Improving the Quality of Hospital Services Through the Integration of Servqual, Kano, and Two Iterations of Quality Function Deployment (QFD)

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DOI: https://doi.org/10.54099/aijb.v3i2.987

ABSTRACT

Purpose – This research focuses on the problem of decreasing the number of private hospital visits, one of the causes of which is patient dissatisfaction with the healthcare services provided. This research aims to design recommendations for improving the quality of a hospital’s health services based on the perceived needs of patients so that it is hoped that patient satisfaction can be achieved well.

Methodology/approach – The literature review defines service quality and patient requirements in this research. Servqual and Kano questionnaires are used in this research, with 150 patients as respondents. After the quantitative data has been obtained and analyzed, the next step is to collect qualitative data by conducting interviews with health service management experts. By using QFD analysis, the relations between patient requirements and service characteristics are obtained. Targeted health service criteria will be chosen to be used as recommendations to improve hospital services.

Findings – Some patient requirements are not optimally fulfilled by the hospital. Service characteristics and service critical parts are prioritized for the recommendation in improving the hospital health services.

Novelty/value – The research combines scientific disciplines marketing, namely Service Quality (Servqual) and scientific disciplines operations management, namely Kano and Quality Function Deployment (QFD) first iteration (House of Quality) and second iteration (Part Deployment), with the hospital’s health service as the research object. The integration can be used in other service companies, especially in health services.

JEL (Journal of Economic Literature) Classification Number: M110, M300

INTRODUCTION

The health issues currently occurring in Indonesia have quite an impact on the health industry, especially in the Bandung City area, where over the last five years health complaints from Indonesian people have increased, followed by the number of hospitals starting to increase significantly each year.
One of the private hospitals in the city of Bandung, Indonesia, has experienced a decline in the number of patient visitors over the last five years, starting from 2018. This is also supported by a preliminary survey conducted by researchers, which concluded that the hospital's services had not been able to meet customer satisfaction (Preliminary Survey, 2023). Of course, this problem is quite worrying, and it is very likely that in the future it will continue to decline if the hospital does not implement a solution to this problem (Nottingham et al., 2018).

Apart from that, there are previous researches regarding improving health services based on customer requirements using several theories that focus on improving service quality. First, research was conducted by Lacerda et al. (2022), regarding the evaluation of the quality of public health services in Brazil using dimensional integration Servqual and Kano Model. The results of this research show that 6 patient requirements need to be developed, one of which is a clean and comfortable environment. However, this research only focus on the form of health service requirements that need to be met by service providers without providing details of the actions that must be taken. Second, research was conducted by Gavahi et al. (2023), regarding service improvement radiology unit health by translating customer requirements into service quality specifications, using Quality Function Deployment (QFD). The results of this research show that 7 technical characteristics are not optimal, so one way that needs to be done is to add new technological devices and equipment to increase patient satisfaction. However, this research does not focus on providing priority recommendations regarding what actions are more effective in improving the quality of health services in hospitals. So, this research tries to combine the methods used by the two studies which will be a novelty in this research.

The combination of methods carried out is by combining two scientific disciplines, namely, marketing which consists of Service Quality (Servqual), and operations management which consists of Kano and Quality Function Deployment (QFD). Apart from that, this research also adds a second iteration process or Part Deployment in the QFD analysis, which is a continuation of the QFD first iteration of House of Quality (Ginting et al., 2020). This was done because this research aims to improve the quality of hospital; health services based on patient requirements and focuses on recommendations for effective actions that can be taken by hospital management. So, with this merger, it is hoped that improvements in health services at hospitals can be achieved more optimally.

Based on the explanation above, it can be concluded that this research is necessary to find out what the patients' requirements are. So that recommendations for improving the quality of a hospital's health services can be obtained. It is hoped that these recommendations can increase the competitiveness of hospitals in the health industry, especially in the city of Bandung, in providing the best health services to patients so that patient needs will be met optimally, and patient satisfaction will be achieved.

