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Analysis of Patient Satisfaction on Disease Polyclinic Services in Pirngadi General Hospital with Fuzzy Service Quality Method

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ABSTRAK

Kebutuhan dan tuntutan pasien terhadap suatu pelayanan kesehatan pada masyarakat merupakan salah satu bentuk kebutuhan dasar. Pihak rumah sakit harus mengetahui sejauh mana kepuasan pasien terhadap pelayanan yang sudah dilakukan pihak rumah sakit. Tujuan penelitian ini adalah untuk melihat dan mengetahui harapan dari pasien mengenai pelayanan yang dilakukan serta mengetahui prioritas perbaikan yang harus dilakukan untuk meningkatkan kualitas dari pelayanan yang ada di rumah sakit pirngadi. Metode yang dipakai untuk menyelesaikan persoalan yaitu metode servqual yang digabungkan terhadap teori fuzzy supaya pengukuran dari persepsi dan harapan pasien memiliki nilai pengukuanr yang tepat. Nilai gap tertinggi adalah pada dimensi reliability sebesar -28,17. Dengan hasil tersebut dapat dilihat pada dimensi reliability menjadi akan menjadi perhatian dalam hal peningkatan kualitas pelayanan terkhusus pada cara maupun sikap dari para petugas kesehatan untuk melayani para pasien yang memiliki nilai gap tertinggi sebesar -31,25 dari semua variabel pertanyaan.

Kata Kunci: Fuzzy, Gap, Kepuasan, Pelayanan, Service Quality

ABSTRACT

The need and demands of patients in health services are includes in basic needs. The hospital must know the extent of patient satisfaction with hospital services. The purpose of this reseearch was to determined patients expectation for the service received and find out the priority improvements to improve the quality of service at Pirngadi Hospital. This method used in this study are the servqual approach combined with fuzzy theory so that the measurement of perceptions and expectations of patients can be measured accurately. The highest gap value is the reliability dimension of -28,17. Thus it can be seen that the reliability dimension is a concern to be able to improve the quality of service especially in ways and attitudes of health workers in serving patients which has the highest gap value of -31,25 of all question variables.

***Keyword**: Fuzzy, Gap, Satisfaction, Service, Service Quality*

A. Introduction

Along with the increasing level of educations, sciences, rapid medical-technology and the socio-economic community conditions, knowledge about the importance of health is in-creasing as well. This has resulted in the needs and demands of the community for good quality health services to become a very important basic need, which is expected to provide good and quality health services for the community.

The government has tried to meet the community's need for health services by establishing several hospitals and health centers throughout Indonesia. However, until now the government's efforts have not been able to meet the expectations of the community. Many community members com- plain and feel dissatisfied with the quality of services provided by government hospitals or health centers. Patient complaints can not be used as a measure to make improvements. The hospital must know in advance for sure the wants and needs and the extent of customers satisfaction with service provide by the hospital so far, so that it can be known with certainty what factors are causing the decline in patients. This is to avoid mistakes in making repairs due to differences in perception between the hospital and the patient.

The patient's wishes are not necessarily the same as what is intended and understood by the hospital. Information from these patients is used to improve the quality of services/services by determining the priority of repairs/improvement ofservice quality that should take precedence.

The fuzzy method used to solve problems where the description of an activities, research and assessments is subjective, uncertain and imprecise. The method used is a combination of the servqual approach and fuzzy theory so that the measurement of customer perceptions or expectations can be measured accurately. Stefano et al (2015) conducted a study on service satisfaction in the hotel industry in Brazil using the Fuzzy Service Quality method and concluded there is a gap in some services, so there needs to be an increase in the quality of services, on the quality of service by the bell boy (waitress) which does not meet the expectations of visitors (Stefano et al, 2015).

Sharma et al (2014) conducted a study on hospital patient satisfaction whose results showed that most of the respondents who filled out the questionnaire were satisfied with the quality of the existing services. This is indicated by the overall satisfaction rate was 73% excellent to good.

B. Literature review

1. Service Quality

Quality is a dynamic condition related to products, services, people, processes and environments that meet or exceed what is expected of service products that are in accordance with what cus- tomers want (Suprapto, 1997). A quality product or service if it can give full satisfaction to consumers, which is in accordance with what consumers expect for a product or service (Feigenbaum, 1991).

