

Staffs Perceptions of Important Indicators and Self-Assessment of Hospital Food Service Operations Performance

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ABSTRACT

Background: Enhancing hospital food services performance can be challenging as identifying components that influence accurate evaluation is a critical element of organisational success. Thus, this study was conducted to assess staff perceptions of key performance indicators and their self-evaluation on the performance of hospital food service operations. **Methods:** This cross-sectional survey was conducted using a validated and reliable self-administered questionnaire. Respondents were selected from the food service staffs at Malaysian hospitals based on specific inclusion and exclusion criteria. The data analysis was performed using IBM SPSS version 26.0 software. The sociodemographic data was examined, and the means of importance and performance indicators were compared using a paired-sample t-test. The IPA grid was generated by integrating the means scores of importance and performance. **Results:** A total of 160 respondents comprising 35 males (21.9%) and 125 females (78.1%) completed this survey. The gap analysis reveals that eleven indicators demonstrate a significant difference between staff evaluation of hospital food service performance and their perceptions of the importance of food service attributes ($p < 0.01$). Five indicators have been identified by the IPA grid that require improvement in the areas of food production and distribution management, as well as patient and customer service management. **Conclusions:** The findings suggest that hospital food service providers should focus on using a variety of food ingredients, evaluating their menus, and monitoring the health and cleanliness of their staff in order to improve their service quality.

Keywords:

Performance measurement; hospital food service; food service operation; importance-performance analysis; quality indicators

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INTRODUCTION

Performance improvement in food service organisations refers to the ongoing assessment and adaptation of the organisation's operations and procedures to increase the probability of accomplishing the desired outcomes and better satisfy the demands of customers (Payne-Palacio & Theis, 2016). A performance improvement disposition in food industry implies taking all the required steps to ensure high-quality food products and services, optimal service quality, increased satisfaction, and financial success (Gregoire, 2017). This approach aims to maximise quality and efficiency, improve overall performance, and provide benefit consumers (Payne-Palacio & Theis, 2016).

To assess quality and identify marketing-relevant performance aspects, Martilla and James (1977) developed a straightforward and useful tool known as the Importance-Performance Analysis (IPA). The IPA has been widely used to guide for quality improvement across diverse domains including healthcare, IT service, service

quality, customer evaluation, marketing management, hospitality and tourism, banking, education, and transportation (Markazi-Moghaddam et al., 2019).

Moreover, previous research has demonstrated that IPAs are useful instruments for evaluating the importance and performance of food service quality attributes in various settings, including hospitals, childcare facilities, educational institutions, residential food services, and dining establishments (Abdelaty & Abdel Aal, 2017; Choi & Ju, 2022; Lee, 2016; Lee & Park, 2016; Park et al., 2017; Park & Lyu, 2011; Roy et al., 2020). Additionally, numerous studies have been conducted in South Korea adopting the IPA to determine alternatives that may improve quality in food service operations within healthcare settings (Lee, 2012, 2016; Lee & Park, 2016; Park & Lyu, 2011; Song & Bae, 2013).

Previous studies in Malaysia have employed the IPA approach to evaluate customer satisfaction and quality improvement in various sectors, including banking,

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healthcare, tourism, and business marketing (Dewi et al. 2013; Irwana et al., 2018; Islam & Madkouri, 2018). However, only one study used the IPA approach to evaluate how satisfied customers were with the food service in a university cafeteria (Akbara et al., 2021).

The quality of hospital meal service is generally assessed using patient satisfaction, food consumption, and food waste indicators (Dall'Oglio et al., 2015). However, understanding hospital food service management is also essential for enhancing food service operations (Vijayakumaran et al., 2018). The viewpoints and experiences of key stakeholders increase the understanding of hospital food procurement, production, and service about patient orders, which in turn influence patient satisfaction and food intake (Ahmed, 2018; Ahmed et al., 2015; Vijayakumaran et al., 2018).

Previous studies have shown that the overall satisfaction with food services can be predicted by the quality of the food, however, limited studies have indicated that the overall process involved in food service operations play an essential role in patient satisfaction with food quality (Ahmed, 2018; Ahmed et al., 2015). In this study, the IPA approach was proposed to address this gap by evaluating staff perceptions of important indicators and their self-assessment of the performance hospital food services, aiming to enhance overall hospital food service quality.

