

# Prediction of Inpatient Satisfaction with Service Quality with SEM Method

Maria Sinaga, Chrismis Novalinda Ginting, Ali Napiyah Nasution, Ermi Girsang  
*Department Magister of Public Health, Faculty of Medicine, University of Prima Indonesia.*

**Keywords:** Service Quality, Inpatient Satisfaction.

**Abstract:** Patient satisfaction is an indicator of the hospital services quality. In fact, hospital services often make patients dissatisfied like convoluted, boring, inhospitable, and less dexterous. This is allegedly because the provided quality services is out of the patient expectations. The purpose of this study is to model the relationship between service quality and inpatient satisfaction, which can then be used to predict satisfaction with various variables. Modeling was conducted on questionnaire measurement data from 2,071 respondents with 250 samples. Analysis of questionnaire data was processed using univariate, bivariate with chi-square tests, and multivariate with multiple logistic regression at 95% confidence level ( $\alpha = 0.05$ ). The modeling accuracy above 90% was obtained with an input and output relationships in the form of satisfaction. Statistically there was a relationship between physical evidence, reliability, quick response, and empathy with inpatient satisfaction,  $p < 0.05$ . The most significant variable related to inpatient satisfaction was reliability, where patients who state good reliability will be satisfied with hospital services by 7.6 times higher than those that are less good.

## 1 INTRODUCTION

Inpatient services in hospitals often cause satisfaction and dissatisfaction felt by patients and families. Dissatisfaction most frequently expressed in relation to the attitudes and behavior of health workers, among others: delays in the service of doctors and nurses, difficult to find, less communicative and informative, length of admission and order and cleanliness of the hospital environment that indicate that the quality of hospital services is still necessary improved (Rahmawati, Febriana, & Stefanus, 2013).

Health services in hospitals are basically intended to provide satisfaction to patients. According to Parasuraman, the services provided by hospitals must be quality and meet five main quality dimensions, namely: tangibles, reliability, responsiveness, assurance, and empathy (Tjiptono & Chandra, 2015).

Robbins and Luthan in (Warda, Junaid, & Fachlevy, 2016) stated that for users of health services, the quality of service is more related to the responsiveness of officers to meet patient needs and the smooth communication between officers and patients. Patients as users of hospital services demand services in accordance with their rights, that is, quality and perfect services.

Fatas research conducted at Boyayali Hidayah Hospital showed that the results of the analysis with Cartesian diagram showed two attributes included in quadrant a, first, doctors and nurses were quick in providing the services needed, both doctors and nurses patiently listened to patient complaints (Fatas, 2017). Rosjid's research at Nirmala Suri Sukoharjo Hospital found that all service quality variables included in the five dimensions of Servqual stand alone or simultaneously, had a close correlation with customer satisfaction. So that the Servqual method can be applied in hospitals to measure patient satisfaction with service quality (Rosjid, 2012). Arwani's research at PKU Muhammadiyah Gubug Hospital in 2011 concerning a decrease in the number of patients showed that consumer satisfaction could not be fulfilled. Some complaints felt by consumers are related to tariffs that are not in accordance with services provided by hospitals and hospital facilities that are still not good (Arwani, 2011).

The better socio-economic condition of the community so that in getting services at the hospital also demands more quality service. This fact should be of particular concern to the hospital to further improve its services. But in reality some hospitals still ignore the importance of customer/ patient

satisfaction by providing poor service. For example health care for patients who are convoluted, boring, less dexterous, patient care rooms that do not meet health requirements and others. If this is not resolved it can result in a decrease in the quality of hospital services themselves (Sakti, 2009, Turnip et al, 2018).

Patient satisfaction surveys about the presence of officers who are unprofessional in providing health services include complaints that will be heard from officers who are not friendly and indifferent to the complaints of their patients. Two directions with doctors, which reflects how weak the position of patients as recipients of health services (Isnindar, et al, 2013; Turnip et al, 2020; Wijaya et al, 2019).

Stella Maris Hospital in Medan is a specialized hospital that provides services for maternal and child health. Stella Maris Medan Women's and Children's Hospital has several integrated polyclinics that can help serve family health. By presenting the best doctors, as well as medical services provided, as a form of commitment of Stella Maris Medan Women's and Children's Hospital to reliable health services for all maternal and child health problems. Based on the performance indicators achieved by the Stella Maris Hospital in Medan in 2017, the Bed Occupancy Rate (BOR) is 80.2%, the Average Length of Stay (ALOS) is 2.7 days and the Turn Over Interval (TOI) is 1 day whereas in 2018, the number of BOR was 72.9%, ALOS was 2.8 days and TOI was 0.6 days (RSIA Stella Maris, 2019). The ideal BOR parameter value is 60-85%, the ALOS value is between 6-9 days, the TOI value is in the range of 1-3 days (MOH RI, 2005).

