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Unlocking Economic Value in Healthcare: Applying Importance-Performance Mapping Analysis (IPMA) to Identify Key Drivers of Patient Satisfaction in Medical Check-Up Services

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Abstract:

Medical check-up services are essential for clinics to enhance patient satisfaction and loyalty. This study examines the effectiveness of the service quality model, encompassing infrastructural quality, interactional quality, outcome quality, procedural quality, and personnel quality, in measuring satisfaction with medical check-up services. A quantitative survey was conducted with patients, and data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). Importance-Performance Map Analysis (IPMA) was applied to identify key indicators for improvement and areas of strength. This study obtained 211 respondents who had undergone medical check-ups, and questionnaires were distributed directly at the clinicThe results showed that outcome quality has the strongest influence on satisfaction (0.362), followed by procedural quality (0.242), while personnel quality had the weakest effect (0.121). The IPMA highlighted indicators of Outcome Quality 1 (comprehensive medical reports) and Procedural Quality 1 (efficient workflows) as priority areas for improvement, while Outcome Quality 2 (clear and understandable results) demonstrated high performance and importance, warranting continued focus. These findings suggest that improving clinical outcomes and streamlining procedural efficiency are crucial for enhancing satisfaction. The study provides practical recommendations for clinic managers to prioritize service improvements that align with patient expectations, thereby enhancing overall satisfaction and loyalty.

Keywords*: Service quality dimension, satisfaction, medical check-up, outcome quality, IPMA, PLS-SEM*

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1. Introduction

Routine medical check-ups are essential for maintaining the health and productivity of labor forces, including office employees and other workers whose performance often directly impacts organizational success (Hakro & Jinshan, 2019; Zhenjing et al., 2022). Beyond the early detection and prevention of diseases, periodic health evaluations are critical in ensuring employees remain physically and mentally fit to meet workplace demands (Cisse, 2018). Previous studies highlight that healthier employees are more productive, experience fewer absences, and contribute to a more efficient work environment (Kim & Park, 2019). As organizations increasingly

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recognize the link between employee health and workplace performance, medical check-ups have become an integral component of occupational health strategies (Lohsoonthorn, 2002; Pramintasari et al., 2024). Planned medical check-ups can be conducted in hospitals but are also increasingly available in private clinics. Generally, private clinics view medical check-up services as a strategic business opportunity, catering to the growing demand from corporate clients and individual professionals. This has led to intense competition among clinics, especially in big cities like Jakarta, driving the need for continuous improvements in service quality to attract and retain patients. High service quality not only enhances patient satisfaction (Batbaatar et al., 2016) but also generates positive word-of-mouth (WOM), builds a favorable clinic image, and increases the likelihood of patient recommendations (Abbasi-Moghaddam et al., 2019; Ai et al., 2022; Liu & Tao, 2022; Lepianda et al., 2024; Ricca & Antonio, 2021). These outcomes are crucial for the sustainable growth and profitability of private clinics in a competitive healthcare market (Amankwah et al., 2022; Norasiya & Antonio, 2024; Park et al., 2022).

Patient satisfaction with medical check-up services is shaped by various dimensions of service quality, including procedural, personnel, infrastructural, interactional, and outcome quality studies (Swain & Kar, 2018). These dimensions reflect both the functional and technical aspects of service delivery, as conceptualized in Grönroos' theory of service quality (Grönroos, 1984), which have been broadly implemented (Apostol & Matchimura, 2024, Kang & James, 2004; Sharifi et al., 2021) Functional quality encompasses how services are delivered, while technical quality focuses on the outcomes patients receive. Both aspects are critical in determining patient perceptions and satisfaction, particularly in the context of healthcare services where trust and reliability are paramount (Endeshaw, 2020; Woo & Choi, 2021).

