Application of the Kano Model to Evaluate Healthcare Management in Public Hospitals

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ABSTRACT

In public hospitals, healthcare management is essential to guaranteeing effective healthcare service delivery. To assess healthcare management characteristics based on patient perceptions in Malaysian public hospitals, this study uses the Kano Model. Healthcare management traits were categorised into Attractive, One-dimensional, Must-be, Indifferent, Reverse, and Questionable using a Kano pairwise questionnaire. The results emphasise the characteristics that most influence the patient's perceptions thus revealing patient priorities. The findings of this study give hospital administrators important information to help them prioritise service enhancements, allocate resources as efficiently as possible, and improve the general standard of healthcare management. The Kano Model's value as a decision-support tool for ongoing quality improvement in Malaysian public healthcare services is shown by this study.

Keywords: Kano Model; Healthcare Management; Patient Perception; Public Healthcare, Service Quality Improvement

INTRODUCTION

Healthcare management has become increasingly critical as hospitals contend with workforce shortages, tightening budgets, and rapid technological change, all occurring simultaneously (Kiran et al., 2025). These pressures are not abstract as they shape how satisfied patients, staff, and families ultimately are with the care a hospital delivers, and that satisfaction is itself a product of deliberate planning, design, and management, not incidental outcomes (Garg, 2023). Hospitals are also expected to keep pace with fast-moving advances in medical research and technology, which raises the bar for what "good management" even means in practice (Redi & Marliana, 2024). The result is a shift away from viewing healthcare quality as a purely clinical matter, toward a management paradigm that treats personnel, processes, and organisational identity as strategic assets requiring active coordination. This shift is driven largely by technological change, market competition, and rising patient expectations. For private providers, in particular, reputation and service quality are no longer peripheral concerns but core strategic assets that determine long-term viability (Hoxha et al., 2026).

Within Malaysian public hospitals specifically, healthcare management means organising resources, staff, workflows, and communication channels to deliver timely, efficient patient care, but under conditions private providers rarely face: strict regulatory oversight, high patient loads, and constrained budgets, all while service demand continues to climb. These constraints make one question especially urgent: which aspects of healthcare management do patients actually consider important, and where should improvement efforts be concentrated? Conventional service quality and patient satisfaction metrics struggle to answer this precisely, because they rarely distinguish between attributes patients treat as basic necessities and those that offer satisfaction only as a bonus. The Kano Model closes this gap. By sorting healthcare management attributes into six categories which

are, Must-be, One-dimensional, Attractive, Indifferent, Reverse, and Questionable, based on patient perception, it gives administrators a much sharper lens for identifying which attributes genuinely drive satisfaction or dissatisfaction.

Applying the Kano Model to Malaysian public hospitals, then, offers a structured way to surface what patients actually prioritise in healthcare management. By identifying which attributes are indispensable, which are directly performance-linked, and which merely add value, administrators can direct limited resources toward what matters most a distinction that carries particular weight in a public system where sustaining quality, accessibility, and effectiveness depends on getting resource allocation right. This study therefore applies the Kano Model to assess healthcare management attributes from the patient's perspective in Malaysian public hospitals, with the aim of identifying priority areas for improving both management practice and service delivery.

Healthcare Management Overview

Effective healthcare management depends on coordinating specialists across medical, nursing, pharmacy, and social work domains toward a shared goal: patient-centred care that accounts for social, psychological, environmental, and physical dimensions of health (G Udensi et al., 2025). Central to this is value creation, cost-effectiveness, patient satisfaction, service quality, and community health outcomes are increasingly the metrics by which "good management" is judged, achieved through integrated service delivery, patient-centred care, and evidence-based decision-making (Sarfaraz & Kumara, 2026). Modern, appropriately specialised infrastructure matters too: dedicated cardio-oncology units embedded within cardiovascular or cancer centres, for instance, illustrate how structural integration in healthcare settings directly shapes clinical outcomes (Jacobs & Shulman, 2024). These pressures compound at the health-system level, where strategy must simultaneously address patient access, health equity, quality indicators, and budget allocation, a balancing act that grows harder in community or rural settings, where low awareness, inconsistent clinical expertise, and a lack of standardised guidelines are persistent problems (Quagliariello et al., 2025).