LITERATURE REVIEW
Service Quality
Service quality or servqual is a service scale measure developed by Parasuraman in 1988, which is used to measure customer perceptions of service quality. By assisting the company in understanding the needs and expectations of its customers, quality promotes the development of a strong relationship with
customers (Hidayah et al., 2019) Customer satisfaction has been influenced by several aspects, including service quality (Samsul et al., 2022). So, it can be said that if the hospital’s services meet high standards of quality, it will lead to increased patient satisfaction (Wulansari and Pratama, 2022). In conclusion, service quality is used as a powerful tool in increasing the superiority and competitiveness of a company or organization, especially in the service sector (Lizarelli et al., 2021; Lacerda et al., 2022). The following is the equation of Servqual (Altuntas and Kansu, 2020; Lacerda et al., 2022), namely as follows:

$$SQ = PS - ES$$  \hspace{1cm} (1)

Where,

- **SQ**: Servqual Score (service quality value)
- **PS**: Perceptions Score (perceived value of services)
- **ES**: Expectations Score (value of service expectations)

Equation model Servqual above, will show the value of the gap between the services or services provided by the company or organization to their customers. There are five dimensions in the theory of service quality, namely as follows (Kotler and Keller, 2022; Lacerda et al., 2022; Gavahi et al., 2023).

1. **Tangible**: namely the physical appearance of service facilities such as equipment, employee appearance, and other physical facilities.
2. **Reliability**: namely the ability to provide promised services reliably and accurately.
3. **Responsiveness**: namely the ability to respond to customer requests or complaints quickly and appropriately.
4. **Assurance**: namely a guarantee of services provided to customers so that a sense of trust arises in the service provider.
5. **Empathy**: namely the attention given by the service provider to customers that is personal or individual in nature.

**Customer Satisfaction**

In competitive markets, customer satisfaction is considered an important element in business strategy so it is hoped that companies can acquire and retain customers (Rachman and Hendayani, 2023). Customer satisfaction will arise when a product or service performs better than expected, where customers will compare the perceived and expected service performance (Indrawati et al., 2021). The way to assess customer satisfaction value is usually called CSV (Customer Satisfaction Value). This value refers to the dimensions determined to improve service quality. The CSV calculation formula is as follows (Ishak et al., 2020; Nurjannah et al., 2020).

$$Gap = Reality - Expectations$$  \hspace{1cm} (2)

$$CSV = Gap \times Importance\ Value$$  \hspace{1cm} (3)

**Kano**

In the Kano Model, several attributes that influence customer satisfaction are classified into six categories. This category is based on the relationship between performance and satisfaction non-linear. The six categories are as follows (Gangurde and Patil, 2018; Lizarelli et al., 2021; Lacerda et al., 2022).

1. **Attributes Must-be (M)**: Basic attributes that customers expect, if they are absent or underperformed, customers will be very disappointed. However, when working well, this attribute doesn’t bring any satisfaction.
2. **Attributes One-dimensional (O)**: Attributes where the higher the performance value, the higher the customer satisfaction value, and vice versa.
3. **Attributes Attractive (A)**: Attributes that are important for proportional customer satisfaction. However, if it is not fulfilled, it won’t bring customer dissatisfaction.
4. **Attributes Indifferent (I)**: Attributes that won’t bring satisfaction if present and won’t bring dissatisfaction if these attributes are absent.
5. **Attributes Reverse (R)**: An additional attribute that brings dissatisfaction when present and satisfaction if this attribute is absent.
Attributes Questionable (Q): Attributes that lead to circumstances when customer satisfaction cannot be defined.

According to Fofan and Asian in (Lacerda et al., 2022), in the Kano Model questionnaire, there are two types of questions or statements, namely functional and dysfunctional. A statement functional is a statement that is expected by respondents if the attribute is applied by the product or service provider. A statement dysfunctional is a statement that is expected by respondents if the attribute is not implemented by the product or service provider.

