



Customer Satisfaction Analysis for Medical Service Quality from Foreign Females' Perspective in Korea During COVID-19

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Abstract. The aim of this paper is to measure the relationship among medical service quality, customer satisfaction, and revisit intention for foreign female hospital visitors in Korea during COVID-19. This study employed an extended SERVQUAL model including COVID-19 regulations such as keeping social distance and COVID-19 symptom monitoring. To evaluate the proposed model, we collected response data from 84 foreign females in Korea by an online survey from March 15 to May 15, 2022. We verified the data by various statistical analysis metrics, such as validity and reliability test, discriminant validity, and structural modeling analysis. The results from our analysis revealed that the responsiveness, empathy, and COVID-19 regulations significantly affect customer satisfaction. Consistently, the customer satisfaction of medical services positively impacts revisit intention. Therefore, based on the results of this study hospitals should pay more attention to the regulation of COVID-19 and the quality of medical services. This study provides medical institutions with management strategies to increase customer satisfaction when an infectious disease occurs in the future.

Keywords: Medical service quality · COVID-19 · Customer satisfaction · Revisit intention

1 Introduction

With the increasing number of foreigners living in Korea, the amount of foreigners using medical institutions in Korea is also rising [1]. By 2019, the number of foreign patients using Korean medical institutions steadily increased to 497,464, but in 2020 due to the COVID-19 pandemic foreign patients dropped to 117,069 [2]. In 2021, the number of foreign patients increased by 24.6% compared with the number in 2020, and the number of foreign patients is expected to increase as the COVID-19 situation is recovering [3]. Therefore, foreigners will also be the main customers of Korean hospitals in the future.

In 2020, totally 74,484 (63.6%) female foreign patients visited medical institutions in Korea, which is almost 30% larger than the number of male foreign patients (42,585(36.4%)) who used medical services in Korea [2]. For that reason, female foreign patients have more experience for using the medical services and may show a more significant satisfaction response. It is important for Korean medical institutions to know

the quality of medical services for them. The feedback from female foreign patients can not only help increase the service quality for foreign patients, but also bring new insights for the overall medical service quality. Thus, it is necessary to study the satisfaction of medical service among female foreigners residing in Korea.

Although there are many studies on medical service satisfaction for local Koreans, few research focus on service satisfaction for foreigners living in Korea. Thus, in this study, we measure the quality of medical services for female foreigners living in Korea during COVID-19 by an extended Parasuraman's SERVQUAL model [4]. This study aims at providing useful information to hospitals that can improve the quality of medical services and increase the service satisfaction for foreign patients.

The major contributions in this study can be summarized as follows:

- We extended the existing service satisfaction model, SERVQUAL, to consider COVID-19 impacts.
- We collected and analyzed the medical service satisfaction data based on the feedback from foreign residents in Korea.
- Based on the surveyed data and analyzed results, we identified that the responsiveness and empathy from medical institutions along with the COVID-19 regulations given by the government positively affect the customer satisfaction.

The remaining of this paper is organized as follows. Section 2 reviews the related work and introduces the hypotheses defined in this paper. Section 3 presents the results surveyed in our study. We conclude this work by discussing the indications and limitations for the results along with the future work in Sect. 4.

2 Literature Review and Hypotheses

This section describes the previous studies on medical service quality, COVID-19 regulation, customer satisfaction, and revisit intention. We also propose hypotheses and research model based on previous studies.

2.1 Medical Service Quality

Service quality was described by Parasuraman et al. [4] as an overall assessment of the gap between customer experience and service excellence, which includes customer expectations and a judgment or attitude toward service excellence. Although the standards for service evaluation vary, the SERVQUAL model developed by Parasuraman et al. is the most typical one. The SERVQUAL model consists of five dimensions including tangibles, reliability, responsiveness, empathy, and assurance [5].

Tangibles are tangible characteristics such as the appearance of physical facilities, equipment, and employees. Reliability is the ability to perform the promised service dependably and accurately. Responsiveness is the willingness of giving help to customers and to provide rapid prompt services. Assurance includes knowledge and courtesy of employees and their ability to communicate with trust and confidence. Finally, empathy means care and individual attention provided to customers [5].

Lytle and Mokva explained that medical service quality satisfies the patient's needs, and the patient evaluates the service quality based on the service result, service process, and physical environment [6]. Donavedian defined the good medical service quality as achieving the highest level of patient well-being while at the same time maintaining a balance between the expected benefits and losses during the course of treatment [7].