Previous studies (Swain & Kar, 2018; Swain & Singh, 2021) have emphasized the importance of multidimensional service quality in healthcare settings such as in clinics (Norasiya & Antonio, 2024) and particularly in the context of medical check-ups in government institutions (Pramintasari et al., 2024). Those empirical studies underlined the theory that enhanced service quality leads to higher levels of patient satisfaction and loyalty (Zeithaml et al., 1996) However, in the context of private clinics offering medical check-ups, limited research has examined the implementation of service quality dimensions, including technical quality, that drive satisfaction (Pramintasari et al., 2024; Sharifi et al., 2021). Understanding these dimensions is pivotal for clinics to tailor their services and improve their competitive advantage in the healthcare market. Previous research generally only focused on functional qualities such as responsiveness, empathy, and assurance. while does not involve much technical or procedural quality, which is important and relevant in the healthcare sector (Endeshaw, 2020; Swain & Singh, 2021) This empirical study seeks to address that issue by examining the influence of several key dimensions adapted from Swain and Kar's framework (2018) of service quality on satisfaction with medical check-up services.

The research is grounded in the practical setting of private clinics that conduct medical check-ups for routine health evaluations and employment requirements. With the

rising prevalence of annual health screenings, particularly among professional workers, the demand for high-quality services has grown (Hakro & Jinshan, 2019). This study focuses on clinics that cater to these needs, specifically targeting patients who underwent medical check-ups. By exploring the relationship between service quality dimensions and patient satisfaction, the findings aim to provide actionable insights for private clinic managers.

A practical methodological approach employed in this study is Importance-Performance Mapping Analysis (IPMA) using Partial Least Square - Structural Equation Modeling (known as PLS-SEM (Hair et al., 2022). IPMA is particularly useful in identifying service attributes that are critical to patient satisfaction but underperforming in current service delivery (Ringle et al., 2016). This dual perspective on importance and performance together allows healthcare providers to prioritize improvement efforts more effectively, ensuring resources are allocated to areas with the highest impact on satisfaction and areas that need immediate improvement (Teeluckdharry et al., 2022). Recent studies in the health sector show IPMA as an effective method (Wiyono & Antonio, 2024). This approach is useful for evidence-based strategies in healthcare management to enhance service quality in healthcare providers and patient outcomes.

The contribution of this study lies in its application of IPMA to the specific context of private clinics offering medical check-ups (MCU) in Jakarta. By integrating theoretical frameworks from service quality theory (Grönroos, 1984) in the field of healthcare (Swain & Kar, 2018) and focusing on practical aspects of healthcare management, this study aims to provide a comprehensive understanding of how service quality dimensions influence patient satisfaction. Additionally, the findings offer practical guidance for private clinics to enhance their service offerings, improve patient experiences, and foster long-term patient loyalty through positive word of mouth and clinic recommendations.

2. Methodology

This study employed a quantitative cross-sectional survey design to explore the influence of service quality dimensions on patient satisfaction with medical check-up services in private clinics. The research setting included six private clinics with different ownership in Jakarta, providing comprehensive medical check-ups tailored to professional workers. The target population consisted of individuals who had undergone a complete medical check-up during October 2024. Using purposive sampling, respondents were selected based on the following inclusion criteria: being of productive age, currently in good health or fit condition, having their medical check-up expenses covered by their workplace or institution such as pre-employment screening or annual health check-ups, and undergoing a full check-up package that included physical examinations, consultations, and laboratory tests. The minimum sample size was determined using power analysis, with f^2=0.15, alpha=0,05, and power 90%, with five predictors, which resulted in at least 136 respondents achieving sufficient statistical power for the analysis.

The conceptual framework of this study, depicted in Figure 1, consists of five independent variables (dimensions of service quality, namely procedural, personnel, infrastructural, interactional, and outcome quality) and one dependent variable (patient satisfaction). All variables were assessed using a Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"), with items adapted from the validated measurement tool by Swain and Kar (2018) for quality dimensions. and Swain and Singh (2021) for satisfaction indicators.