MATERIAL AND METHODS

Study design and data collection

This cross-sectional survey was carried out between November 2023 and January 2024. Prior to data collection, ethical approval was acquired from the Malaysian Ministry of Health, the Clinical Research Council, and the Research Management Institute at Universiti Teknologi MARA. The respondents were contacted by phone, email, and the WhatsApp app to obtain their consent for the collection of their data. Respondents were chosen based on the following criteria: they had to be Malaysian citizens; be employed in the food service and dietetics department's administrative team as a head of department, manager, dietitian or catering dietitian, catering or assistant catering officer; have at least six months of experience in the field; and be fluent in Malay and/or English. Individuals who did not meet the inclusion criteria were excluded from the study. The questionnaires were distributed via a Google Form URL link. Before completing the questionnaire, their informed verbal consent was obtained.

Sample size

The sample size for this study was determined using the formula provided by Bujang et al. (2012). The formula indicates that for response formats containing four or more items, it is advisable to have a minimum sample size of three respondents per item for conducting exploratory factor analysis. This study employed a five-point Likert scale, necessitating a minimum sample size of 1:3 for each item. Consequently, the minimum sample size necessary for a scale consisting of 17 items is 61 samples, accounting for a 20% dropout rate.

Survey instrument

A revised self-administered questionnaire developed by Osman et al. (2023) was utilised in this study. The questionnaire contained three sections: A) socio-demographic variables; B) the perception of importance indicators; and C) an evaluation of performance indicators. The sections B and C provided clear definitions of the "importance" and "performance" indicators to facilitate a better understanding prior to the respondents assigning their scores. All importance indicators were rated on a 5-point scale, with 1 indicating "very unimportant" and 5 indicating "extremely important". Another 5-point scale varied from 1 (far below standard) to 5 (far above standard).

Validity and reliability of the survey instrument

Prior to the distribution of the questionnaires, IBM SPSS Statistics version 26 for Windows was used to assess construct validity and internal consistency. For construct validity, the Exploratory Factor Analysis (EFA) with the principal component method of extraction and varimax rotation was used to estimate the number of factors and guide decisions on whether to retain or reject items. The statistical significance level for the p-value was set at less than 0.05. The repeated EFA indicated three factors: food production and distribution management, patient or customer service management, and operational management, which accounted for 69.9% of the total explained variation based on scree plot analysis and Eigenvalues greater than 1.0. The factor loading ranged from 0.575 to 0.893, and the communalities between all revised items exceeded 0.50.

Cronbach's alpha and composite reliability (CR) were used to assess the internal consistency of the overall scale and subscales. Cronbach's alpha coefficient for factors with total scale reliability was 0.891. The Cronbach's alpha coefficient for the overall scale and factors was greater than 0.70, indicating that the items correlated with their

component groups, demonstrating internal consistency (Taber 2018). The composite reliability ratings for food production and distribution, patient or customer service, and operational management were 0.944, 0.879, and 0.845, respectively, indicating internal consistency among scale components. Composite reliability levels of 0.6 to 0.7 are considered acceptable (Shrestha, 2021).

Data analysis

The data for this study was analysed using IBM SPSS version 26.0. Socio-demographic data were analysed using descriptive statistics including frequency, percentage, and means. The means of importance and performance indicators were compared with a paired-sample *t*-test. The importance-performance matrix was generated by combining the mean importance and performance values for the hospital food service indicators. These values were then used to analyse each plot in the importance performance analysis grid (Martilla & James, 1977). The IPA grid along with its indications is presented in Figure 1.

