methods: Persian databases (SID, Elmnet, Magiran, and IranMedex) and English electronic databases including Scopus and PubMed were searched (from 2005 to 2017). Our main search terms include medical university, SERVQUAL, and quality of education. The methodological quality was assessed by a modified Newcastle–Ottawa Scale (NOS). Information was gathered for the following terms: author, publication year, keywords, and main conclusion. The main outcome measurement was the measured gap for tangibles, reliability, assurance, responsiveness, and empathy dimensions along with the total educational services quality gap. Pooled difference in means (95 CI%) were evaluated. All analyzes were performed using comprehensive meta-analysis software.
Result: For this study, 143 cross-sectional studies were found for review. Based on the random effect models, total weighted mean difference (WMD) was -1.23 (95 CI%: -1.35 to -1.11), WMD of assurance was -1.24 (95 CI%: -1.41 to -1.08), WMD of reliability was -1.04 (95 CI%: -1.28 to -0.80), WMD of responsiveness was -1.38 (95 CI%: -1.52 to -1.24), WMD of tangible was -1.25 (95 CI%: -1.41 to -1.10), and WMD of empathy dimension was -1.18 (95 CI%: -1.34 to -1.03). Stratified analysis revealed that if universities types and quality of studies decreases, all dimensions of the quality gap would be deteriorated.
Conclusion: Negative gap was reported for all faculties/universities. Students are the main customers of universities; hence items that are requested by students should be offered. Determining where gaps lie in different dimensions can guide the allocation of financial resources in education systems, in addition to improving decision-making and strategic planning.

Keywords: QUALITY OF SERVICE, SERVAQUAL, EDUCATION, SYSTEMATIC REVIEW, MEDICAL UNIVERSITY

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Introduction

The quality of service is defined as the gap between the services that should be given and the customers' perceptions (1). Paying enough

attention to this concept is vital for the survival of organizations. This issue is even more substantial in the medical education system. The negative quality gap can threaten the lives of people because graduates are probably not capable of managing the health condition of their patients.

It is believed that the viewpoints of the main customers of each system (i.e. students in medical education) are of great value for improving the quality of services (2). This may be the reason for numerous studies that have been conducted to determine the gaps in the educational quality from students' point of view (3, 4). The most popular tool to measure the quality gap is SERVQUAL Model, which measures the quality gap in five dimensions: tangible, confidence, responsiveness, assurance, and empathy (5, 6). Despite lots of previous studies, dealing with each medical university in Iran separately, there is no overview of overall medical educational quality in this country. Therefore, this systematic review was conducted to show a big picture for educational quality of service in medical universities of the Islamic Republic of Iran.

Materials and Methods

Literature Search

Persian databases (SID, Elmnet, Magiran, and IranMedex) and English electronic databases including Scopus and PubMed were searched (from 2005 to 2017) by two independent investigators (A.A and M.K.R). Studies, providing data on the assessment of quality of educational services in Iranian universities of medical sciences using SERVQUAL model were considered. Then the search was completed by hand-searching of the reference lists of included papers, abstracts from national medical meetings, and grey literature to identify additional relevant studies. Our search terms included medical university, SERVQUAL, and quality of education.

Search Strategy Development and Study Screening

After developing the protocol of the project, the search was performed by two independent reviewers (A.A.) & (M.K.R.). All search results were exported into the reference manager software, EndNote X7 (Thomson Reuters, New York, NY, USA). The aforementioned reviewers independently assessed the studies regarding inclusion criteria (that was determined previously in the study protocol) and any unresolved disagreement between these two reviewers were resolved by the third one (S.A).

Inclusion and Exclusion Criteria

Studies were considered eligible for inclusion in the present study if they met the following criteria: 1. Studies with cross-sectional design; 2. Studies performed in Iranian universities of medical sciences; 3. Studies conducted on undergraduate students; and 4. those using SERVQUAL method for assessing the quality of educational services. Studies were excluded if the perception or expectation of participants were not assessed. Additionally, studies conducted in postgraduate students and those with no accessible full-text were also excluded from the study. Other exclusion criteria were letter to editors, unstructured papers, proceeding papers, theses, dissertations, and the papers with insufficient information on aspects of educational quality service. The included papers were read and verified by two researchers (A.A. and M.K.R) and then confirmed by the third one (S.A.). A summary PRISMA flow diagram of the study protocol is shown in figure 1.