Figure 1. Conceptual Framework

Questioner items to measure the latent variables were adapted into Indonesian and underwent face validity by three academics as expert panels. The survey questions were distributed online using Google Forms, targeting respondents who had completed their clinic medical check-ups. The online dissemination ensured accessibility and ease of data collection, minimizing response bias and allowing participants to provide feedback at their convenience shortly after their medical check-up experience.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), a robust multivariate analysis technique suitable for predictive modeling (hair et al., 2022). The analysis began with tests for reliability and validity to ensure the measurement model's adequacy, including composite reliability, Cronbach's alpha, and average variance extracted (AVE). Subsequently, the Importance-Performance Mapping Analysis (IPMA) method was applied to evaluate service quality dimensions at the indicator level. IPMA generates a visual representation of importance and performance on a four-quadrant matrix. The quadrants categorize attributes as "high importance–low performance," "low importance–low performance," "high importance–high performance," or "low importance–high performance," enabling clinics to identify critical areas for improvement. The mean scores for importance and

performance served as reference lines for positioning service attributes within the quadrants, guiding strategic priorities for enhancing patient satisfaction.

3. Empirical Findings/Result

The respondents of this study were 211 individuals who presented a diverse demographic profile, reflecting the target population for medical check-up services in private clinics. The demographic profile of the respondents reveals key characteristics of individuals undergoing medical check-ups in private clinics. The data in Table 1. highlights a predominance of male participants (63%) and a highly educated population, with the majority holding undergraduate or higher degrees. Most respondents are employed in the private sector, reflecting the prevalence of employer-sponsored medical check-ups for full-time workers. The age distribution shows that the majority are within the productive working age range of 28–47 years, aligning with the target demographic for routine health evaluations linked to workplace wellness programs. This profile suggests that private clinics serve a workforce-oriented clientele, emphasizing the need for tailored service quality to meet the expectations of this segment, particularly given their significant contribution to patient satisfaction and clinic reputation.

Table 1. Respondent Profile

Description	Category	Number (n)	Percentage (%)
Sex	Male	132	63
	Female	79	37
	Total	211	100
Education	High school	31	15
	Under graduate	131	62
	Graduate	49	23
	Total	211	100
Occupation	Private employee	122	58
	Entrepreneur	35	17
	Part time worker	14	7
	Professional	21	10
	Others	19	9
	Total	211	100
Age	18-27 Year old	30	14
	28-37 Year old	68	32
	38-47 Year old	55	26
	48-57 Year old	41	19
	> 58 Year old	17	8
	Total	211	100

This study was carried out based on PLS-SEM with SmartPLS4^{TM}, where the evaluation of the measurement (outer model) model involves assessing **reliability** and **validity** to ensure that the constructs are measured accurately and consistently. The process includes the evaluation of **indicator reliability for each indicator, internal consistency reliability**, **convergent validity,** and **discriminant validity. The result, as in Table 2 below,** forms a strong foundation for analyzing the structural model and IPMA analysis in PLS-SEM.

