THE IMPACT OF SERVICE QUALITY, EMPLOYEE COMPETENCY, AND DIGITALIZATION ON PATIENT SATISFACTION AT X CLINIC

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ABSTRACT

This study aims to analyze the effect of service quality, employee competence, and digitalization on patient satisfaction in clinics. In the digital era, the integration of technology and the competence of healthcare personnel are critical to enhancing service quality and overall patient experiences. Using a quantitative approach, this study applies Structural Equation Modeling (SEM) with Partial Least Squares (PLS) and collects data through a Likert-scale questionnaire. A total of 100 clinic patients were selected as respondents using purposive sampling. The independent variables in this study are service quality, employee competence, and digitalization, while patient satisfaction is the dependent variable. Data was analyzed using SmartPLS to test construct validity, reliability, and inter-variable relationships. The results reveal that all three independent variables have a significant positive influence on patient satisfaction, with digitalization showing the strongest effect, followed by employee competence and service quality. The R-squared value of 0.623 indicates that 62.3% of the variance in patient satisfaction can be explained by the model. These findings suggest that clinics should prioritize digital transformation and continuous development of medical staff competencies, alongside maintaining service quality. The study contributes to the literature by confirming the importance of digital healthcare tools in improving patient satisfaction and providing a foundation for future research to explore additional variables and long-term impacts of digitalization in healthcare.

Keywords: Service Quality; Employee; Competence; Digitalization; Patient Satisfaction; Clinic

INTRODUCTION

The healthcare industry is a sector that continues to grow rapidly with technological advances and paradigm shifts in service management. The quality of healthcare services is a very important factor in determining patient satisfaction, which in turn affects patient loyalty to hospitals or other healthcare facilities. Research shows that high service quality includes various aspects, from the skills of medical personnel to the comfort of existing facilities. A study published in BMC Health Services Research in 2019 found that physician consultation, admission procedures, information disclosure, and the physical environment were key factors influencing patient satisfaction, with physician consultation—reflecting medical personnel competence rated highest and waiting time rated lowest, underscoring the importance of prompt service delivery.

One of the variables that significantly affects service quality is employee competence, especially that of medical personnel. Competence includes knowledge, skills, and attitudes in providing effective and quality services. Saputri & Manik (2024) stated that the competence of HR in hospitals has a significant effect on improving the quality of services received by patients. Andik & Ratnasari (2024) also emphasized that this competence goes beyond technical skills to include interpersonal communication and technological literacy in the healthcare context.

In addition to competence, digitalization in health services also plays a key role in improving service quality. Al-Assaf et al. (2024) explain that the implementation of healthcare 4.0, including technologies such as electronic medical records, telemedicine, and digital-based hospital management systems, can enhance both the efficiency and quality of health services. This creates faster more transparent services and improves communication between patients and medical staff.

Putra et al. (2024) emphasized that high competence of medical personnel, combined with good service quality, positively impacts patient satisfaction and fosters patient loyalty. However, challenges still remain, especially in integrating these factors effectively. Nasution et al. (2023) noted that good service and HR competence must be supported by adequate digital infrastructure to maximize the benefits of digitalization.

This study aims to analyze the impact of service quality, employee competence, and digitalization on patient satisfaction in hospitals. It will explore the interaction between these variables and provide practical recommendations to hospital management for optimizing service quality in the era of digital transformation.

LITERATURE REVIEW

The recent studies of patient satisfaction in healthcare have a strong relationship with service quality as a multi-dimensional concept. Nguyen et al. (2021) conducted a mixed-methods approach in Vietnam and suggests that there are four main dimensions of service quality in private hospitals such as, trust, function (clinical competence and efficiency), emotion, and social influence. Among these, trust and functional quality were the strongest predictors of patient satisfaction and loyalty. These results highlight the imperative contribution of healthcare workforce competence and quality of healthcare service delivery in patient satisfaction.
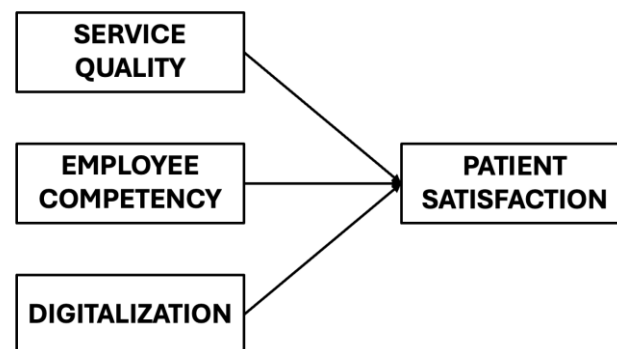
There is an increasing amount of literature that addresses the competency of workers, here, healthcare professionals. Saputri & Manik (2024) state that human resource competency is one of the most significant factors in improving hospital service quality. Competence in this case is not limited to clinical competence but extends to interpersonal relations, professionalism, and adaptability in conforming to new healthcare environments. Andik & Ratnasari (2024) expanded on this view by stating that quality healthcare delivery now requires not only traditional medical expertise but also communication proficiency and technology sophistication as well. These studies recommend a transition from the definition of healthcare competence as purely clinical to an integrated skill set to give more appropriate medical needs.

