

Analysis of customer satisfaction in hospital by using Importance-Performance Analysis (IPA) and Customer Satisfaction Index (CSI)

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Abstract. As a major health referral centre, the hospital demanded to provide comprehensive services provided by a multi-disciplinary team according to the needs of patient. In the expansion of a growing number of hospitals in Yogyakarta especially Sleman area where retreat acquire customers even more stringent, it is necessary to increase the quality of services. There are five determinants of service quality namely: reliability, responsiveness, assurance, empathy, and tangible. Collecting data is done by observation and distributing questionnaires to 70 respondents, and Importance-Performance Analysis and Customer Satisfaction Index are used to determine satisfaction level of outpatients. As a results, six out of twenty attributes need improvement, namely: a) The condition of the hospital is clean, comfortable and tidy; b) Guidance and information boards poly is easy to see and read; c) The ease and accuracy of obtaining information for patients (referrals, lab results, etc.); d) The hospital staff has a quick response to the needs of patients; e) Attention physicians in managing patients and willingness to provide a particular time for consultation; and f) The prescribed medication is suitable and safe. It is known that the value of CSI by 76% means the service is not satisfied the patient.

1 Introduction

Quality is a dynamic condition associated with the products, services, people, processes, and environments that meet or exceed expectations. The quality of service is addressing the needs and desires of customers as well as the accuracy of delivery to offset the customers' expectations. Currently, people increasingly expect the quality of service that can satisfy and provide ease of the registration process or inspection.

According to [1], five attributes can be used to evaluate the quality of services. First, Reliability is the ability to perform the services promised appropriately. It can be seen from the reception of patients quickly and accurately, examination and treatment quickly and precisely, service schedules carried out correctly, and the service procedure is straightforward. Second, Responsiveness is the ability to help customers and provide faster services. It can be seen on the willingness of officials to be responsive to resolve patient complaints; officers provide clear information and easy to understand; as well as quick action when required. Assurance is about the knowledge, ability and courtesy service providers to generate trust and confidence, ability to assign officers to solve problems, personnel skills in working, polite and friendly service, as well as security and trust services. Empathy is the personal attention given to the customers by providing individual attention to each patient, attention to complaints of patients and families, and care for all

patients regardless of social status. Tangible is physical appearance, equipment, personal cleanliness, neatness and comfort of the room, the arrangement of the exterior and interior, completeness, readiness and hygiene tool equipment used, neatness and cleanliness of the hospital staff appearance.

Many researches have been conducted analysis of service quality gap in hospital by using Importance-Performance Analysis (IPA) from the view of patients [8, 10], nurse [4], and physicians [9], while [6] applied SERVQUAL scale to evaluate patient's perception of nine Chinese cities. Scholar [5] proposes an integrative model of the health care consumer satisfaction based on established relationships among service quality, value, patient satisfaction and behavioural intention, and tests it in the context of the South Korean healthcare market. Results showed that service quality emerged as a more important determinant of patient satisfaction than value and both service quality and value have a significant direct impact on behavioural intention while perceived service quality influence value assessment.

Considering the importance of research on the level of satisfaction and attributes of what needs to be improved to meet patient satisfaction, this study aims to measure the quality of service that is performed by using Importance-Performance Analysis (IPA) and measuring customer satisfaction by using Customer Satisfaction Index (CSI). The results will show how the patients' satisfaction level towards services of the hospital as well as it can be utilized

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as an evaluation in decision-making to improve service quality.

2 Theory

2.1 Importance-Performance Analysis (IPA)

It was first introduced by [3] with the aim to measure the relationship between the perception of consumers and improving the quality of services also known as the quadrant analysis. Importance-performance analysis has the function of displaying information relating to the factors which, according to customer service significantly affect their satisfaction and loyalty, and the factors that need to be improved service because the conditions do not currently satisfy the client. The importance-performance analysis combines measurement of the level of interest and the level of satisfaction in the two-dimensional graph that facilitates explanation of data and gains practical proposals. Graph interpretation of importance-performance analysis is elementary, where the graph divided into four quadrants based on the measurement results [3].