Table 2. Construct Validity and Reliability

Variable	Code	Indicator	OL
Infrastructural Quality	IFSTQ1	I felt that the examination room was kept clean	0.768
	IFSTQ2	The examination waiting room has a comfortable atmosphere.	0.823
	IFSTQ3	I saw that this clinic had modern examination equipment.	0.643
	IFSTQ4	The location of this clinic is easy for visitors to reach	0.826
Mean= 3.257 CA=0.771 CR=0.851 AVE=0.591			
Interactional Quality	INTRQ1	I feel the doctor has a friendly attitude towards his patients	0.606
	INTRQ2	I feel the nurses in this clinic treat patients politely	0.927
	INTRQ3	I received a clear explanation regarding the stages of the examination being carried out.	0.903
	INTRQ4	I felt helped by the warm attitude of the clinic staff during the examination	0.934
Mean=3.477 CA=0.873 CR=0.913 AVE=0.729			
Outcome Quality	OUTCQ1	I went through all stages of the examination smoothly.	0.735
	OUTCQ2	Blood collection for laboratory examination went smoothly.	0.876
	OUTCQ3	The results of the medical check-up examination can be known quickly	0.728
	OUTCQ4	I received input from the doctor regarding my general health condition.	0.830
Mean=3.808 CA=0.803 CR=0.872 AVE=0.632			
Personnel Quality	PERSQ1	I believe the doctor has the medical competence to carry out the examination.	0.872
	PERSQ2	I feel that nurses are skilled in helping doctors carry out examinations.	0.921
	PERSQ3	I feel that the staff at this clinic are experienced in examination procedures.	0.701
	PERSQ4	I feel that the staff at this clinic are equipped with good communication skills	0.859
Mean=4.169 CA=0.860 CR=0.906 AVE=0.710			
Procedural Quality	PRCDQ1	I feel that all stages of the examination have been carried out professionally in accordance with medical protocols	0.867
	PRCDQ2	I felt that the waiting time from the time I arrived at the clinic until the start of the medical check-up was not long.	0,873
	PRCDQ3	Examination was carried out with adequate equipment that works smoothly.	0.782
	PRCDQ4	I felt that my privacy was protected while in the examination room	0.625
Mean= 3.793 CA=0.799 CR=0.870 AVE=0.629			
Satisfaction with MCU	PSMCU1	I felt that the good interaction with the examining doctor met my expectations	0.894
	PSMCU2	The medical check-up service at this clinic has met my expectations.	0.847

Variable	Code	Indicator	OL
	PSMCU3	Overall, my experience when undergoing a medical check-up at this clinic was good	0.739
	PSMCU4	I feel this clinic is the right choice for a medical check-up.	0.680
Mean=3.913 CA=0.802 CR=0.871 AVE=0.631			

OL=outer loading, CA=Cronbach Alpha, CR=Composite reliability, AVE=Average variance extracted

The analysis of the measurement model reveals that all constructs exhibit acceptable levels of reliability and validity based on the provided data. The outer loadings (OL) for individual indicators are predominantly above the threshold of 0.7, with some exceptions. It found two indicators, IFSTQ3 with 0.643 and PSMCU4 with 0.680, which are marginally below the threshold but can still accepted as recommended (Hair et al., 2022). These lower loadings are still permissible when other indicators within the construct exhibit strong loadings, as evidenced by their contribution to the composite reliability and AVE (Hair et al., 2022). Cronbach's alpha (CA) values across all constructs exceed the minimum acceptable threshold of 0.7, indicating good internal consistency. Composite reliability (CR) values range between 0.851 and 0.913, further confirming high internal consistency and the robustness of the constructs, as CR serves as the upper boundary of reliability.

Convergent validity, assessed through AVE, demonstrates satisfactory results with all constructs achieving values above 0.5, indicating that more than 50% of the variance in indicators is explained by their respective constructs. **Interactional Quality** was found as the strongest convergent validity with an AVE of 0.729, reflecting the high explanatory power of its indicators, while **Infrastructural Quality** achieves a lower but acceptable AVE of 0.591. These findings confirm that the constructs are both reliable and valid for further structural model and IPMA analysis. Additionally, the mean scores suggest that **Personnel Quality** (Mean = 4.169) and **Satisfaction with MCU** (Mean = 3.913), although not yet optimum, are highly rated by respondents, highlighting their critical role in shaping positive perceptions of the medical check-up services. The analysis of the Heterotrait-monotrait Ratio (HTMT) revealed that all values fall below the threshold of 0.90, indicating strong discriminant validity among the constructs. This finding confirms that each construct in the model is conceptually distinct and measures unique aspects of the medical check-up service quality and satisfaction. Furthermore, in the model, the variance inflation factor (AVE) value was found below 3, indicating no multicollinearity issue between the dependent variables. The next step in the structural analysis of the PLS-SEM model is to look at the significance and coefficients, as seen in Figure 2 below.

