

Analysis on Relationship between Waiting Time and Customer Satisfaction of General Hospitals

 Jong-Hyun Yang¹ and  An-Sook Park^{2*}

¹Department of Health Administration, Jungwon University, Chungbuk, Korea

^{2*}Department of Nursing, Jungwon University, Chungbuk, Korea

*Corresponding author. Email: pkase2001@jwu.ac.kr

Abstract

One of the most significant complaint factors for patients using medical institutions is various waiting times that occur in the course of receiving medical services. Therefore, this study tries to analyze relationship between waiting time and service value of general hospitals. This study was conducted on 265 outpatients at 10 general hospitals all over the country from July 01 to July 31, 2019, and the analysis results are as follows. First, even if the utilization of time and waiting procedures for medical treatment were fair while waiting for medical treatment, it did not affect the perceived waiting time. Second, the utilization of waiting time did not affect acceptability, but the procedural fairness had a positive effect on acceptability. Third, the patient's acceptability resulting from sufficient empathy had effect of lowering the perceived waiting time. Fourth, the patient's acceptable range increased customer satisfaction and further enhanced service value. According to the above results of this study, it is found that an increase in waiting time lowers customer satisfaction, and customer satisfaction is closely related to service value. Accordingly, medical institutions will have to make various efforts to shorten waiting times to improve customer satisfaction and service value.

Keywords: General Hospital, Medical Services, Service Value, Waiting Procedure, Waiting Time

1. Introduction

In recent years, the medical community has suffered serious financial difficulties, regardless of the size and operating entity. The national health insurance fee increases far below the inflation rate, and the hospital's bankruptcy rate is increasing every year due to the continued increase in hospitals (Korean Hospital Association, 2017). Accordingly, hospitals are increasingly required to maintain customer loyalty and long-term relationship. For patients who use hospitals, waiting time, which wastes time, has been pointed out as a major complaint factor. According to a customer satisfaction survey of medical services conducted by Korea Consumer Agency, complaints about waiting time out of complaints from hospital users were 56% in 2015, but increased to 59% in 2016 (Korea Consumer Agency, 2016). A recent survey conducted by the Korea Statistics Information Service showed that about half of patients who use general hospitals were not satisfied with medical services. The main reason for this were high medical expenses, insufficient treatment results and waiting time (Korea Statistics Information Service, 2017). In order to resolve complaints caused by delays in waiting for medical treatment, medical institutions are making various efforts, including prior appointment system, waiting ticket for treatment, limiting the number of outpatients, provision of interests such as TV and magazine, and early operation of consultation hours.

In this way, there are few actual studies compared to the importance of waiting time in medical services. In particular, studies that applied theoretical models to analyze systematically are very rare. Thus, this study was intended to categorize waiting time factors of medical service into the utilization of waiting time, perceived waiting time, fairness, explanation of delay and acceptability, and to analyze their impact on customer satisfaction and service value in various ways by means of theoretical consideration of prior research.

2. Research Method

2.1. Data Collection

The data were collected from survey on outpatients at 10 general hospitals nationwide which was conducted from July 01 to July 30, 2019. In order to improve reliability of the survey, it was conducted for customers waiting to receive medical treatment in a self-entry manner. A total of 300 people were surveyed, but 265 copies were used for final analysis, excluding 35 copies which were poorly prepared.

2.2. Analysis Method

As an analysis method, reliability verification by correlation was done to understand internal consistency among variables, and a factor analysis was conducted to test validity of survey configuration. Furthermore, a path analysis based on SEM (Structural Equation Modeling) was performed to analyze causal relationship between waiting time factor and service value of general hospitals.

2.3. Utilization of Waiting Time, Perceived Waiting Time and Acceptability

Hornik (2004) categorized the waiting time recognized by the customer into 'Perceived Waiting Time' and 'Objective Waiting Time'. Perceived waiting time means the time that the customer perceives subjectively according to the degree of utilizing time while the customer waits, which varies depending on the attractiveness and utilization of the waiting space. Based on the results of these prior studies, the following hypotheses were established, anticipating that the utilization of waiting time would affect perceived waiting time and acceptability.

- H1: Utilization of waiting time will have a negative impact on perceived waiting time.
- H2: Utilization of waiting time will have a positive impact on acceptability.