Data Extraction and Quality Assessment

A total of 143 studies were identified and reviewed. References of selected articles were investigated for additional studies. The Newcastle–Ottawa Scale (NOS) was modified according to the method of included studies

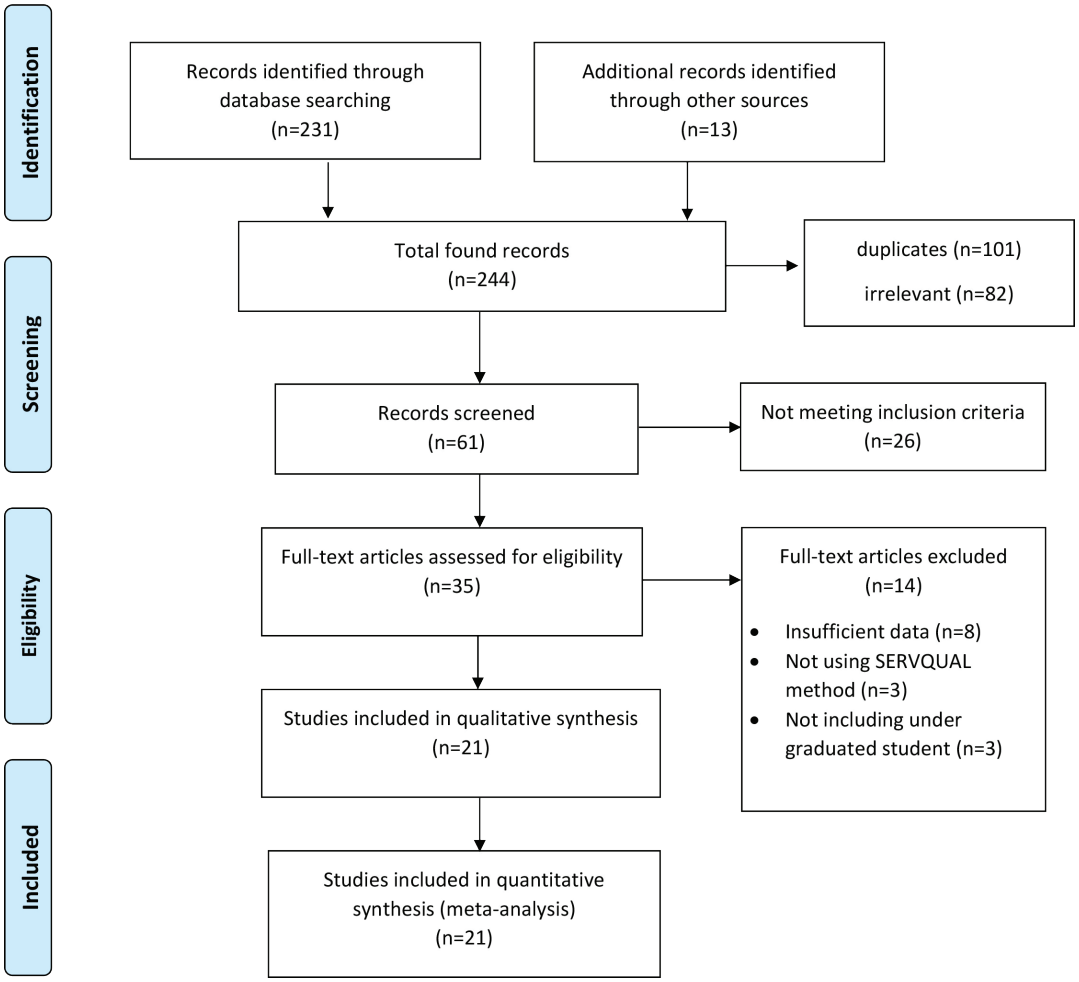

Figure 1: PRISMA flow diagram of included and excluded studies

and was utilized to assess the methodological quality of the articles by two reviewers (A.A. and M.K.R), independently and verified by the third reviewer (S.A). The quality of articles was assessed based on the selection of study groups, comparability, and the ascertainment of the exposure/outcome of interest. NOS scores of 1-4, 5-6, and 7-8 were considered as low, intermediate, and high quality studies, respectively (tables 1 and 2).

After designing the primary data extraction form, it was evaluated by data extraction of a pilot study and then finalized and used for gathering the entire data for all studies. Information was gathered for the following terms: author, publication year, keywords, and conclusion. The main measured outcomes were the total quality of educational services along with tangible, reliability, responsiveness, assurance, and empathy dimensions.