Service Quality can be identified by comparing customer perceptions of the actual service received with the expected service. service based on what happens between the service received and cus- tomer expectations (Parasuraman et al, 1985). Service Quality that is used as a reference to measure service quality is Reliability, Assurance, Responsiveness, Empathy, and Tangibles (Goetsch & Davis, 1994).

2. Validity test

Validity is a measure of the goodness of data to use. Valid instruments, meaning that measurements made with certain measuring instruments can be used to obtain data. The validity test formula is as follows (Sugiyono 2012):

$$r_{xy} = \frac{n \sum Xi\, Y - (\sum X)\,(\sum Y)}{\sqrt{\{n \sum Xi\, 2 - (\sum Xi\,)2\}\{n \sum Y\, 2 - (\sum Y)2\}}} \quad (1)$$

If $r_{count} \geq r_{table}$ then the question item is said to be valid with a significance level of 5%.

3. Reliability Test

Reliability test is a tool in measuring the consistency of the questionnaire. A reliable questionnaire if the answers are consistent. if the value of cronbach's alpha <0.6 then the attribute is reliable. The reliability test formula is as follows (Saifuddin, 2004):

$$r = \left(\frac{k}{k-1}\right)\left(1 - \frac{\sum \sigma n^2}{\sigma t^2}\right) \quad (2)$$

Description:
r = Value (coefficient) Alpha Cronbach
k = number of question
$\sum \sigma n^2$ = number of question item variants
σt^2 = varians total

4. Fuzzy Theory

The fuzzy theory was put forward by Prof. Lotfi Zadeh in 1965 (Kusumadewi & Purnomo, 2010). The ability of a fuzzy set to show the value of the degree of membership change and vice versa has very broad uses. This fuzzy system can develop intelligence systems where there are uncertain conditions

5. Membership Function

The membership function is a curve that represents a mapping of input points into a membership value that has a value between 0 to 1. The membership function of several conditions is as follows (Kusumadewi, 2002):

a. Linear Representation

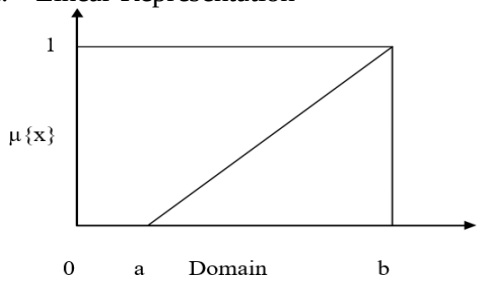
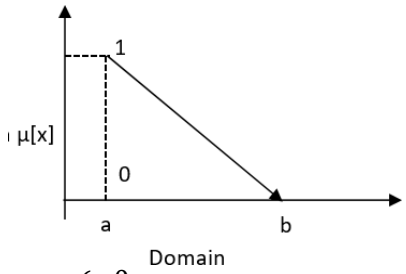


Figure 1. Linier Up Representation

Membership function:



$$\mu(x) = \begin{cases} 0 & x \le a \\ \frac{(x-a)}{(b-a)} & ; \ a \le x \le b \\ 1 & x \ge b \end{cases} \qquad (3)$$

Figure 2. Linier Down Representation

Membership function:

$$\boldsymbol{\mu(x)} = \begin{cases} \frac{(\boldsymbol{b-x})}{(\boldsymbol{b-a})} & ; \ \boldsymbol{a \le x \le b} \\ \boldsymbol{0} & \boldsymbol{x \ge b} \end{cases} \qquad (4)$$

b. Triangle Curve Representation

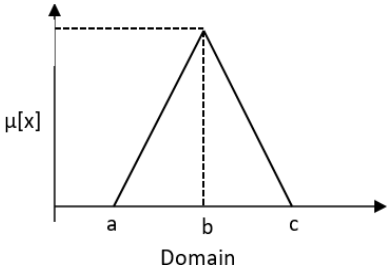


Figure 3. Triangle Curve Representation

Membership function:

$$\mu(x) = \begin{cases} 0 & \\ \frac{(x-a)}{(b-a)} & ; \ x \le a \ atau \ x \ge c \\ \frac{(b-x)}{(c-b)} & a \le x \le b \\ & b \le x \le c \end{cases} \qquad (5)$$

c. Trapezoidal Curve Representation

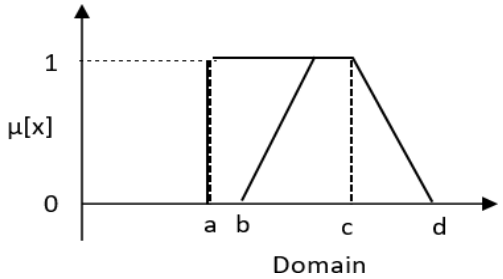


Figure 4. Trapezoidal Curve Representation

Membership function:

