# The Mediating role of customer satisfaction in the relationship between service quality and customer loyalty

A thesis submitted to the
Graduate School of Natural and Applied Sciences

by

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in partial fulfillment for the
degree of Master of Science

in
Industrial and Systems Engineering

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Industrial and Systems Engineering.

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# The Mediating role of customer satisfaction in the relationship between service quality and customer loyalty

Abdülhey Erdoğan

# Abstract

In today's competitive environment, hospitals are becoming more aware of service quality and the necessity to improve. Therefore, the SERVQUAL instrument has been used to evaluate the perceived service quality according to the customer's perspective. An adapted questionnaire designed by Carman was used to collect data from customers using public hospitals in Turkey. The purpose of the study is to extract the key dimensions of SERVQUL and build a regression model to understand the most effective factors to service quality after checking them using reliability and validity test. Also, examining the relationship between customer satisfaction, customer loyalty, and the new extracted factors. Exploratory factor analysis (EFA) with the principal component method has been used to extract the key dimensions after examining the sufficiency of our data set using (KMO) test. After that, reliability tests were done to the newly created factors using Cronbach alpha coefficients. Moreover, after generating the regression model, mediation analysis has been conducted to examine the relationship between independent variables and customer loyalty considering customer satisfaction as a mediator. The result of (EFA) was having 4 dimensions (Responsiveness, Tangibility, Reliability, and Food quality) and all their Cronbachâs alpha result to the reliability was greater than 0.7 (0.927, 0.886, 0.773 and 0.869). The result of regression analysis was very significant (P-value = 0.000*) and R2= 0.564. For mediation, overall service quality, responsiveness, tangibility, and food quality were used as independent variables and all of them had a full type mediation (indirect effect) with customer loyalty considering customer satisfaction as a mediator. However, only the reliability factor had a partial mediation (both direct and indirect effect).

**Keywords:** service quality, SERVQUAL, customer satisfaction, customer loyalty, reliability, exploratory factor analysis, EFA , regression analysis, mediation analysis, healthcare, hospitals.

# Hizmet kalitesi ile müşteri sadakati arasındaki ilişkide müşteri memnuniyetinin aracı rolü

Abdülhey Erdoğan

# Öz

Günümüzün rekabetçi ortamında, hastaneler hizmet kalitesinin önemini ve iyileştirilmesinin gerekliliğini daha fazla farkına varmaktadırlar. Bu nedenle, algılanan hizmet kalitesini müşterinin bakış açısına göre değerlendirmek için SERVQUAL ölçüm aracı kullanılmıştır. Türkiye'de devlet hastaneleri kullanan müşterilerden veri toplamak için Carman tarafından tasarlanan uyarlanmış bir anket kullanılmıştır. Bu çalışmanın amacı, SERVQUL'un temel boyutlarını belirlemek ve güvenilirlik ve geçerlilik testini kullanarak hizmet kalitesini kontrol ettikten sonra en etkili faktörleri anlamayabilmek için bir regresyon modeli oluşturmaktır. Ayrıca müşteri memnuniyeti, müşteri sadakati ve belirlenen yeni faktörler arasındaki ilişkinin incelenmesi ele alınmıştır. (KMO) testi kullanılarak veri setimizin yeterliliği incelendikten sonra temel boyutları belirlemek için Temel Bileşen Analizi ile Açıklayıcı Faktör Analizi (EFA - Exploratory factor analysis) kullanılmıştır. Daha sonra yeni oluşturulan faktörlere Cronbach alfa katsayıları kullanılarak güvenilirlik testleri yapılmıtır. Ayrıca regresyon modeli oluşturulduktan sonra, müşteri memnuniyeti aracı değişken olarak düşünülerek bağımsız değişkenler ile müşteri sadakati arasındaki ilişkiyi incelemek için aracı değişken analizi yapılmıştır. (EFA) 'nın sonucunda 4 boyut (Yanıtlama oranı, Somutluk, Güvenilirlik ve Gıda kalitesi) elde edildi ve tüm Cronbach alfaâın güvenilirlik sonuçları 0.7'den büyüktür (0.927, 0.886, 0.773 ve 0.869). Regresyon analizi sonucunda anlamlılık seviyesi yüksek çıkmıştır (P değeri = 0.000 *) ve R2 = 0.564. Aracı ilişkisi denkleminde, genel hizmet kalitesi, yanıtlama oranı, somutluk ve gıda kalitesi bağımsız değişkenler olarak kullanılmış, müşteri memnuniyetinin aracı etken olduğu göz önünde bulundurularak, hepsinin müşteri sadakati ile (dolaylı etki) ilişkili olduğu bulunmuştur. Bununla birlikte, sadece güvenilirlik faktörünün kısmi bir aracılığı vardır (hem doğrudan hem de dolaylı etki).

**Anahtar Sözcükler:** hizmet kalitesi, SERVQUAL, müşteri memnuniyeti, müşteri sadakati, güvenirlilik, açıklayıcı faktör analizi, regresyon analizi, arabuluculuk analizi.

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# Abbreviations

| | |
|---|---|
| **AGFI** | **A**djusted **G**oodness **F**it **I**ndex |
| **CFA** | **C**onfirmatory **F**actor **A**nalysis |
| **CFI** | **C**omparative **F**it **I**ndex |
| **E** | Customer's **E**xpectations |
| **EFA** | **E**xploratory **F**actor **A**nalysis |
| **GFI** | **G**oodness **F**it **I**ndex |
| **KMO** | **K**aiser **M**eyer **O**lkin |
| **O.R** | **O**dds **R**atio |
| **P** | Customer's **P**erceptions |
| **PGFI** | **P**arsimony **G**oodness **F**it **I**ndex |
| **Q** | Overall service **Q**uality |
| **RMR** | **R**oot **M**ean square **R**esidual |

# Chapter 1

# Introduction and Objectives

## 1.1  Introduction

Nowadays, the world has been changing and developing very rapidly, due to that the market needs are altering and businesses becoming more challenging for both manufacturing and service companies, the environment becomes more and more competitive [1]. According to Anderson et al. 1984; Berry et al. 1985 quality is a major key to satisfy the market needs and survive in a competitive environment [2]. Many developed countries have noticed the importance of service industries and how it leads to a better economy, so the application of the SERVQUAL instrument has been increased widely especially in services sectors such as restaurants, hotels, and airlines. However, in hospitals, the application of service quality was still limited [3]. Customers become more aware of rising standards in services which helps them to develop higher expectations, so any decline in customer satisfaction will lead to poor overall service quality [4]. Recently, healthcare industry especially hospitals have been improving continuously to offer a better service for patients after realizing the crucial impact of service quality on customer satisfaction, in order to do so SERVQUAL instrument has been used to explain the quality gaps and determine the various dimensions that affect the overall service quality [5].

## 1.2 Aims and Objectives

- To understand the dimensions of SERVQUAL.

- To extract the factors which determine consumersâ perception of service quality.

- To build a regression model that provides a better understanding of healthcare services.

- To examine the mediation effect between service quality and consumer loyalty in 11 hospitals in Turkey.