When analyzing the influence of the availability of a customer requirement attribute on the level of customer satisfaction and dissatisfaction, a calculation is carried out which is called Customer Satisfaction Coefficient (CSC). The calculation formula for CSC is as follows (Lizarelli et al., 2021; Lacerda et al., 2022).

\[
SC\% = \frac{(A\% + O\%)}{(A\% + O\% + M\% + I\%)}
\]

\[
DC\% = \frac{((O\% + M\%) \times (-1))}{(A\% + O\% + M\% + I\%)}
\]

Where,
- SC\%: Satisfaction Coefficient
- DC\%: Dissatisfaction Coefficient
- A\%: Percentage of respondents who meet the category attribute of attractive
- O\%: Percentage of respondents who meet the category attribute of one-dimensional
- M\%: Percentage of respondents who meet the category attribute of must-be
- I\%: Percentage of respondents who meet the category attribute of indifferent

The value range for the level of satisfaction is between 0 and 1. If the resulting value is close to 1, it shows a stronger influence. Meanwhile, if it is close to 0, it shows a weak influence. The negative sign (-) obtained in the dissatisfaction value indicates the direction of influence of the attribute (Lizarelli et al., 2021; Lacerda et al., 2022).

Quality Function Deployment (QFD)
The main tool in QFD First Iteration or the planning phase is interconnected matrices, namely a matrix that connects customer needs and desires "voice of customer” and the design characteristics of a product or service. This matrix is also known as House of Quality or HoQ (Cohen, 1995; Ishak et al., 2020). The House of Quality translates the voice of customer or customer requirements (the WHAT’s) become design characteristics or technical characteristics (the HOW’s). These technical characteristics are obtained based on existing literature studies and also the capabilities and needs of service providers or those who create products (Cohen, 1995; Natte et al., 2016; Gavahi et al., 2023).

In QFD second iteration or what is called the design phase contains part deployment matrices. At this stage, modeling of material data analysis needs is carried out or components that can meet the design target standards in the first iteration of the QFD Method (planning phase). This happens by carrying out the process of translating technical characteristics or design characteristics be a design requirement or critical part (Cohen, 1995; Ginting et al., 2020). Determination critical part based on discussions with the company (voice of the organization) and experts (Ginting et al., 2020).

Research Framework
The research carried out included case study research with quantitative and qualitative data collection (Sekaran and Bougie, 2020; Creswell and Creswell, 2023). The following is the research framework used in this research.
This research uses a combination of marketing disciplines and operations management science, using three main theories, namely Servqual (Service Quality), Kano, and Quality Function Deployment (QFD). In order to achieve the research objectives, a structured questionnaire was used in this research based on the development of Kano's theory by Kano et al. (1994) integrated with the dimensions of Servqual developed by Parasuraman et al. (1988). The results of the questionnaire will be analyzed further using the integration theory Servqual and Kano, which will later produce customer needs that need to be improved and developed to improve the quality of service.

The selected customer needs will then be analyzed using the theory of Quality Function Deployment (QFD) developed by Cohen (1995). The analysis uses two iterations of QFD, namely the planning phase (First Iteration) and the design phase (second iteration). The final results of the QFD will be developed into recommendations for improving the quality of health services. The development of recommendations is carried out using a combined analysis of the integration of three main theories, namely Servqual, Kano, and Quality Function Deployment. There is previous research that examines service quality using a combination of three theories Servqual, Kano, and QFD. First, research conducted by Tan and Pawitra (2001), where this research discusses developing service quality using the integration Servqual, Kano Model, and QFD. Second, research conducted by Lizarelli et al. (2021), where this research develops service quality in companies starting the field of education using integration Servqual, Kano, and QFD via approach fuzzy. The gap between the previous research and this research is the previous research didn’t use the second iteration of QFD and their research object is not the health service area.