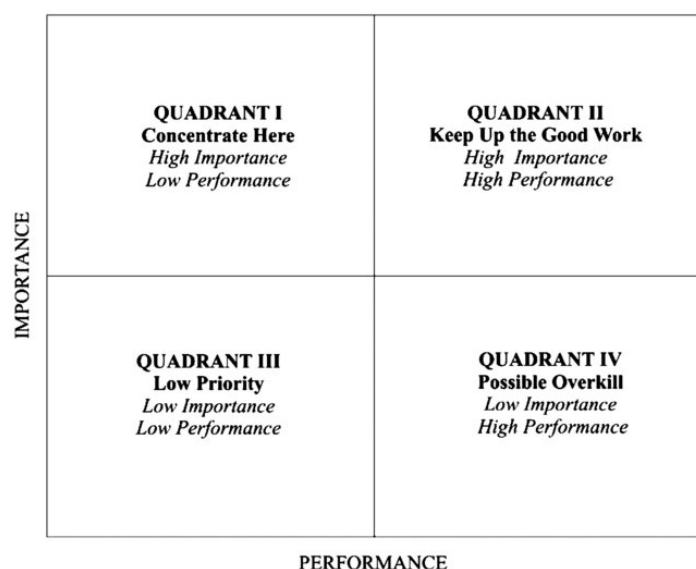


Figure 1: The example of IPA grid

RESULTS

Socio-demographic characteristics

Table 1 shows that 35 (21.9%) of the 160 respondents to this survey were males, while 125 (78.1%) were females. The average age was 33.31 (± 5.65), while the length of service was 7.53 (± 5.66). The majority of them were catering officers/assistant catering ($n=95$, 59.4%), and 120 of them had a degree ($n=120$, 75.0%). Out of 160 respondents, 101 (63.1%) of them worked in government hospitals, 117 (73.1%) are from in-house food service operations, and 106 (66.3%) are from hospitals that employ centralised food delivery systems.

Table 1: Socio-demographic characteristics of the respondents. (N=160)

Characteristics	n (%)	Mean (SD)
Sex		
Male	35 (21.9)	
Female	125 (78.1)	
Age (years)		33.31 (5.65)
Length of service (years)		7.53 (5.66)
Job position		
Director/ Operation director/ Head of department	21 (13.1)	
Manager/ Catering manager/ Outlet manager	7 (4.4)	
Dietitian/ Catering dietitian	37 (23.1)	
Catering officer/ Assistant catering officer	95 (59.4)	
Academic qualification		
Diploma	37 (23.1)	
Degree	120 (75.0)	
Master/ PhD	3 (1.9)	
Type of hospital		
Government	101 (63.1)	
Private	46 (28.7)	
Teaching	13 (8.1)	
Type of food service operation		
In-house/self-operated	74 (46.3)	
Outsources/contracted	36 (22.5)	
Type of food delivery system		
Centralised	12 (7.5)	
Decentralised	28 (17.5)	
Hybrid	10 (6.3)	

Gap analysis of staff's perceptions of importance scores and evaluation of performance scores

Paired sample *t*-tests were used to determine the mean differences of staff perceptions between importance and performance indicators for hospital food service attributes are shown in Table 2. The mean and standard deviation for overall importance indicators were 2.83 ± 0.06 , while the mean and standard deviation for overall performance indicators were 2.91 ± 0.07 . The staff's perceptions of the importance of indicators and their overall performance indicators did not differ significantly ($t(df) = -1.80(159)$, $p=0.073$). The indicator "Utilisation of standardised recipe in the development of normal and therapeutic menus" scored the highest in performance (3.70 ± 0.07), while "Utilisation of a variety of ingredients" had the greatest importance score (3.16 ± 0.10). On the other hand, "Temperature control of raw materials and storage area" had the lowest performance rating (2.54 ± 0.09) and "Existence of purchasing and ordering standards and procedures" received the lowest importance rating (2.47 ± 0.09). The importance and performance scores for indicators 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, and 17 differed significantly ($p < 0.01$). It was discovered that the staff's

perception on the significance of these indicators outweighed their assessments of their performance.

Table 2: Gap analysis of staff's perception on the importance and performance scores for food service attributes. (N=160)

