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IMPROVEMENT OF LABORATORY SERVICE QUALITY OF OUTPATIENT INSTALLATION AT SEMEN GRESIK HOSPITAL BY QUALITY FUNCTION DEPLOYMENT (QFD) METHOD

Heru Suswojo

Faculty of Public Health , Universitas Airlangga, Indonesia

Email: suswoyoheru@gmail.com

Abstract: A Quality Assessment in a hospital is very important to be done. In 2014, the level of patients' satisfaction in the Outpatient Installation of Semen Gresik Hospital was low with an average reaching 73.75% compared with Hospital Minimum Service Standard i.e. by ≥ 90%. This research aimed to arrange a recommendation of the quality improvement of laboratory services in the Outpatient Installation of Semen Gresik Hospital with *Quality Function Deployment* (QFD) method. This research was an analytic observational research using *Cross Sectional* method in data collection. The research was conducted from April to September 2015. Respondents of this research were patients who received more than twice services at the Outpatient Installation of Semen Gresik Hospital. The final result of this research of *Quality Function Deployment* (QFD) method is House of Quality (HoQ) of Laboratory service in Outpatient Installation of Semen Gresik Hospital. The conclusion of the research was that the first priority of Customers' Needs of Laboratory service was that the result waiting time in laboratory became faster. The recommendation given was to increase supervision role, to evaluate the SOP of the result waiting time, to increase the staff competency, to optimize the existing facilities and to make laboratory direction of outpatient installation.

Keywords: Quality Function Deployment, Laboratory, Outpatient Installation, Customer Service

Introduction

A hospital is a means of public health services which has a very important role in improving public health status. On the other hand, a hospital should be able to provide satisfaction to its customers in order to survive and be able to compete with other hospitals. Azwar (1996) stated that quality is compliance with standards that have been established or in accordance with the requirements. Hospital Minimum Service Standards is a provision for a hospital issued by the Minister of Health of the Republic of Indonesia in the design of government efforts to ensure the quality of hospital services.

The Semen Gresik Hospital is a C-typed private hospital, established since 1995 and has a strategic location in JL. R.A. Kartini 280, Gresik.

Semen Gresik Hospital provides services not only to its employees and families of PT. Semen Gresik but also to employees and family of surrounding companies, insurance participants, the Gresik people and people of surrounding areas. Services provided include basic medical services, medical specialists, supporting services, as well as some subspecialty medical services.

The evaluation result of customers satisfaction of Minimum Service Standards of Outpatient Installation in 2014, based on the evaluation report of the Committee of Patients' Quality and Safety of Semen Gresik Hospital, indicates that in 2014 the customers satisfaction in the Outpatient Installation of Semen Gresik Hospital reached 73.75%, still less than Minimum Service Standards of Hospital of outpatient installation, which had been established by the Minister of Health on Permenkes RI Number 129 Year 2008 about Hospital Minimum Service Standard that is ≥ 90%.

The condition indicated that Semen Gresik Hospital, especially the Outpatient Installation is still lacking or unable to provide services as expected by the patients. Consumers will be satisfied if the reality of service received by consumers is the same with or exceeds their expectations. Satisfaction is one of service quality indicators. The better the quality of service provided to consumers, the more satisfaction that consumers will get. A satisfied customer will re-visit and will potentially be a loyal customer who will recommend to family, friends, relatives and others who need health services to come for treatment, using the services. Loyal customers will have an impact on hospital profitability.

Services that consumers demand is a service which is suitable with consumers' expectations and needs. Quality is an abstract term, which is often translated as the achievement of consumers' needs and expectations. That is why the consumers' expectation is very important in designing a service product. One of methods that can improve the service quality, regarding to consumers' needs and desires, is Quality Function Deployment (QFD).