**METHOD**

Quantitative data collection was carried out by using a questionnaire instrument. Questionnaires were distributed to 150 patients in a private hospital in Bandung City (that was used as the research object), as research samples, by giving written questionnaires and being guided directly by researchers. The results obtained as many as 61 male respondents and 89 female respondents. Filling out the questionnaire was dominated by 145 respondents in the outpatient respondent category. This research measures the quality of services provided by the hospital through questions according to the following requirement attributes.

<table>
<thead>
<tr>
<th>Requirement Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Requirement Attribute (Satisfaction)</td>
</tr>
<tr>
<td>2. Requirement Attribute (Developed)</td>
</tr>
<tr>
<td>3. Requirement Attribute (Maintained)</td>
</tr>
</tbody>
</table>

Figure 1. Research Framework
Next, qualitative data collection was carried out by using interview techniques with health service experts. According to Saaty, someone can be said to be an expert if they have one of the criteria, namely experts, previous performance, experience, persuasive ability, and efforts towards a problem (Hendayani et al., 2012). Two health service experts are used as sources in the research, namely a health management expert who is also a doctor and the director of a hospital in Jakarta, Indonesia, and the management of the hospital in Bandung, Indonesia, which is the object of research. This qualitative data collection is needed to support the results obtained in the analysis using QFD theory First Iteration and second iteration.

**RESULTS**

**Validity and Reliability Data**

This research validity used the Pearson Correlation Test by correlating item scores with the total item scores on each variable. This validity test uses a two-tailed test with a confidence value used is 95%. The instrument (questionnaire) can be concluded to be valid if the $r$-count $\geq r$-table, which the $r$-table used is 0.361 (Priyatno, 2018). This research also used the Cronbach Alpha Test to do the

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Code</th>
<th>Requirement Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tangible</strong></td>
<td>TN1</td>
<td>The cleanliness of the hospital</td>
</tr>
<tr>
<td></td>
<td>TN2</td>
<td>The tidiness of the hospital</td>
</tr>
<tr>
<td></td>
<td>TN3</td>
<td>The comforts of the hospital</td>
</tr>
<tr>
<td></td>
<td>TN4</td>
<td>Adequate hospital ventilation</td>
</tr>
<tr>
<td></td>
<td>TN5</td>
<td>Modern medical equipment</td>
</tr>
<tr>
<td></td>
<td>TN6</td>
<td>Completeness of hospital medical equipment</td>
</tr>
<tr>
<td></td>
<td>TN7</td>
<td>A sufficient number of medical personnel</td>
</tr>
<tr>
<td></td>
<td>TN8</td>
<td>Ample hospital parking</td>
</tr>
<tr>
<td></td>
<td>TN9</td>
<td>Ease of access of the hospital location</td>
</tr>
<tr>
<td></td>
<td>TN10</td>
<td>The appearance of the entire hospital workforce</td>
</tr>
<tr>
<td><strong>Reliability</strong></td>
<td>RL1</td>
<td>Completeness of hospital service information</td>
</tr>
<tr>
<td></td>
<td>RL2</td>
<td>Provide service as promised</td>
</tr>
<tr>
<td></td>
<td>RL3</td>
<td>The service hours provided are according to the specified schedule</td>
</tr>
<tr>
<td></td>
<td>RL4</td>
<td>Patient privacy is well-maintained</td>
</tr>
<tr>
<td></td>
<td>RL5</td>
<td>Knowledge of hospital personnel who respond to patient needs</td>
</tr>
<tr>
<td></td>
<td>RL6</td>
<td>24 hour hospital service</td>
</tr>
<tr>
<td><strong>Responsiveness</strong></td>
<td>RP1</td>
<td>The willingness of hospital personnel to help patients</td>
</tr>
<tr>
<td></td>
<td>RP2</td>
<td>The speed of hospital personnel in serving patients</td>
</tr>
<tr>
<td></td>
<td>RP3</td>
<td>The willingness of hospital personnel to accept advice</td>
</tr>
<tr>
<td></td>
<td>RP4</td>
<td>Accuracy in providing information on hospital services</td>
</tr>
<tr>
<td></td>
<td>RP5</td>
<td>The willingness to provide information on hospital services from various media</td>
</tr>
<tr>
<td><strong>Assurance</strong></td>
<td>AS1</td>
<td>Good behaviour of hospital personnel in serving patients</td>
</tr>
<tr>
<td></td>
<td>AS2</td>
<td>Guarantee patient safety</td>
</tr>
<tr>
<td></td>
<td>AS3</td>
<td>Guarantee of patient trust in the hospital</td>
</tr>
<tr>
<td><strong>Empathy</strong></td>
<td>EM1</td>
<td>Sensitivity in identifying patient needs</td>
</tr>
<tr>
<td></td>
<td>EM2</td>
<td>Good communication between hospital personnel and patients</td>
</tr>
<tr>
<td></td>
<td>EM3</td>
<td>Affordable prices for hospital health services</td>
</tr>
</tbody>
</table>

