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Research Article

AN ANALYSIS OF OUTPATIENT HEALTHCARE SERVICE QUALITY USING IMPORTANCE PERFORMANCE ANALYSIS (IPA) AND THE KANO MODEL

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Abstract

Healthcare service play a vital role in maintaining, restoring, and improving individual and community health, particularly through primary healthcare facilities such as puskesmass. As frontline healthcare providers, puskesmas are required to deliver high quality services to ensure patient satisfaction and trust. However, Puskesmas Ulee Kareng in Banda Aceh City faces challenges in service quality, as indicated by patient complaints regarding waiting times of 15-20 minutes following the implementation of an online registration system. These delays are caused by limited patient understanding of online form completion and inadequate internet access. This study aims to measure patient satisfaction with service quality at Puskesmas Ulee Kareng using the Importance Performance Analysis (IPA) and KANO methods. Data were collected through questionnaires covering 22 service attributes distributed to 100 patients. The IPA results indicate four attributes in Quadrant I that require immediate improvement, including the availability of modern medical equipment, staff readiness to assist patients, efficient admission procedures, and competent medical personnel who build patient trust. The KANO analysis classifies service attributes into Must-be, Attractive, and one-dimensional categories. The integration of IPA-KANO provides strategic priorities to support continuous service quality improvement at Puskesmas Ulee Kareng.

1. Introduction

Healthcare services constitute a fundamental component of public welfare systems, as they aim to maintain, restore, and enhance the health status of individuals and communities (Seftylia, 2021). These services encompass a wide range of activities, including disease prevention, medical treatment, rehabilitation, and long-term care (Redjeki, 2020). A well- functioning healthcare system not only improves population health outcomes but also contributes to social stability and economic development. Consequently, governments and healthcare providers are increasingly challenged to ensure that healthcare services are delivered efficiently, equitably, and in accordance with the evolving needs of society.

The effectiveness of healthcare systems is not solely determined by the availability of physical infrastructure, medical equipment, or healthcare personnel, but also by the quality of services delivered to patients (Tias et al., 2023). Service quality has become a central concern in healthcare management, as patients today are more informed, more critical, and more demanding regarding the services they receive. In many developing countries, improving healthcare service quality has emerged as a strategic priority due to increasing public expectations, demographic transitions, epidemiological shifts, and rapid advancements in medical technology (Dhingra & Dabas, 2020). As healthcare systems expand and modernize, measuring and managing service quality becomes essential to ensure that improvements translate into meaningful benefits for patients.

In Indonesia, healthcare services are regulated through a multi-tiered system, as stipulated in Government Regulation No. 47 of 2016, which categorizes healthcare facilities into primary, secondary, and tertiary levels (Alfatiyah

& Bastuti, 2023). This hierarchical structure is designed to ensure an efficient referral system and equitable access to healthcare services across different regions. Primary healthcare facilities, particularly puskesmass (Puskesmas), play a critical role as the first point of contact between the healthcare system and the community (Amin et al., 2024). Puskesmas are responsible for delivering comprehensive basic healthcare services, including preventive, promotive, curative, and rehabilitative care, especially for populations in rural and underserved areas (Kementerian kesehatan repubilik indonesia, 2019).

As the frontline of healthcare delivery, the performance of puskesmas has a direct impact on public health outcomes, patient satisfaction, and community trust in the national healthcare system (Yuhefizar et al., 2024). Puskesmas are expected to provide accessible, affordable, and high-quality services while operating under resource constraints and increasing service demand. Therefore, ensuring high service quality at the primary healthcare level is essential not only for improving individual patient experiences but also for strengthening the overall effectiveness and sustainability of the healthcare system.

Despite their strategic importance, the mere existence of healthcare facilities does not guarantee patient satisfaction. Service quality has been widely recognized as a key determinant of patient satisfaction, healthcare utilization, and continuity of care (Deharja et al., 2017). Healthcare services that are responsive, reliable, empathetic, and patient-oriented are more likely to meet patients' expectations and foster positive healthcare experiences (Ningsih & Jakaria, 2023). Patient satisfaction reflects patients' overall evaluation of the healthcare services they receive, based on the comparison between their expectations and perceived performance.

Moreover, patient satisfaction plays a crucial role in shaping healthcare-related behaviors. Satisfied patients are more likely to return to the same healthcare facility, comply with medical advice, adhere to treatment plans, and recommend healthcare services to others (Tanan, 2017). Conversely, dissatisfaction may lead to reduced healthcare utilization, negative word-of-mouth, and diminished trust in healthcare providers. In the context of public healthcare systems, low patient satisfaction can undermine policy objectives aimed at improving population health and achieving universal health coverage.

Evaluating healthcare service quality therefore requires systematic, reliable, and patient-centered analytical approaches that are capable of capturing patients' perceptions and expectations (Syakbani & Rahmiati, 2025). Quantitative methods are commonly used to assess service quality, as they allow researchers and practitioners to identify performance gaps and prioritize improvement efforts. One widely applied method for service quality evaluation is Importance Performance Analysis (IPA) (Adi et al., 2023). IPA enables researchers and healthcare managers to assess service attributes by comparing their perceived importance and actual performance from the patients' perspective (Nickita, 2024).