Medical services require more professional knowledge than other services, but they have most of the characteristics of general services. Therefore, service marketing concepts and theories can be used in medical services [8]. Many studies on patient satisfaction and revisit intention in the medical services used SERVQUAL models [9–11].

According to the Shin's study [9], tangible, responsiveness, assurance, and empathy had a positive effect on medical service satisfaction, and these factors were found to have a partial mediating effect on medical service reuse intention and recommendation intention. Park and Shin studied the medical services in Daejeon, Korea for medical tourists who visited the place. Their study shows that assurance, tangibles, responsiveness, and reliability had a positive effect on customer satisfaction [10]. Lee et al. examined relationships between medical service quality and revisiting intention based on SERVQUAL model and found that assurance and empathy had a positive effect on revisiting intention [11].

Based on the existing research, we suggest a general hypothesis (i.e., H1) with five sub-hypotheses (i.e., H1-1 to H1-5) for our study as follows:

H1: Medical service quality has a positive effect on customer satisfaction.

- H1-1: Tangibles have a positive effect on customer satisfaction.
- H1-2: Reliability has a positive effect on customer satisfaction.
- H1-3: Responsiveness has a positive effect on customer satisfaction.
- H1-4: Assurance has a positive effect on customer satisfaction.
- H1-5: Empathy has a positive effect on customer satisfaction

2.2 COVID-19 Regulation

COVID-19 is an infectious disease caused by the SARS CoV-2 virus [12]. Since COVID-19 was first discovered in Wuhan, China in December 2019, it has spread rapidly around



Fig. 1. The extended research model based on SERVQUAL in this study.

the world. Finally, on March 11, 2020, the World Health Organization (WHO) declared a pandemic [13]. In Korea, the first confirmed case of COVID-19 occurred on January 20, 2020, and the cumulative number of confirmed cases exceeded 20 million by August 2022 [14]. From July 2020 to June 2021, the proportion of the population who visited a hospital at least once for treatment decreased by 6.7% compared to the previous year. In addition, those who felt anxious about the possible COVID-19 infection while using a medical institution were 31.2% for outpatient treatment and 31.6% for inpatient treatment, respectively, which increased by 16.5% and 13.5% compared to the previous year [15]. Therefore, the Korea Institute for Health and Social Affairs has distributed guidelines for the prevention of COVID-19 in medical institutions [16]. The recommendations included the following guidelines: posting infection prevention rules, ventilation, social distancing, adherence to COVID-19 prevention rules, and confirmation of suspected COVID-19 symptoms. According to Diego et al., confidence in COVID-19 safety had a direct and positive effect on service quality and customer satisfaction [17]. Thus, in this study, the effect of COVID-19 prevention items on customer satisfaction is estimated by including them in medical service quality. Through this discussion, one more sub-hypothesis is proposed in addition to the five sub-hypotheses mentioned in the previous section: H1-6: COVID-19 regulation has a positive effect on customer satisfaction.

2.3 Customer Satisfaction and Revisit Intention

Westbrook and Reilly stated that customer satisfaction is the customer's subjective and overall evaluation response to the purchase or consumption experience of a particular product or service [18]. Oliver defined customer satisfaction as a psychological state in which customer expectations and emotions formed based on actual experience are complexly combined, that is consistent with the expectation discrepancy theory [19]. Kotler and Keller defined satisfaction with medical services as an attitude that indicates being in or out of favor for the medical services delivered by medical staff after the medical service has been performed [20].

The intention to revisit refers to the planned future behavior of the customer and the probability that the individual's beliefs and attitudes will change into actual purchasing activities. Blodgett et al. argued that if a positive attitude toward service quality is created, customer satisfaction will be improved, resulting in reuse intention for services [21]. Bitner also argued that customer satisfaction has a significant effect on reuse intention [22]. Like previous studies, this study defines a causal relationship between medical service quality, customer satisfaction, and revisit intention. Therefore, the following hypothesis is developed:

H2: Customer satisfaction has a positive effect on revisit intention.

Based on the previous research, this study developed hypotheses to evaluate the impact of medical service quality on customer satisfaction and revisit intention [9–11]. This study also includes COVID-19 regulation as a variable. Figure 1 shows the theoretical framework of the proposed research model based on the proposed hypotheses.