Data Synthesis

To assess the association, summary data from individual studies were pooled using a random effect model. All continuous data were summarized as Odds ratio along with 95% confidence intervals (95% CIs). Pooled difference in means (95% CI) was also reported. All analyzes were performed using comprehensive meta-analysis version 2 and a P value of below 0.05 was considered as statistically significant.

Results

In this study, 143 cross-sectional studies were preliminary eligible for review (Elmnet: 31, Irandoc: 53, magiran: 90, SID: 14, PubMed: 19, Scopus: 24, and hand-searching: 13). After

Table 1: Characteristics of the included studies in Iranian universities of medical sciences

Study, year	Faculty	University (Type)	N	Response rate (%)	Quality Score
Mohebbifar R, 2013 (7)	Nursing & Public Health	Qazvin (II)	256	N/A*	3
Enayati T, 2013 (8)	Medicine, Paramedicine, Nursing, Pharmacy	Mazandaran (II)	341	85	6
Mohammadi, 2011 (9)	Medicine, Paramedicine, Nursing, Pharmacy, Public health	Zanjan (II)	320	N/A	4
Zarei E AM, 2016 (10)	Public Health	Shahid Beheshti (I)	246	100	7
Yarmohammadian MH, 2015 (11)	Management and Medical Information	Isfahan (I)	96	81.25	6
Abbasian M, 2013 (12)	Nursing & Midwifery, Public Health, Medicine	Shahroud (III)	274	100	5
Yazdi-Feyzabadi V, 2015 (13)	Medicine	Kerman (I)	303	85.5	6
Gholami A, 2014 (14)	Nursing, Paramedicine	Neyshabour (III)	199	99.5	6
Haresabadi MAB, 2013 (15)	Nursing & Midwifery, Public Health, Medicine	North Khorasan (III)	175	N/A	4
Kebriaei A, 2005 (16)	Medicine, Paramedicine, Public Health, Nursing, Dentistry	Zahedan (III)	386	100	3
Khadem Rezaiyan, 2016 (17)	Medicine	Mashhad (I)	216	N/A	5
Aghamolaei T, 2008 (18)	Nursing & Midwifery, Public Health, Medicine	Hormozgan (III)	300	N/A	3
Jafari Asl MAC, 2014 (19)	Nursing & Midwifery	Rasht (II)	336	N/A	7
Bahadori M, 2013 (20)	Medicine, Paramedicine, Nursing, Pharmacy, Public Health, Dentistry	Kermanshah (II)	383	73	4
Mohebi SAA, 2015 (21)	Medicine, Paramedicine, Public Health, Nursing & Midwifery, Dentistry	Qom (II)	307	N/A	5
Kavosi Z, 2014 (22)	Management and Medical Information	Shiraz (I)	247	82	6
Norouzinia R, 2016 (23)	Medicine, Paramedicine, Public Health, Nursing, Midwifery	Alborz (II)	176	100	6
Beheshtirad R, 2013 (24)	Nursing	Urmia (II)	73	N/A	4
Bakhshi, 2011 (25)	Medicine, Paramedicine, Nursing & Midwifery, Dentistry	Rafsanjan (III)	310	N/A	3
Kavosi Z, 2014 (26)	Medicine, Paramedicine, Nursing, Pharmacy, Public Health, Dentistry, Rehabilitation	Shiraz (I)	220	100	3
Zakerjafari HR, 2015 (27)	Dentistry	Gilan (II)	105	N/A	4

*N/A: Not Available

the primary screening of titles and abstracts, 61 studies remained eligible for the next step. Figure 1 explains the selection process of 21 studies using PRISMA flow chart.

Study Characteristics

Table 3 describes the characteristics of the 21 final included studies. Universities were categorized to three types namely type I (two universities), type II (eight universities) and type III (11 universities), according to the Ministry of Health and Medical Education of Islamic Republic of Iran. The studies had been performed in different faculties of medical universities. The number of participants in included studies ranged from 73 to 383.