The results of IPA are typically visualized in a four-quadrant matrix, which categorizes service attributes into four groups: attributes requiring immediate improvement (high importance, low performance), attributes with satisfactory performance that should be maintained (high importance, high performance), attributes of low priority (low importance, low performance), and attributes that may represent an over-allocation of resources (low importance, high performance) (Ujianti et al., 2017). Due to its simplicity, clarity, and managerial relevance, IPA has been increasingly applied in healthcare settings, including hospitals, clinics, and primary healthcare facilities, to identify critical gaps in service delivery and guide quality improvement initiatives (Vidyanto et al., 2023).

However, despite its advantages, IPA has inherent limitations. One key limitation is its assumption of a linear and symmetric relationship between service performance and patient satisfaction, implying that any improvement in service performance will proportionally increase patient satisfaction (Chen & Liu, 2023). In practice, this assumption does not always hold true in healthcare settings (Nuzuli et al., 2025). Patients may perceive certain service attributes as basic requirements that must be fulfilled, but their presence does not necessarily increase satisfaction, while their absence leads to significant dissatisfaction (Silitonga et al., 2024). Conversely, some service attributes may delight patients when present, but their absence does not necessarily cause dissatisfaction.

Such asymmetric and non-linear relationships between service attributes and patient satisfaction cannot be fully captured by IPA alone (Trisna et al., 2019). As a result, relying solely on IPA may lead to suboptimal managerial decisions, such as prioritizing improvements in attributes that do not significantly influence patient satisfaction or neglecting attributes that are critical for preventing dissatisfaction.

To address these limitations, the KANO model has been increasingly adopted as a complementary analytical tool in service quality research (Azzahro' & Syairuddin, 2024). The KANO model classifies service attributes into several categories, including Must-be, One-dimensional, Attractive, Indifferent, and Reverse attributes, based on how they influence customer satisfaction and dissatisfaction (Izzurromadlon & Khoiroh, 2024). Must-be attributes represent basic requirements that are expected by patients; their absence causes dissatisfaction, but their presence does not significantly increase satisfaction. One-dimensional attributes have a linear relationship with satisfaction, where better performance leads to higher satisfaction. Attractive attributes generate high satisfaction when present but do not cause dissatisfaction when absent (Wu et al., 2010).

In healthcare research, the KANO model has been applied to identify critical service elements that significantly affect patient satisfaction, loyalty, and perceived service value (Haumetan & Nababan, 2022). By capturing the asymmetric nature of satisfaction drivers, the KANO model provides deeper insights into patient expectations and preferences, which are essential for effective service design and improvement.

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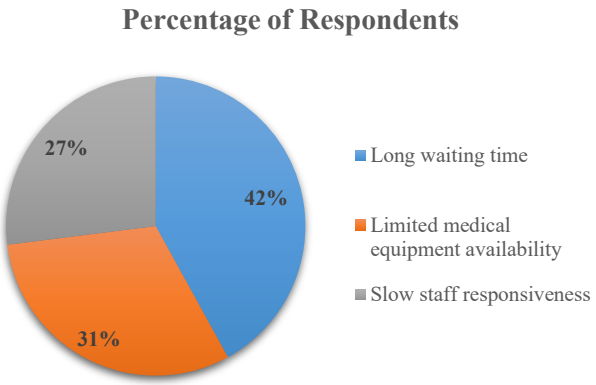

Figure 1. Preliminary Service Issues

Recent studies have highlighted the advantages of integrating IPA and KANO to obtain a more comprehensive and nuanced evaluation of service quality (Ismianti et al., 2023). The integrated IPA-KANO approach allows service attributes to be prioritized not only based on their importance and performance but also on their satisfaction characteristics. This integration supports more effective managerial decision-making by aligning service improvement strategies with patient expectations and the nature of satisfaction drivers (Costaner, 2024). The combined approach has been successfully applied in various service sectors, including healthcare, public services, transportation, and tourism, demonstrating its ability to generate actionable and strategic insights (Aslamiyah, 2022).

Despite the growing application of the integrated IPA-KANO approach, empirical studies focusing on primary healthcare services in Indonesia remain limited, particularly at the *puskesmas* level. Many existing studies focus on hospitals or private healthcare facilities, leaving a research gap regarding service quality evaluation in public primary healthcare settings. Additionally, few studies have explicitly translated the results of integrated IPA-KANO analysis into strategic service categories that can directly guide managerial actions.

Preliminary observations at *Puskesmas* Ulee Kareng indicate several service quality problems in outpatient healthcare services, particularly related to long waiting times, service responsiveness, admission procedures, and the adequacy of healthcare facilities. Patients frequently experience delays during the registration and consultation processes, while some service procedures are still perceived as inefficient and time-consuming. In addition, the availability of medical equipment and the responsiveness of healthcare staff in assisting patients remain important concerns that may influence patients' perceptions of service quality and overall satisfaction. To strengthen these observations, several preliminary service issues identified during the initial observation stage are presented in **Figure 1**.