# Chapter 2

# Historical Background and Definition of the Problem

## 2.1 Historical background

### 2.1.1 Definitions of service quality

The importance of service quality has been described by different perspectives starting with Sasser (1982) who described it as a significant key variable in the battle for competency. Berry et al. (1989) explained the excellence of service quality as the weapon that shields you during competitions [6]. Kotler (2000) claimed that customer satisfaction is related to customerâs feelings whether a product or a service was performed as he/she expected or not [7]. In other words, Metters et al. (2003) mentioned that achieving customer satisfaction can be done by defining the service quality in terms of customer's perspective [8]. The definition of service quality had been clarified by Booms (1983) mentioning that the whole idea is comparing customers' expectations with their perception about the service performance, this definition was supported by Gronroos (1984) [9]. During 1985 many studies have specified the service quality as only the comparison between the customers' expectation and perception such as Solomon et al., Klaus and Parasuraman, moreover naming it as a gap so the service quality level can be measured by this gap [10]. After that, Parasuraman (1988) established an instrument to measure service quality called "SERVQUAL", this instrument can be used to find the difference between two measurements which are customers' expectations and perception,

SERVQUAL = P - E will be positive if the overall performance had a better score than expectations and vice versa, this instrument has been developed by using 22 item scale to measure the validity and reliability of SERVQUAL [11].

### 2.1.2 Dimensions of service quality

The history of service quality dimensions has been changed throw years, starting with Sasser et al. (1978) who propose the first three dimensions of service quality which are material, facility, and personnel [12]. In 1982 Lehtinen recommends using another 3 dimensions to measure service quality which are Physical quality, a corporate quality which considers the image of the company and the last one is interactive quality [13]. After 2 years, Gronroos (1984) summarizes the service quality in two dimensions, the technical quality is considered as the outcome that customers received from the service, and the functional quality focuses on the interaction between customer and seller while delivering the service [14]. However, the most used method to measure the service quality conducted by Parasuraman et al. (1985) using ten dimensions as a tool to measure [15], but after 3 years, factor analysis has been used in order to decrease the number of dimensions and find out the optimal number which is 5 dimensions :

- Tangibles: Anything that can be physical.

- Reliability: Performing the service as promised.

- Responsiveness: Helping and following customer's needs.

- Assurance: Information and graciousness of workers and their capacity to rouse trust and confidence.

- Empathy: Individual attention to present the importance of customers' needs and try to satisfy them. [16]

After concluding the 5 dimensions, another research was conducted to find the differences between customers and producers ending up having 5 gaps:

1. Gap 1: Differences between customer expectations and management's perceptions of expected service.

2. Gap 2: The difference between service specification and management's perceptions of expected service.

3. Gap 3: management's specifications for service is different than what is delivered.

4. Gap 4: what is said and commented about the delivered service is different from the delivered service

5. Gap 5: The difference between customer expectations and customer perceptions.

Gap 5 is the most significant gap to be considered in order to measure service quality and overall customer satisfaction [17].
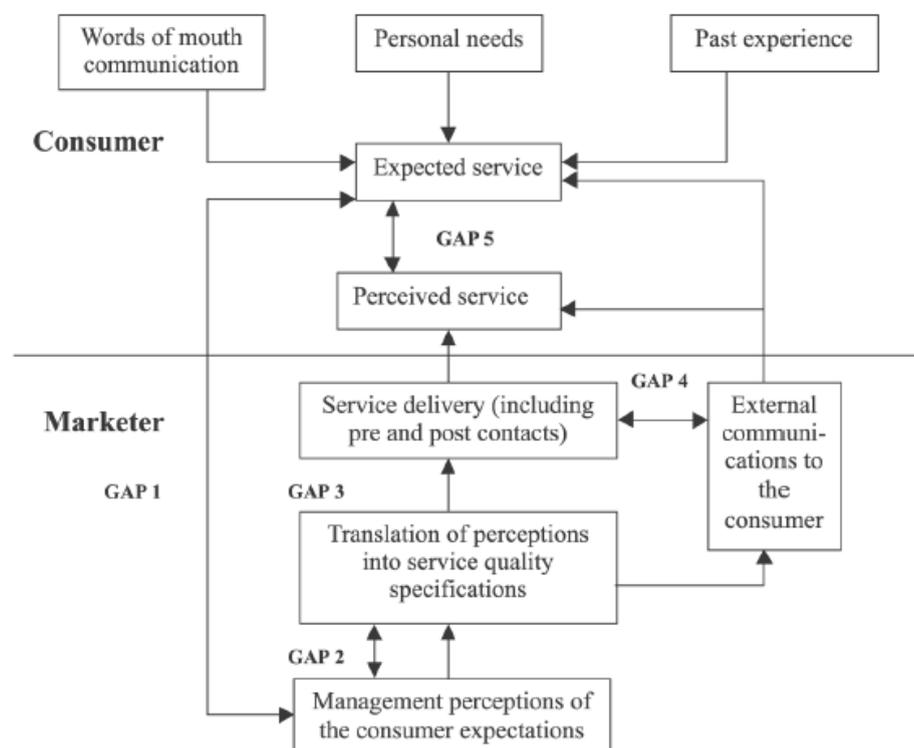


FIGURE 2.1: Gaps model of service quality

### 2.1.3 Counter argument

On the other hand, many researches criticize the SERVQUAL instrument. According to Cronin and Taylor (1992) Boulding et al. (1993) the concept of expectation has been questioned in terms of usefulness [18]. In other words, expectations scores turned out to

have a restricted variance because the expectations are very high, Boller et al. (1992); Brown et al. (1993). Moreover, Cronin and Taylor (1994) indicate that considering only the variance of the perception side, it explained the service quality more than taking the difference scores between perception and expectation [19]. In addition, Bolton and Drew (1991); Boulding et al. (1993) mentioned that customer expectations may differ throw time after trying the service. Cronin and Taylor (1992) concluded that only the perception side is better than taking the difference as a predictor of the SERVQUAL. Finally, Parasuraman (1995) is the one who had found the 5 dimensions and used Q = P - E decided to change what he said before to consider taking only the perception part as a better and more valid approach to measure the overall service quality. Therefore, service quality is a performance concept [20].

## 2.2 Alternatives

### 2.2.1 Logistic regression model

Many service quality studies were focusing on the healthcare industry especially hospitals. Firstly, some dimensions should be identified to create a suitable model for empirical study. As usual, at least having 5 dimensions to be selected using Parasuraman et al.'s SERVQUAL instrument [21], some studies may adapt and extend the dimension to use 6 or 7 of them. Moreover, the original 22 questions can be extended specifically when more than 5 dimensions have been used [22]. Likert scale from 1 to 7 has been recommended as a survey format in the healthcare sector [23]. In this model, two questionnaires should be answered separately by the same patients because the used SERVQUAL formula was Gap = P - E, so the gap score of each service quality measures had a weighted average to be analyzed. If P - E < 0, then service quality does not fulfill the customer's needs and must be improved. If P - E = 0, then the customer's expectation was achieved. While the gap results of P - E > 0, this means that the overall service quality has exceeded the customer's expectation [24]. The logistic regression analysis has been used to investigate the relationship between each factor and 3 components (customer satisfaction, overall service quality, and future purchase behavior). Logistic regression when it is not assumed that error terms are normally distributed for the dependent variable [25]. Also, it can be used when the relationship between the dependent variable and the independent

variables is not assumed to be linear. After the logistic analysis, odds ratios (O.R) will be produced and associated with each predictor value in order to know how much the predictor might increase or decrease per 1 unit [26]. The O.R ratio can be found by dividing the probability of occurring and the probability of not occurring to the same predictor. In the end, the chi-squares ratio test should be done to examine the significance of the model [27].