$$(x) = \begin{cases} 0 & \\ \frac{(x-a)}{(b-a)} & ; \ x \le a \ or \ x \ge d \\ 1 & a \le x \le b \\ \frac{(d-x)}{(d-c)} & b \le x \le c \\ & x \ge d \end{cases} \qquad (6)$$

d. Representation of the curve of the shoulder shape

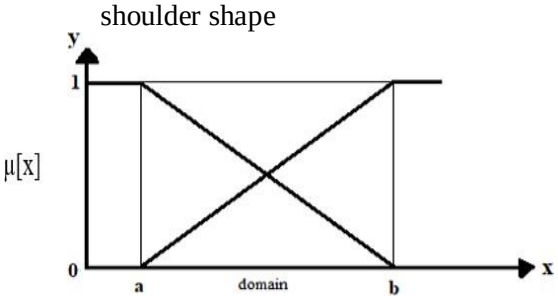


Figure 5. Shoulder Shape Curve Representation

6. Fuzzy Servqual (Service Quality)

Fuzzy-Servqual is useful for giving a more precise value to researchers because of the subjectivity of respondents in filling out the questionnaire.The calculation process in Fuzzy-Servqual consists of fuzzyfication and defuzzification. Fuzzyfication is the determination Triangular Fuzzy Number (TFN) and defuzzification is the determination of the crisp fuzzy value. Triangular FuzzyNumber (TFN) are a range of values from the weight of respondents' answers. TFN consists of three limit values, namely the lower limit value (a), the middle value (b) and the upper limit value(c). Each choice is given a range of values that will be calculated using the formula to determine the TFN. The following is the formula for determining the Triangular

Fuzzy Number (TFN) (Suharyanta & A'yunin, 2012).

a. Lower limit value (a)

$$a_i = \frac{a_{i1}n_1 + a_{i2}n_2 + \cdots + a_{ik}n_k}{n_1 + n_2 + \cdots + n_k} \quad (8)$$

b. Midle limit value (b)

$$b_i = \frac{b_{i1}n_1 + b_{i2}n_2 + \cdots + b_{ik}n_k}{n_1 + n_2 + \cdots + n_k} \quad (9)$$

c. Uper limit valiue (c)

$$c_i = \frac{c_{i1}n_1 + c_{i2}n_2 + \cdots + c_{ik}n_k}{n_1 + n_2 + \cdots + n_k} \quad (10)$$

Meanwhile, defuzzyfication is carried out using the Arithmatic Mean which is formulated as fol-lows:

$$defuzzyfication = \frac{a+b+c}{3} \quad (11)$$

7. Service Quality Gap

Service quality is difference between ofthe service perceived or perceived by con-sumers (perception) with the ideal service desired or requested by consumers (expectations) (Purnama, 2006). Value The difference between the perceived value and the expected value is called the "gap". The gap formula is:

$$Gap = Perception - Hope \quad (12)$$

a. If gap > 0 is positive (Perception > Expectation) then the service is surprising and satisfactory.

b. If gap = 0 (Perception = Expectation) then the service is high quality and satisfactory.

c. If the gab < 0 (Perception < Expectation) then the service is poor quality and unsatisfactory.

C. Result and Discussion

1. Data Validity Test

The Data validity test was conducted to determine the accuracy of data. The validity test using the SPSS 22 software with the following results:

Table 1. Perception Data Validity Test

Attribute Question	r_{count}	rt_{abel}	Result
Q1	0.768	0.197	Valid
Q2	0.841	0.197	Valid
Q3	0.817	0.197	Valid
Q4	0.739	0.197	Valid
Q5	0.819	0.197	Valid
Q6	0.793	0.197	Valid
Q7	0.522	0.197	Valid
Q8	0.511	0.197	Valid
Q9	0.754	0.197	Valid
Q10	0.837	0.197	Valid
Q11	0.738	0.197	Valid
Q12	0.725	0.197	Valid
Q13	0.775	0.197	Valid
Q14	0.786	0.197	Valid
Q15	0.792	0.197	Valid
Q16	0.749	0.197	Valid
Q17	0.703	0.197	Valid