The latest data that researchers obtained from the Stella Maris Mother and Child Hospital Medan that the number of inpatient visits during the last 3 months was June 2019 as many as 2140 visits, as of July 2019 as many as 2151 visits, and as of August 2019 as many as 2071 visits. Fluctuations have been seen over the past 3 months, and in August 2019 the lowest compared to June 2019 and July 2019. The decline is presumably due to patients feeling less satisfied with inpatient care.

Structural Equation Model (SEM), an analysis of variance-based structural equations designed to solve multiple regressions when 25 specific problems occur in data such as relatively small sample sizes, missing or abnormal data and multicollinearity that aims to predict relationships between constructs and explain the theoretical relationship between these constructs (Ghozali & Laten, 2015; Kusumandari et al, 2018; Turnip et al, 2018).

A preliminary survey that researchers conducted by interviewing 10 inpatients about the satisfaction

felt during treatment. As many as 5 people expressed satisfaction, while 2 others stated that they were quite satisfied, and 3 people stated that they were not satisfied. Patient dissatisfaction is usually caused by doctors and nurses who are less friendly, less responsive when asked for help, and others. In this study, predictions of inpatient satisfaction with service quality with the Structural Equation Modeling (SEM) method were developed.

## 2 METHOD

This type of research is a quantitative analytic study with a cross sectional study design. The research was conducted at the Stella Maris Hospital in Medan in November 2019. The study population was all inpatients as many as 2,071 people, and samples were obtained as many as 250 respondents. Univariate data analysis, bivariate using chi-square test, and multivariate using multiple logistic regression tests with a confidence level of 95% ( $\alpha = 0.05$ ).

Analysis techniques were used to interpret and analyze data. In accordance with the model developed in this study, the data analysis tool used was SEM, which is operated through the AMOS 16.0 program (Hair et al, 1998; Ferdinand, 2006). Using the stages of modeling and analysis of structural equations into 7 steps, namely: theoretical model development; Arrange path diagram; Turn a path diagram into a structural equation; Choose an input matrix for data analysis; Assessing model identification; Assessing Goodness-of-Fit Criteria; Model estimation interpretation.

The use of SEM can expand the ability to explain with the existence of statistical efficiency as a model that tests the method thoroughly. Hypothesis testing is done using a structural equation model using AMOS software. For the purpose of rejecting or accepting a hypothesis, a significance level of  $P < 0.05$  was used. After the raw data has been collected, the data are then presented in various forms: (i) Presentation of the results of the initial analysis. (ii) Presentation of SEM analysis. (iii) Testing and research hypotheses based on the results of data processing.

## 3 RESULTS AND DISCUSSIONS

Characteristics of respondents ie most respondents aged <40 years were 58.0%. Based on gender, all respondents involved were female. Based on

education, the majority of respondents had a diploma education of 49.6%, a small proportion had a high school education of 20.0%. Based on work, most respondents were housewives as much as 38.8%, a small proportion of respondents worked as entrepreneurs as much as 36.0%. Based on the length of stay, the majority of respondents had been treated for 2 days as much as 49.2%, a small portion had been treated for 5 days as much as 2.8%.

Based on the results of bivariate analysis, all independent variables were found to be significantly related to inpatient satisfaction ( $p = 0,000$ ). The complete Chi-Square statistical test results can be seen in Table 1.

Table 1: Relationship of Each Independent and Dependent Variable.

Variabel	Kepuasan Pasien Rawat Inap				Jumlah		p-value
	Puas		Kurang Puas		F	%	
	f	%	f	%			
<b>Bukti Fisik (Tangible):</b>							
Baik	165	89,2	20	10,8	185	100,0	0,000
Kurang	33	50,8	32	49,2	65	100,0	
<b>Kehandalan (Reliability):</b>							
Baik	175	90,2	19	9,8	194	100,0	0,000
Kurang	23	41,1	33	58,9	56	100,0	
<b>Daya Tanggap (Responsiveness):</b>							
Baik	180	89,1	22	10,9	202	100,0	0,000
Kurang	18	37,5	30	62,5	48	100,0	
<b>Jaminan (Assurance):</b>							
Baik	170	88,1	23	11,9	193	100,0	0,000
Kurang	28	49,1	29	50,9	57	100,0	
<b>Empati (empathy):</b>							
Baik	173	91,5	16	8,5	189	100,0	0,000
Kurang	25	41,0	36	59,0	61	100,0	

The results of multivariate analysis (Table 2) with multiple logistic regression tests showed that of the 5 variables as model candidates, 4 variables were obtained that affected maternal satisfaction, namely tangible, reliability, responsiveness, and empathy. The most influential variable in this study was the responsiveness variable which has a value of  $\text{Exp (B)} / \text{OR} = 7.985$  meaning that mothers who state good hospital responsiveness, have the opportunity to feel satisfied with pregnancy and childbirth services by 7.9 times higher.