Indicators	Mean \pm SD		Gap (I – P)	<i>t</i> (df)	<i>p</i> -value
	Importance (I)	Performance (P)			
Operational management					
1. Review the contract’s specification/ standard of procedure (SOP) periodically.	2.69 \pm 0.09	2.84 \pm 0.10	-0.15	-1.12 (159)	0.267
2. Systematization of the diet ordering process.	2.48 \pm 0.09	2.79 \pm 0.10	-0.31	-2.38 (159)	0.180
3. Existence of purchasing and ordering standards and procedures.	2.47 \pm 0.09	2.89 \pm 0.10	-0.42	-3.07 (159)	0.003*
4. Inspection of all food ingredients at all points (e.g. receiving, storing, food preparation, etc.)	2.56 \pm 0.08	2.76 \pm 0.10	-0.20	-1.57 (159)	0.119
Food production and distribution management					
5. Utilisation of a variety of ingredients.	3.16 \pm 0.10	2.63 \pm 0.09	0.53	5.79 (159)	0.000**
6. Temperature control of raw materials and storage area.	2.79 \pm 0.10	2.54 \pm 0.09	0.25	2.83 (159)	0.005*
7. Kitchen staffs in neat and clean uniforms.	2.97 \pm 0.10	2.73 \pm 0.09	0.24	2.71 (159)	0.007*
8. Verify if any infectious diseases are present among the staffs.	3.03 \pm 0.11	2.81 \pm 0.10	0.22	2.72 (159)	0.007*
9. Nutritional analysis of menu.	2.87 \pm 0.10	2.88 \pm 0.09	-0.01	-0.08 (159)	0.939
10. Menu evaluation.	3.05 \pm 0.09	2.73 \pm 0.09	0.32	3.83 (159)	0.000**
11. Establishing standards for nutritional recommendations and menu planning.	2.76 \pm 0.10	3.54 \pm 0.08	-0.78	-5.93 (159)	0.000**
12. Utilisation of standardised recipe in the development of normal and therapeutic menus.	3.06 \pm 0.10	3.67 \pm 0.07	-0.61	-4.19 (159)	0.000**
13. Monitoring the cleanliness of food production and assembly areas.	2.79 \pm 0.09	3.03 \pm 0.10	-0.24	-2.69 (159)	0.008*
Patient or customer service management					
14. Overall patient/customer satisfaction.	2.71 \pm 0.10	3.05 \pm 0.10	-0.34	-2.60 (159)	0.010*
15. Overall food quality and taste.	2.73 \pm 0.09	2.94 \pm 0.10	-0.21	-1.54 (159)	0.125
16. Providing a variety of food choice for patient with normal diet.	2.88 \pm 0.11	2.97 \pm 0.10	-0.09	-0.74 (159)	0.459
17. Kitchen porters in clean and tidy uniforms while meals are being served in the wards.	3.09 \pm 0.10	2.71 \pm 0.08	0.38	3.50 (159)	0.001*
OVERALL	2.83 \pm 0.06	2.91 \pm 0.07	-0.08	-1.80 (159)	0.073

* p-value <0.01

** p-value <0.001

The IPA grid of the hospital food service attributes

The overall IPA grid shown in Figure 2 revealed that four indicators, were in the "Possible overkill" quadrant, while two indicators, were in the "Keep up the good work" quadrant. There were five indicators that fell into the "Low priority" quadrant. Finally, six indications fell in the "Concentrate here" quadrant.

"Concentrate here" quadrant

Figure 2 illustrates that six out of seventeen indicators (n=6, 35.3%) are positioned within the "concentrate here" quadrant. These indicators were primarily related to food production and distribution management including utilisation of a variety of ingredients (indicator 5), kitchen

staff in neat and clean uniforms (indicator 7), verify if any infectious diseases are present among the staffs (indicator 8), nutritional analysis of menu (indicator 9), and menu evaluation (indicator 10). Additionally, one indicator was associated with patient or customer service management, specifically regarding kitchen porters in clean and tidy uniforms while meals are being served in the wards (indicator 17). The findings highlight notable underperformance in these areas of hospital food service, indicating a need for immediate quality improvement initiatives.

"Keep it up a good work" quadrant

The indicators classified within this quadrant were deemed highly important and demonstrated effective

performance. As shown in Figure 2, these indicators included the utilisation of standardised recipe in the development of normal and therapeutic menus (indicator 12), as well as the providing a variety of food choices for patients with a normal diet (indicator 16).

“Possible overkill” quadrant

The indicators positioned within this quadrant were perceived by staff as having relatively lower importance. Despite this, their performance was satisfactory and exceeded basic expectations. This quadrant encompassed indicators such as establishment of standards for nutritional recommendations and menu planning (indicator 11), monitoring the cleanliness of food production and assembly areas (indicator 13), overall patient/customer satisfaction (indicator 14), and overall food quality and taste (indicator 15).