Source: Lacerda et al., 2022; Gavahi et al., 2023
reliability test. The instrument (questionnaire) can be concluded to be reliable if Cronbach Alpha’s Value is greater than 0.6, with the maximum value is +1 (Creswell and Creswell, 2023). Validity and reliability tests were carried out using 30 respondents (Creswell and Creswell, 2023). After the calculation, the results state that all variables are valid (r-count ≥ 0.361) and reliable (Cronbach Alpha’s Value > 0.6). So that, the instrument can be used for the data collection.

Servqual and Kano Integration

As previously mentioned, the questionnaire results will be analyzed using the integration Servqual and Kano. The result is the identification of customer or patient needs that need to be improved, developed or maintained. The first identification process is to calculate the gap value of the services provided by the hospital on the satisfaction of patients or customers who visit by using the formula Servqual, customer satisfaction scores, and Kano analysis. The results of the analysis can be seen in Table 2. Based on the results of the analysis Servqual, it can be seen that several attributes fall into the categories of strong attributes and weak attributes. Need attributes that are categorized as the strong category have a positive CSV value. Meanwhile, attributes that are categorized as the weak category have a negative CSV value (Mansur et al., 2019).

Next, each attribute is transformed into a Kano category. Results Kano’s transformation can be seen in Table 2. When each attribute has been transformed, 18 requirements attributes are categorized as one-dimensional (O), 6 requirements attributes are categorized as must-be (M), and 3 requirements attributes are categorized as attractive (A). Then, using combined integration analysis Servqual and Kano by looking at the CSV value, attribute category, and Kano category (Tan and Pawitra, 2001; Ishak et al., 2020; Lizarelli et al., 2021). The attribute that is maintained is the requirement attribute that has a positive CSV value, categorized as the strong attribute category, and the O-M-A Kano category. An improved requirement attribute whose CSV value is positive but close to zero, is categorized as the strong attribute category, and the O-M-A Kano category. Meanwhile, the requirement attribute that is developed is those with a negative CSV value, which is categorized as the weak attribute category, and the O-M-A Kano category (Tan and Pawitra, 2001; Ishak et al., 2020; Lizarelli et al., 2021). The results obtained 16 requirement attributes that need to be maintained, 2 requirement attributes that need to be improved, and 9 requirement attributes that need to be developed.