2.4. Fairness of Waiting Order, Perceived Waiting Time and Acceptability

Maister (2008) presented eight principles of customer waiting time, and Davis & Heineke (2004) said that physically uncomfortable waiting time makes a patient feel longer than comfortable one. While waiting, emotional responses cause negative emotional reactions such as disagreement, uncertainty, rage, distress, disappointment, stress and anger, and these negative reactions directly affect service quality (Park Y.S., 2010). Therefore, the following hypotheses were established on the assumption that the fairness of waiting order would affect perceived waiting time and acceptability.

- H3: the fairness of waiting order will have a negative impact on perceived waiting time.
- H4: the fairness of waiting time will have a positive impact on acceptability.

2.5. Explanation, Perceived Waiting Time and Acceptability

Yoon S.W. and Kim S.B. (2003) described that careful concern such as an explanation on how long customers wait lowered negative emotions and had a positive impact on their acceptability. When the treatment is delayed, the information about delay is, in some cases, more urgent than the treatment information due to increased anxiety and growing curiosity about the reason for delay and how long the delay time is. Therefore, a sufficient explanation on the reason for delay is thought to reduce the perceived waiting time and increase acceptability, and this study establishes the following hypotheses.

- H5: A sufficient explanation will have a negative impact on perceived waiting time.
- H6: A sufficient explanation will have a positive impact on acceptability.

2.6. Acceptability and Perceived Waiting Time

Acceptability means whether a given waiting time is acceptable or not (Pruyn & Smidts, 2011). Therefore, the longer the waiting time is, the more it is likely to get out of the acceptable range, so the likelihood of accepting the waiting time is estimated to lower, and the following hypotheses were established.

- H7: Acceptability will have a negative impact on perceived waiting time.

2.7. Perceived Waiting Time, Customer Satisfaction and Service Value

Parasuraman, Zeithaml & Berry (1998) viewed that even though the service quality and customer satisfaction are evaluated using the expectation disconfirmation paradigm that compares actual perceived performance with expectation based on prior experience, the concept of expectation applied to the two is different from each other. With reference to these prior studies, the following hypotheses were established as the perceived waiting time is expected to lower customer satisfaction and service value.

- H8: The perceived waiting time will have a negative impact on customer satisfaction
- H9: The perceived waiting time will have a negative impact on service value.

2.8. Acceptability, Customer Satisfaction and Service Value

Increasing acceptability of waiting time is likely to result in a positive evaluation on medical service. Therefore, the following hypotheses were established as the acceptability perceived by the customer was believed to have a positive impact on customer satisfaction and service value.

- H10: Acceptability will have a positive impact on customer satisfaction.
- H11: Acceptability will have a positive impact on service value.

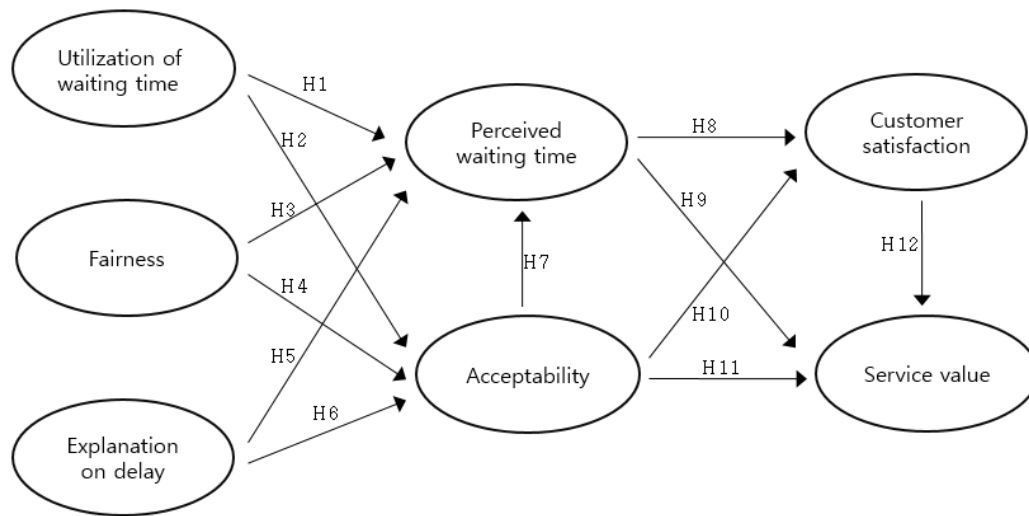
2.9. Customer Satisfaction and Service Value

Many studies on the service industry have shown that customer satisfaction and service value inevitably affect each other. Therefore, the following hypotheses were established.