“Low-priority” quadrant

The indicators classified within this quadrant were considered low priority, as they were perceived by the staff to be of lesser importance. This suggests that the indicators represent in this quadrant are not recognized as critical areas requiring quality improvement. The indicators in this category included reviewing the contract’s specification/ standard of procedure (SOP) periodically (indicator 1), systematisation of the diet ordering process (indicator 2), existence of purchasing and ordering standards and procedures (indicator 3), inspection of all food ingredients at all points (e.g. receiving, storing, food preparation, etc.) (indicator 4), and temperature control of raw materials and storage area (indicator 6)

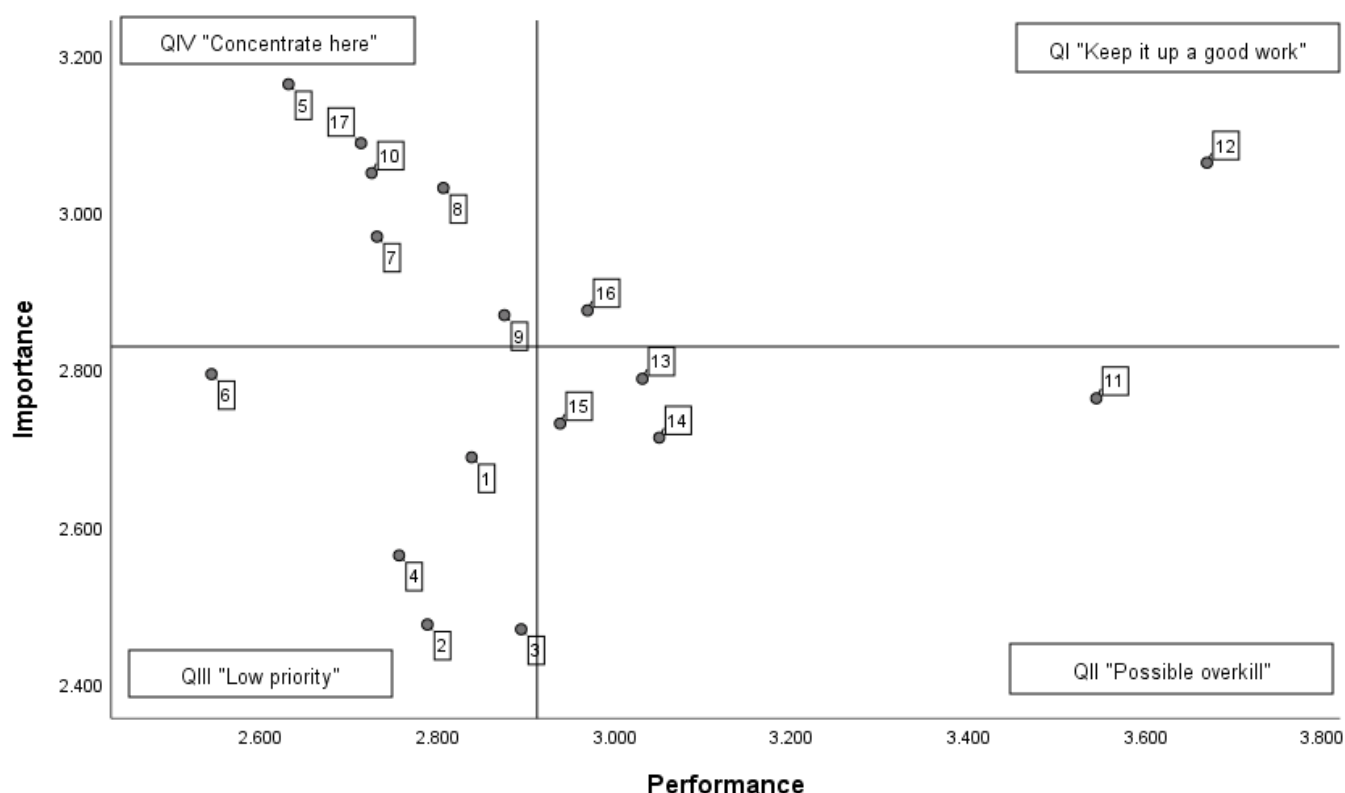


Figure 2: The overall IPA grid for hospital food service attributes

DISCUSSIONS

The present study identified a significant difference between food service staff evaluations of the hospital food service performance and their perceptions of the importance of various indicators. Specifically, the gap analysis revealed that only six out of seventeen indicators were rated as more important than their corresponding performance scores. This misalignment underscores the urgent need for targeted quality improvement initiatives

to address underperforming yet high-priority areas.