### 2.2.2 Confirmatory factor analysis

Another method that was applied in hospitals to measure service quality by using confirmatory factor analysis CFA [28]. In the beginning, almost every empirical service quality study used the SERVQUAL instrument that was identified by Parasuraman (1985) which includes 5 dimensions [29]. 7 points Likert scale was developed by Rensis Likert (1932) and used as a response to the questions [30]. By using CFA, a structural model can be created and tested throw AMOS 22 program, the CFA analysis uses maximum likelihood estimation [31]. Each variable had a factor load and it should not be less than 0.5, if it is less then the variable should be eliminated and the model structure must be updated [32]. CFA was commonly evaluated using metrics such as the comparative fit index (CFI), the root mean square residual (RMR), the fit index goodness (GFI), the fit index goodness adjusted (AGFI), and the fit index parsimony goodness (PGFI) [33].

# Chapter 3

# Methodology

## 3.1 Research Design  Methodology

### 3.1.1 Data collection

In order to measure the service quality of the healthcare sector in Turkey, the SERVQUAL instrument has been used and a 6-dimensions questionnaire (Tangibility, Reliability, Responsiveness, Assurance, Courtesy, and Empathy) was adapted to be applied in the health care sector. The questionnaire has 34 items to be answered by patients before getting the service which is considered as patients' expectations, while the same 34 items were being asked to the same patients before leaving the hospital in order to get their perceptions about the service. A seven-point Likert type scale was used for all the questions consisted of 1 = "strongly disagree" to 7 = "Strongly agree" [34]. In total we asked 266 patients in 11 different hospitals before and after getting the service as we mentioned before, only 9 patients' scores were removed due to missing values, so we had 257 valid scores to analyze.

### 3.1.2 Method

In this study, only the perception part has been used to measure the service quality because it was found that expectation had a restricted variance and all expectations were very high (only 6 and 7 scores). Moreover, many studies preferred using only perception and found it more appropriate, also using perception gave a better explanation of the

variance of service quality [35]. The first step was using Exploratory factor analysis (EFA) which is a statistical technique that is utilized to decrease data to a smaller set of summary variables and to investigate the fundamental hypothetical structure of the phenomena. It is used to identify the structure of the relationship between the variable and the respondent. The method principal component factor analysis was used in EFA which is driving the minimum number of factors and explain the maximum portion of the variance in the original variable. To study the sufficiency of the sample we used Bartlett's test of sphericity and the Kaiser Meyer Olkin (KMO) [36]. After that, reliability tests were done to the newly created components using Cronbach alpha coefficients which express internal consistency to the measure components, Cronbach alpha scores should be more than 0.5 according to Nunnally (1967) but later in (1978), the score was adjusted to be 0.7 [37]. In the end, a regression model was included to illustrate the overall service quality in terms of our new factors.

### 3.1.3 Hypothesis Testing

- H1a: Overall service quality will be positively related to customer satisfaction [38].

- H1b: Positive relationship between overall service quality and customer loyalty throw customer satisfaction mediator [39].

- H1c: Overall service quality has a direct positive influence on customer loyalty [40].

- H2a: Responsiveness will be positively related to customer satisfaction [41].

- H2b: Positive relationship between Responsiveness and customer loyalty throw customer satisfaction mediator [42].

- H2c: Responsiveness has a direct positive influence on customer loyalty [43].

- H3a: Tangibility will be positively related to customer satisfaction [44].

- H3b: Positive relationship between Tangibility and customer loyalty throw customer satisfaction mediator [45].

- H3c: Tangibility has a direct positive influence on customer loyalty [46].

- H4a: Reliability will be positively related to customer satisfaction [47].

- H4b: Positive relationship between Reliability and customer loyalty throw customer satisfaction mediator [48].

- H4c: Reliability has a direct positive influence on customer loyalty [49].

- H5a: Food quality will be positively related to customer satisfaction [50].

- H5b: Positive relationship between Food quality and customer loyalty throw customer satisfaction mediator [51].

- H5c: Food quality has a direct positive influence on customer loyalty [50].

# Chapter 4

# Results

## 4.1 Results

### 4.1.1 Data analysis

As mentioned before, only the perception part has been used and analyzed using SPSS software. Firstly, we applied KMO and Bartlett's test to check the sampling adequacy:

TABLE 4.1: KMO and Bartlett's test.

| | |
|---|---|
| KMO measure of sampiling adequacy | 0.973 |
| Bartlett's test of sphericity, chi-square | 8063.794 |
| Degrees of freedom (df) | 561 |
| Significance | 0.000* |

The result was very high 0.973 and very significant 0.000* meaning that a reasonable number of variables were correlated. After that, we applied EFA using the principal component method which can be used in order to explain the maximum portion of variance using a minimum number of factors. The type of rotation was varimax and the scree test Kasier (1960) eigenvalue-one criterion was used to find the number of factors to be extracted [52], eigenvalue was set to be greater than 1.

TABLE 4.2: Eigenvalues

| Component | Total | Percent of variance | Cumulative percentage |
|-----------|-------|---------------------|----------------------|
| 1 | 16.794 | 49.261 | 49.261 |
| 2 | 2.165 | 6.368 | 55.629 |
| 3 | 1.868 | 5.494 | 61.123 |
| 4 | 1.597 | 4.698 | 65.820 |
| 5 | 1.203 | 3.540 | 69.360 |
| 6 | 1.026 | 3.019 | 72.379 |
| 7 | 0.874 | 2.571 | 74.950 |
| 8 | 0.780 | 2.293 | 77.243 |
| . | . | . | . |
| 34 | 0.077 | 0.227 | 100 |

We had 6 components to be greater than 1 that is shown in the eigenvalue scatterplot:
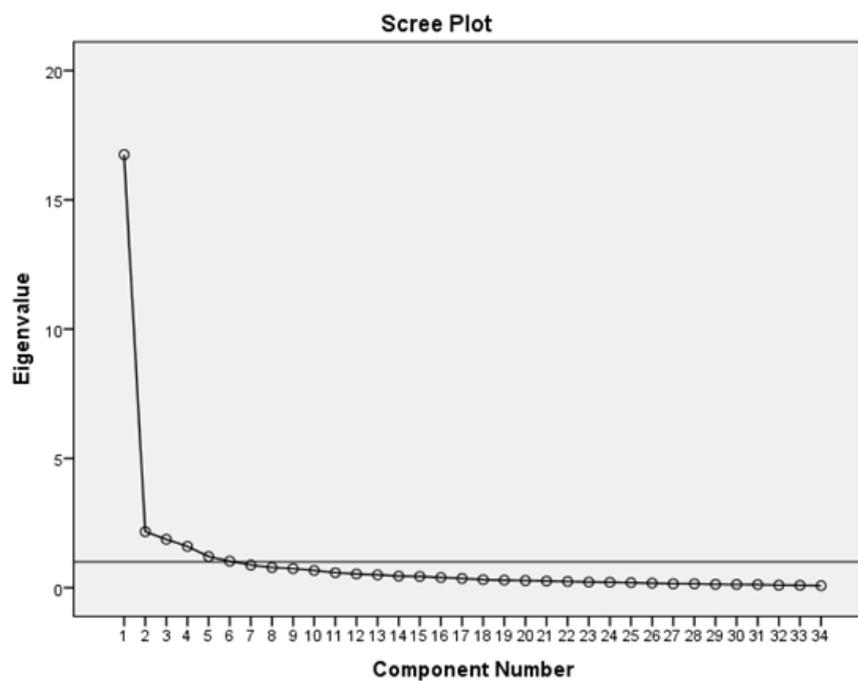


FIGURE 4.1: Eigenvalues for the components

## 4.1.2   Assessment of Reliability and Validity

We ran the model again having six factors to check the validity and exclude the items which had low loadings or in case we got cross-loadings because items should be discriminant.