Table 2: Quality assessment of the included studies

Author, year	Selection				Comparability	Outcome		Total
	Appropriate representativeness of the sample	Justify sample size	Appropriate Response rate	Validated Measurement tool	The subjects in different outcome groups are comparable, based on the study design or analysis. Confounding factors are controlled	Assessment of the outcome	Appropriate statistical test	
Mohebbifar R, 2013	Yes	No	N/A	Non-validated/ but available tools	Most important factors	Self-report	No	Poor
Enayati T, 2013	Yes	Yes	Yes	Yes	No	Self-report	Yes	Moderate
Mohammadi A, 2011	Yes	No	N/A	Yes	Most important factors	Self-report	No	Poor
Zarei E AM, 2016	Yes	Yes	Yes	Non-validated/ but available tools	Some important factor	Self-report	Yes	High
Yarmohammadian MH, 2015	Yes	Yes	Yes	Non-validated/ but available tools	Some important factor	Self-report	No	Moderate
Abbasian M, 2013	Yes	No	N/A	Yes	Some important factor	Self-report	No	Moderate
Yazdi-Feyzabadi V, 2015	Yes	Yes	Yes	Yes	Most important factors	Self-report	No	Moderate
Gholami A, 2014	Yes	Yes	Yes	Non-validated/ but available tools	Some important factors	Self-report	No	Moderate
Haresabadi MAB, 2014	Yes	No	N/A	Non-validated/ but available tools	Some important factors	Self-report	No	Poor

Kebriaei A, 2005	Yes	No	Yes	Non-validated/ but available tools	N/A	Self-report	No	Poor
Khadem Rezaiyan M, 2016	Yes	Yes	N/A	Non-validated/ but available tools	Some important factors	Self-report	No	Moderate
Aghamolaei T, 2008	Yes	No	N/A	Non-validated/ but available tools	Most important factors	Self-report	No	Poor
Jafari Asl MAC, 2014	Yes	Yes	YES	Yes	Some important factors	Self-report	Yes	High
Bahadori M, 2013	Yes	No	Yes	Yes	N/A	Self-report	No	Poor
Mohebi SAA, 2015	Yes	Yes	N/A	Non-validated/ but available tools	Some important factors	Self-report	No	Moderate
Kavoosi Z, 2013	Yes	Yes	Yes	Yes	Most important factors	Self-report	No	Moderate
Norouzinia R, 2016	Yes	Yes	Yes	Yes	Most important factors	Self-report	No	Moderate
Beheshtirad R, 2013	Yes	Yes	N/A	Yes	N/A	Self-report	No	poor
Bakhshi H, 2011	Yes	No	N/A	Non-validated/ but available tools	Most Important Factors	Self-Report	No	poor
Kavoosi Z, 2014	Yes	Yes	N/A	Non-validated/ but available tools	N/A	Self-Report	No	poor
Zaker Jafari HR, 2014	Yes	Yes	N/A	Yes	N/A	Self-Report	No	poor

Quality Assessment

Table 2 depicts the summary of the quality assessment of the included studies. All of them had appropriate representativeness of the sample, while 13 studies described the justification of sample size, and ten articles re-calculated Cronbach's alpha for the SERVQUAL questionnaire. Furthermore, 10 studies had proper response rate (i.e. higher than 80%) (table 1). However, a proper statistical test (as the questionnaire had a paired structure) was used in only three surveys. According to the final evaluation of the quality, 10 articles had

Table 3: The result of the quality gap in total and five related dimensions

		Total		Assurance		Reliability		Responsiveness		Tangible		Empathy	
		n	Pooled results	n	Pooled results	n	Pooled results	n	Pooled results	n	Pooled results	n	Pooled results
Total		19	-1.23 (-1.35 to -1.11)	21	-1.24 (-1.41 to -1.08)	21	-1.04 (-1.28 to -0.80)	21	-1.38 (-1.52 to -1.24)	21	-1.25 (-1.41 to -1.10)	21	-1.18 (-1.34 to -1.03)
University type subgroup analysis	Type I	3	-1.19 (-1.60 to -0.78)	4	-1.05 (-1.28 to -0.82)	4	-1.04 (-1.28 to -0.80)	4	-1.26 (-1.51 to -1.01)	4	-1.16 (-1.74 to -0.59)	4	-1.14 (-1.40 to -0.88)
	Type II	7	-1.17 (-1.38 to -0.96)	8	-1.26 (-1.53 to -0.98)	8	-0.94 (-1.41 to -0.47)	8	-1.41 (-1.65 to -1.16)	8	-1.23 (-1.45 to -1.01)	8	-1.19 (-1.47 to -0.91)
	Type III	9	-1.30 (-1.51 to -1.08)	9	-1.32 (-1.56 to -1.08)	9	-1.13 (-1.33 to -0.93)	9	-1.42 (-1.62 to -1.21)	9	-1.32 (-1.62 to -1.02)	9	-1.20 (-1.42 to -0.98)
Study Quality subgroup Analysis	High quality	2	-0.94 (-2.17 to 0.28)	2	-0.76 (-1.95 to 0.42)	2	-0.77 (-1.87 to 0.32)	2	-1.04 (-2.21 to 0.13)	2	-1.26 (-2.69 to -0.15)	2	-0.88 (-2.08 to 0.30)
	Medium quality	8	-1.21 (-1.34 to -1.08)	9	-1.19 (-1.43 to -0.95)	9	-0.97 (-1.41 to -0.53)	9	-1.32 (-1.52 to -1.12)	9	-1.17 (-1.33 to -1.00)	9	-1.21 (-1.41 to -1.01)
	Low quality	9	-1.32 (-1.52 to -1.12)	10	-1.39 (-1.60 to -1.18)	10	-1.15 (-1.32 to -0.99)	10	-1.51 (-1.70 to -1.32)	10	-1.33 (-1.58 to -1.09)	10	-1.22 (-1.41 to -1.03)
Subgroup Analysis	Faculty	11	-1.13 (-1.32 to -0.94)	13	-1.12 (-1.37 to -0.86)	13	-1.02 (-1.30 to -0.74)	13	-1.31 (-1.52 to -1.09)	13	-1.17 (-1.35 to -0.98)	13	-1.14 (-1.37 to -0.91)
	Univer-sity	8	-1.37 (-1.54 to -1.20)	8	-1.44 (-1.64 to -1.25)	8	-1.08 (-1.46 to -0.69)	8	-1.50 (-1.66 to -1.34)	8	-1.40 (-1.60 to -1.20)	8	-1.24 (-1.39 to -1.09)