Table 2: Multiple Logistic Regression Test Results.

Variables	B	Sig.	Exp (B)	95% CI for Exp(B)
Tangible	1,166	0,013	3,209	1,279-8,052
Reliability	2,035	0,000	7,656	3,013-19,453
Responsiveness	1,904	0,000	6,715	2,536-17,782
Empathy	1,832	0,000	6,246	2,490-15,667
Constant	-1,524			

### 3.1 Tangible Factors

Based on the results of the study showed that there was a relationship of physical evidence with inpatient satisfaction,  $p = 0.013 < 0.05$ . Variable physical

evidence that has a value of  $\text{Exp (B)} / \text{OR} = 3.209$  means that patients who state good physical evidence, have the opportunity to feel satisfied with hospital services by 3.2 times higher than patients who claim physical evidence is not good.

This study is in line with research conducted by Burhanuddin (2016) to get the result that there is a relationship between the quality of health services based on the dimensions of physical evidence and patient satisfaction of BPJS participants. Research conducted by Nova (2015) that examined the effect of service quality on inpatient satisfaction stated that the greatest influence was the variable of manifestation or physical evidence (5,191). Based on the results of research conducted by Winarno (2015) that from the test results, the first hypothesis can be explained through the sign parameter  $b_1$  in the regression equation, which in this study is positive, namely (+ 0.165) and t test where  $t_{count} (1,914) > t_{table} (1,660)$ , then  $H_0$  is rejected and  $H_a$  is accepted. This means that there is a positive and significant influence of tangibles variable on service user satisfaction. Physical manifestations include the appearance and completeness of physical facilities such as treatment rooms, buildings, and the availability of clean parking lots, neatness, and comfort of waiting rooms and examination rooms, the completeness of communication and appearance equipment (Tjiptono & Chandra, 2015). Everyone wants service satisfaction so they can feel the importance of the physical evidence presented by the developer.

The results prove that physical evidence was significantly related to inpatient satisfaction. Patients who state that good physical evidence tends to be satisfied with the services provided. Everyone's satisfaction is actually very relative, depending on their perceptions and social status. Hospital physical evidence makes inpatients feel satisfied with regard to comfort, cleanliness, neatness, and appearance. This makes the patient feel satisfied with the services related to tangible.

### 3.2 Reliability Factors

The results showed that there was a relationship of reliability with inpatient satisfaction,  $p = 0,000 < 0.05$ . The reliability variable has a value of  $\text{Exp (B)} / \text{OR} = 7.656$ , meaning that patients who state good reliability, have the opportunity to feel satisfied with hospital services at 7.6 times higher. Fatas research (2017) states that the results of the analysis with Cartesian diagrams show two attributes included in quadrant A, firstly doctors and nurses are quick in

providing the services needed, both doctors and nurses patiently listen to patient complaints. The results of Triwahyuni's research (2015) show that perceptions about the quality of reliable doctor services have an influence on the satisfaction of inpatients. Winarno's research results (2015) get results that prove that there is a positive and significant influence of the reliability variable on service user satisfaction.

The reliability dimension shows the ability to provide services according to the promises offered. The assessment is related to the timeliness of service at registration, the time of treatment / examination, the suitability between expectations and the realization of time for patients (Tjiptono & Chandra, 2015). The demand for reliability of health workers in providing fast, appropriate, easy and smooth services is a condition for patient evaluation in showing the actualization of the work of health workers. The satisfaction of these patients in the assessment of reliability is the ability of health workers to provide services immediately and satisfactorily as desired by patients and families (Azwar, 2016).