These findings are consistent with previous research by Lee (2016) reporting significant differences between perceived importance and actual performance across 27 food service items. This highlights critical operational weaknesses that could impact food safety and meal quality. Similarly, Song and Bae (2013) found that the importance scores exceeded performance ratings for 22 items in South Korean hospitals, reflecting systematic

weakness in food service operations. These results reinforce the importance of aligning performance improvements with staff perceptions of priority indicators. Addressing these gaps may enhance not only food service efficiency and safety but also patient satisfaction and clinical outcomes.

This study also highlights the importance of enhancing food quality through improvements in hospital menu planning. A key recommendation is the increased use of diverse, nutrient-rich ingredients to improve both the nutritional profile and appeal of patient meals. Supporting this, Manimaran et al. (2025) found that visually appealing meals incorporating colourful vegetables like mustard greens, broccoli, and cabbage improved patient appetite and reduced food waste in Malaysian hospitals.

Moreover, the study emphasizes the need for routine nutritional analysis and menu evaluation. Bélanger et al. (2023) argued that patient perceptions of meal quality depend not only on nutritional content but also on menu cycle duration and the use of local, seasonal ingredients. Evidence from Canada further illustrates the issue: Trang et al. (2015) found that many hospital menus failed to meet dietary recommendations for calories and protein, while Barcina-Pérez et al. (2023) reported consistent deficiencies in vitamins E and D, and magnesium. These findings call for continuous monitoring, regular updates to hospital diet manuals, and procurement policies aligned with national nutritional standards to ensure the adequacy and effectiveness of patient meals.

Beyond menu quality, the study identifies personnel hygiene as another area requiring improvement. Indicators related to the cleanliness of kitchen staff and porters, as well as regular health screening for infectious diseases, were found to be lacking—especially during meal distribution in patient wards. While Elmadbouly et al. (2017) reported moderate knowledge and practices concerning personal hygiene among hospital food service staff in Makkah, the study emphasized gaps in sanitation protocols and food-borne disease prevention. Likewise, Salam et al. (2021) highlighted a complete absence of structured food hygiene or HACCP training in Sudanese hospitals.

These results stress the need for continuous food safety and hygiene training to uphold food service standards in healthcare environments. Structured, mandatory training programs—ideally integrated into hospital continuing professional development (CPD) systems—are vital for reinforcing food safety principles and ensuring consistent application of best practices. Such capacity-building measures are essential to reduce foodborne illness risk and

comply with national and international safety protocols.

The findings of this study carry important implications at both organizational and policy levels. Addressing the gaps between staff expectations and actual performance requires the establishment of structured quality assurance mechanisms. Hospitals should consider forming dedicated Food Service Quality Committees and adopting established frameworks such as the Malaysian Food Service Quality (MyFoSQ) system (MOH Malaysia, 2018) to systematically monitor and improve service delivery.

Policy updates should also focus on enhancing menu diversity in line with the Malaysian Dietary Guidelines and global recommendations (NCCFN, 2020; WHO, 2019). Moreover, implementing consistent and mandatory hygiene training and certifications supported by administrative oversight and sufficient resource allocation—can ensure sustainable improvement across food service operations. These changes are necessary to elevate the overall standard of healthcare delivery through improved food safety and patient nutrition.

Several limitations were encountered during data collection. Although the online questionnaire method facilitated accessibility, the response rate was lower than anticipated, requiring multiple follow-ups to encourage participation. Additionally, some respondents demonstrated limited understanding of the IPA framework, particularly in distinguishing between the ‘importance’ and ‘performance’ constructs. To address this, the researcher provided explanations to ensure consistent interpretation of the scales. These limitations suggest the need for more extensive training or guidance when applying IPA in future studies.

CONCLUSIONS

This study emphasizes the need for targeted quality improvements in hospital food service operations, particularly in the areas of food production, distribution and patient service management. It highlights the policy and managerial importance of addressing key performance gaps through strategic interventions. Future efforts should focus on ingredient variety, menu evaluation, hygiene practices among food service personnel, and health monitoring. A proposed Continuous Quality Improvement (CQI) model featuring performance audits, staff training, patient feedback mechanisms, and alignment with frameworks such as Malaysian Food Service Quality (MyFoSQ) can support sustained enhancements in food service quality and overall healthcare standards in Malaysian hospitals.

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