poor, nine had moderate, and two had high quality scores.

Overall Quality Gap

All studies involved in the meta-analysis described the mean and standard deviation of perceptions and expectations of participants. Overall, all studies reported a lower mean for perception than expectation in total and all dimensions (i.e. a negative service quality gap). Based on the random effect models, weighted mean difference (WMD) was -1.23 (95% CI: -1.35 to -1.11) for total quality (figure 2), -1.24 (95% CI: -1.41 to -1.08) for assurance (figure 3), -1.04 (95% CI: -1.28 to -0.80) for reliability (figure 4), -1.38 (95% CI: -1.52 to -1.24) for responsiveness (figure 5), -1.25 (95% CI: -1.41 to -1.10) for tangible (figure 6), and -1.18 (95% CI:-1.34 to -1.03) for empathy (figure 7) (table 3). To measure the mean difference, a multiple stratified analysis was performed regarding the university type and quality of the study. Stratified analysis showed that negative quality gap in all dimensions increases (i.e.

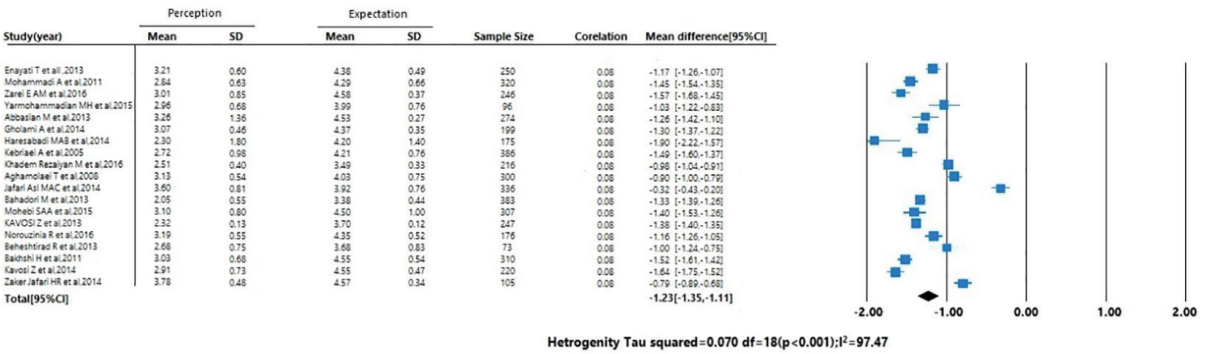

Figure 2: Forest plot of the included studies assessing the weighted mean difference of overall score of the educational quality gap. A diamond data marker represents the overall OR, 95 % CI, and relative weight for the outcome of interest.