- H12: Customer satisfaction will have a positive impact on service value.

The research model is as follows

Figure 1 The Research Model



3. Research Result

3.1. Sample Characteristics

The demographic characteristics of those surveyed are shown in Table 1. The gender of respondents was 137 males (51.7%) and 128 females (49.3%), while the distribution by age showed that 5 persons under 20s (1.9%), 67 in 20s (25.3%), 63 in 30s (23.8%), 60 in 40s (22.6%), 51 in 50s (19.2%) and 19 in 60s or older (7.2%).

For marital status, it showed 171 of the married (64.5%) and 94 of the unmarried (35.5%), for academic background, 127 high school graduates (47.9%), 123 college graduates (46.4%) and 15 in graduate degree or higher (5.7%). For monthly income, it showed 27 less than KRW1 million (10.2%), 91 between KRW1 million and KRW1.99 million (34.3%), 78 between KRW2 million and KRW2.99 million (29.4%), 29 between KRW3 million and KRW3.99 million (10.9%), 15 between KRW4 million and KRW4.99 million, and 14 more than KRW5 million (5.5%).

Table 1. Demographic Characteristics

Item	Category	Number of respondents	Ratio (%)
Gender	Male	137	51.7
	Female	128	49.3
Age	Under age 20	5	1.9
	20~29	67	25.3
	30~39	63	23.8
	40~49	60	22.6
	50~59	51	19.2
	Over age 60	19	7.2
Marital status	Married	171	64.5
	Unmarried	94	35.5

Level of education	High school graduates	127	47.9
	College graduates	123	46.4
	Graduate degree or higher	15	5.7
Monthly income	Less than KRW1 million	27	10.2
	KRW1 million ~KRW1.99 million	91	34.3
	KRW2 million ~KRW2.99 million	78	29.4
	KRW3 million ~KRW3.99 million	29	10.9
	KRW4 million ~KRW4.99 million	15	5.7
	More than KRW5 million	14	5.5
Total		265	100.0

3.2. Reliability Analysis

Cronbach's alpha, which indicates internal consistency of data, was used to verify reliability of measurement tool. The result of reliability test for the measured items used in this study showed that the utilization of waiting time was .538, fairness .851, and explanation on the delayed waiting time .847 in exogenous variables, while the perceived waiting time was .738, acceptability of waiting time .844, customer satisfaction .831 and service value .821 in endogenous variables, meaning overall reliability was very good. One item was removed from the fairness of medical service procedures and from acceptability of waiting time, respectively. Table 2 shows the number of items and the result of reliability test for each research concept finally used in the analysis.

Table 2. Reliability Analysis

Measurement Variables	Number of measurement items				Cronbach's Alpha
	Initial	After reliability analysis	After feasibility analysis	Final	
Perceived waiting time	2	2	2	2	.738
Fairness	4	4	3	3	.851
Explanation on delay	2	2	2	2	.847
Utilization of waiting time	4	4	4	4	.538
Acceptability	4	4	3	3	.844
Customer satisfaction	3	3	3	3	.831
Service value	4	4	4	4	.821

3.3. Factor Analysis

Exploratory factor analysis was conducted after dividing it into exogenous and endogenous variables. Exogenous variables include 9 measurement variables used in the final analysis, excluding one measurement item out of ten. Their total degree of explanation was high at 75.27%. Also, KMO (Kaiser-Meyer-Olkin) was .734, indicating that the suitability of selecting variables was obtained. The commonality was also high, from the lowest at .653 to the highest at .876. Measurement variables of utilization of waiting time were .805(WU 1), .831(WU 2), .826(WU 3), .802(WU 4). Measurement variables of Fairness were .847(FA 1), .901(FA 2). Measurement variables of explanation on delay were .924(EX 1), .917(EX 2).