3 Results

To evaluate the proposed hypotheses and model, we conducted an online survey focusing on female foreigners living in Korea. A pilot test was conducted with 30 responses before the questionnaire was officially distributed. The results of the pilot test were significant, so an official survey was conducted. A total of 84 questionnaires were completed and collected for two months from March 15, 2022 to May 15, 2022. IBM SPSS Statistics 26.0 and Smart PLS 3.0 statistical programs were used for empirical analysis.

3.1 Demographic Profile

As shown in Table 1, among the 84 respondents, 20's (83.3%) accounts for the biggest portion of the sample followed by 30's (11.9%) and under 20 (4.8%). Most people live in Busan (84.5%) and 5 (6.0%) live in Seoul. In nationality, 28 (33.3%) are Nepalese, 26 (31.0%) are Indonesian, and 7 (8.3%) are Chinese. Among them, 40 (47.6%) visited general hospital, 37 (44.0%) visited clinic, and 5 (6.0%) went to university hospital.

3.2 Measurement Model

The reliability and validity were evaluated by using Cronbach's alpha, average variance extracted (AVE), loadings, and composite reliability (CR). It was found that the values for AVE, Factor loading, CR, and Cronbach's alpha were higher than the suggested levels of 0.50, 0.50, 0.70, and 0.70, respectively. Table 2 shows that the evaluation applied to this model is reliable.

Discriminant validity was tested based on Fornell-Larcker criterion. Values in bold indicate the AVE's square root. Bold values are higher than the recommended value of 0.5. As shown in Table 3, this study suggested that the square root of AVE was greater than the off-diagonal component of the corresponding row and column in all cases. This suggests that the necessary discriminant validity has been achieved [23].

Table 1. Demographic Profile

Variables		Count (Ratio)	Variables		Count (Ratio)
Age	Under 20	4 (4.8%)	Nationality	Nepal	28 (33.3%)
	20's	70 (83.3%)		Indonesia	26 (31.0%)
	30's	10 (11.9%)		Vietnam	4 (4.8%)
City	Busan	71 (84.5%)		China	7 (8.3%)
	Seoul	5 (6.0%)		Inda	2 (2.4%)
	Others	8 (9.5%)		Uzbek	4 (4.8%)
Hospital	Clinic	37 (44.0%)		Bangladesh	4 (4.8%)
	General Hospital	40 (47.6%)		UK	2 (2.4%)
	University Hospital	5 (6.0%)		Others	7 (8.3%)
	Others	2 (2.4%)		Total	84

Table 2. Validity and Reliability Test

Constructs	Item	Loading	VIF	SMC	CR	AVE	Cronbach's α
Tangibles	T1	0.78	1.37	1.89	0.82	0.53	0.71
	T2	0.73	1.50	2.25			
	T3	0.72	1.31	1.73			
	T4	0.69	1.26	1.60			
Reliability	Rb1	0.87	2.42	5.88	0.91	0.66	0.87
	Rb2	0.72	1.59	2.53			
	Rb3	0.87	2.88	8.29			
	Rb4	0.84	2.61	6.81			
	Rb5	0.77	1.66	2.76			
Responsiveness	Rp1	0.84	1.97	3.87	0.88	0.64	0.82
	Rp2	0.78	1.2	3.31			
	Rp3	0.81	1.69	2.84			
	Rp4	0.78	1.63	2.66			
Assurance	A1	0.86	2.32	5.38	0.91	0.72	0.87
	A2	0.81	1.75	3.06			
	A3	0.85	2.36	5.55			
	A4	0.87	2.35	5.50			
Empathy	E1	0.81	2.23	4.97	0.89	0.62	0.85
	E2	0.74	1.67	2.79			
	E3	0.79	2.03	4.12			
	E4	0.81	1.90	3.60			
	E5	0.80	1.88	3.52			
COVID-19 Regulation	CO1	0.82	1.80	3.24	0.90	0.69	0.85
	CO2	0.78	1.67	2.78			
	CO3	0.89	2.77	7.66			
	CO4	0.83	2.32	5.38			

3.3 Structure Model

The structural model was applied using bootstrapping with 5000 sub-samples after reliability and validity were confirmed in the evaluation of the measurement model. The investigation of the relationship between the dependent (endogenous) variable and the independent (exogenous) variable, as well as a test of the path coefficient's significance, were the main objectives. Path coefficients are used to evaluate the significance of relationships in the structural model, and R2 values are estimated to indicate model [24].