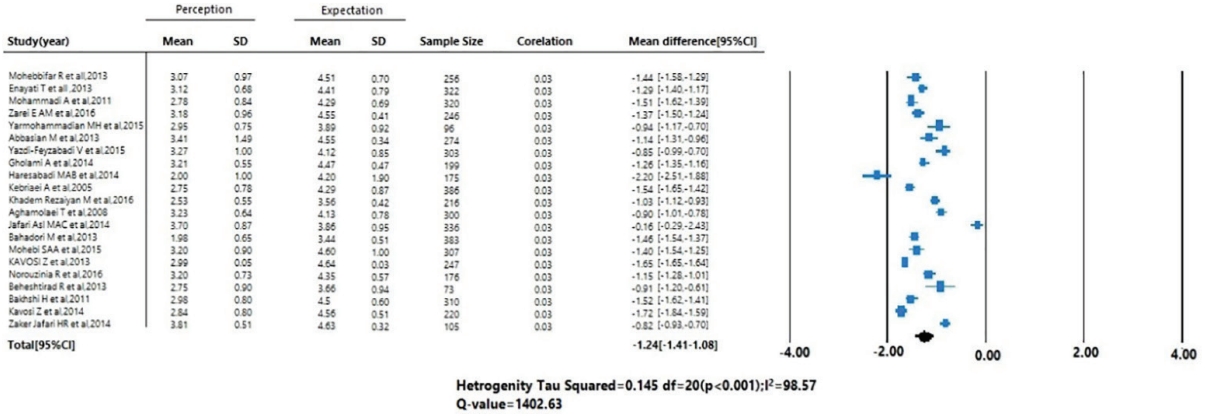

Figure 3: Forest plot of the included studies assessing the weighted mean difference of assurance dimension. A diamond data marker represents the overall OR, 95 % CI, and relative weight for the outcome of interest.

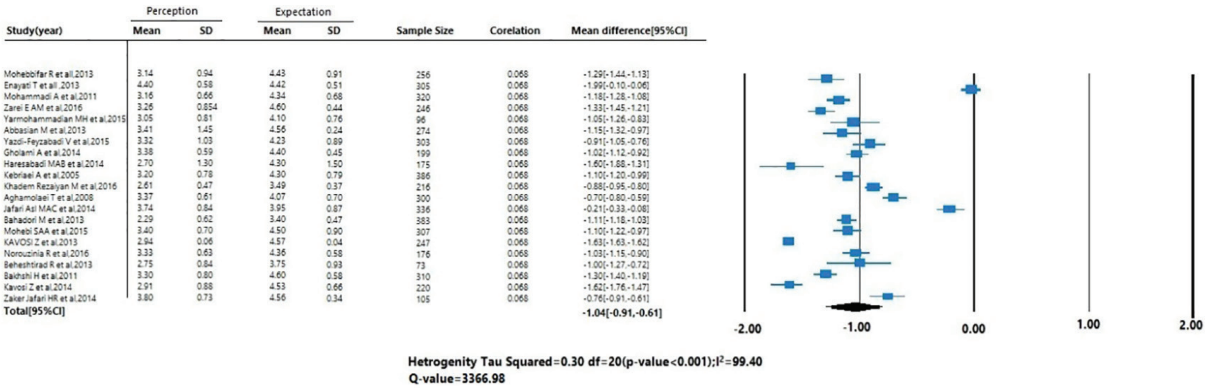

Figure 4: Forest plot of the included studies assessing the weighted mean difference of reliability dimension. A diamond data marker represents the overall OR, 95 % CI, and relative weight for the outcome of interest.

deteriorates) along with a decrease in university quality (from type I to type III) and a decrease in study quality.

Heterogeneity and Publication Bias

Heterogeneity was found in all analyzes of dimensions, justifying the use of random effects models. Publication bias was identified among the studies, as demonstrated by funnel plots.

Discussion

In this study, responsiveness had the largest gap in medical universities from the students' point of view. In most of Iranian medical universities, responsiveness had the lowest score (7, 8, 12, 18, 28-31). Among the questions of the responsiveness dimension, those evaluating educational staff's response