TABLE 4.3: Rotated Component Matrix

| Q | C.1 | C.2 | C.3 | C.4 | C.5 | C.6 |
|---|-----|-----|-----|-----|-----|-----|
| Q29 | .790 | .299 | .138 | .210 | .091 | .217 |
| Q33 | .762 | .191 | .266 | .156 | .215 | .171 |
| Q28 | .737 | .292 | .236 | .172 | .165 | .037 |
| Q34 | .717 | .186 | .017 | .154 | .350 | .105 |
| Q32 | .650 | .186 | .180 | .115 | .230 | .292 |
| Q30 | .647 | .253 | .206 | .211 | .426 | -.139 |
| Q31 | .631 | .164 | .143 | .119 | .531 | -.060 |
| Q21 | .630 | .500 | .280 | .247 | .086 | .067 |
| Q19 | .602 | .305 | .367 | .482 | .001 | .085 |
| Q26 | .601 | .197 | .485 | -.029 | .255 | .181 |
| Q20 | .567 | .366 | .391 | .450 | .008 | .097 |
| Q18 | .566 | .177 | .157 | .329 | .281 | .435 |
| Q24 | .501 | .208 | .496 | .309 | .011 | .263 |
| Q1 | .187 | .810 | .189 | .085 | .120 | .116 |
| Q2 | .244 | .757 | .072 | .124 | .172 | .231 |
| Q4 | .316 | .755 | .128 | .180 | .165 | .128 |
| Q3 | .344 | .728 | -.006 | .108 | .136 | .200 |
| Q25 | .269 | -.004 | .718 | .136 | .161 | .137 |
| Q13 | .152 | .153 | .715 | .246 | .286 | .012 |
| Q12 | .202 | .228 | .608 | .227 | .481 | .085 |
| Q22 | .465 | .230 | .522 | .399 | .124 | .203 |
| Q14 | .184 | .035 | .146 | .778 | -.021 | .119 |
| Q11 | .115 | .215 | .185 | .674 | .379 | .067 |
| Q10 | .200 | .158 | .196 | .659 | .212 | .273 |
| Q15 | .291 | .194 | .425 | .587 | .134 | .227 |
| Q23 | .426 | .217 | .160 | .066 | .662 | .286 |
| Q7 | .322 | .235 | .073 | .028 | .652 | .373 |
| Q16 | .140 | .092 | .178 | .447 | .651 | .007 |
| Q27 | .472 | .086 | .419 | .037 | .570 | .125 |
| Q6 | .170 | .238 | .176 | .254 | .112 | .786 |
| Q5 | .086 | .232 | .217 | .119 | .146 | .766 |
| Q8 | .232 | .378 | -.010 | .166 | .436 | .457 |

The conducted result at the end of excluding was having 4 factors and a total of 16 items which explained the maximum portion of the variance.
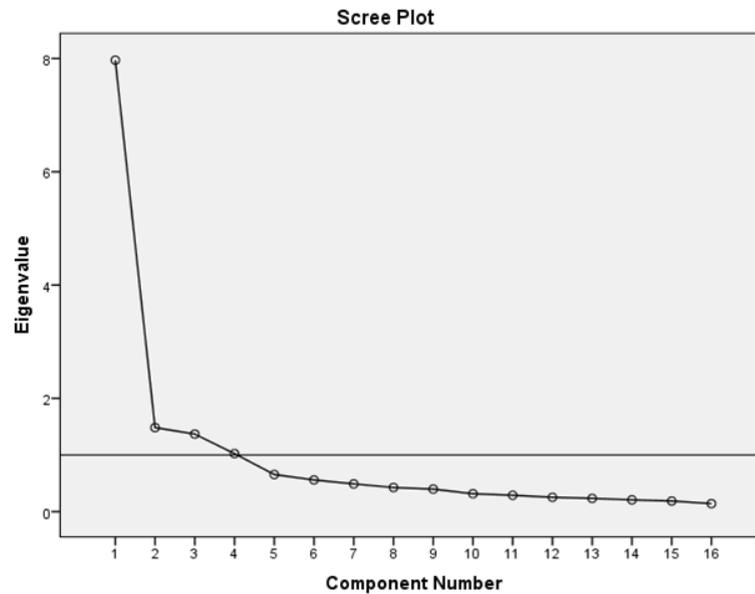


FIGURE 4.2: Eigenvalues for the components

TABLE 4.4: Rotated Component Matrix

| Q | C.1 | C.2 | C.3 | C.4 |
|---|-----|-----|-----|-----|
| Q34 | .833 | | | |
| Q33 | .816 | | | |
| Q28 | .771 | | | |
| Q29 | .765 | | | |
| Q30 | .758 | | | |
| Q32 | .736 | | | |
| Q23 | .645 | | | |
| Q1 | | .814 | | |
| Q4 | | .774 | | |
| Q2 | | .771 | | |
| Q3 | | .765 | | |
| Q14 | | | .830 | |
| Q11 | | | .742 | |
| Q10 | | | .737 | |
| Q5 | | | | .876 |
| Q6 | | | | .854 |

After the factors have been constructed, a Cronbach alpha coefficient test was used to check the reliability of each factor and according to Nunally (1978), the coefficient should

be greater than 0.7 [53].

TABLE 4.5: Cronbach alpha coefficient test .

| Factor | Cronbach's alpha |
|---|---|
| Responsiveness | 0.927 |
| Tangibility | 0.886 |
| Reliability | 0.773 |
| Food quality | 0.869 |

### 4.1.3 Regression model

In order to construct the regression model, we used the 4 dimensions that we got from the SERVQUAL instrument as independent variables and the overall quality as the dependent variable. The regression equation is:

**Overall Quality = 0.899 + 0.421 Responsiveness + 0.106 Tangibility + 0.281 Reliability + 0.0587 Food Quality.**

TABLE 4.6: Regression Model.

| Model | R | R Square | Ajusted R Square | Std. Error |
|---|---|---|---|---|
| 1 | .751 | .564 | .557 | .683 |

TABLE 4.7: ANOVA Test.

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 151.712 | 4 | 37.928 | 81.396 | .000* |
| Residual | 117.424 | 4 | 252 | .466 | |
| Total | 269.136 | 256 | | | |

TABLE 4.8: Regression Coefficients.

| Model | t | Sig. |
|---|---|---|
| Constant | 2.866 | .005 |
| Responsiveness | 7.675 | .000* |
| Tangibility | 2.247 | .026 |
| Reliability | 4.866 | .000* |
| Food quality | 1.785 | .075 |

The model explained a significant **56%** of the overall quality since $R^2 = 0.564$ with a significant value $P = .000^* < .05$, while the dimensions of Responsiveness $P = .000^*$, Tangibility $P = .026$ and Reliability $P = .000^*$ had a significant influence on overall quality using $P < .05$. In addition, the food quality dimension $P < .075$ was accepted using a significance level $P < .1$ [54].