Healthcare management, in other words, is not reducible to clinical service delivery; it extends across personnel, resources, processes, technology, and communication throughout the system, and this balancing act is felt most acutely in public hospitals, which must meet diverse patient needs under constant resource pressure. Understanding how patients actually perceive these management attributes therefore becomes a practical necessity, not just an academic exercise, it lets healthcare organisations separate what patients see as essential from what shapes satisfaction directly, and from what merely adds value beyond basic expectations. This distinction matters most where it informs resource allocation. Not every management attribute moves patient satisfaction to the same degree, improving one area may shift perceptions far more than improving another, so a systematic method for classifying attributes by their impact on satisfaction and dissatisfaction becomes essential. The Kano Model meets this need directly, sorting attributes into Must-be, One-dimensional, Attractive, Indifferent, Reverse, and Questionable categories. Applied within Malaysian public hospitals, it gives administrators a sharper read on patient expectations, enabling more targeted quality improvement, smarter resource allocation, and management practices that are genuinely patient-centred.

According to Xiong (2024), key areas of healthcare management are as follows:

Table 1. Key Areas of Healthcare Management

Key Management Area	Focus and Description
Allocation Management	The strategic arrangement of skilled staff into positions that align with clinical demand and hospital development needs.
Performance Management	Activating the subjective initiative of staff to enhance work efficiency and quality.
Quality and Safety Management	Implementing systems to monitor medical practices and prevent preventable medical errors.
Training and Development	Improving the team's overall quality through systematic professional education and career planning.

Importance In Healthcare Management

As it focuses on the efficient planning, organization, coordination, and ongoing development of services, healthcare administration is regarded as a crucial and essential topic within contemporary healthcare systems. Due to variables including population expansion, longer life expectancies, and the quick development of medical technology, the complexity of global healthcare ecosystems has expanded, greatly boosting its significance (Albathali & Aldhafeeri, 2025). Although Malaysian public hospitals exhibit good technical efficiency (mean score >0.90), district hospitals are underutilised (30%–50% occupancy), and big institutions are severely overcrowded (90%–115% bed occupancy). With a mean Technical Efficiency (TE) of 0.994, the Cluster Hospital Initiative (CHI) has increased efficiency with the goal of making better use of smaller facilities (Baharuddin et al., 2025).

In Table 2 below, it summarizes the importance of healthcare management as per Albathali & Aldhafeeri (2025):

Table 2. Importance of Healthcare Management

Area of Importance	Key Contributions and Impact
Improving Patient Outcomes	Prevents fragmented care, reduces medical errors, and ensures timely interventions through coordinated care pathways.
System Sustainability	Balances cost containment with quality improvement to ensure long-term viability and affordability of services.
Resource Optimization	Strategically allocates limited personnel, equipment, and financial assets to maximize value and minimize waste.
Operational Efficiency	Uses principles like lean management to streamline workflows, reduce delays, and lower operational costs.
Data-Driven Decision-Making	Replaces intuition with evidence-based strategies using KPIs and real-time dashboards to identify and solve challenges.
Workforce Excellence	Fosters a culture of accountability and collaboration while investing in staff development to maintain a resilient workforce.
Patient-Centred Care	Ensures services are equitable, compassionate, and responsive to individual needs through cultural competence and effective communication.