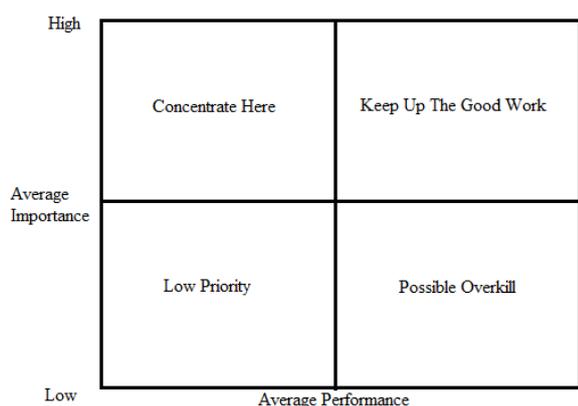


Fig. 1. Cartesius diagram [3]

The formula used as follows:

$$TK_i = x_i / Y_i \times 100 \quad (1)$$

Where:

i : Research attributes

TK_i : Suitability of respondents

x_i : Score of i^{th} performance level

Y_i : Score of i^{th} importance level

$$Q = PE \quad (2)$$

Where:

Q : Performance quality

P : Perceived service

E : Expected service

The meaning of the calculation using the formula above is as follows: positive gap means the service is said to be a surprise and very satisfying; zero means the perceived as expected; while the negative value means unsatisfactory.

2.2 Customer Satisfaction Index

Customer Satisfaction Index can be calculated by using steps as follow [7]:

1. Calculate weighting factors (WF),
2. Calculate Weighted Score (WS),
3. Calculate Weight Median Total (WMT), and
4. Calculate Customer Satisfaction Index.

CSI percentage value in this study was divided into seven criteria, Table 1 shows the percentage CSI criteria.

Table 1. Criteria of CSI

No	Index (%)	Criteria of CSI
1	$X \leq 64\%$	Very Poor
2	$64\% < X \leq 71\%$	Poor
3	$71\% < X \leq 77\%$	Cause for Concern
4	$77\% < X \leq 80\%$	Borderline
5	$80\% < X \leq 84\%$	Good
6	$84\% < X \leq 87\%$	Very Good
7	$87\% < X$	Excellent

Source : Customer Satisfaction Measurement, Satisfaction Index

3 Methodology

This study conducted at the Hospital X, Sleman, Yogyakarta, Indonesia. The object of research in this study was patients as users of hospital services. Primary data was obtained from the results of questionnaires which are important services and the level of service performance and direct interview to patients. While secondary data acquired from journals. Accident sampling method especially simple random sampling technique was used in this study, so that each element of the population has an equal opportunity to be selected into the sample. To determine how large a sample as a representative of the population to be used, the researchers used the following formula:

$$n = \frac{Z^2 \cdot p(1 - p)}{E^2}$$

$$f(p) = p - p^2$$

$$\frac{df(p)}{d(p)} = 1 - 2p$$

$$\frac{df(p)}{d(p)} \text{ maximum, if } \frac{df(p)}{d(p)} = 0$$

$$0 = 1 - 2p$$

$$-1 = -2p$$

$$p = 0,5$$

with confidence level 90% and degree of accuracy (α)

$$10\% = 0.1; \alpha / 2 = 0.05; Z_{\alpha/2} = 1.645$$

$$n = \frac{Z^2 \cdot p(1 - p)}{E^2}$$

$$n = \frac{1,645 \cdot 0,5(1 - 0,5)}{0,1^2}$$

$$n = 67,65 \approx 68 \text{ sample}$$

Therefore, 70 data from respondents was sufficient ($n' (70) > n (68)$). The questionnaire in this study is based on five dimensions of service quality as shown in Table 2.