These conditions indicate the need for a structured evaluation approach to identify priority service attributes that require improvement. Therefore, this study applies an integrated IPA-KANO framework to evaluate patient satisfaction with healthcare services at *Puskesmas* Ulee Kareng in Banda Aceh City. The novelty of this research lies in its structured integration of IPA and KANO to generate strategic service categories, including Major Weapon, Precious Treasure, Survival, Supportive Weapon, Minor Weapon, AND Dusty Diamond. These categories provide practical and intuitive guidance for healthcare managers by linking service performance priorities with the underlying nature of patient satisfaction.

The significance of this research is both theoretical and practical. From a theoretical perspective, this study contributes to the healthcare service quality literature by demonstrating the applicability and advantages of integrated IPA-KANO approach in primary healthcare settings, particularly in *puskesmas* in developing countries. From a practical perspective, the findings provide healthcare managers and policymakers with an evidence-based framework to prioritize service improvements, optimize resource allocation, and enhance patient satisfaction. Ultimately, this research supports continuous quality improvement initiatives and contributes to strengthening public trust in primary healthcare services.

2. Methods

This study adopted a quantitative cross-sectional design using a survey method to assess patient satisfaction with healthcare service quality. The research began with a preliminary study involving problem identification through observation and literature review to determine relevant service attributes.

Primary data were collected using a structured questionnaire consisting of 22 service quality attributes. Each attribute measured patients' perceived performance and importance. Prior to data collection, the questionnaire was tested for validity and reliability to ensure the accuracy and consistency of the measurement instrument. The sample size was determined to meet minimum research requirements, and data were collected from 100 outpatient respondents at *Puskesmas* Ulee Kareng. Questionnaires were distributed directly to ensure completeness of responses.

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Table 1. Research Variables and Questionnaire

Dimension	Code	Service Attributes
Tangibles	T1	The *puskesmas* has adequate facilities such as parking areas, toilets, and buildings
	T2	The rooms inside the *puskesmas* are well-organized, clean, comfortable, and spacious
	T3	The *puskesmas* has clear and well-designed information boards
	T4	The *puskesmas* has clean and hygienic medical equipment
	T5	The *puskesmas* has sufficiently complete, modern, and advanced medical equipment
	T6	The *puskesmas* provides responsive and easily understandable post-treatment consultation services through telephone SMS, and WhatsApp
Reliability	K1	Doctors and nurses always arrive according to the scheduled time
	K2	Doctors provide service and conduct necessary examination according to patients' complaints
	K3	Nurses serve patients promptly after arrival according to doctors' instructions
	K4	Doctors are able to clearly and understandably explain the results of medical examinations to patients
	K5	Nurses provide explanations that are easy for patients understand
Responsiveness	R1	Staff are readily available to assist whenever needed
	R2	Patient admission procedures are handled quickly and without unnecessary complexity
	R3	Cleaning staff promptly carry out their duties when rooms appear dirty
Assurance	A1	Doctors are able to answer patients' questions clearly
	A2	The *puskesmas* is supported by competent medical personnel, fostering patients' sense of safety and confidence in recovery
	A3	Medical (doctors, nurses) and non-medical staff are polite and friendly in providing service
Empathy	E1	Staff provide ease of access to healthcare service
	E2	*Puskesmas* staff provide necessary explanations clearly and in an easily understandable manner
	E3	Doctors provide motivation and emotional support to encourage patients' recovery
	E4	Doctors and nurses ensure that patients feel safe and comfortable during treatment
	E5	Doctors and nurses respect patients' rights by asking for consent before conducting examinations

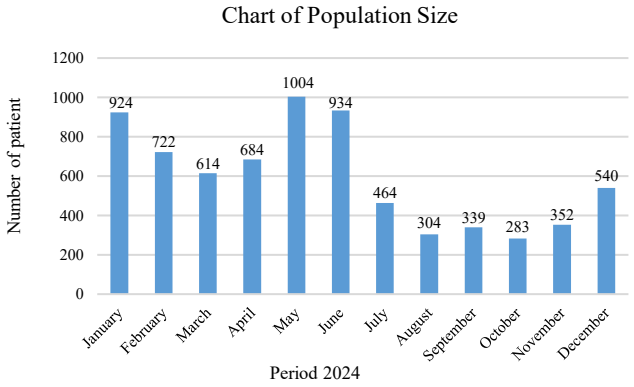

Figure 2. Population Size

Data analysis was conducted using Importance Performance Analysis (IPA) to identify priority service attributes based on importance and performance levels. Attributes were mapped into four quadrants to determine improvement priorities and performance maintenance. Furthermore, the KANO model was applied to classify service attributes according to their impact on patient satisfaction.