The results of this study prove that the reliability variable of health workers was related to the satisfaction felt by hospitalized patients. The reliability variable is the most related to inpatient satisfaction. The services provided can be relied upon if it is in accordance with the wishes of the consumers related to the speed of service time and accuracy in providing services which will ultimately have an impact on the achievement of customer satisfaction. The reliability of health workers can be seen from the ability of health workers (doctors and nurses) who are professional in providing services to patients and families. Health workers check the condition of patients from morning to night on a regular basis, nurses pay attention to the cleanliness of the patient's body being treated, control the infusion that is installed, as well as provide counseling or health education in accordance with the illness suffered by the patient so that it can add insight into the knowledge of the patient and family.

### 3.3 Responsiveness Factors

The results showed that there was a fast response relationship with inpatient satisfaction,  $p = 0,000 < 0,05$ . The variable rapid response has a value of  $\text{Exp (B) / OR} = 6,715$  meaning that patients who state good hospital responsiveness are good, have the opportunity to feel satisfied with hospital services by 6.7 times higher. Rosjid's research results (2016) found that all service quality variables included in the

five dimensions of Servqual stand alone or simultaneously, have a pretty close correlation with customer satisfaction, especially the variable responsiveness. Research conducted by Mukti, Hamzah, & Nyorong (2015) shows that the results of statistical tests using the chi square test obtained  $p$  value = 0.002. This means that there is an effect of responsiveness or timeliness on patient satisfaction. The results showed that 63.6% of respondents said they were dissatisfied with hospital staff who were not responsive or not on time.

Quick response or timeliness in service was the ability of the hospital to provide services as promised, which includes the speed and accuracy of officers in providing services include: accuracy in procedures for patient acceptance, registration, speed of health workers when asked for help, when examined and diagnosing the disease and healing of diseases (Azwar, 2016).

The results of this study prove that the responsiveness of health workers was significantly related to the satisfaction felt by inpatients. Patients who claim that health workers are responsive in providing services tend to feel satisfied. This is related to the speed of the nurse if called by the patient or family in less than 5 minutes, the nurse is responsive in helping to meet the needs of eating / drinking when the patient cannot do it himself, doctors and nurses always check the condition after taking action to see reaction from the actions taken, health workers show readiness and always be willing to help if requested by patients and families. In addition, doctors and nurses also explained further care at home in accordance with the conditions of the illness experienced.

### 3.4 Empathy Factors

The results showed that there was an empathy relationship with inpatient satisfaction,  $p = 0,000 < 0,05$ . Empathy variable which has a value of  $\text{Exp (B) / OR} = 6.246$  means that patients who state good hospital empathy, have the opportunity to feel satisfied with hospital services by 6.2 times higher. Empathy is an important variable in increasing the satisfaction of inpatients.

Based on research conducted by Prabowo, Noer; aini, & Supriyadi (2016) shows that most respondents have satisfied empathy (71.9%). There is a relationship between the quality of service dimensions of empathy with insurance patient satisfaction. This is also in line with the study of Winarno (2015) which found that there was a positive and significant influence of empathy variables on



service user satisfaction. Research conducted by Immas, Saryadi, & Dewi, (2015) found that there was a significant influence between empathy on patient satisfaction. Where the better the empathy is given, the higher the customer satisfaction.

Empathy is one of the factors driving the progress of the hospital. Because empathy is needed by people who are sick or who are being treated. If the empathy given is not appropriate then the patient will not use services at the hospital let alone recommend to others. Factors of empathy or personal attention can make an effective contribution or the greatest contribution to increasing patient loyalty. The personal attention factor is thought to be closely related to the level of customer satisfaction with all facilities and the quality of service they have received.

The results of this study prove that empathy is significantly related to the satisfaction of inpatients. Empathy is shown by health workers (doctors and nurses) by communicating well with patients with sympathy, giving more attention to patients that patients do need attention both physically and psychologically, health workers always seek approval when taking action or doing examination. Likewise, manners and manners are shown by health workers when they take action. In addition, health workers provide the opportunity for patients to express feelings or complaints that are felt. Health workers explain care and treatment procedures using language that is easy to understand.

To facilitate management and make decisions regarding variables that are considered to have a large role, modeling using SEM methods is carried out. The results of testing the structural model to test the relationship of service quality, satisfaction and trust are presented in Figure 1 through the model's Goodness of Fit test. The model suitability test results on the full SEM model show the results of the evaluation of the model suitability for the full SEM model. Of the eight criteria, only two criteria meet the Goodness of Fit value, namely CMIN / DF with a value of 0.871 (cut-off value <2.00) and RMSEA with a value of 0.030 (cut-off value <0.08). The parsimony principle and the rule of thumb say that the model can be said to be fit or meet if there are at least one or two goodness of fit criteria that meet (Rinaldo, 2009). Referring to the principle of parsimony and rule of thumb, it can be concluded that the model built is good and acceptable.