### 4.1.4 Mediation

In this study, mediation analysis was used to define and describe the system or process underlying the observed interaction between an independent variable (X) and a dependent variable (Y) by the addition of a third hypothetical variable called a mediator variable (M). The aim of using mediation is to see whether the mediator 's effect is greater than the independent variable's direct influence [55].
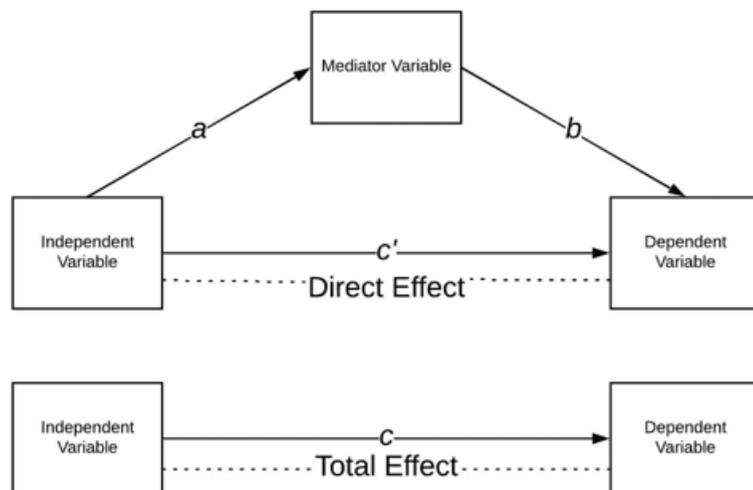


FIGURE 4.3: A three-variable mediation model.

In this model, the mediator was fixed using customer satisfaction and the dependent variable was also fixed using customer loyalty. Therefore, the only changing factor was the independent variable because we needed to test the effects of our model (4 factors):

- Independent variable (overall service quality): using SPSS PROCESS by Andrew F. Hayes we found out that the relationship between overall service quality and customer satisfaction (a) was very significant (P-value = .000*), also the relationship between customer satisfaction and customer loyalty (b) was very significant (P-value = .000*). However, the direct effect between overall service quality and customer loyalty ($c'$) was not significant (P-value = .355). After that, we checked the total effect (c) to find out that it was significant (P-value = .000*). This kind of mediation type has an indirect effect and itâs called a full mediation which means that the dependent and independent variable have a strong relationship but through the mediator. In other words, the relationship will be disappeared if we take the mediator out.
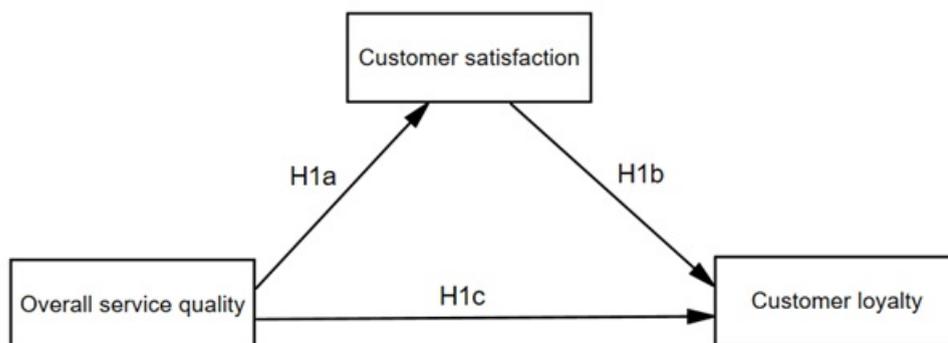


FIGURE 4.4: Mediation between Service quality and Customer loyalty.

- Independent variable (Responsiveness): here we used the same method but we changed the independent variable. We found out that the relationship between responsiveness and customer satisfaction (a) was very significant (P-value = .000*), also the relationship between customer satisfaction and customer loyalty (b) was very significant (P-value = .000*). However, the direct effect between responsiveness and customer loyalty ($c'$) was not significant (P-value = .21). After that, we checked the total effect (c) to find out that it was significant (P-value = .000*). This is a full mediation type having an indirect effect.
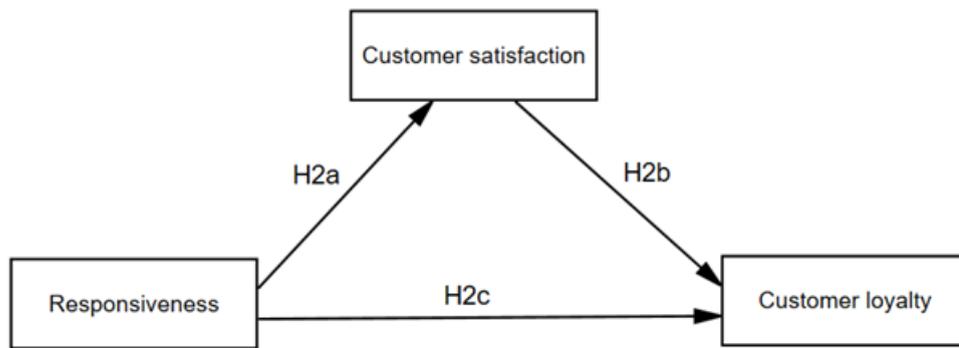
FIGURE 4.5: Mediation between Responsiveness and Customer loyalty.

- Independent variable (Tangibility): the relationship between tangibility and cus-
  tomer satisfaction (a) was very significant (P-value = .000*), also the relationship
  between customer satisfaction and customer loyalty (b) was very significant (P-
  value = .000*). However, the direct effect between tangibility and customer loyalty
  ($c'$) was not significant (P-value = .547). Lastly, the total effect (c) was significant
  (P-value = .000*). This is a full mediation type having an indirect effect.
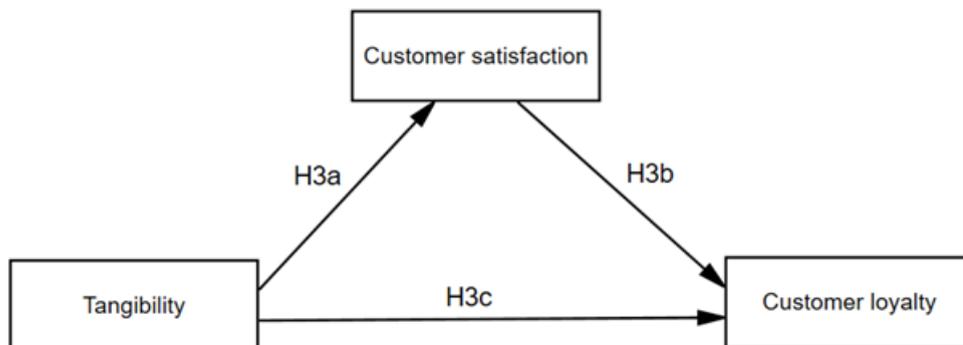


FIGURE 4.6: Mediation between Tangibility and Customer loyalty.