<table>
<thead>
<tr>
<th>Code</th>
<th>Servqual Score</th>
<th>Gap</th>
<th>CSV</th>
<th>Attribute Category</th>
<th>Kano Category</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>TN1</td>
<td>0.09</td>
<td>0.09</td>
<td>0.28</td>
<td>Strong</td>
<td>O</td>
<td>Maintained</td>
</tr>
<tr>
<td>TN2</td>
<td>-0.09</td>
<td>-0.09</td>
<td>-0.28</td>
<td>Weak</td>
<td>O</td>
<td>Developed</td>
</tr>
<tr>
<td>TN3</td>
<td>-0.22</td>
<td>-0.22</td>
<td>-0.71</td>
<td>Weak</td>
<td>M</td>
<td>Developed</td>
</tr>
<tr>
<td>TN4</td>
<td>0.09</td>
<td>0.09</td>
<td>0.28</td>
<td>Strong</td>
<td>O</td>
<td>Maintained</td>
</tr>
<tr>
<td>TN5</td>
<td>0.15</td>
<td>0.15</td>
<td>0.47</td>
<td>Strong</td>
<td>O</td>
<td>Maintained</td>
</tr>
<tr>
<td>TN6</td>
<td>0.02</td>
<td>0.02</td>
<td>0.06</td>
<td>Strong</td>
<td>A</td>
<td>Improved</td>
</tr>
<tr>
<td>TN7</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.02</td>
<td>Weak</td>
<td>M</td>
<td>Developed</td>
</tr>
<tr>
<td>TN8</td>
<td>-0.13</td>
<td>-0.13</td>
<td>-0.40</td>
<td>Weak</td>
<td>A</td>
<td>Developed</td>
</tr>
<tr>
<td>TN9</td>
<td>0.22</td>
<td>0.22</td>
<td>0.67</td>
<td>Strong</td>
<td>O</td>
<td>Maintained</td>
</tr>
<tr>
<td>TN10</td>
<td>0.08</td>
<td>0.08</td>
<td>0.25</td>
<td>Strong</td>
<td>O</td>
<td>Maintained</td>
</tr>
<tr>
<td>RL1</td>
<td>-0.07</td>
<td>-0.07</td>
<td>-0.20</td>
<td>Weak</td>
<td>M</td>
<td>Developed</td>
</tr>
<tr>
<td>RL2</td>
<td>0.14</td>
<td>0.14</td>
<td>0.40</td>
<td>Strong</td>
<td>O</td>
<td>Maintained</td>
</tr>
<tr>
<td>RL3</td>
<td>-0.15</td>
<td>-0.15</td>
<td>-0.48</td>
<td>Weak</td>
<td>O</td>
<td>Developed</td>
</tr>
<tr>
<td>RL4</td>
<td>0.15</td>
<td>0.15</td>
<td>0.47</td>
<td>Strong</td>
<td>M</td>
<td>Maintained</td>
</tr>
<tr>
<td>RL5</td>
<td>-0.07</td>
<td>-0.07</td>
<td>-0.23</td>
<td>Weak</td>
<td>O</td>
<td>Developed</td>
</tr>
<tr>
<td>RL6</td>
<td>0.18</td>
<td>0.18</td>
<td>0.57</td>
<td>Strong</td>
<td>M</td>
<td>Maintained</td>
</tr>
</tbody>
</table>
Quality Function Deployment (First Iteration)
The second stage is to transform customer requirement attributes into design or technical characteristics. This process uses the theory of Quality Function Deployment (QFD: planning phase or First Iteration). The initial data used in this process are 2 improved requirements attributes and 9 developed requirements attributes, based on the results of integration calculations Servqual and Kano. Technical characteristics were obtained using qualitative data collection with interviews as the instrument used for data collection. Based on the results of interviews with health service experts, from a total of 11 requirements attributes, 13 technical characteristics were obtained (Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022; Expert of Health Service, 2024). Then the weight value of these technical characteristics is calculated based on their relationship with the requirement attributes. This weight value describes how much influence technical characteristics have when implemented in a service. The probability value is the value of the company’s ability to implement existing technical characteristics (Cohen, 1995; Ishak et al., 2020).