Table 3. Discriminant Validity (Fornell-Larcker Criterion)

	A	CO	E	Rb	Rp	T
A	0.85					
CO	0.65	0.83				
E	0.75	0.55	0.79			
Rb	0.71	0.6	0.66	0.81		
Rp	0.77	0.49	0.61	0.73	0.80	
T	0.58	0.54	0.56	0.68	0.53	0.73

Table 4. Results of The Hypothesis Test

Hypothesis	Variables	Path Coefficients	STED	t-statistics	p-value	Results
H1-1	T → CS	-0.01	0.08	0.08	0.94	NS
H1-2	Rb → CS	0.13	0.12	1.05	0.29	NS
H1-3	Rp → CS	0.26	0.11	2.41	0.02	S
H1-4	A → CS	0.03	0.12	0.21	0.84	NS
H1-5	E → CS	0.23	0.10	2.28	0.02	S
H1-6	CO → CS	0.35	0.10	3.65	<0.001	S
H2	CS → RI	0.68	0.06	12.12	<0.001	S

The R² value indicates that customer satisfaction (CS) and revisit intention (RI) have explanatory power of 67.8% and 45.8%, respectively. As shown in the Table 4, responsiveness (Rp) ($\beta = 0.26$, t-value = 2.41, p-value = 0.02), empathy (E) ($\beta = 0.23$, t-value = 2.28, p-value = 0.02), and COVID-19 regulation (CO) ($\beta = 0.35$, t-value = 3.65, p-value < 0.001) significantly predict customer satisfaction at the level of $P < 0.05$, which support H1-3, H1-5, and H1-6. However, tangibles (T) ($\beta = -0.01$, t-value = 0.08, p-value = 0.94), reliability (Rb) ($\beta = 0.13$, t-value = 1.05, p-value = 0.29), and assurance (A) ($\beta = 0.03$, t-value = 0.021, p-value = 0.84) are found not significant to the customer satisfaction. In addition, customer satisfaction ($\beta = 0.68$, t-value = 12.12, p-value < 0.001) has a significant effect on revisit intention, which supports H2.

4 Discussion and Conclusion

There have been many studies conducted in the area of medical services, but less prior studies focused on the medical service quality provided for foreigners during COVID-19. Compared with other studies, this study investigates an overall customer satisfaction and a revisit intention according to medical service quality, including COVID-19 prevention for foreign female patients who visited Korean medical institutions. The SERVQUAL model was used in this study to examine the relationship among the quality of medical

services, customer satisfaction, and revisit intention. The results from this study provide important information for Korean medical institutions to improve their services and female foreign patient satisfaction during COVID-19.

Implication

The results from our study indicate that the responsiveness, empathy, and COVID-19 regulations positively (+) affect customer satisfaction. Additionally, customer satisfaction with medical services has a positive (+) effect on the revisit intention. This is in line with the previous research showing that when customers have a favorable attitude about service quality, their willingness to use the service again also increases [21, 22]. The findings of this study also imply that in order for medical institutions to achieve favorable long-term commercial performance, various efforts are required to manage their service quality and to match the relational expectations between patients and medical staffs.

Therefore, medical institutions should pay more attention to improving medical service quality, especially responsiveness and empathy. Medical staffs should provide prompt services, quickly respond to patients, and willing to help. Furthermore, they should give patients personal attentions, understand their specific needs, and provide convenient operating hours.

Among the medical service quality, the COVID-19 regulation was found to have a high positive effect on customer satisfaction. Hence, medical institutions should pay particular attention to COVID-19 regulations, such as checking the patient's body temperature and suspected symptoms of COVID-19 along with recommending hand sanitizers. Although the COVID-19 situation is currently recovering, this result explains how medical institutions cope with other infectious diseases in the future. Even if other infectious diseases occur in the future, medical institutions should pay attention to the infectious disease prevention regulations as in the case of COVID-19 to increase customer satisfaction.

Limitations and Future Research

This study has several limitations. The samples in the survey may not be diverse enough, therefore it may be less accurate to represent all foreign patients who used Korean medical institutions during the pandemic. In addition, since the COVID-19 situation and regulations continue changing, it is difficult to reflect the effects caused by all those changes in the current study. Thus, future studies should focus on foreigners from more varied regions, occupations, and nationalities. Furthermore, the proposed model also needs to properly reflect the continuously changing of COVID-19 situation.

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