Table 2. Dimensions and attributes questionnaire

Dimension	Attribute
Tangible	The condition of the hospital is clean, comfortable and tidy
	Board instructions and information poly easily visible and readable
	Examination room complete, neat, clean, comfortable and hygienic
	Toilets are clean and comfortable
	Waiting room administration is clean and comfortable
Reliability	The hospital staffs are tidy and polite
	The process of administrative services patients is quick and easy
	Ease and accuracy of the information for patients (referrals, lab results, etc.)
	Officer pharmacy tells the rules of taking the medication in a clear and complete
Responsiveness	Medical personnel have the proper competence to diagnose and provide medical solutions needed
	The hospital staff quickly in responding to the needs of patients
	The hospital staff showed enthusiasm in working
Assurance	Alertness officers in managing patients
	No discriminatory to deliver services
	Confidentiality of patient data is well preserved
Empathy	Medical staff have the competence and the appropriate certificate to the areas cultivated
	Prescription drugs appropriate and safe
	Attention doctor in managing patients and willingness to give a specific time for the patient to consult
	Hospital staff patience in providing services

In this study, the calculation of reliability test using SPSS 16.0 software can be seen by the value of Cronbach's alpha ranging from 0.824 to 0.920 > 0.6 which means the questionnaire is reliable. While the validity test was calculated from the value of $r_{\text{calculation}}$ on each of the questions with a view looking output table Correct Item - Total Correlation in which every question has greater value than $r_{\text{table}} (X > 0.2352)$ means valid.

4 Results and Discussion

4.1 Customer Satisfaction Index (CSI)

Value of Customer Satisfaction Index (CSI) is an overall customer satisfaction with the services provided by the hospital. Based on calculations that have been done, CSI values obtained for services provided by the hospital is 76%. This means that the attributes of services provided overall still not satisfied the customers and it is necessary to improve and maintain the service performance.

4.2 Importance Performance Analysis (IPA)

After distributing questionnaires and calculating the data, then Cartesian diagram is built by using SPSS 16.

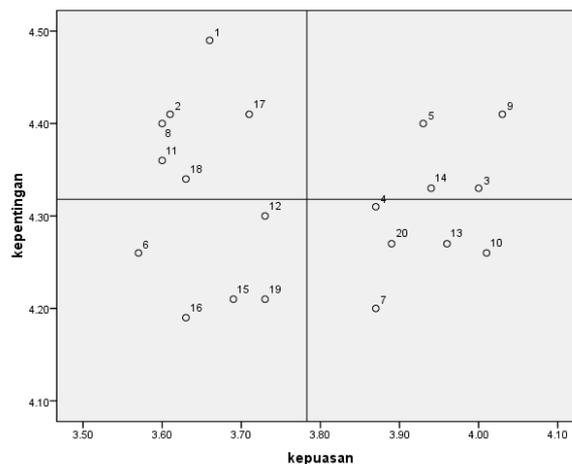


Fig. 2. Cartesian diagram

Quadrant 1. Concentrate Here (high importance & low performance). Factors that lies in this quadrant is regarded as a very important factor to consumers, but the conditions at this time have not been satisfactory, so that management is obliged to allocate qualified resources to improve the performance of these factors. These factors include:

Table 3. Attributes in quadrant 1

No.	Attribute	Gap Score	Priority
1	The condition of the hospital is clean, comfortable and tidy	-0,83	1
2	Board instructions and information poly easily visible and readable	-0,80	2
8	Ease and accuracy of the information for patients (referrals, lab results, etc.)	-0,80	3
11	The hospital staff quickly in responding to the needs of patients	-0,76	4
18	Attention doctor in managing patients and willingness to give a specific time for the patient to consult	-0,71	5
17	Prescription drugs appropriate and safe	-0,70	6

From the results obtained in the first quadrant, then these attributes need to be improved. The improvements that can be made:

- Monitoring and evaluating the staff to improve hospital cleanliness as well as checking of existing facilities on regularly.
- Use color gradation for more clear information as well as visual comfort.
- The hospital should provide the results and detailed explanation to the patient for lab results, referral, etc.
- Training to improve the competence of officers in managing patients, so that patients will be more comfortable.
- Doctors give special attention to each patient and give the motivation to help cure patients faster.