The existing technical characteristics of the research object (come from hospital) will be compared with the technical characteristics of competitive data (come from health service experts and other supporting data). If they have the same value, then the technical characteristics can be assumed to have optimal values. Meanwhile, if there is a gap value, then these technical characteristics need to be optimized by improving or developing these technical characteristics. Technical characteristics that need to be developed further are technical characteristics that have a value column weight the largest and have a gap value with competitive data characteristics (Cohen, 1995; Ginting et al., 2020; Gavahi et al., 2023). As a result, there are 7 out of 13 technical characteristics that need to be developed and improved. The result can be seen in Figure 2.

Quality Function Deployment (Second Iteration)
The third stage is to develop technical characteristics into critical parts. This process uses theory Quality Function Deployment (QFD: design phase or second iteration). The initial data from this process are the technical characteristics that need to be developed based on the results of the QFD process analysis (planning phase or first iteration), namely 7 technical characteristics. Likewise with technical characteristics, critical parts were obtained based on the results of qualitative data collection using interviews as a data collection instrument. Based on the results of interviews with health service experts, 29 critical parts were obtained from a total of 7 technical characteristics (Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022; Expert of Health Service, 2024). The result can be seen in Figure 3.
DISCUSSION
The aim of this research is to improve the quality of health services at a private hospital in the city of Bandung, Indonesia, based on the value of the hospital’s customer requirements. This research found that of the 27 patient requirement attributes, 11 main patient requirement attributes were concluded to have not been able to be met by the hospital as a health service provider. These unmet patient requirement attributes are included in the dimensions tangible, responsiveness, and reliability, where these three needs are included in the Kano category one-dimensional, must-be, and attractive. Based on research conducted by Lacerda et al. (2022) stated that the requirement attributes included in these Kano categories are crucial requirement attributes that can influence the level of quality of service. Research conducted by Altuntas and Kansu (2020) also revealed that there are unmet requirement attributes that are categorized into the dimensions of tangible, responsiveness, and reliability. These requirement attributes should be met immediately by improving the quality of the products or services provided to customers. So, based on this, the hospital management is strongly advised to improve its health services to meet the unmet requirement attributes of patients.

In order to answer patient requirement attributes regarding hospital neatness and comfort, several service sections need to be developed. In essence, neatness is closely related to comfort, where things that are very neat will create very good comfort, and vice versa (Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022). Based on the results of the critical part obtained, which can be seen in Figure 3, there are six recommendations for developing health services regarding hospital neatness and comfort. The development of health services involves the need for additional public facilities (children's play areas and dining areas), changes to more efficient spatial layouts, additional maintenance periods for public facilities, additional customer evaluation forums regarding the facilities they receive, additional area and lighting for several spaces, and additional evaluation reports (Bandung City Regional Regulations, 2018; Ministry of Indonesian Health, 2019; Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022; Expert of Health Service, 2024).

The need for a large parking space is also something that can influence the comfort value of a facility (Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022). Developing service facilities so that this requirement attribute can be met, namely by increasing the size of the parking area (especially car parking), adding lighting in the parking area, and rearranging the layout of the parking position for each vehicle that comes. Based on the research results, this requirement attribute is one of the attributes that has a fairly large level of negative satisfaction value. So, if the hospital can meet these requirements, at least most of the problems with the requirements of customer or patient that visiting, have been sufficiently resolved (Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022; Expert of Health Service, 2024).

The requirement attribute for complete hospital medical equipment will be met if several health services are developed. Service development includes adding medical equipment to each specialist unit that does not yet have special medical equipment, increasing the maintenance period for medical equipment, adding lighting to each area of medical equipment, as well as providing free space to store unused medical equipment (Ministry of Indonesian Health, 2019; Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022; Ministry of Indonesian Health, 2023; Expert of Health Service, 2024).