Finally, the results of IPA and KANO were integrated to formulate strategic recommendations for service quality improvement and maintenance. This integrated IPA-KANO approach provided a comprehensive basis for managerial decision-making aimed at enhancing patient satisfaction and healthcare service quality.

The questionnaire was developed based on indicators that influence service quality. It was constructed using five service dimensions, namely Tangibles, Reliability, Responsiveness, Assurance, and Empathy. The selection of service attributes was derived from previous studies on patient service quality to ensure that the attributes were relevant and appropriate to the research context. In this study, a total of 22 service quality attributes were identified and included in the questionnaire. Research variables and questionnaire can be seen in **Table 1**.

The population of this study comprised all outpatient visitors at the general clinic of *Puskesmas* Ulee Kareng from January 2024 to December 2024, totaling 7,164 outpatients. The sampling technique employed was purposive sampling, in which respondents were selected based on predefined inclusion criteria relevant to the objectives of the study. Population size can be seen in **Figure 2**.

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Table 2. Results of the Perceived Performance Validity Test

Perceived Performance			
Attribute	**Calculated r-value**	**Critical r-value**	**Description**
TI	0.339	0.195	Valid
T2	0.521	0.195	Valid
T3	0.545	0.195	Valid
T4	0.592	0.195	Valid
T5	0.545	0.195	Valid
T6	0.659	0.195	Valid
K1	0.681	0.195	Valid
K2	0.658	0.195	Valid
K3	0.621	0.195	Valid
K4	0.597	0.195	Valid
K5	0.575	0.195	Valid
R1	0.56	0.195	Valid
R2	0.689	0.195	Valid
R3	0.619	0.195	Valid
A1	0.501	0.195	Valid
A2	0.593	0.195	Valid
A3	0.62	0.195	Valid
E1	0.615	0.195	Valid
E2	0.584	0.195	Valid
E3	0.499	0.195	Valid
E4	0.582	0.195	Valid
E5	0.613	0.195	Valid

Table 3. Results of the Expected Performance Validity Test

Expected Performance level			
Attribute	**Calculated r-value**	**Critical r-value**	**Description**
TI	0.619	0.195	Valid
T2	0.587	0.195	Valid
T3	0.603	0.195	Valid
T4	0.713	0.195	Valid
T5	0.675	0.195	Valid
T6	0.469	0.195	Valid
K1	0.724	0.195	Valid
K2	0.744	0.195	Valid
K3	0.672	0.195	Valid
K4	0.773	0.195	Valid
K5	0.705	0.195	Valid
R1	0.571	0.195	Valid
R2	0.766	0.195	Valid
R3	0.65	0.195	Valid
A1	0.673	0.195	Valid
A2	0.637	0.195	Valid
A3	0.738	0.195	Valid
E1	0.638	0.195	Valid
E2	0.705	0.195	Valid
E3	0.706	0.195	Valid
E4	0.649	0.195	Valid
E5	0.674	0.195	Valid

After data were collected through questionnaire distribution, validity and reliability tests were conducted using SPSS software for both performance and importance levels. Results of the performance validity test can be seen ini **Table 2**. The attributes for the perceived performance level are declared valid because the calculated r -value is greater than the critical r value. Therefore, the attributes in the questionnaire can be used in this study to measure the perceived service performance at *Puskesmas* Ulee Kareng. The expected performance validity test results, as detailed in **Table 3**.

The attributes for the expected performance level are declared valid because the calculated r -value is greater than the critical r value. Therefore, the attributes in the questionnaire can be used in this study to measure patient's expectations of service at *Puskesmas* Ulee Kareng.

The attributes at the perceived performance level are declared reliable because the Cronbach's alpha coefficient is greater than 0,6. Therefore, the questionnaire attributes used in this study are considered reliable and consistent for measuring the perceived service performance at *Puskesmas* Ulee Kareng. This result can be seen in **Tabel 4**.

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Table 4. Results of the Perceived Performance Reliability Test

Perceived performance				
N	**Cronbach Alpha**	**N of items**	**>0.600**	**Description**
100	0.908	22	0.600	Reliable

Table 5. Results of the Expected Performance Reliability Test

Expected performance level				
N	**Cronbach Alpha**	**N of items**	**>0.600**	**Description**
100	0.94	22	0.600	Reliable

Table 6. Gap Score Calculation Results

Attributes	P	E	Q
TI	4.110	4.320	-0.210
T2	4.100	4.310	-0.210
T3	4.120	4.470	-0.350
T4	4.120	4.460	-0.340
T5	3.940	4.530	-0.590
T6	3.760	4.250	-0.490
K1	4.010	4.390	-0.380
K2	4.200	4.370	-0.170
K3	4.090	4.350	-0.260
K4	4.100	4.400	-0.300
K5	4.100	4.440	-0.340
R1	4.080	4.480	-0.400
R2	3.880	4.530	-0.650
R3	4.060	4.410	-0.350
A1	4.320	4.530	-0.210
A2	4.040	4.450	-0.410
A3	4.140	4.440	-0.300
E1	4.210	4.380	-0.170
E2	4.170	4.410	-0.240
E3	4.220	4.450	-0.230
E4	4.280	4.470	-0.190
E5	4.100	4.300	-0.200

The attributes at the expected performance level are declared reliable because the Cronbach's alpha coefficient is greater than 0.6. Therefore, the questionnaire attributes used in this study are considered reliable and consistent for measuring patients' expectations of service at *Puskesmas* Ulee Kareng. This result can be seen in **Table 5**.