Quality Function Deployment (QFD) is a process of determining consumers' desires ('what' consumers 'desire') and translating it into service ('how'), so that each functional area can understand and execute it (Heyzer, 2006). The fundamental idea of *Quality Function Deployment* (QFD) is to translate consumers' needs and expectations into the requirements of product or service design (Kusiak, 2007).

The purpose of this research is to arrange a recommendation for improving the quality of medical laboratory support services in the Outpatient Installation of RSSG with *Quality Function Deployment* (QFD) method

Method

This research is an observational analytic research with quantitative approach and uses cross sectional research design. The study was conducted at the Outpatient Installation of Semen Gresik Hospital in April-September 2015. The research population was divided into two groups, namely the external respondents, consisting of the customers of the internal medicine clinic at the Outpatient Installation of Semen Gresik Hospital and the internal respondents, consisting of the team of quality improvement at the Outpatient Installation of Semen Gresik Hospital.

External sample of the research were 50 respondents who were obtained by using the proportional random sampling formula with the inclusion criteria of respondents were patients who had received 2 or more services in the internal medicine clinic in the Outpatient Installation of Semen Gresik Hospital, willing to be respondents and if they were uncooperative, they could be represented by families who took them. The internal respondents were obtained from the entire quality team of Semen Gresik Hospital, amounting to 9 people.

The research variable used was the expectation and fact of the customer service towards the service of the Outpatient Installation of Semen Gresik Hospital and House of Quality. The Variable of *House of Quality* (HoQ) consisted of *Customer's Needs,* IC (*Importance to Customer*), CSP (*Customer Satisfaction Performance*), G (*Goal*), IR (*Improvement Ratio*), RW (*Raw Weight*), NRW (*Net/Normalized Raw Weight*) and Response Technique. Variables used were based on the QFD (*Quality Function Deployment)* method. The research instruments were questionnaires which had been tested for the validity and reliability on 20 respondents and had

been through the ethical study of the research instruments. The research conducted only on the supporting service of medical laboratories of the Outpatient Installation of Semen Gresik Hospital. The analysis of research data used was adapted to some stages to meet the components of each variable to produce quality houses for doctors' services and patients' registrations in the Outpatient Installation of Semen Gresik Hospital.

Results and Discussion

External respondents in the research were patients of outpatient who had come at least twice to the Semen Gresik Hospital. The characteristics of respondents were classified by age, sex, last education and occupation. The results showed that the majority of respondents were 26-35 years old (30 %). Based on sex of external respondents, there are 40% of male respondents and 60% of female respondents. High workload on the respondents has a higher risk of work accidents and higher risk of disease attack. This is because if the high workload is not matched with a good life pattern will have an impact on health. Rosjidi, et al (2014) mentioned that the female sex has a physical condition that is more susceptible to cardiovascular disease because women have high LDL and lack of physical activity.

One indicator of hospital service quality success is customer satisfaction. Kotler (2003) defines satisfaction as the level of one's feelings after comparing performance or results with expectations. Customer satisfaction depends on how far perceived product performance meets customer expectations.

The service of the hospital personnel is an interrelated and independent service system.

Patient service in the outpatient installation (internal medicine clinic) is totally related and cannot be separated with service of medical supporter, in this research is laboratory and radiology. Customers' expectation to the laboratory service with the highest value that was found in sub-service of laboratory test result can be trusted. While, the lowest value of customers' expectation was found in sub-service of result waiting time of laboratory. Before using services of Semen Gresik Hospital laboratories, the customers have already had the perception that the results of laboratory tests can be trusted, but the waiting time of laboratory results is still less rapid.

Customers' assessment to the highest value of laboratories was found in sub-service of complete and sophisticated equipment. While, customers' assessment for laboratory services with the lowest value was found in sub-service of laboratory staff submitting the results in time. Customers assessed that the fact of service provided by Semen Gresik Hospital at laboratory services is averagely met, but the customer assessed that the timing of delivering the results was still not in time.