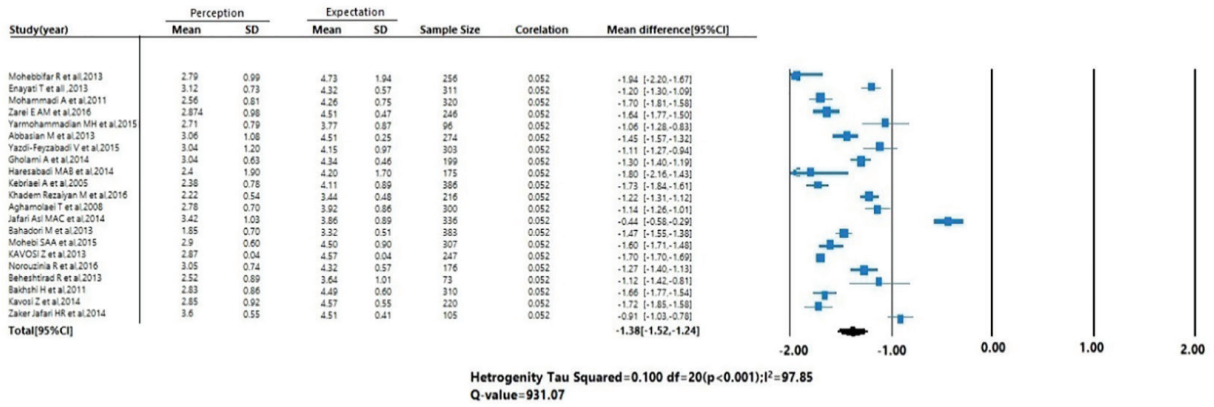

Figure 5: Forest plot of the included studies assessing the weighted mean difference of responsiveness dimension. A diamond data marker represents the overall OR, 95 % CI, and relative weight for the outcome of interest.

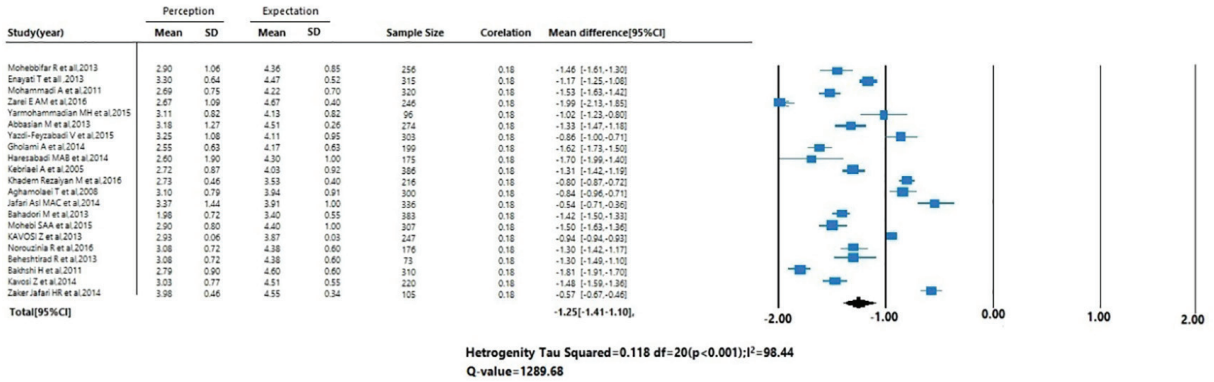

Figure 6: Forest plot of the included studies assessing the weighted mean difference of tangible dimension. A diamond data marker represents the overall OR, 95 % CI and relative weight for the outcome of interest.

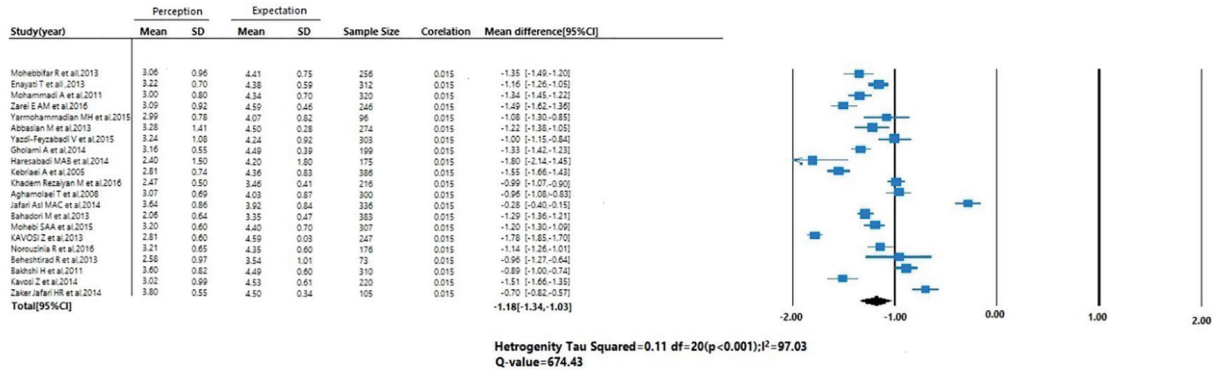

Figure 7: Forest plot of the included studies assessing the weighted mean difference of empathy dimension. A diamond data marker represents the overall OR, 95 % CI and relative weight for the outcome of interest.