3. Results and Discussions

In the Service Quality (SERVQUAL) analysis, the gap score was calculated by subtracting the mean expectation score from the mean perception score using Microsoft Excel. A positive gap value indicates that outpatients' perceptions of the services received at *Puskesmas* Ulee Kareng exceed their expectations, whereas a negative gap value indicates that outpatients' perceptions of the services received are lower than their expectations. Gap score calculation result can be seen in **Table 6**.

Results of the KANO model classification for 22 service quality attributes evaluated by 100 respondents. Each attribute was categorized into one of six KANO categorized Attractive, One- dimensional, Must Be, Indifferent, Reverse and Questionable based on the highest frequency of responses obtained from the functional and dysfunctional questionnaires.

The results show that most service attributes are dominantly classified as Must Be and Indifferent. This indicates that these attributes are considered basic requirements by patients and are expected to be fulfilled during service delivery. Failure to provide Must Be attributes may result in dissatisfaction, while their fulfillment does not significantly increase satisfaction. Indifferent attributes, on the other hand, have minimal impact on patient satisfaction regardless of their presence or absence.

Several attributes, particularly within the tangible and responsiveness dimensions, fall into the Attractive category, suggesting that these attributes can significantly enhance patient satisfaction when provided but do not

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Table 7. KANO Classification of Each Attribute

Attributes	KANO Categories					
	A	**O**	**M**	**I**	**R**	**Q**
T1	14	35	30	20	1	0
T2	17	27	21	32	3	0
T3	28	22	23	24	1	0
T4	31	17	24	27	0	0
T5	34	21	16	26	0	0
T6	28	17	22	32	0	0
K1	26	13	28	32	0	0
K2	28	19	17	33	0	0
K3	27	14	23	32	1	0
K4	23	20	22	33	0	0
K5	24	16	26	32	0	0
R1	31	10	23	33	0	0
R2	25	16	25	31	0	0
R3	29	15	30	24	0	0
A1	21	18	33	25	1	0
A2	24	18	29	28	0	0
A3	17	20	31	30	1	0
E1	23	12	31	32	0	0
E2	29	16	27	26	0	0
E3	29	6	31	32	0	0
E4	26	1	30	40	0	0
E5	33	2	27	34	0	0

Table 8. Attribute Category Mapping Based on Blouth's Formula

Attributes	KANO Categories
T1	O
T2	O
T3	A
T4	A
T5	A
T6	A
K1	M
K2	A
K3	A
K4	A
K5	M
R1	A
R2	M
R3	M
A1	M
A2	M
A3	M
E1	M
E2	A
E3	M
E4	M
E5	A

dissatisfaction if absent. Meanwhile, a smaller number of attributes are categorized as One Dimensional, indicating a linear relationship between service performance and patient satisfaction.

Overall, the KANO model analysis provides valuable insights into how different service attributes influence patient satisfaction. The classification results serve as an important basis for prioritizing service improvement strategies, particularly when integrated with the IPA analyses in subsequent stages of this study. KANO classification can be seen in **Table 7**. After identifying the KANO categories for each attribute, the categories were aggregated using Bloth's formula to determine the dominant classification. The total of positive categories (One-Dimensional, Attractive, and Must-Be) was compared with the total of neutral and negative categories (Indifferent, Reverse, and Questionable). If the positive total was higher, the attribute was assigned to the category with the highest frequency among O, A, or M. Conversely, if the negative total was higher, the attribute was classified based on the dominant category among I, R, or Q. This result can be seen in **Table 8**.

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Table 9. Customer Satisfaction (CS) and Dissatisfaction (DS) Values for Each KANO Attribute

Attributes	KANO Categories						CS	DS
	A	O	M	I	R	Q		
T1	14	35	30	20	1	0	0.494949	-0.65657
T2	17	27	21	32	3	0	0.453608	-0.49485
T3	28	22	23	24	1	0	0.515464	-0.46392
T4	31	17	24	27	0	0	0.484848	-0.41414
T5	34	21	16	26	0	0	0.56701	-0.38144
T6	28	17	22	32	0	0	0.454545	-0.39394
K1	26	13	28	32	0	0	0.393939	-0.41414
K2	28	19	17	33	0	0	0.484536	-0.37113
K3	27	14	23	32	1	0	0.427083	-0.38542
K4	23	20	22	33	0	0	0.438776	-0.42857
K5	24	16	26	32	0	0	0.408163	-0.42857
R1	31	10	23	33	0	0	0.42268	-0.34021
R2	25	16	25	31	0	0	0.42268	-0.42268
R3	29	15	30	24	0	0	0.44898	-0.45918
A1	21	18	33	25	1	0	0.402062	-0.52577
A2	24	18	29	28	0	0	0.424242	-0.47475
A3	17	20	31	30	1	0	0.377551	-0.52041
E1	23	12	31	32	0	0	0.357143	-0.43878
E2	29	16	27	26	0	0	0.459184	-0.43878
E3	29	6	31	32	0	0	0.357143	-0.37755
E4	26	1	30	40	0	0	0.278351	-0.31959
E5	33	2	27	34	0	0	0.364583	-0.30208