- Independent variable (Reliability): this factor was different from others. The rela-
  tionship between reliability and customer satisfaction (a) was very significant (P-
  value = .000*), also the relationship between customer satisfaction and customer
  loyalty (b) was very significant (P-value = .000*). Moreover, the direct effect be-
  tween reliability and customer loyalty ($c'$) was significant (P-value = .016). Lastly,
  the total effect (c) was significant (P-value = .000*). In this case, we had a direct
  and indirect effect on the dependent variable, this type we call it a partial me-
  diation which means that the mediating variable is only responsible for a part of

the relationship. In other words, the relationship will remain if we take away the mediator but it will not have the same strength.
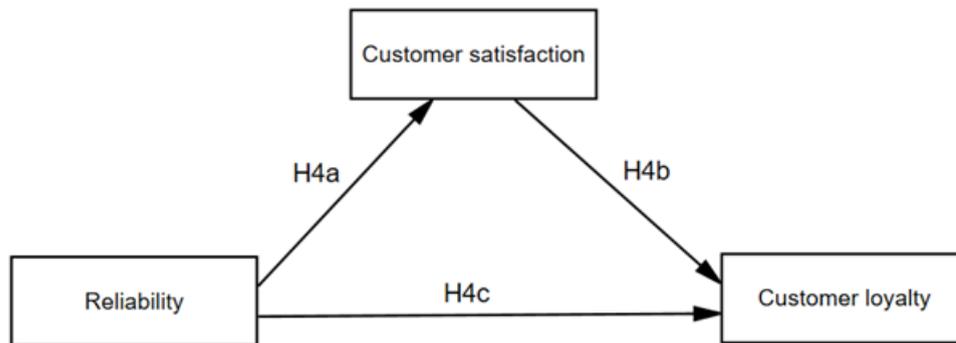


FIGURE 4.7: Mediation between Reliability and Customer loyalty.

- Independent variable (Food quality): the relationship between food quality and customer satisfaction (a) was very significant (P-value = .000*), also the relationship between customer satisfaction and customer loyalty (b) was very significant (P-value = .000*). However, the direct effect between food quality and customer loyalty ($c'$) was not significant (P-value = .268). Finally, the total effect (c) was significant (P-value = .000*). This is a full mediation type having an indirect effect.
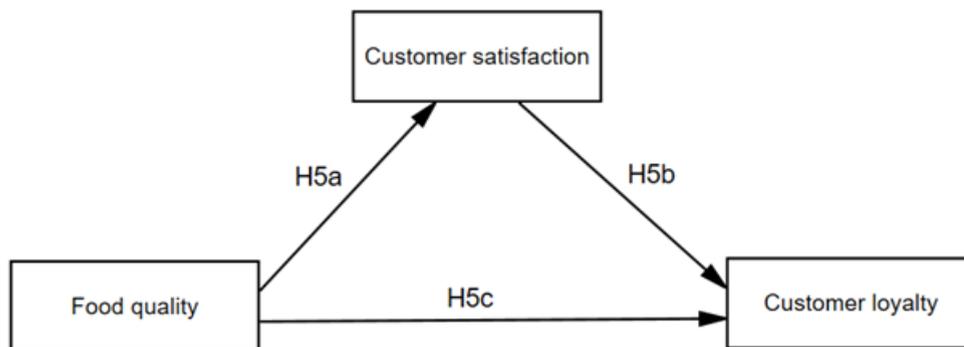


FIGURE 4.8: Mediation between Food quality and Customer loyalty.

### 4.1.5 Hypothesis Testing Results

| Hypothesis | Description | Result |
|---|---|---|
| H1a | Overall service quality will be positively related to customer satisfaction. | Accepted |
| H1b | Positive relationship between overall service quality and customer loyalty throw customer satisfaction mediator. | Accepted |
| H1c | Overall service quality has a direct positive influence on customer loyalty. | Rejected |
| H2a | Responsiveness will be positively related to customer satisfaction. | Accepted |
| H2b | Positive relationship between Responsiveness and customer loyalty throw customer satisfaction mediator. | Accepted |
| H2c | Responsiveness has a direct positive influence on customer loyalty. | Rejected |
| H3a | Tangibility will be positively related to customer satisfaction. | Accepted |
| H3b | Positive relationship between Tangibility and customer loyalty throw customer satisfaction mediator. | Accepted |
| H3c | Tangibility has a direct positive influence on customer loyalty. | Rejected |
| H4a | Reliability will be positively related to customer satisfaction. | Accepted |
| H4b | Positive relationship between Reliability and customer loyalty throw customer satisfaction mediator. | Accepted |
| H4c | Reliability has a direct positive influence on customer loyalty. | Accepted |
| H5a | Food quality will be positively related to customer satisfaction. | Accepted |
| H5b | Positive relationship between Food quality and customer loyalty throw customer satisfaction mediator. | Accepted |
| H5c | Food quality has a direct positive influence on customer loyalty. | Rejected |

FIGURE 4.9: Hypothesis Testing Results.

# Chapter 5

# Conclusion and Discussions

## 5.1  Conclusion and Discussions

In this study, we clarified the key dimensions of SERVQUAL that explains the overall service quality according to our data set, also we evaluated the relationship between service quality and customer loyalty in the Turkish public hospitals. EFA with the principle component method has been used as a dimension reduction to find the significant factors that build our regression model. Noted that only the perception component was used because it displayed better reliability and validity [56]. In conclusion:

- We extracted 16 significant items to construct the 4 factors.

- A regression model has been built to explain 56% of the overall quality service.

- We used mediation analysis to find out that there is an indirect relationship between the 4 factors and customer loyalty except for the reliability factor that had both direct and indirect effects.

This model can be adapted and used in the healthcare sector to enhance the performance that leads to a better service quality which means a higher rate of customer satisfaction.

## 5.2   Limitation

This study was conducted in Turkey, so applying and using the same questionnaire might be inaccurate unless an adaptation process has been made to the questionnaire. Moreover, the variety of healthcare centers should be considered because this study was limited to public hospitals only. Therefore, it is suggested that surveying patients from both public and private hospitals will lead to a better understanding of the general picture. Finally, the SERVQUAL instrument is only focusing on the functional aspect of service quality, so the technical aspect should also be taken into consideration.

## 5.3   Future work

The future study should involve more questions, so the number of significant items will increase to establish more factors. Hence, increasing the maximum portion of variance that can be understood from the model, besides extend the study so it can have both functional and technical aspects of service quality. Lastly, to have more useful data, it should be collected from both private and public hospitals seeking a better healthcare industry.

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# Appendix A

# Questionnaire

TABLE A.1: Tangibility:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1. | They should have up to date equipment and technology. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | Their physical facility should be visually appealing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | Bathrooms should be very clean. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | Rooms should be clean. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | Meals should be attractive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | Food should have right temperature. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | Nurses should respect privacy. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | Room should be quite. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | Parking should be convenient. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

TABLE A.2: Reliability:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 10. | Food should be delivered by a certain time. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | When staff of the institutions promise to do something by a certain time, they should do it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | They should keep patientsâ records accurately. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | Hospital charges should be accurate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

14. When the staff promises to perform certain services,   1  2  3  4  5  6  7
    they should provide them.

TABLE A.3: Responsiveness:

---

15. Patients who will be discharged should expect prompt   1  2  3  4  5  6  7
    service from employees of the hospital for the discharg-
    ing operations.

16. Patients should expect prompt services from nurses   1  2  3  4  5  6  7
    when the patients need them.

17. Patients who come to hospital should expect prompt   1  2  3  4  5  6  7
    service from employees of the hospital for the admis-
    sion operation.

18. Employees of the hospital should always be willing to   1  2  3  4  5  6  7
    help their patients.

19. Employees of the hospitals should explain customerâs   1  2  3  4  5  6  7
    question appropriately about the discharge process.

20. Employees of the hospital should explain customerâs   1  2  3  4  5  6  7
    question appropriately about any procedure.