The results of the structural model demonstrate that all five service quality dimensions significantly influence patient satisfaction with medical check-ups, as indicated by the p-values below 0.05. This finding is consistent with previous studies. Outcome quality exerts the strongest influence (0.362, p=0.000), emphasizing the importance of smooth examination processes, timely results, and actionable feedback from doctors on overall healthcare. Procedural quality follows with a notable effect (0.242,

p=0.000), underscoring the critical role of professional adherence to medical protocols and efficient service delivery. Infrastructural quality (0.134, p=0.025) and interactional quality (0.155, p=0.007) have moderate impacts, suggesting that clean facilities, accessible locations, and polite, friendly interactions contribute positively to patient satisfaction. While significant, personnel quality demonstrates the weakest effect (0.121, p=0.029), indicating that technical expertise and staff skills, while important, have less influence than other dimensions.

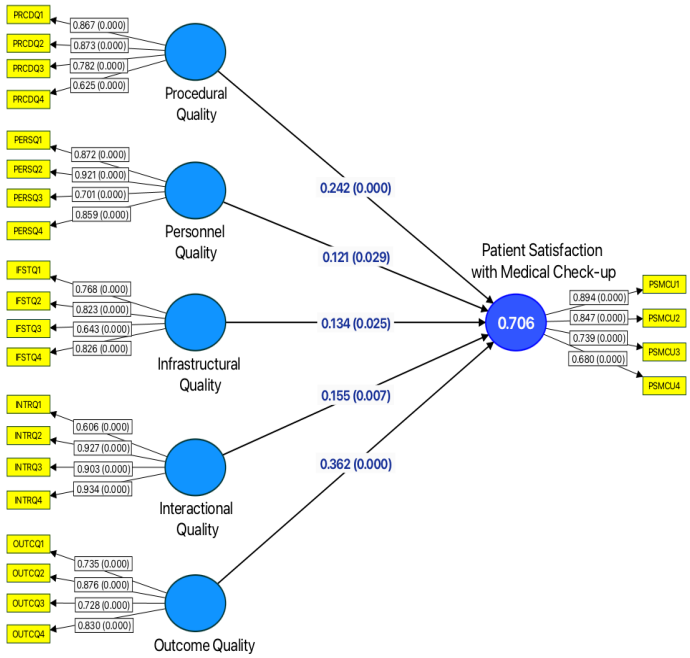

Figure 2 PLS-SEM Model

The explanatory power with an R^2 value of 0.706 indicates that 70.6% of the variability in patient satisfaction is explained by these dimensions, showcasing the strong relevance of the model in understanding patient perceptions. From a managerial perspective, enhancing outcome quality should be the primary focus, as it has the strongest impact on satisfaction. This can be achieved by ensuring timely and accurate delivery of examination results and providing comprehensive feedback during consultations. Furthermore, procedural quality must be prioritized by streamlining examination protocols and reducing waiting times to enhance overall service efficiency. While infrastructural quality and interactional quality remain important, investments in staff communication and interpersonal skills should complement technical training to address the relatively weaker influence of personnel quality. These improvements can lead to higher satisfaction levels and reinforce patient trust in the clinic's services.

Table 3. IPMA Indicator

Variable	Indicator	Importance	Performance
Infrastructural Quality	IFSTQ1	0.044	50.553
	IFSTQ2	0.051	44.550
	IFSTQ3	0.026	25.750

	IFSTQ4	0.050	38.863
Interactional Quality	INTRQ1	0.022	27.330
	INTRQ2	0.049	39.652
	INTRQ3	0.049	41.390
	INTRQ4	0.056	51.659
Outcome Quality	OUTCQ1	0.112	45.498
	OUTCQ2	0.133	60.900
	OUTCQ3	0.109	49.605
	OUTCQ4	0.101	46.603
Personnel Quality	PERSQ1	0,043	64.692
	PERSQ2	0.037	63.033
	PERSQ3	0.029	61.611
	PERSQ4	0.034	56.556
Procedural Quality	PRCDQ1	0.079	45.261
	PRCDQ2	0.078	45.498
	PRCDQ3	0.060	49.289
	PRCDQ4	0.094	62.243
Mean		0.063	48.527

In this study, the Importance-Performance Map (IPMA) approach was deployed as a valuable tool for identifying priorities for improvement based on the relationship between the importance of indicators (their impact on satisfaction) and their current performance. The map in Figure 3 divides indicators into four quadrants: high importance-high performance (top-right), high importance-low performance (bottom-right), low importance-high performance (top-left), and low importance-low performance (bottom-left). The primary focus is on the bottom-right quadrant, where indicators are highly important but underperforming, as these areas offer the greatest potential for improvement.