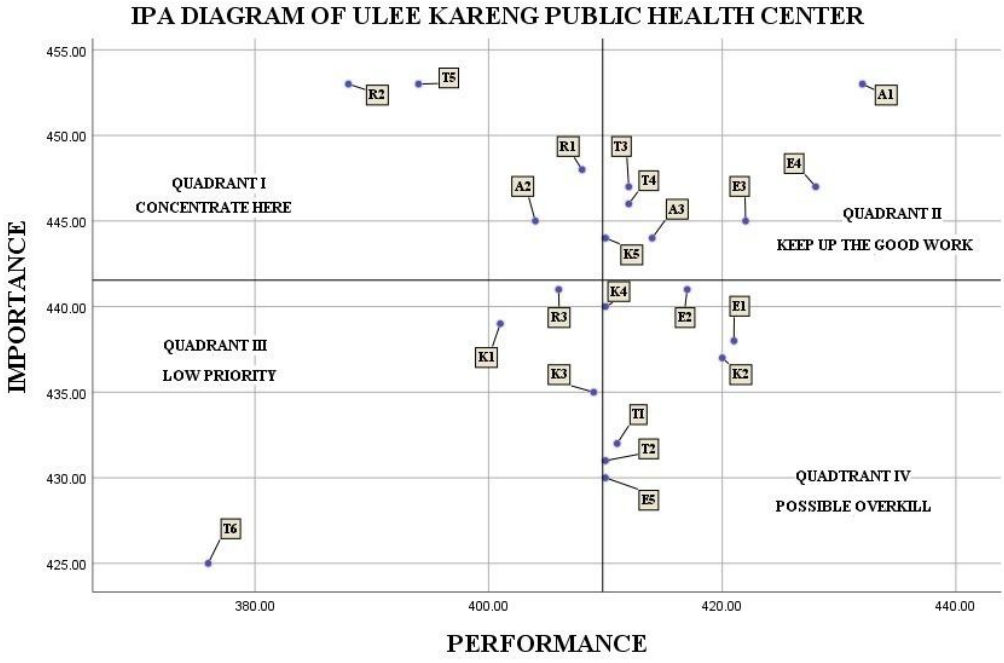

Figure 3. Importance–Performance Analysis (IPA) Diagram of Ulee Kareng *Puskesmas*

Customer Satisfaction (CS) and Customer Dissatisfaction (DS) values were calculated to measure the extent to which each service attribute influences patient satisfaction and dissatisfaction. The CS index was computed using the ratio of Attractive (A) and One-Dimensional (O) categories to the total of Attractive, One-Dimensional, Must Be (M), and Indifferent (I) categories. Meanwhile, the DS index was calculated based on the proportion of One-Dimensional (O) and Must-Be (M) categories relative to the same total, multiplied by 1 to indicate the potential level of dissatisfaction when the attribute is not fulfilled. These indices provide quantitative insight into the impact of each attribute on satisfaction and dissatisfaction levels. This result can be seen in **Table 9**.

In the Importance Performance Analysis (IPA), A quadrant diagram was constructed using IBM SPSS Statistics based on the mean values of perceived performance and mean values of importance (expectations). The purpose of the IPA quadrant diagram is to identify which service attributes fall into each of the four quadrants.

The IPA diagram of *Puskesmas* Ulee Kareng is divided into four quadrants can be seen in **Figure 3**. Quadrant I (high importance- low performance) contains four attributes, indicating that these aspects are considered very important by patients but are perceived to have low performance; therefore, they should become the main priority for

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Table 10. Attribute Plotting