Kano Model Overview

The Kano Model is a framework for understanding customer satisfaction by classifying features of products or services into five categories: Basic Needs, which are expected and cause dissatisfaction if absent (e.g., clean hospital rooms); Performance Needs, where better performance leads to higher satisfaction (e.g., shorter wait times); Excitement Needs, which are unexpected features that delight customers (e.g., free wellness programs); Indifferent Needs, which have little to no effect on satisfaction (e.g., waiting room wall color); and Reverse Needs, where some customers may prefer a feature's absence (Kim et al., 2025). Previously, Wang et al. (2025) applied the Kano Model to identify nursing service needs of outpatients undergoing thyroid fine needle aspiration biopsy (FNAB). Using a Kano-based questionnaire administered between February and May 2024, the study classified 32 nursing service needs into four Kano categories: Attractive (12), One-Dimensional (10), Must-Be (9), and Indifferent (1). Notably, psychological counselling and service attitude were classified as Attractive (delighter) attributes, while technical skills and prompt complication identification fell under Must-Be (basic expectation) attributes. Quadrant analysis was then used to prioritize improvement areas, allowing the researchers to focus resources on service needs with the greatest potential to enhance patient satisfaction and care quality. Thus, this study intends to evaluate Hospital Management from the patient perspective in Malaysian public hospitals.

Patient perception and their voices are important in many ways in the context of research in healthcare management. Moya et al. (2023) narrates that patient satisfaction and perception are considered important indirect markers of care quality in healthcare management, and most quality models incorporate their measurement. Because it is associated with better patient outcomes, decreased use of medical resources, and increased therapeutic compliance, positive patient perception has practical clinical significance. In addition to

patient expectations and sociodemographic variables, the distinctive features of the healthcare system or facility itself also influence these perceptions.

Table 3. Kano Model Attributes

Attribute Category	Scholarly Definition and Impact
Attractive (A)	Excitatory Factors: Attributes that yield nonlinear satisfaction gains when present, yet do not induce dissatisfaction upon omission as they exceed baseline expectations.
One-Dimensional (O)	Performance Attributes: Factors exhibiting a symmetrical, linear correlation where satisfaction is directly proportional to the level of functional fulfilment.
Must-Be (M)	Threshold Requirements: Fundamental prerequisites perceived as mandatory; while their fulfilment is taken for granted, their absence triggers profound dissatisfaction.
Indifferent (I)	Neutral Factors: Elements that reside outside the stakeholder's value perception; their presence or absence has no statistically significant impact on satisfaction.
Reverse (R)	Counter-productive Attributes: Features where increased provision inversely correlates with satisfaction, suggesting a preference for their exclusion.
Questionable (Q)	Ambiguous Data Points: Anomalous or illogical responses that typically signify methodological errors or respondent misconceptions.

METHODOLOGY

The Kano Model analysis was conducted using a pairwise questionnaire comprising functional (presence of an attribute) and dysfunctional (absence of an attribute) questions for each healthcare management attribute. Respondents selected one of five Kano response options for both questions, and each pair of responses was subsequently classified into one of the Kano evaluation categories: Attractive (A), One-dimensional (O), Must-be (M), Indifferent (I), Reverse (R), or Questionable (Q), using the standard Kano evaluation table. Frequency counts for each category were calculated for every attribute, and the dominant category was identified as the final Kano classification based on the highest frequency. To further evaluate the influence of each attribute on customer satisfaction, the Satisfaction Index coefficient and Dissatisfaction Index coefficient were computed using Berger's satisfaction coefficient formulas: $SS = (A + O) / (A + O + M + I)$ and $SD = -(M + O) / (A + O + M + I)$. These coefficients were then interpreted to determine each attribute's potential to increase satisfaction when fulfilled and to generate dissatisfaction when absent, thereby facilitating the prioritization of healthcare management attributes for quality improvement.