Table 2. Expected Data Validity Test

Attribute Question	r_{count}	rt_{abel}	Result
Q1	0.768	0.197	Valid
Q2	0.841	0.197	Valid
Q3	0.817	0.197	Valid
Q4	0.739	0.197	Valid
Q5	0.819	0.197	Valid
Q6	0.793	0.197	Valid
Q7	0.522	0.197	Valid
Q8	0.511	0.197	Valid
Q9	0.754	0.197	Valid
Q10	0.837	0.197	Valid
Q11	0.738	0.197	Valid
Q12	0.725	0.197	Valid
Q13	0.775	0.197	Valid
Q14	0.786	0.197	Valid
Q15	0.792	0.197	Valid
Q16	0.749	0.197	Valid
Q17	0.703	0.197	Valid

2. Test Reliability Data

The data reliability test was carried out to show that the measuring instrument consistent or not consistent. Re-liability test is done using software SPSS 22. It can be seen that the perception of Cron-bach's Alpha = 1 > 0.6 and expectation Cronbach's Alpha = 0.885 > 0.6 so that b questions on the patient's perceptions and expectations are said reliable.

3. Determinition of Fuzzy Set and Membership Function

This stage is carried out to determine the score given by the respondent .The linguistic variables and the membership function diagram is as follows:

Table 3. Membership Function Diagram for The Expectation Variable

Universe of Conversation	Fuzzy Set Name	Domain	Range
0-100	Not satisfied (TPS)	[0-25]	0 ; 0 ; 25
0-100	Less satisfied (KPS)	[0-50]	0 ; 25 ; 50
0-100	Quite satisfied (CPS)	[25-75]	25 ; 50 ; 75
0-100	Satisfied (PS)	[50-75]	50 ; 75 ; 100
0-100	Very satisfied (SPS)	[75-100]	75 ; 100 ; 100

4. Fuzzyfication and Defuzzyfication

Fuzzyfication is the determination of the TFN. TFN is the tange of values from the weight of the respondents' answers.

Lower Limit Value (a):

$$a_{x1} = \frac{0(2) + 0(8) + 25(9) + 50(28) + 75(53)}{2 + 8 + 9 + 28 + 53}$$

$$a_{x1} = \frac{0 + 0 + 225 + 1400 + 3975}{100}$$

$$a_{x1} = 56$$

Middle Limit Value (b):

$$b_{x1} = \frac{0(2) + 25(8) + 50(9) + 75(28) + 100(53)}{2 + 8 + 9 + 28 + 53}$$

$$b_{x1} = \frac{0 + 200 + 450 + 2100 + 5300}{100}$$

$$b_{x1} = 80{,}5$$

Upper Limit Value (c):

$$c_{x1} = \frac{25(2) + 50(8) + 75(9) + 100(28) + 100(53)}{2 + 8 + 9 + 28 + 53}$$

$$c_{x1} = \frac{50 + 400 + 675 + 2800 + 5300}{100}$$

$$c_{x1} = 92{,}25$$

Meanwhile, defuzzyfication of service perception is calculated using the Arithmatic Mean formula:

$$defuzzyfication = \frac{a + b + c}{3}$$

$$defuzzyfication = \frac{56 + 80{,}5 + 92{,}25}{3}$$

$$defuzzyfication = 76{,}25$$

The next calculation is calculated using Microsoft Excel 2013 software and the results are as shown in the following table:

Table 5. Fuzzyfication and Defuzzyfication of Patient Perception

No	Questions	TFN			Defuzzyfication
		B	A	C	
1	Assurance-1	80.50	56.00	92.25	76.25
2	Assurance-2	71.50	46.75	90.75	69.67
3	Assurance-3	73.75	49.00	91.25	71.33
4	Assurance-4	74.75	50.00	90.00	71.58
5	Emphaty-1	74.25	49.75	91.50	71.83
6	Emphaty-2	70.75	46.00	89.50	68.75
7	Reliability-1	60.00	35.75	80.00	58.58
8	Reliability-2	60.50	36.00	82.00	59.50
9	Reliability-3	67.75	43.25	87.75	66.25
10	Tangibles-1	77.00	52.25	91.50	73.58
11	Tangibles-2	67.50	43.00	87.75	66.08
12	Tangibles-3	70.50	46.00	89.50	68.67
13	Tangibles-4	73.75	49.25	91.75	71.58
14	Responsiveness-1	75.50	50.75	91.25	72.50
15	Responsiveness-2	71.50	46.75	89.50	69.25
16	Responsiveness-3	71.75	47.00	89.50	69.42
17	Responsiveness-4	71.25	47.50	89.00	69.25