Quadrant	Code	Attribute	Average Performance Score	Average Expectation Score
Quadrant I (Top Priority)	T5	The *puskesmas* has sufficiently complete, modern, and advanced medical equipment	3.940	4.320
	R1	Staff are always ready to assist whenever needed	4.080	4.310
	R2	Patient admission procedures are fast and not complicated	3.880	4.470
	A2	The *puskesmas* is supported by competent medical personnel, creating a sense of safety and trust for patients to recover	4.040	4.460
Quadrant II (Maintain Performance)	T3	The *puskesmas* has clear and well-organized information boards	4.120	4.530
	T4	The *puskesmas* has clean and hygienic medical equipment	4.120	4.250
	K5	Nurses provide explanations that are easy for patients to understand	4.100	4.390
	A1	Doctors are able to answer patients' question clearly	4.320	4.370
	A3	Medical staff and non-medical staff are polite and friendly in providing service	4.140	4.350
	E3	Doctors provide motivation and emotional support to encourage patients to recover quickly	4.220	4.400
	E4	Doctors and nurses provide patients with a sense of safety and comfort during treatment	4.280	4.440
Quadrant III (Low Priority)	T6	The *puskesmas* provides post-treatment consultation facilities that are responsive and easy to understand through telephone, SMS, and WhatsApp	3.760	4.480
	K1	Doctors and nurses always arrive to schedule	4.010	4.530
	K3	Nurses serve patients immediately upon arrival according to the doctor's instruction	4.090	4.410
	R3	Cleaning staff Promptly perform their duties when rooms appear dirty	4.060	4.530
Quadrant IV (Possible Overkill)	T1	The *puskesmas* has adequate facilities such as parking area, toilets, and buildings	4.110	4.450
	T2	The rooms inside the *puskesmas* are well-organized, clean, comfortable, and spacious	4.100	4.440
	K2	Doctors provide services and conduct necessary medical examinations according to patients' complaints	4.200	4.380
	K4	Doctors are able to clearly and easily explain the results of medical examinations to patients	4.100	4.410
	E1	Staff provide ease to access to healthcare services	4.210	4.450
	E2	*Puskesmas* staff provide the necessary explanations clearly and in a way that is easy for patients to understand	4.170	4.470
	E5	Doctors and nurses respect patients' rights by asking for consent before conducting medical examinations	4.100	4.300

improvement to enhance service quality and patient satisfaction. Quadrant II (high importance-high performance) includes seven attributes, meaning that these aspects are highly important to patients and have been well performed; thus, their performance should be maintained in the future. Quadrant III (low importance-low performance) consists of four attributes, which are perceived as less important and have low performance. Quadrant IV (low importance-high performance) comprises seven attributes, indicating that these aspects are considered less important by patients but show high performance.

Based on the results of the integrated Importance-Performance Analysis (IPA) and KANO model, several strategic recommendations for service improvement at the *puskesmas* can be formulated. The integration of these two approaches provides a comprehensive understanding of service attributes by considering both their level of importance and their impact on patient satisfaction. Therefore, the proposed recommendations are focused on enhancing service quality effectively and efficiently in accordance with patient expectations.

The primary focus of improvement should be directed toward attributes classified in Quadrant I, which represent the main priority area. These attributes are considered highly important by patients. However, their current performance has not yet met expectations. In this quadrant, attributes categorized as Survival (Must-be) and Dusty Diamond (Attractive) play a crucial role in determining overall patient satisfaction. The availability of complete, modern and advanced medical equipment is one of the key attributes that requires immediate attention. Improving this aspect will not only enhance diagnostic accuracy and treatment effectiveness but also increase patient confidence in the healthcare services provided. Gradual investment in essential medical equipment, accompanied by regular evaluation of equipment utilization and relevance, is recommended to ensure alignment with patient needs and service demands.

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Staff responsiveness and readiness should be improved through training, clear task allocation, and effective shift management, as these attractive attributes can significantly enhance patient satisfaction. Patient admission procedures classified as survival attributes also need simplification to reduce waiting times and administrative complexity. In addition, improving the competency of medical personnel through continuous professional development and adequate staffing is essential to ensure service reliability and patient trust.

Attributes in Quadrant II should be consistently maintained through regular monitoring and adherence to standard operating procedures, as they already meet patient expectations. For Quadrant IV, service performance should be maintained efficiently without excessive resource allocation, with surplus resources redirected to priority improvements in Quadrant I. Meanwhile, Quadrant III attributes require minimal improvement and should be monitored to prevent performance decline.

Overall, the IPA-KANO strategy emphasizes focusing improvements on high-impact survival and dusty diamond attributes in Quadrant I while maintaining existing strengths and optimizing resource allocation to ensure sustainable service quality. This result can be seen in **Table 11**.