21. Treatment should be explained to the patient very   1  2  3  4  5  6  7
    clearly.

22. Discharge should be explained to the patientâs family.   1  2  3  4  5  6  7

TABLE A.4: Assurance:

---

23. Customer should be able to trust nurses of the hospital.   1  2  3  4  5  6  7

24. Patient should be secure that they recovered well be-   1  2  3  4  5  6  7
    fore they are dischsrged.

25. Patients should be able to trust billing.   1  2  3  4  5  6  7

26. Patient should be able to feel safe in their transactions   1  2  3  4  5  6  7
    with these institutionâs employees.

27. Patients should be able to feel safe that nurses are knowledgeable.    1  2  3  4  5  6  7

TABLE A.5: Courtesy:

| | | |
|---|---|---|
| 28. | Employees should be polite during admissions procedure. | 1  2  3  4  5  6  7 |
| 29. | Employees should be polite during housekeeping process. | 1  2  3  4  5  6  7 |
| 30. | Nursesâ behavior should be very polite against customers. | 1  2  3  4  5  6  7 |
| 31. | Nurses should be cheerful. | 1  2  3  4  5  6  7 |
| 32. | Visitors should be treated well. | 1  2  3  4  5  6  7 |

TABLE A.6: Empathy:

| | | |
|---|---|---|
| 33. | Patients should expect employees to know their needs. | 1  2  3  4  5  6  7 |
| 34. | Patients should expect nurses to show personal attention to the patients. | 1  2  3  4  5  6  7 |

# Appendix B

# Validity

TABLE B.1: Initial Communalities

| Item | Extraction |
| --- | --- |
| Q1 | .761 |
| Q2 | .736 |
| Q3 | .718 |
| Q4 | .763 |
| Q5 | .730 |
| Q6 | .811 |
| Q7 | .728 |
| Q8 | .624 |
| Q9 | .358 |
| Q10 | .656 |
| Q11 | .696 |
| Q12 | .753 |
| Q13 | .700 |
| Q14 | .677 |
| Q15 | .716 |
| Q16 | .683 |
| Q17 | .700 |
| Q18 | .753 |
| Q19 | .829 |

.5 *Continued on next page*

Table B.1 – *Continued from previous page*

| Item | Extraction |
|------|------------|
| Q20 | .821 |
| Q21 | .798 |
| Q22 | .756 |
| Q23 | .779 |
| Q24 | .706 |
| Q25 | .651 |
| Q26 | .734 |
| Q27 | .748 |
| Q28 | .742 |
| Q29 | .831 |
| Q30 | .771 |
| Q31 | .746 |
| Q32 | .641 |
| Q33 | .787 |
| Q34 | .706 |

Table B.2: Initial Eigenvalues

| Component | Total | % of Variance | Cumulative % |
|-----------|-------|---------------|--------------|
| 1 | 16.749 | 49.261 | 49.261 |
| 2 | 2.165 | 6.368 | 55.629 |
| 3 | 1.868 | 5.494 | 61.123 |
| 4 | 1.597 | 4.698 | 65.820 |
| 5 | 1.203 | 3.540 | 69.360 |
| 6 | 1.026 | 3.019 | 72.379 |
| 7 | .874 | 2.571 | 74.950 |
| 8 | .780 | 2.293 | 77.243 |
| 9 | .739 | 2.173 | 79.416 |
| 10 | .666 | 1.959 | 81.376 |
| 11 | .580 | 1.705 | 83.081 |
| 12 | .529 | 1.557 | 84.637 |

Table B.2 – *Continued from previous page*

| Component | Total | % of Variance | Cumulative % |
|:---:|:---:|:---:|:---:|
| 13 | .495 | 1.455 | 86.093 |
| 14 | .450 | 1.323 | 87.416 |
| 15 | .434 | 1.277 | 88.693 |
| 16 | .391 | 1.150 | 89.843 |
| 17 | .355 | 1.044 | 90.887 |
| 18 | .310 | .912 | 91.799 |
| 19 | .289 | .849 | 92.648 |
| 20 | .273 | .802 | 93.450 |
| 21 | .257 | .755 | 94.205 |
| 22 | .238 | .701 | 94.906 |
| 23 | .216 | .636 | 95.542 |
| 24 | .208 | .611 | 96.152 |
| 25 | .193 | .568 | 96.721 |
| 26 | .176 | .519 | 97.240 |
| 27 | .151 | .444 | 97.683 |
| 28 | .149 | .440 | 98.123 |
| 29 | .130 | .383 | 98.506 |
| 30 | .124 | .365 | 98.871 |
| 31 | .120 | .352 | 99.223 |
| 32 | .094 | .278 | 99.500 |
| 33 | .093 | .273 | 99.773 |
| 34 | .077 | .227 | 100.000 |

TABLE B.3: Final Communalities

| Item | Extraction |
|------|-----------|
| Q1 | .761 |
| Q2 | .755 |
| Q3 | .726 |
| Q4 | .763 |
| Q5 | .861 |
| Q6 | .884 |
| Q10 | .710 |
| Q11 | .683 |
| Q14 | .718 |
| Q23 | .579 |
| Q28 | .725 |
| Q29 | .763 |
| Q30 | .699 |
| Q32 | .678 |
| Q33 | .779 |
| Q34 | .760 |

TABLE B.4: Final Eigenvalues

| Component | Total | % of Variance | Cumulative % |
|---|---|---|---|
| 1 | 7.971 | 49.817 | 49.817 |
| 2 | 1.483 | 9.271 | 59.088 |
| 3 | 1.369 | 8.555 | 67.642 |
| 4 | 1.023 | 6.397 | 74.039 |
| 5 | .655 | 4.095 | 78.134 |
| 6 | .560 | 3.497 | 81.631 |
| 7 | .490 | 3.060 | 84.690 |
| 8 | .425 | 2.659 | 87.349 |
| 9 | .398 | 2.485 | 89.834 |
| 10 | .315 | 1.969 | 91.803 |
| 11 | .289 | 1.808 | 93.611 |
| 12 | .252 | 1.576 | 95.187 |
| 13 | .234 | 1.460 | 96.647 |
| 14 | .208 | 1.299 | 97.946 |
| 15 | .187 | 1.169 | 99.116 |
| 16 | .142 | .884 | 100.000 |

# Appendix C

# Reliability

## C.1 Responsiveness

TABLE C.1: Reliability Statistics

| Number of items | Cronbach's Alpha |
|---|---|
| 7 | .927 |

TABLE C.2: Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Variance |
|---|---|---|---|---|---|
| Item Means | 6.068 | 5.936 | 6.245 | .309 | .010 |

TABLE C.3: Item-Total Statistics

|  | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|
| Q34 | .799 | .647 | .913 |
| Q29 | .820 | .702 | .911 |
| Q33 | .826 | .703 | .910 |
| Q28 | .787 | .685 | .914 |
| Q32 | .748 | .614 | .918 |
| Q30 | .747 | .603 | .918 |
| Q23 | .658 | .476 | .926 |

## C.2 Tangibility

TABLE C.4: Reliability Statistics

| Number of items | Cronbach's Alpha |
|---|---|
| 4 | .886 |

TABLE C.5: Summary Item Statistics

|  | Mean | Minimum | Maximum | Range | Variance |
|---|---|---|---|---|---|
| Item Means | 5.807 | 5.562 | 5.947 | .385 | .032 |

TABLE C.6: Item-Total Statistics

|  | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|
| Q1 | .750 | .600 | .854 |
| Q2 | .762 | .614 | .850 |
| Q3 | .735 | .590 | .860 |
| Q4 | .761 | .616 | .851 |