Table 3. Exploratory Factor Analysis of Exogenous Variables

Research Concept	Measurement Variables	Factor Loadings			Commonality
		Factor 1	Factor 2	Factor 3	
		Utilization of waiting time	Fairness	Acceptability	
Utilization of waiting time	WU 1	.805	.051	.018	.653
	WU 2	.831	.024	.064	.701
	WU 3	.826	.035	.063	.695
	WU 4	.802	.058	-.052	.653
Fairness	FA 1	.049	.847	.149	.778
	FA 3	.118	.901	.087	.845
	FA 4	-.009	.058	.102	.771
Explanation on delay	EX 1	.032	.124	.924	.876
	EX 2	.038	.161	.917	.872
Eigen Value		2.98	2.38	1.42	75.27
R ²		33.33	26.31	26.31	

✂Factor extraction: principal component analysis

✂Rotation method: Varimax with Kaiser Normalization

According to Table 4, the endogenous variables performed a feasibility analysis on 13 measurement items, and the final 12 measurement variables were used, excluding one measurement items. Their total degree of explanation was high at 74.82%. KMO (Kaiser-Meyer-Olkin) was .805, indicating that the suitability of selecting variables was obtained. Measurement variables of perceived waiting time were .893(PW 1), .881(PW 2). Measurement variables of Acceptability were .832(EX 2), .852(EX 3), .854(EX 4). Measurement variables of customer satisfaction were .874(CS 1), .852(CS 2), .864(CS 3). Measurement variables of Service value were .784(SV 1), .793(SV 2), .761(SV 3), .692(SV 3),

Table 4. Exploratory Factor Analysis of Endogenous Variables

Research Concept	Measurement Variables	Factor Loadings				Commonality
		Factor 1	Factor 2	Factor 3	Factor 4	
		Customer satisfaction	Service value	Acceptability	Perceived waiting time	
Perceived waiting time	PW 1	-.053	-.131	-.127	.893	.829
	PW 2	-.117	-.024	-.134	.881	.824
Acceptability	EX 2	.046	.143	.832	-.115	.724
	EX 3	.188	.102	.852	-.064	.775
	EX 4	.093	.165	.854	-.135	.839
Customer satisfaction	CS 1	.874	.155	.087	-.036	.798
	CS 2	.852	.232	.132	-.053	.798
	CS 3	.865	.193	.123	-.125	.819
Service value	SV 1	.105	.784	.057	-.031	.632
	SV 2	.034	.793	.216	-.011	.680
	SV 3	.323	.761	.091	-.063	.697
	SV 4	.367	.692	.144	-.184	.673
Eigen Value		4.51	1.84	1.44	1.31	74.82
R ²		37.65	15.46	11.82	10.75	

✂Factor extraction: principal component analysis

✂Rotation method: Varimax with Kaiser Normalization

3.4. Hypothesis Test and the Result

A covariance structure model was used to test hypothesis of this study. The test result showed that the goodness-of-fit for the structural model that estimated the final goodness-of-fit for study model and path coefficient was $\chi^2=227.38$ (df=173, p=.001), RMSEA=.034, NNFI=.965, CFI=.971, GFI=.920, AGFI=.885. In terms of goodness-of-fit of model, adjusted goodness-of-fit (AGFI) was not up to the general reference value of .90, but all other items met the standard, so there was no difficulty in testing hypotheses. The results of testing hypotheses in this study are shown in the following Table 5. As a result of analyzing the causal relationship between factors suggested in the study model, 7 hypotheses were adopted out of a total of 12 hypotheses, and 5 of them were rejected.

The results of the hypothesis test are as follows.

First, the hypothesis that utilization of waiting time would have a negative(-) effect on the perceived waiting time was rejected. The hypothesis 2 that utilization of waiting time would have a negative(-) effect on acceptability was also rejected.

Second, the hypothesis 3 that the fairness of treatment procedures would reduce the perceived waiting time was rejected. Hypothesis 4 was adopted that the fairness of procedures in hospitals would have a positive effect on acceptability.

Third, the verification result of hypothesis 5 was supported that the explanation on delay would lower the perceived waiting time. The hypothesis 6 that the explanation on delay would have a positive effect on the acceptability was rejected.

Fourth, the hypothesis 7 that the acceptability would lower the perceived waiting time was adopted. The hypothesis 8 was supported that the perceived waiting time would have a negative effect on customer satisfaction. The hypothesis 9 that the perceived waiting time would have a negative(-) effect on service value was also rejected.

Fifth, hypotheses 10 and 11 were both adopted that the acceptability of waiting time would have a positive effect on customer satisfaction and service value. The hypothesis 12 that customer satisfaction would have a positive effect on service value was adopted.