- f. Standard Operational Procedure should be socialized as well as implemented effectively and efficiently.
- g. Pharmacist gives clearer explanation towards drugs given to patients such as the quality of the drug, the dosage, and also the side effects.

Quadrant 2. Keep up the good work (high importance & high performance). The four attributes lie here called by additional factors in which management is obliged to ensure that the performance of the institution under its management can sustain the achievements.

Table 2. Attributes in Quadrant 2

No.	Attributes
3	Examination room complete, neat, clean, comfortable and hygienic
5	Waiting room administration is clean and comfortable
9	Officer pharmacy tells the rules of taking the medication in a clear and complete
14	No discriminatory to deliver services

Quadrant 3. Low priority (low importance & low performance). Factors that lies in this quadrant have a low level of satisfaction and once considered too important to the consumer so that the management does not need to prioritize or pay attention to these factors.

Table 3. Attributes in Quadrant 3

No.	Attributes
6	The hospital staffs are tidy and polite
12	The hospital staff showed enthusiasm in working
15	Confidentiality of patient data is well preserved
16	Medical staff have the competence and the appropriate certificate to the areas cultivated
19	Hospital staff patience in providing services

Quadrant 4. Possible overkill (low importance & high performance). Factors which is located in this quadrant are considered less important so that it is better to allocate resources to other higher priority which needs improvement.

Table 4. Attributes in Quadrant 4

No.	Attributes
4	Toilets are clean and comfortable
7	The process of administrative services patients is quick and easy
10	Medical personnel have the proper competence to diagnose and provide medical solutions needed
13	Alertness officers in managing patients
20	Easy to contact management if there are complaints and its follow-up

Based on the research that has been done, it can be seen that the attributes that need to be improved at each hospital is different. A study conducted by [2] on RUMKITDIK, there are seven attributes that a top priority that needs to be fixed whereas in this study there were six attributes that need to be fixed. However, the similar attributes that need to be improved, namely: a) the results of the examination, b) service to patients, c) the attention of doctors towards patient.

5 Conclusions and Suggestions

5.1 Conclusions

Based on the results of research and discussion that has been done, it can be summarized that the quality of existing services at the Hospital X is not satisfactory for the patient due to the presence of attributes that need to be improved and therefore required an increase in service which is essential to meet patient satisfaction. From this research study conducted by several other sources are similar attributes that need to be improved, namely: a) the results of the examination, b) service to patients, c) the patient's towards doctor's attention.

CSI value obtained in this research is 76% means the service is not satisfied the patient yet, so that it needs to be improved. According to IPA method, improvements to meet patients' satisfaction should be prioritized in several aspects. There are : a) The condition of the Hospital clean, comfortable and tidy;) Guidance and information boards poly easy to see and read; c) The ease and accuracy of obtaining information for patients (referrals, lab results, etc.); d) The hospital staff have a quick response to the needs of the patient; e) Attention physicians in managing patients and willingness to provide a special time for patient consultation. f) The prescribed medication is suitable and safe.

5.2 Suggestions

Based on the above conclusions, the authors can provide recommendations as follows:

- a. Monitoring and evaluating the staff to improve hospital cleanliness as well as checking of existing facilities on regularly.
- b. Use color gradation for more clear information as well as visual comfort.
- c. The hospital should provide the results and detailed explanation to the patient for lab results, referral, etc.
- d. Training to improve the competence of officers in managing patients, so that patients will be more comfortable.
- e. Doctors give special attention to each patient and give the motivation to help cure patients faster.
- f. Standard Operational Procedure should be socialized as well as implemented effectively and efficiently.
- g. Pharmacist gives clearer explanation towards drugs given to patients such as the quality of the drug, the dosage, and also the side effects.

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