RESULTS AND DISCUSSIONS

Table 4. Demographics

Variable	Category	Frequency	Percent (%)
Gender (Jantina)	Female (Perempuan)	12	63.2
	Male (Lelaki)	7	36.8
	Total	**19**	**100.0**
Race (Bangsa)	Malay (Melayu)	15	78.9
	Indian (India)	3	15.8
	Chinese (Cina)	1	5.3
	Total	**19**	**100.0**
Highest Education Level (Tahap Pendidikan Tertinggi)	Degree (Ijazah Sarjana Muda)	8	42.1
	STPM / Matriculation / Diploma	6	31.6
	Others (Lain-Lain)	5	26.3
	Total	**19**	**100.0**
Marital Status (Status Perkahwinan)	Married (Berkahwin)	14	73.7
	Single (Bujang)	5	26.3
	Total	**19**	**100.0**
Salary (Gaji)	RM 1000 & below	5	26.3

Variable	Category	Frequency	Percent (%)
	RM 1001 - RM 2000	5	26.3
	RM 2001 - RM 3000	4	21.1
	RM 3001 - RM 4000	3	15.8
	RM 4001 & above	2	10.5
	Total	**19**	**100.0**
How Often Visiting Public Hospital	Emergency (Kecemasan)	10	52.6
	Rarely (Sekiranya sakit)	7	36.8
	2-3 days per week	1	5.3
	5-7 days per week	1	5.3
	Total	**19**	**100.0**
Prior Appointments/Treatments in Public Hospital Before	Yes (Ya)	13	68.4
	No (Tidak)	6	31.6
	Total	**19**	**100.0**
Platform of Appointments and Treatments	Face-to-Face (Secara Bersemuka)	17	89.5
	Hybrid (Bersemuka & Dalam Talian)	2	10.5
	Total	**19**	**100.0**

Table 5. Healthcare Management Attributes

Attribute	Dimensions	M	O	A	I	R	Q	Total	Category	CS	DS
HM1	Efficient allocation management	0	4	10	5	0	0	19	Attractive	0.74	-0.21
HM2	Performative use of Technology	2	6	5	6	0	0	19	One-dimensional	0.58	-0.42
HM3	Safe, high-quality care	1	6	3	9	0	0	19	Indifferent	0.47	-0.37
HM4	Clear leadership and accountability	4	6	7	2	0	0	19	Attractive	0.68	-0.53
HM5	Teamwork and Development	2	6	7	4	0	0	19	Attractive	0.68	-0.42

Note: HM1=Healthcare Management1

Explanation Healthcare Management (HM1–HM5)

Three of the five attributes (HM1, HM4, HM5) fall in the Attractive quadrant, with CS values between 0.68 and 0.74, while HM2 is One-dimensional (CS = 0.58) and HM3 is Indifferent (CS = 0.47). HM1 records the highest CS in this dimension (0.74) and the lowest dissatisfaction pull (DS = -0.21), meaning strong resource allocation is the clearest opportunity in this dataset to delight patients without much corresponding risk if it falls short. Overall, this dimension is dominated by Attractive attributes, suggesting hospital management practices are where service improvements would be most keenly appreciated by this age group.

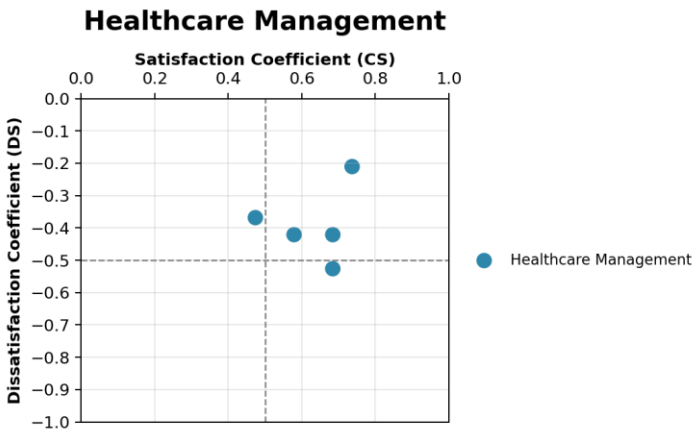

Figure 1 Kano Grid Mapping- Healthcare Management

Looking more closely at the individual attributes, HM4 and HM5 share an identical CS of 0.68, but HM4's DS (-0.53) is noticeably stronger than HM5's (-0.42), indicating that although both attributes delight patients to a similar degree when present, patients react more negatively to HM4's absence. This makes HM4 a higher-priority attribute despite the tied satisfaction score, since the downside risk of neglecting it is greater.