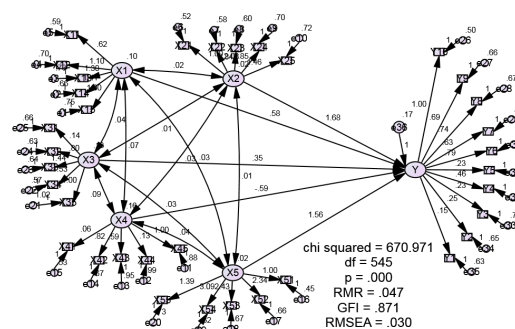


Figure 1: Model design using the SS method

Table 3: Effect of service quality on loyalty of Inpatients

	Estimate	S.E	C.R.	P	Keterangan Model
<u>Kepuasan</u> <-- <u>Kehandalan</u>	1.676	1.353	1.239	.215	Signifikan
<u>Kepuasan</u> <-- <u>Tangible</u>	.579	.502	1.154	.249	Signifikan
<u>Kepuasan</u> <-- <u>Daya Tanggap</u>	.346	.413	.838	.402	Signifikan
<u>Kepuasan</u> <-- <u>Jaminan</u>	-.592	.939	-.630	.529	Tidak Signifikan
<u>Kepuasan</u> <-- <u>Empati</u>	1.556	1.669	.932	.351	Signifikan

The results of the calculation of hypothesis testing between variables can be seen in Table 3. From the hypothesis testing Table 3 can be explained as follows: Hypothesis 1: Reliability significantly influences the satisfaction of inpatients at the hospital. The standardized regression weight between reliability and patient satisfaction is 1,676 with a t / C.R. = 1,239 (Probability = 0.215). Thus it can be said that the influence is positive and significant. These results provide support for the first hypothesis. Hypothesis 2: Tangible has a significant effect on inpatient satisfaction. The standardized regression weight between reliability and patient satisfaction is 0.346 with a t / C.R value. was 0.838 (Probability was 0.249) thus it can be said that in order to achieve inpatient satisfaction one of the aspects required is tangible. The effect is positive and significant. These results provide support for the selected hypothesis. Hypothesis 3: Responsiveness significantly influences inpatient satisfaction. The standardized regression weight between reliability and patient satisfaction is -0.592 with a t / C.R value. was -0.630 (Probability was -0.592). Thus it can be said that Responsiveness is a very influential factor to achieve patient satisfaction where the effect is positive and significant to further provide support for hypothesis 3. Hypothesis 4: Health insurance does not significantly influence patient satisfaction. The

standardized regression weight between reliability and patient satisfaction is -0.592 with a t / C.R value. was -0.630 (Probability was 0.351). Thus it can be said that Empathy is one of the factors that has a significant influence on achieving patient satisfaction. Hypothesis 5: Empathy has a significant effect on patient satisfaction. The standardized regression weight between reliability and patient satisfaction is 1,556 with a t / C.R value. was 0.932 (Probability was 0.529). Thus it can be said that health insurance is one of the factors that does not have a significant influence on achieving patient satisfaction. This is evidenced by the positive value shown by the standardized regression weight.

Table 4: Effect of service on satisfaction.

	Total Effects	Direct Effects
<u>Daya Tanggap → Kepuasan</u>	.212	.212
<u>Empati → Kepuasan</u>	.397	.397
<u>Jaminan → Kepuasan</u>	-.395	-.395
<u>Kehandalan → Kepuasan</u>	.407	.407
<u>Tangible → Kepuasan</u>	.313	.313

From Table 4 it can be concluded that responsiveness, empathy, reliability, tangible have a direct influence on inpatient satisfaction. Others with health insurance that has a negative value indicates that it does not have a positive direct effect that is too influential on patient satisfaction. If seen from Table 4, the biggest factor for achieving inpatient satisfaction in hospital was the responsiveness factor with a total effect of 0.21 which means that the percentage of satisfaction with responsiveness is 79%.

## 4 CONCLUSIONS

The results showed that all variables except collateral affect the satisfaction of inpatients. The most related variable is reliability which has an Exp (B) / OR value = 7.656 meaning that patients who state the reliability of health workers are good, have the opportunity to feel satisfied with hospital services by 7.6 times higher than patients who state the reliability of health workers is not good. Using SEM method, the the biggest factor for achieving inpatient satisfaction in hospital was the responsiveness factor with a total effect of 0.21 which means that the percentage of satisfaction with responsiveness is 79%.

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