Table 5. Hypotheses Test

Hypothesis	Contents	Estimated coefficient	Standard error	t-value	Result
H1	Utilization of waiting time ⇒ Perceived waiting time	-.014	.072	-0.170	Rejected
H2	Utilization of waiting time ⇒ Acceptability	.083	.071	1.171	Rejected
H3	Fairness ⇒ Perceived waiting time	-.132	.082	-1.517	Rejected
H4	Fairness ⇒ Acceptability	.354	.075	4.595**	Adopted
H5	Explanation on delay ⇒ Perceived waiting time	-.177	.077	-2.303*	Adopted
H6	Explanation on delay ⇒ Acceptability	.094	.071	1.265	Rejected
H7	Acceptability ⇒ Perceived waiting time	-.260	.081	-3.163**	Adopted
H8	Perceived waiting time ⇒ Customer satisfaction	-.194	.079	-2.332*	Adopted
H9	Perceived waiting time ⇒ Service value	-.096	.071	-1.270	Rejected
H10	Acceptability ⇒ Customer satisfaction	.253	.074	3.360**	Adopted
H11	Acceptability ⇒ Service value	.213	.071	2.972**	Adopted
H12	Customer satisfaction ⇒ Service value	.495	.080	6.108**	Adopted

4. Consideration and Conclusion

The results of this study, which was analyzed that waiting time had a negative impact on customer satisfaction across the board, were consistent with those of Lee Y.J. (1996), Pruyn & Smidts (2001), Hui & Tse (1996), Park Y.S. (2000), Yoon S.W. and Kim S.B. (2003). And it was found that the utilization of waiting time did not have impact on acceptability. This is different from the research result of Pruyn & Smidts (2001), which can be explained as a change in the perception of modern society where a prior appointment system is established and the importance of time is emphasized.

And ensuring fairness and accepting reason for waiting will affect customer satisfaction, which is consistent with the research results of Kim S.H. (2001). A sufficient explanation on waiting time had a positive effect on reducing waiting time. This is consistent with the principle that uncertain waiting may make patients feel longer than the scheduled waiting, and unexplained waiting make patients feel longer than the explained waiting (Maister, 1988). If the service provider caused the user to make useful use of waiting time, or reduce uncertainty and provide sufficient explanation on waiting time, the waiting time could be perceived shortly. This is also consistent with the research result of Jones & Peppiatt (1996) that the perception of waiting time may change depending on consideration of the service provider.

In this study, hypothesis 7 was supported that patient's acceptability would reduce the perceived waiting time. This showed that if the medical procedure was being conducted fairly and the waiting for treatment was sufficiently explained, the customer perceived the waiting time positively and feels the waiting time shortly. A study by Yoon S.W. and Kim S.B. (2003) showed that customers' acceptability had a positive impact on the perceived waiting time. The relationship between customer satisfaction and service value also showed that customer satisfaction had an effect on service value, which is consistent with the research result of Woodruff (2007) that the perceived service value and customer satisfaction affect each other.

The results of the hypothesis test are as follows.

First, the hypothesis that utilization of waiting time would have a negative(-) effect on the perceived waiting time was rejected. The hypothesis 2 that utilization of waiting time would have a negative(-) effect on acceptability was also rejected. Second, the hypothesis 3 that the fairness of treatment procedures would reduce the perceived waiting time was rejected. Hypothesis 4 was adopted that the fairness of procedures in hospitals would have a positive effect on acceptability. Third, the verification result of hypothesis 5 was supported that the explanation on delay would lower the perceived waiting time. The hypothesis 6 that the explanation on delay would have a positive effect on the acceptability was rejected. Fourth, the hypothesis 7 that the acceptability would lower the perceived waiting time was adopted. The hypothesis 8 was supported that the perceived waiting time would have a negative effect on customer satisfaction. The hypothesis 9 that the perceived waiting time would have a negative(-) effect on service value was also rejected. Fifth, hypotheses 10 and 11 were both adopted that the acceptability of waiting time would have a positive effect on customer satisfaction and service value. The hypothesis 12 that customer satisfaction would have a positive effect on service value was adopted.

The result of this study showed that shortening the perceived waiting time increased customer satisfaction, and customer satisfaction increased service value. Accordingly, medical institutions should focus on shortening waiting time to improve customer satisfaction and service value. Moreover, as it is analyzed that acceptability also affects customer satisfaction and service value, the emphasis should be placed on ensuring fairness of waiting.

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