HM2, the only One-dimensional attribute in this dimension, carries a moderate CS (0.58) alongside a comparatively strong DS (-0.42). Because One-dimensional attributes follow a linear satisfaction relationship, performance on HM2 should be treated as a baseline expectation rather than a differentiator: patients will not be especially delighted by strong performance here, but will be clearly dissatisfied if it falls short. This places HM2 in a "must-maintain" category operationally, even though it does not offer the same upside as the Attractive attributes.

HM3's classification as Indifferent (CS = 0.47, DS = -0.37) suggests patients in this sample do not strongly register this attribute either way, whether present or absent. From a resource-allocation standpoint, this makes HM3 a lower-priority candidate relative to the other four attributes: investment here is unlikely to move satisfaction scores significantly in either direction, and effort may be better redirected toward HM1 or HM4.

Taken together, the pattern across HM1–HM5 indicates that Healthcare Management is a dimension where patient satisfaction is driven primarily by "delighter" effects rather than baseline compliance, with the exception of HM2. This has a practical implication for hospital management: rather than treating all five attributes as equally weighted service standards, resources should be triaged toward the Attractive attributes (particularly HM1 and HM4) to maximize satisfaction gains, while ensuring HM2 is not allowed to degrade below expected service levels, since doing so would actively drive dissatisfaction rather than simply forgoing a potential gain.

The Healthcare Management dimension performs above average on satisfaction potential, four of its five attributes (HM1, HM2, HM4, HM5) exceed the overall mean CS, while its dissatisfaction pull is generally milder than the overall average, aside from HM4. This suggests that relative to the rest of the attribute set, Healthcare Management is a comparatively strong-performing dimension in terms of patient delight, and the hospital may find it more efficient to consolidate gains here before addressing dimensions where attributes skew more heavily toward Must-be or One-dimensional classifications, which typically demand baseline compliance rather than offering room for differentiation.

Future Directions

Based on these findings, several recommendations can be made for both future research and hospital practice, Firstly, given that HM1 and HM4 emerged as the strongest Attractive attributes, future studies should investigate the specific service components underlying these attributes in greater depth, for instance, through qualitative interviews or open-ended survey items to identify precisely which aspects of healthcare management practice patients find most delightful, so that hospitals can replicate and scale these elements deliberately rather than inferring them indirectly from CS/DS scores alone.

Second, because HM2 was classified as One-dimensional, hospital management should treat this attribute as a non-negotiable service standard and incorporate it into routine quality-monitoring processes (e.g., regular audits or patient feedback loops) to ensure performance does not degrade, since deterioration here would directly and predictably increase dissatisfaction.

Third, given HM3's Indifferent classification, future research with a larger and more diverse sample is recommended to confirm whether this result holds consistently, since Indifferent classifications in small pilot samples can sometimes reflect insufficient variance in responses rather than a genuine lack of patient concern. A larger-scale study would help validate whether HM3 should truly remain a lower priority or whether it warrants re-examination.

CONCLUSION

In summary, the Kano analysis of the Healthcare Management dimension reveals a profile weighted toward

Attractive attributes, with HM1, HM4, and HM5 emerging as the strongest candidates for driving patient delight, HM2 functioning as a One-dimensional baseline requirement that must not be allowed to slip, and HM3 registering as largely Indifferent to patients in this sample. HM1 stands out as the single most promising target for improvement, combining the highest satisfaction coefficient (0.74) with the lowest dissatisfaction pull (-0.21), making it the attribute most likely to yield goodwill gains without corresponding downside risk. Healthcare Management performs above the norm on satisfaction potential, positioning it as a dimension where targeted investment: particularly in HM1 and HM4: can meaningfully differentiate the hospital's service offering, provided that HM2's baseline performance is safeguarded and resources are not diluted by over-investing in the comparatively low-impact HM3.

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