Table 1 Expectation, Assessment of Service Fact and Customer's Needs of Outpatient Installation Laboratory Service of Semen Gresik Hospital

No	Description	Mean of Expectation (E)	Mean of Assessment (A)	Gap (A-E)	*Customer's Needs*
1	Laboratory officers submit the results in time,	3,4	3,26	-0,14	Yes
2	Waiting time for laboratory results is fast,	3,28	2,88	-0,4	Yes
3	Laboratory officers are skilled in performing the action,	3,38	3,42	0,04	No
4	The results of laboratory tests can be trusted,	3,5	3,52	0,02	No
5	Officers respect the rights and opinions of a patient in sampling to be performed on him,	3,48	3,56	0,08	No

No	Description	Mean of Expectation (E)	Mean of Assessment (A)	Gap (A-E)	*Customer's Needs*
6	The officer gives sufficient time to a patient and his family to communicate,	3,38	3,26	-0,12	No
7	Hospitality and courtesy of laboratory officers in behaving,	3,44	3,46	0,02	No
8	Laboratory officers' clothes are neat and clean, wearing identification,	3,42	3,52	0,1	No
9	Complete and sophisticated equipment,	3,46	3,56	0,1	No
10	Clean and comfortable laboratory examination room,	3,44	3,36	-0,08	Yes
11	Officers give directions on examination or action plans to be done,	3,36	3,36	0	No
12	Laboratory location guidelines are clear,	3,44	3,28	-0,16	Yes
13	Laboratory officers maintain the safety of actions or examinations performed on the patient,	3,44	3,46	0,02	No
14	Laboratory officers maintain the confidentiality of the patient's examination results,	3,48	3,52	0,04	No

Table 1 shows that, on the laboratory service, there is a difference between the expectation achievement to the laboratory service and the service fact assessment with the highest gap value that was found on the sub-service of the fast result waiting time. This result shows that patients have not been satisfied with the service given by the laboratory, so it needs a further effort to meet the needs. A gap has negative value based on the order of gap value and becomes *Customer's Needs* on the laboratory service, if 1) The waiting time of the laboratory result is fast, 2) The direction of the laboratory location is clear, 3) The laboratory officers submit the result in time, 4) The officers give a sufficient time to the patient and the family to make a communication, and 5) The laboratory examination room is clean and comfortable.

Most of the improvement ratio of the laboratory obtained in this research was on Cohen Scale 4 (*very difficult improvement*) that means it needed a very strong effort to improve. Cohen Scale 3 (*difficult improvement*) means it needed a strong effort to improve, it happened in several laboratory services.

The Improvement ratio described the weight or lightness of improvement efforts required by the organization to achieve the consumers' expectations. The magnitude was determined by the Cohen Scale, the greater the scaling value the heavier the hospital's effort to improve service. The improvement ratio was calculated based on the division results between *Goal* (G) and *Customer Satisfaction Performance* (CSP), Goal was the level of customer satisfaction that the organization wanted to achieve the expectations of the consumers. Goal was *expressed on a scale of 1 to 5. Goal in the Outpatient Registration Service obtained through the Group Discussion Forum* (GDF) with the manager and head of the unit incorporated in the Outpatient Installation of Semen Gresik Hospital Quality Team, in which the Goal magnitude was set at number 5 for all service descriptions. The magnitude of goal would affect the magnitude of the *Improvement Ratio* (IR). Hospital management believed that setting goals should be great, so that the achievement of success would be also big or meaningful. In this case, the Semen

Gresik Hospital understood that there was a very big obstacle and it needed a very hard effort to improve the service quality in Semen Gresik Hospital, especially in Outpatient Installation. The highest improvement ratio was found in sub-service of fast laboratory result waiting time. It needed a very hard effort to reach the fast laboratory result waiting time.