Table 11. Proposed Improvement Strategies

IPA Quadrant	Code	Service Attribute	KANO Category	IPA–KANO Strategy	Decision
Quadrant IV (Possible Overkill)	T1	The *puskesmas* has adequate facilities such as parking area, toilets, and buildings	O	Supportive Weapon	Maintain
Quadrant IV (Possible Overkill)	T2	The rooms inside the *puskesmas* are well-organized, clean, comfortable, and spacious	O	Supportive Weapon	Maintain
Quadrant IV (Possible Overkill)	K2	Doctors provide services and conduct necessary medical examinations according to patients' complaints	A	Precious Treasure	Maintain
Quadrant IV (Possible Overkill)	K4	Doctors are able to clearly and easily explain the results of medical examinations to patients	A	Precious Treasure	Maintain
Quadrant IV (Possible Overkill)	E1	Staff provide ease to access to healthcare services	M	Survival	Maintain
Quadrant IV (Possible Overkill)	E2	*Puskesmas* staff provide the necessary explanations clearly and in a way that is easy for patients to understand	A	Precious Treasure	Maintain
Quadrant IV (Possible Overkill)	E5	Doctors and nurses respect patients' rights by asking for consent before conducting medical examinations	A	Precious Treasure	Maintain
Quadrant I (Top Priority)	T5	The *puskesmas* has sufficiently complete, modern, and advanced medical equipment	A	Dusty Diamond	Improve
Quadrant I (Top Priority)	R1	Staff are always ready to assist whenever needed	A	Dusty Diamond	Improve
Quadrant I (Top Priority)	R2	Patient admission procedures are fast and not complicated	M	Survival	Improve
Quadrant I (Top Priority)	A2	The *puskesmas* is supported by competent medical personnel, creating a sense of safety and trust for patients to recover	M	Survival	Improve
Quadrant II (Maintain Performance)	T3	The *puskesmas* has clear and well-organized information boards	A	Precious Treasure	Maintain
Quadrant II (Maintain Performance)	T4	The *puskesmas* has clean and hygienic medical equipment	A	Precious Treasure	Maintain

IPA Quadrant	Code	Service Attribute	KANO Category	IPA–KANO Strategy	Decision
Quadrant II (Maintain Performance)	K5	Nurses provide explanations that are easy for patients to understand	M	Major Weapon	Maintain
Quadrant II (Maintain Performance)	A1	Doctors are able to answer patients' question clearly	M	Major Weapon	Maintain
Quadrant II (Maintain Performance)	A3	Medical staff and non-medical staff are polite and friendly in providing service	M	Major Weapon	Maintain
Quadrant II (Maintain Performance)	E3	Doctors provide motivation and emotional support to encourage patients to recover quickly	M	Major Weapon	Maintain
Quadrant II (Maintain Performance)	E4	Doctors and nurses provide patients with a sense of safety and comfort during treatment	M	Major Weapon	Maintain
Quadrant III (Low Priority)	T6	The *puskesmas* provides post-treatment consultation facilities that are responsive and easy to understand through telephone, SMS, and WhatsApp	A	Minor Weapon	Low Priority
Quadrant III (Low Priority)	K1	Doctors and nurses always arrive to schedule	M	Minor Weapon	Low Priority
Quadrant III (Low Priority)	K3	Nurses serve patients immediately upon arrival according to the doctor's instruction	A	Minor Weapon	Low Priority
Quadrant III (Low Priority)	R3	Cleaning staff Promptly perform their duties when rooms appear dirty	M	Minor Weapon	Low Priority

4. Conclusion

This study aimed to evaluate service quality at *Puskesmas* Ulee Kareng by integrating Importance Performance Analysis (IPA) and the KANO model in order to identify priority attributes for service improvement and strategic resource allocation. The results clearly address this objective by demonstrating that the combined IPA KANO approach provides a comprehensive framework for understanding not only which service attributes are important to patients, but also how these attributes influence patient satisfaction.

The findings indicate that several service attributes in Quadrant I are considered highly important by patients but still demonstrate relatively low performance, particularly those categorized as Survival (Must-be) and Dusty Diamond (Attractive) attributes. These attributes include the availability of medical equipment, staff responsiveness, patient admission procedures, and the competency of medical personnel, all of which play a critical role in shaping patient satisfaction, trust, and overall service effectiveness at the *puskesmas*.

Based on the integrated IPA-KANO analysis, several actionable and technical improvement strategies are proposed. The availability of medical equipment should be enhanced through the gradual procurement of essential and priority medical devices, supported by routine inventory monitoring and scheduled maintenance programs to ensure equipment readiness and reliability. Staff responsiveness can be improved by conducting regular service excellence and communication training, establishing clearer task distribution, and implementing response time evaluation systems to improve service efficiency. In addition, patient admission procedures should be optimized by simplifying administrative workflows, providing clearer service information, and implementing a digital queue management system to minimize waiting times and improve patient flow. Furthermore, the competency of medical personnel should be strengthened through continuous professional development programs, periodic competency assessments, and appropriate workforce allocation to ensure consistent and reliable healthcare service delivery.

These improvement strategies are expected to enhance healthcare service quality in a more systematic and sustainable manner while aligning service performance with patient expectations and satisfaction priorities. [fs3.1]

Attributes in Quadrant II already meet patient expectations and should therefore be consistently maintained through reguler monitoring and adherence to service standards. In constant, quadrant III attributes require periodic monitoring to prevent further performance decline, while Quadrant IV attributes should be managed efficiently to avoid

excessive resource allocation. Redirecting resources from less critical attributes in Quadrant IV to priority attributes in Quadrant I can support more effective and targeted service improvements.

Practically, the IPA-KANO framework serves as a valuable decision-support tool for healthcare managers at *Puskesmas* Ulee Kareng in prioritizing improvement actions and optimizing resource allocation. However, since this study is limited to a single healthcare center and a specific research period, future studies should involve multiple healthcare facilities, longitudinal approaches, and broader stakeholder perspectives to improve the generalizability and applicability of the findings.

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