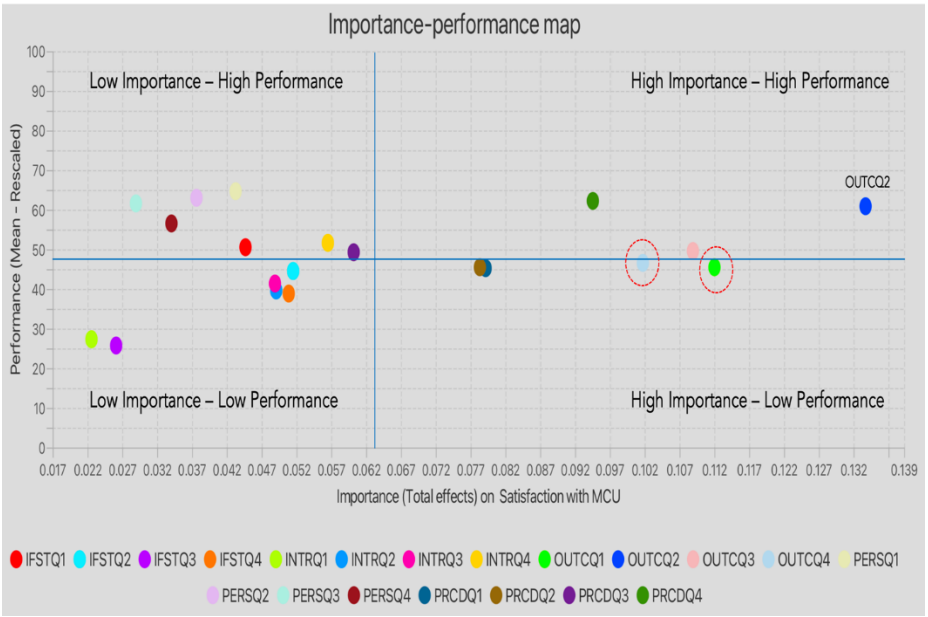

Figure 3. Output IPMA Indicator

From Table 3 and the map of plotting indicators in Figure 3, the indicators that were found fall into High Importance-Low Performance (Bottom-Right Quadrant) were OUTCQ1 (Outcome Quality 1), OUTCQ3 (Outcome Quality 3), and PRCDQ1 (Procedural Quality 1). These indicators are critical to patient satisfaction but are currently underperforming, thus becoming a priority for improvement. The key findings show a particular indicator OUTCQ1 (Importance: 0.112, Performance: 45.498), which stated, "I went through all stages of the examination smoothly." This implies a priority action to enhance patient examination outcomes. It is necessary to clarify what causes the medical check-up process to not run smoothly and then prepare a solution, such as providing clearer medical reports or ensuring test results are more comprehensive. Even though the patient was not able to read the medical terms in the report, they need to understand the result of the examination, such as their fit condition or their status. This can be understood since the uncertainty of the result can make the patient feel uncomfortable or even anxious. It is suggested that the clinic focus on enhancing clinical outcome processes to meet patient expectations. This could include refining diagnostic protocols and ensuring accurate and timely communication of results.