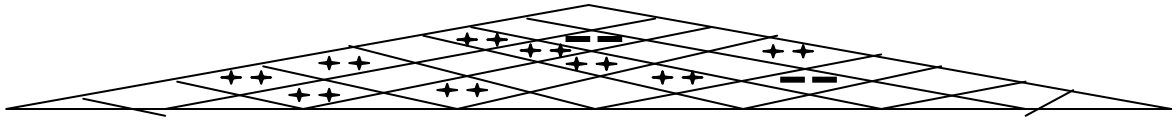
Raw Weight (RW) is the value of data obtained from the multiplication of *Importance to Customer* (IC) with *Improvement Ratio* (IR), while *Normalized Raw Weight* (NRW) is obtained from Raw Weight divided by total Raw Weight on the service. The greater the customer expectation towards a problem the greater weight of the problem will be. The largest net weight or *Normalized Raw Weight* (NRW) in laboratory service research was found in sub-service of fast laboratory result waiting time.

To arrange a *House of Quality* (HoQ) matrix, a technical response arrangement, strong technical response relationships with customer needs (relationships) and technical correlation relationships were required. The arrangement of the technical response of the laboratory services at Semen Gresik Hospital were 1) Optimizing the implementation of *Laboratory Information System* (LIS), 2) evaluating the implementation of the *SOP*, 3) Skill Training, 4) Optimizing the use of laboratory equipment, 5) improving the supervision role, 6) the addition of laboratory officers, 7) The making of direction to Outpatient Installation, and 8) The target of equipment time reparation.

The *Quality Function Deployment* (QFD) method was as a process or structured mechanism for determining customer needs and translating it into relevant technical needs, in which each functional area and level of organization could understand and act. The starting point of *Quality Function Deployment* (QFD) was the customer, as well as knowing the expectations and needs of that customer. From the matrix of *Quality Function Deployment* (QFD) that had been prepared, there was a relationship between Customer's Needs and technical response to the laboratory services in Semen Gresik Hospital with the largest percentage was in a strong relationship, and then followed by a medium and weak relationship. With so many strong and medium relationships, it showed that the technical response being composed was able to answer or meet Customers' Needs.

The roof of the House of Quality matrix is a technical correlation. Laboratory services have 11 relationships and most are strong positive relationships. This means inter-technical responses are mutually supportive. By knowing the technical response that supports and contradicts with other components, it is also known which resources can be used for various functions in an effort to meet customer's needs required by the customer.

HOUSE OF QUALITY OF LABORATORY SERVICE



Picture 1 House of Quality of Laboratory Service

No	Technical Response / *Customer's Needs*	Optimizing the implementation of LIS		Evaluating the implementation of SOP		Improving the officer's competence		Optimizing the use of laboratory equipment		Improving the supervision role		Adding the number of laboratory officers		The making of the direction of Outpatient Installation Laboratory		The target of equipment time reparation		IC	CSP	IR	RW	NRW	Prioritas CN
		A	A*n	B	B*n	C	C*n	D	D*n	E	E*n	F	F*n	G	G*n	H	H*n						
1	Officer submit the result in time	8,44	1,66	6,78	1,33	7,22	1,42	6,78	1,33	5,56	1,09	5,89	1,16	1,67	0,33	6,00	1,18	3,4	3,26	1,53	0,45	0,197	II
2	Result waiting time is fast	6,89	1,59	6,22	1,44	7,44	1,72	7,22	1,67	6,67	1,54	6,78	1,56	1,67	0,38	6,67	1,54	3,28	2,88	1,74	0,53	0,231	I
3	Communication time of patient and family is sufficient	5,89	1,12	6,56	1,25	6,22	1,19	4,56	0,87	5,89	1,12	5,67	1,08	1,11	0,21	2,22	0,42	3,38	3,26	1,48	0,44	0,191	IV
4	Laboratory examination room is clean and comfortable	2,33	0,44	5,67	1,07	3,44	0,65	3,44	0,65	6,44	1,22	4,56	0,86	1,00	0,19	1,89	0,36	3,44	3,36	1,49	0,43	0,189	V