Table 6. Fuzzyfication and Defuzzyfication of Patient Expectation

No	Questions	TFN			Defuzzyfication
		B	A	C	
1	Assurance-1	70.00	95.00	100.00	76.25
2	Assurance-2	71.25	96.25	99.75	69.67
3	Assurance-3	71.50	96.50	100.00	71.33
4	Assurance-4	70.75	95.75	100.00	71.58
5	Emphaty-1	70.00	95.00	100.00	71.83
6	Emphaty-2	71.75	96.75	100.00	68.75
7	Reliability-1	72.50	97.00	100.00	58.58
8	Reliability-2	72.00	97.00	100.00	59.50
9	Reliability-3	71.50	96.50	100.00	66.25
10	Tangibles-1	69.00	94.00	100.00	73.58
11	Tangibles-2	69.50	94.50	100.00	66.08
12	Tangibles-3	69.50	94.50	100.00	68.67
13	Tangibles-4	70.00	95.00	100.00	71.58
14	Responsiveness-1	72.00	97.00	100.00	72.50
15	Responsiveness-2	72.75	97.75	100.00	69.25
16	Responsiveness-3	72.50	97.00	100.00	69.42
17	Responsiveness-4	70.75	95.75	100.00	69.25

5. Calculation of Service Quality Gap Value per Atribute

The service quality gap value per attribute is the difference between the patient's perception and expectation. It aims to measure the extent to which the hospital has provided services in accor- dance with the wishes of its patients. The gap per attribute plays a role in evaluating how far these attributes provide satisfaction in providing services. The calculation is:

Table 7: Value of Service Quality Gap Per Atribute

Question Atribute	Perception	Hope	Gap	Rank
Q1	76.25	88.33	-12.08	1
Q2	69.67	89.08	-19.41	9
Q3	71.33	89.33	-18	7
Q4	71.58	88.83	-17.25	6
Q5	71.83	88.33	-16.5	3
Q6	68.75	89.5	-20.75	12
Q7	58.58	89.83	-31.25	17
Q8	59.5	89.67	-30,17	16
Q9	66.25	89.33	-23.08	15
Q10	73.58	87.67	-14.09	2
Q11	66.08	88	-21.92	14
Q12	68.67	88	-19.33	8
Q13	71.58	88.33	-16.75	4
Q14	72.5	89.67	-17.17	5
Q15	69.25	90.17	-20.92	13
Q16	69.42	89.83	-20.41	11
Q17	69.25	88.83	-19.58	10

The Service Quality gap value per attribute is the difference between perception (reality) and expectations which can indicate the extent to which the hospital has provided services accordingto the needs and desires of the patient. From table above, it can be seen that the gap value obtained is less than zero, where the expectations of the patient have not been met properly.

The highest Service Quality gap value is found in the first reliability attribute, namely the way and attitude of health workers in serving patients with a Gap value = -31.25. While the lowest Service Quality gap value is found in tangible attributes, namely skilled officers in serving patients with aGap value = -12.08.

The Gap aims to measure the extent to which the hospital has provided services according to the wishes of his patients. Gap per dimension play a role give evaluation how much far dimensions the give satisfaction in providing services. The calculation results is:

Table 8. Score Gap Service Quality per Dimension

No.	Dimension	Perception	Hope	gap	Rank
1	Reliability	61.44	89.61	-28,17	1
2	Responsiveness	70.11	89.63	-19.52	2
3	Empathy	70.29	88.92	-18.63	3
4	Tangibles	70	88	-18	4
5	Assurance	72.21	88.89	-16.69	5

From results calculation in table, obtained that score gap biggest until gap smallest consecutive is dimensions Reliability, Responsiveness, Empathy, Tangible and Assurance. Based on results which obtained patient feel party house sick need prioritize attributes on dimensions Reliability based on score gap biggest that is 28.17.

D. Conclusion

Based on the results of the discussion and data analysis carried out, it is concluded by using the fuzzy servqual method, it shows that from the five dimensions it is necessary to improve reliability with a gap value of -28.17. From this gap value, the reliability dimension is a concern for Pirnga in Hospital, especially the way and attitude of health workers in serving patients, which also has the highest gap value of all the question variables, which is -31.25. Based on the measurement of the five dimensions of service quality, all dimensions are negative. Thus, what is expected by the patient is not in accordance with the reality received in the service.

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