Further, the finding in OUTCQ3 (Importance: 0.109, Performance: 49.605) stated, "The results of the medical check-up examination can be known quickly," Highlighting dissatisfaction with follow-up procedures and results after medical check-ups. These results suggest the management of the clinic to improve the time to get timely results. It can be done through implementing post-check-up care, such as automated follow-up reminders or consultations to explain results. The other finding in PRCDQ1 (Importance: 0.079, Performance: 45.261) stated, "I feel that all stages of the examination have been carried out professionally following medical protocols" showing the challenges in procedural adherence. This result may relate to the waiting

times or compliance with clinical protocols that also did not meet the expectation and align with the previous finding in outcome quality. This indicates priority to be taken, that management needs to optimize workflow processes to minimize delays and improve efficiency during patient procedures.

The finding of IPMA analysis in the high importance-high performance (top-right quadrant) shows Indicators of quality dimension that represent strengths that need to be sustained. From the data, the key indicators were OUTCQ2 (Outcome Quality 2), INTRQ4 (Interactional Quality 4), and PRCDQ4 (Procedural Quality 4). The interesting finding shows OUTCQ2 (Importance: 0.133, Performance: 60.900) stated, "blood collection for laboratory examination went smoothly" as the strongest performer, indicating high patient satisfaction with specific actions, such as the process of taking blood samples with a needle (phlebotomy) which is painless and fast with hygiene procedure. This point may result from the highly skilled nurses who have experience therefore, clinics need to maintain these practices through ongoing staff training and regular patient feedback.

Further, the finding of INTRQ4 (Importance: 0.056, Performance: 51.659) stated, "I felt helped by the warm attitude of the clinic staff during the examination," Indicates effective interactional communication between patients and staff. Management needs to continue patient engagement with human touch during interactions but also by leveraging technology, like digital interaction through social media platforms, in the future. The finding of PRCDQ4 (Importance: 0.094, Performance: 62.243) stated, "I felt that my privacy was protected while in the examination room," also reflects strong procedural quality in specific areas like staff courtesy and adherence to standardized processes. This good performance needs to be standardized for success across all procedural aspects to ensure consistent patient experiences.

Since the management faces limited resources such as finances, time, and effort, management needs to identify the priority to be taken wisely. Things that show good performance in a survey are not necessarily important in the eyes of customers, therefore statistical methods that measure the influence of a variable, such as IPMA, will be useful in managerial decisions. The finding of this study indicates which area and point need to be improved immediately to ensure patient satisfaction, which will lead to more positive word of mouth. As a consequence, managers are expected not to be occupied or distracted by things that are less important and not a priority. The findings of this research show Indicators in the (Top-Left Quadrant), such as **PERSQ1 (Personnel Quality 1)** and **PERSQ2 (Personnel Quality 2),** show strong performance but lower importance in their impact on patient satisfaction. This does not mean that it is not important, but attitudes and competence have become a necessity and something standard in health services so that it does not encourage satisfaction too strongly, however, if it is not implemented or when a medical error occurs can make patients less satisfied.

4. Conclusions

This study concludes that the service quality model, comprising five dimensions namely infrastructural quality, interactional quality, outcome quality, procedural quality, and personnel quality, is effective in measuring patient satisfaction with medical check-up services at private clinics. The study identified the strongest influence on satisfaction came from outcome quality, followed by procedural quality, highlighting the need to improve clinical results delivery and procedural efficiency. Practically, this suggests investing in advanced diagnostic tools and streamlining processes for better outcomes.

Furtherly, the Importance-Performance Map Analysis (IPMA) effectively identified key indicators requiring immediate improvement, such as Outcome Quality 1 (clear medical reports) and Procedural Quality 1 (workflow efficiency), while also highlighting strong-performing indicators, such as Outcome Quality 2 (understandable results), which should be maintained. It is hoped that these findings will be able to uncover key drivers of patient satisfaction in medical check-up services, thus helping clinic management develop a more appropriate business strategy. Lastly, this study also has a few limitations; it was found that several indicators were not optimal and had values below 0.7, so it needs to be refined in future studies. Apart from that, several medical check-up procedures are varied, in some cases, medical checks involve testing with a treadmill, so it's a need to ensure that the scope of the medical check-ups is the same.

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