5	Direction to the laboratory is clear	0,67	0,13	2,44	0,47	0,78	0,15	1,33	0,26	3,11	0,60	1,78	0,34	7,67	1,48	0,89	0,17	3,44	3,28	1,52	0,44	0,193	III
	Total of *Relationship*		4,94		5,56		5,13		4,78		5,57		5,01		2,59		3,67						
	Percentage		13,3		14,9		13,8		12,8		15,0		13,4		7,0		9,9						
	Technical Response Priority		V		II		III		VI		I		IV		VIII		VII						

A, B, C, D, E, F, G, H = Strong Value of Customer's Needs and technical response relationship *n = NRW*

The house of quality matrix arranged shows that the priority scale of customer's needs in laboratory services is shown in the dimension of framework of time, which is the fast laboratory result waiting time. It is based on the greatest net worth of weight. The bigger the negative gap between expectation and the assessment of fact customer service on a problem the greater the weight of the problem, and set as the problem priority, since the customer becomes more dissatisfied. The order of priority scale of customer's needs in laboratory services is 1) fast laboratory result waiting time; 2) laboratory officers submit results in time; 3) direction of laboratory location is clear; 4) the officer gives sufficient time to patient and family to communicate; 5) Laboratory examination room is clean and comfortable.

The priority scale of technical response is the key of *Quality Function Deployment* (QFD). This scale lies at the foundation of the House of Quality matrix and describes the relative contribution of the technical response to overall customer satisfaction. The priority scale of the technical response is obtained by summing the result of the multiplication value of the relationship value between the technical response and the net weight of the problem on the customer needs required by the customer. The division result of a technical response to the total value of all technical responses is then multiplied by 100%. The priority is the percentage rank of the management technical response (Cohen, 1995).

The priority of technical response to solve customer needs is 1) increasing the supervision role, 2) evaluating the implementation of SOP, 3) skill training, 4) addition of laboratory officer, 5) optimizing the implementation of *Laboratory Information System* (LIS), 6) optimizing the use of laboratory equipment, 7) Target of repairing equipment, 8) making direction of Outpatient Installation laboratory location.

The result of Focus Group Discussion which was attended by Quality Team of Semen Gresik Hospital as many as 9 people were 1) Improving the role of supervision (customer service) that was delivering information to the patient about the hours of laboratory service result, 2) evaluating the SOP of result waiting time, 3) improving the competence of the officer by dispatching 1 (one) officer to the phlebotomy training, 4) optimizing existing facilities such as *Laboratory Information System* (LIS) and optimizing the use of existing equipment in the laboratory; and 5) making direction of Outpatient Installation laboratory location

Conclusion

The customer need that was immediately met by Semen Gresik Hospital in laboratory services was the fast laboratory result waiting time. Recommendations generated based on FGD and the researcher's study on laboratory services are 1) Placing supervision in the laboratory today as customer services in medical support (laboratory), which will help convey information to the patient about the hours of laboratory service result to avoid miscommunication, 2) Conducting weekly evaluation of laboratory result waiting time, 3) Dispatching a laboratory officer to participate in phlebotomy training, 4) Making a time limit with the information system division about the time of completion of *Laboratory Information System* (LIS) repair which is currently under repair 5) Increasing the volume of laboratory equipment that has the requirements of a certain number of samples for one operation and 6) Producing an outpatient laboratory instruction.

Suggestion

The hospital needs to socialize and discuss the results of this research, both at the top management level, as well as the middle management and the lower management so that the farther steps can be taken in improving the quality of customer service in the Outpatient Installation of Semen Gresik Hospital. The hospital should conduct ongoing evaluations toward the quality of laboratory services at the Outpatient Installation of Semen Gresik Hospital or at other units. Besides, the hospital can also develop a research by using QFD method on other product development services in Semen Gresik Hospital. The research related to QFD method should further incorporate the competitor factor as one of the factors studied.

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