Patients' requirement attributes regarding sufficient numbers of medical personnel will be met if the hospital develops services such as increasing the number of specialist medical personnel and increasing the number of general nursing staff. This leads to activities for recruiting new hospital personnel and activities in managing existing human resources within the hospital. Adding the types of qualifications and competency values for each hospital personnel is something that also needs to be developed. Meanwhile, improving the management of hospital personnel requires activities that can increase the competency value of each individual (Tan et al., 2019). These activities include certification training, workshops, and seminars. The addition of customer evaluation forums on the performance of hospital personnel, and the addition of evaluation periods for hospital personnel is also one way to improve the management of hospital personnel (Ministry of Indonesian Health, 2023; Expert of Health Service, 2024). Ministry of Indonesian Health (2023) states that good management of hospital personnel will increase the competency of all hospital personnel and increase the requirement attributes of patients who receive hospital personnel services. Apart from that, Nottingham et al. (2018) stated that good
hospital staff performance will influence waiting service times that are getting smaller, so that patients will get more satisfaction with the services provided.

Note: Adjusted Importance Percentage = CSV × Kano Multiplier Value (A: 4; O:2; M:1)

Figure 2. Result of QFD First Iteration (House of Quality)
Source: Developed by Authors
Furthermore, regarding patient requirement attributes for the completeness of hospital service information, some developments that can be carried out by hospital management are adding information related to public facility service information (such as floor plans and directions for hospital rooms) (Expert of Health Service, 2024). Apart from that, the information given to all patients must be distributed accurately and quickly. So that this can be carried out well, the hospital is advised to create an integrated information system with various functional elements.

### Figure 3. Results of QFD Second Iteration (Part Deployment)

Below is a table showing the Critical Part Percentage Column Weight for the second iteration of Quality Function Deployment (QFD).

<table>
<thead>
<tr>
<th>Critical Part</th>
<th>Percentage Column Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Percentage Column Weight = Percentage Column Weight of Technical Characteristics from First Iteration

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**Percentage Column Weight = Percentage Column Weight of Technical Characteristics from First Iteration**
media, such as a website, hospital service applications, social media, and more. When a hospital has information services that are systematically integrated across various media, the information needed and obtained by patients and all hospital personnel will be distributed quickly, accurately, effectively and efficiently (Nottingham et al., 2018; Ministry of Internal Affairs, 2022; Sefnedi and Alfarizi, 2022). These requirement attributes include a requirement of service hours provided according to the specified schedule, a requirement of accuracy in providing information on hospital services, and a requirement of willingness to provide information on hospital services in various media (Ministry of Indonesian Health, 2019; Ministry of Indonesian Health, 2020; Ministry of Internal Affairs, 2022; Ministry of Indonesian Health, 2023; Expert of Health Service, 2024).

CONCLUSION

This research aims to improve the quality of health services at a private hospital in the city of Bandung, Indonesia, based on the value of the hospital's customer requirement attributes. Based on integration results Servqual and Kano, there are 11 main requirement attributes of patients regarding health services that have not been fully met. If the hospital continues to ignore this, it could become a big problem. So, a plan to improve health services is needed. The eleven-patient health service requirement attributes were then developed into 13 technical characteristics. Through QFD analysis, the first iteration produces 7 technical characteristics that are not yet optimal. These seven technical characteristics were then developed into 29 critical parts. Through the second iteration, QFD analysis resulted in 21 results critical parts that are considered not optimal. Then, these 21 critical parts will become recommendations to improve the quality of health services. These recommendations are part of the critical part which was obtained from the results of an interview with a health service expert who also served as management director of a public hospital. It is hoped that the results of this research can help the private hospitals improve their health services quality.

This research supports several studies conducted to improve the quality of health services using Servqual, Kano, and Quality Function Deployment (QFD) theories. Researchers recommend combining the three main theories, because they are in line with the research objectives and objectives of the three combined theories, namely determining recommendations for improving service quality based on customer requirements. These theories can be applied by hospitals in improving the quality of their health services. The practical impact on hospitals is that some of the hospital health services quality can be improved according to what patients need and what the hospital’s capabilities are.

ACKNOWLEDGMENT

The authors would like to thank the editor of Asean International Journal of Business for the professional handling of the manuscript. Also, the authors would like to thank all parties who were willing to be involved in the research process.

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