to students' questions and students' ability to influence syllabi had the largest educational quality gaps. Responsiveness focuses on the awareness of customers' demands, questions, and complaints. The existence of a wider gap in this dimension reflects the unavailability of advisors and supervising professors. Students cannot easily access authorities to express their opinions and suggestions regarding their education. The system seems to be rigid and students' suggestions are rarely considered. Resources for further reading are not introduced and time slot for meeting of faculty members, particularly those dedicated to counselling are not available. The quality gap has widened due to the long-time spending to express an opinion or receive an answer through a proper communication path to the

managers. This issue is further compounded by faculty members' heavy workload and their inadequate sensitivity to students' demands and criticisms (12, 18, 30).

Studies show that the gap is larger in the clinical stages of medical education as a result of limited access to learning resources and poor management (29). The quality of gap could be narrowed by holding sessions with student representatives and empowering student associations. It might be helpful if education councils such as the advisory committee could serve as a medium to convey students' proposals to managers. Other interventions such as surveys for measuring satisfaction, workshops on proper attitude and behaviour for staff, and providing feedback from students about problems could also help to improve responsiveness (31).

It seems that the heavy workload of faculty members may prevent them from proper time allocation for students' complaints (21). According to other studies, improvements in one dimension can positively influence others. Responsiveness was shown to be the dimension with the largest gap in other studies as well. Thus, university managers and faculty policymakers should provide strategies for addressing this issue (21).

Among all dimensions, the physical dimension had the second largest gap. The gap was noticeably larger in type III universities compared with type I and II universities (12). However, insufficient physical space has the third rank in type II universities. It seems likely that insufficient facilities and insufficient budgets of undeveloped universities compared with type I and II universities, lead to a sense of dissatisfaction among students. For example, in a study performed in a type III medical university, old equipment, shortage of physical space, staff's appearance, state of buildings and tidiness were counted as factors contributing to the gap in service quality (12, 21, 30, 32). In contrast, a study in a type I medical university showed that quality of service gap in the physical dimension was the smallest one.

The assurance was the third dimension in terms of service quality gap. However, among the questions assessing assurance in the SERVQUAL questionnaire, students' anxiety about their employment in the future showed the largest gap, which is likely due to the specialization of medical education, more attention to sophisticated clinical aspects at hospitals, and the long period students spend on basic-sciences and physiopathology courses. Further investigation is needed to clarify the root causes of medical students' concern over their future employment (17).

Empathy was the fourth dimension with the largest educational service quality gap. In most of the medical universities, this aspect has the smallest gap while in separate studies performed at paramedical departments of Tehran University of Medical Sciences and Mashhad University of Medical Sciences, empathy was considered as a dimension with a large gap (10, 17). The large gap in empathy could be the result of ineffective communication between staff and students along with students' unfamiliarity with the complex structure of hospitals in their first months of clinical education (31). Furthermore, the heavy workload, the imbalance in student-professor ratio, and the poor communication skills of some professors are other considerable factors (33).

Overall, providing professors with students' evaluation feedbacks can boost their ability or improve their communication skills. Sharing the output of student evaluations can generate interest among professors to employ better methods and fully exploit existing facilities in order to improve education. The proper following of academic schedules, more free time for the professors to consult students, as well as enhancing the professors' interest and patience can improve the responsiveness dimension. Professors' social behaviour toward students, fostering enthusiasm and mutual respect, openness to criticism, and taking interest in research are some of the factors that can enhance the quality of medical education (32).

The limitations of this review study include the dissimilarities between universities, the inability to reach out to all students, pooling clinical and basic-sciences students, and the unavailability of response rate in some studies. Other influential factors such as inclusion criteria, the time studies were performed, and students' socio-cultural status and family background were also ignored. To track the influence of educational interventions and newer modified policies, newer studies may be helpful. In some universities, the SERVQUAL study was carried out in only one or two of faculties while to obtain a clear picture of the level of satisfaction, university-wide studies are required. We were unable to perform analyzes for individual departments or faculties due to the scarcity of information.

The SERVQUAL method is a general evaluation of problems in an education system. Consequently, qualitative studies in each dimension are required to explore challenges. It is also recommended that similar studies be performed at other medical universities in the country. Students are main customers of universities; hence items that are requested by students should be seriously taken into consideration. Determining where gaps lie in different dimensions not only guides the direction of financial allocation in education systems but also improves decision-making and strategic planning policies.

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