## C.3  Reliability

TABLE C.7: Reliability Statistics

| Number of items | Cronbach's Alpha |
|---|---|
| 3 | .773 |

TABLE C.8: Summary Item Statistics

|  | Mean | Minimum | Maximum | Range | Variance |
|---|---|---|---|---|---|
| Item Means | 6.148 | 6.075 | 6.215 | .140 | .005 |

TABLE C.9: Item-Total Statistics

|  | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
|---|---|---|---|
| Q10 | .641 | .417 | .665 |
| Q11 | .631 | .402 | .674 |
| Q14 | .569 | .324 | .735 |

## C.4 Food quality

TABLE C.10: Reliability Statistics

| Number of items | Cronbach's Alpha |
| --- | --- |
| 2 | .869 |

TABLE C.11: Summary Item Statistics

| | Mean | Minimum | Maximum | Range | Variance |
| --- | --- | --- | --- | --- | --- |
| Item Means | 5.413 | 5.264 | 5.562 | .298 | .044 |

TABLE C.12: Item-Total Statistics

| | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach's Alpha if Item Deleted |
| --- | --- | --- | --- |
| Q5 | .771 | .594 | . |
| Q6 | .771 | .594 | . |

# Appendix D

# Mediation

## D.1 Service Quality

### D.1.1 Mediation Model

TABLE D.1: Model Summary (Customer satisfaction)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .7465 | .5573 | .5025 | 320.97 | .000* |

TABLE D.2: Effect between Service quality & Customer satisfaction

| coeff | t | P | LLCI | ULCI |
|-------|---|---|------|------|
| .7742 | .0432 | .000* | .6891 | .8593 |

TABLE D.3: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .9147 | .8366 | .1637 | 650.27 | .000* |

TABLE D.4: Effects with & Customer Loyalty

| | coeff | t | P | LLCI | ULCI |
|---|-------|---|---|------|------|
| Service quality | .0343 | .9264 | .3551 | -.0387 | .1073 |
| Customer satisfaction | .8326 | 23.29 | .000* | .7622 | .9030 |

### D.1.2  Total Effect Model

TABLE D.5: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|---|---|---|---|
| .6982 | .4875 | .5114 | 242.55 | .000* |

TABLE D.6: Total Effect between Service quality & Customer Loyalty

| coeff | t | P | LLCI | ULCI |
|---|---|---|---|---|
| .6789 | 15.5743 | .000* | .5931 | .7648 |

## D.2  Responsiveness

### D.2.1  Mediation Model

TABLE D.7: Model Summary (Customer satisfaction)

| R | R-sq | MSE | F | P |
|---|---|---|---|---|
| .6620 | .4382 | .6377 | 198.89 | .000* |

TABLE D.8: Effect between Responsiveness & Customer satisfaction

| coeff | t | P | LLCI | ULCI |
|---|---|---|---|---|
| .6478 | 14.103 | .000* | .5573 | .7383 |

TABLE D.9: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|---|---|---|---|
| .9149 | .8371 | .1632 | 652.47 | .000* |

TABLE D.10: Effects with & Customer Loyalty

| | coeff | t | P | LLCI | ULCI |
|---|---|---|---|---|---|
| Responsiveness | .0390 | 1.256 | .210 | -.0221 | .1000 |
| Customer satisfaction | .8310 | 26.22 | .000* | .7686 | .8934 |

### D.2.2  Total Effect Model

TABLE D.11: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|---|---|---|---|
| .6291 | .3958 | .6030 | 167.04 | .000* |

TABLE D.12: Total Effect between Responsiveness & Customer Loyalty

| coeff | t | P | LLCI | ULCI |
|---|---|---|---|---|
| .5773 | 12.9248 | .000* | .4893 | .6652 |

## D.3  Tangibility

### D.3.1  Mediation Model

TABLE D.13: Model Summary (Customer satisfaction)

| R | R-sq | MSE | F | P |
|---|---|---|---|---|
| .4737 | .2244 | .8804 | 73.77 | .000* |

TABLE D.14: Effect between Tangibility & Customer satisfaction

| coeff | t | P | LLCI | ULCI |
|---|---|---|---|---|
| .4147 | 8.5891 | .000* | .3196 | .5098 |

TABLE D.15: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|---|---|---|---|
| .9145 | .8363 | .1640 | 648.76 | .000* |

TABLE D.16: Effects with & Customer Loyalty

| | coeff | t | P | LLCI | ULCI |
|---|---|---|---|---|---|
| Tangibility | .0143 | .6028 | .5472 | -.0323 | .0609 |
| Customer satisfaction | .8496 | 31.43 | .000* | .7964 | .9028 |

### D.3.2 Total Effect Model

TABLE D.17: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .4466 | .1995 | .7989 | 63.533 | .000* |

TABLE D.18: Total Effect between Tangibility & Customer Loyalty

| coeff | t | P | LLCI | ULCI |
|-------|---|---|------|------|
| .3666 | 7.9708 | .000* | .2760 | .4572 |

## D.4 Reliability

### D.4.1 Mediation Model

TABLE D.19: Model Summary (Customer satisfaction)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .5193 | .2697 | .8290 | 94.16 | .000* |

TABLE D.20: Effect between Reliability & Customer satisfaction

| coeff | t | P | LLCI | ULCI |
|-------|---|---|------|------|
| .6070 | 9.7040 | .000* | .3196 | .7302 |

TABLE D.21: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .9164 | .8398 | .1605 | 665.58 | .000* |

TABLE D.22: Effects with & Customer Loyalty

| | coeff | t | P | LLCI | ULCI |
|---|-------|---|---|------|------|
| Reliability | .0781 | 2.424 | .0160 | .0146 | .1415 |
| Customer satisfaction | .8226 | 29.85 | .000* | .7684 | .8769 |

### D.4.2 Total Effect Model

TABLE D.23: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .5269 | .2776 | .7209 | 97.988 | .000* |

TABLE D.24: Total Effect between Reliability & Customer Loyalty

| coeff | t | P | LLCI | ULCI |
|-------|---|---|------|------|
| .5775 | 9.8989 | .000* | .4626 | .6923 |

## D.5 Food quality

### D.5.1 Mediation Model

TABLE D.25: Model Summary (Customer satisfaction)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .3437 | .1181 | 1.001 | 34.1564 | .000* |

TABLE D.26: Effect between Food quality & Customer satisfaction

| coeff | t | P | LLCI | ULCI |
|-------|---|---|------|------|
| .2485 | 5.8443 | .000* | .1647 | .3322 |

TABLE D.27: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .9148 | .8368 | .1635 | 651.4069 | .000* |

TABLE D.28: Effects with & Customer Loyalty

| | coeff | t | P | LLCI | ULCI |
|---|-------|---|---|------|------|
| Food quality | .0203 | 1.1085 | .2687 | -.0157 | .0563 |
| Customer satisfaction | .8477 | 33.4987 | .000* | .7979 | .8975 |

### D.5.2  Total Effect Model

TABLE D.29: Model Summary (Customer Loyalty)

| R | R-sq | MSE | F | P |
|---|------|-----|---|---|
| .3406 | .1160 | .8821 | 33.4736 | .000* |

TABLE D.30: Total Effect between Food quality & Customer Loyalty

| coeff | t | P | LLCI | ULCI |
|-------|---|---|------|------|
| .2309 | 5.7856 | .000* | .1523 | .3095 |