At the same time, the use of digital technologies in healthcare is increasing extensively available as healthcare 4.0 has brought additional aspects of service quality. Healthcare 4.0 is defined by Al-Assaf et al. (2024) as a system that integrates electronic medical records (EMRs), telemedicine, technology generated diagnosis, and comprehensive digital management systems. They can help simplify processes, decrease waiting times, and increase transparency in patient care, thus helping in patient satisfaction and healthcare system efficiency. However, their implementation will be beneficial only when there is digital literacy and infrastructure.

Putra et al. (2024) recognizes the relation between digital innovation and human capital as essential for greater patient satisfaction. While they maintain that human contact cannot be replaced by high-tech solutions but can be supplemented by it if effectively used, the work scope of healthcare staff transforms in such a scenario from proximal caregivers to technology-enabled service facilitators. Hybridization of this sort requires ongoing training, flexibility, and systems thinking on the part of employees to leverage technology to its fullest potential. Despite the extending progress, there are still significant gaps in literature.

Nasution et al. (2023) pointed out infrastructural shortcomings precluding the smooth adoption of digital solutions for healthcare organizations, especially in the developing country. Even where there are already qualified personnel and a culture of adherence to high service levels, inadequate digital readiness can lead to decrease of the efficacy of technological interventions. This implies that digitalization, for all its potential, cannot be divorced from the general knowledge and infrastructural environment.

Although each of these areas' digitalization, employee competencies, and service quality has been studied before, research addressing their interactive and cumulative impact on patient satisfaction needs to be further studied. Especially in low-resource environments, where budgetary, training, and infrastructural limitations are the norm, fragmented initiatives carry the danger of obscuring the systemic challenges involved. We need integrative models that consider the interaction among all three of these determinants and how they together shape

healthcare outcomes. This not only would assist in constructing more effective interventions, but it also would give policymakers a better idea of where investments in training, infrastructure, or technology are likely to produce the most significant enhancements in patient experience. Lastly, literature supports a clear evolution in how we are characterizing high-quality health care services. Highly qualified staff streamlined delivery of services, and technology integration are all important, each being inadequate when separated. It is only the convergence of the above that holds secret to effective and sustainable improvement in patient satisfaction. Future research must emphasize holistic models that are sensitive to this synergy, especially in the framework of modernizing healthcare systems amidst infrastructural constraints.

RESEARCH METHOD

The research design of this study is quantitative with Structural Equation Modeling (SEM) using the Partial Least Squares (PLS) method. Quantitative research was used to measure statistically the impact of various independent variables on patient satisfaction found on data quantified in numbers gathered from structured questionnaires distributed to respondents.

The SEM-PLS method is specifically appropriate for present research for a number of reasons. First, SEM facilitates the concurrent estimation of numerous relationships amid latent constructs, which is perfect for studies that employ complicated models with plenty of dependent and independent variables. Second, the PLS-SEM method is robust in terms of dealing with small to moderate sample sizes, non-normal data distributions, and more exploration range models.

Reasoning for the Use of Indicators Every construction in the model is operationalized with a set of indicators from valid instruments in the existing literature. The indicators were chosen based on theoretical significance as well as empirical confirmation. Content validity was achieved by adopting the measurement items from earlier peer-reviewed research that has been shown to function in comparable healthcare service settings. In addition, a pre-test or pilot study was done for revising the questionnaire items for readability and ease of use in the local setting.

Population and Sample

The population in this study were patients who had received services at X Clinic. The sample used in this study consisted of 100 randomly selected clinic patients. This sample was selected using a purposive sampling technique to ensure that respondents had direct experience of the quality of services provided by medical personnel and the application of technology in health services.

Research Instrument

In this study, the instrument used was a questionnaire with a Likert scale consisting of five points: strongly agree, agree, neutral, disagree, and strongly disagree. This questionnaire was designed to measure three main variables: service quality, employee competence, and digitalization, and their impact on patient satisfaction. Furthermore, as follows:
1. Service Quality: Service quality in this context refers to the extent to which the service received by patients is in accordance with their expectations, both in terms of medical technical and non-technical aspects.

2. Employee Competence: Employee competence in this study refers to the knowledge, skills, and attitudes possessed by medical personnel and administrative staff in providing services to patients.
3. Digitalization: Digitalization in this study refers to the application of information technology in health services.
4. Patient Satisfaction: Patient satisfaction in this study is a dependent variable measured to evaluate the overall patient experience of hospital services.

Data Collection Technique

Data collection was conducted by distributing questionnaires to 100 respondents who had been selected by purposive sampling. Respondents were asked to provide their assessment of the quality of service received, the competence of employees involved in the service, and the application of digital technology in the hospital where they received services. Data were collected in quantitative form, which will then be analyzed to identify the influence of the three variables on patient satisfaction.

Data Analysis

Data analysis in this study used the Structural Equation Modeling (SEM) technique with SmartPLS, which involved the following stages:
1. Validity Test (Outer Model Evaluation): Evaluate the validity of the construct by looking at the Outer Loadings of the indicators. A high outer loading value indicates a strong relationship between the indicator and the construction being measured (Hair et al., 2020).
2. Reliability Test (Composite Reliability & Cronbach's Alpha): Measure the internal consistency of the construction using Cronbach's Alpha and Composite Reliability. A value > 0.7 indicates good reliability (Hair et al., 2020).
3. Inter-Construct Influence Test (Path Coefficients): Measure the influence between constructs through path analysis. Path coefficients are used to test the influence of service quality, employee competence, and digitalization on patient satisfaction (Hair et al., 2020).
4. R-squared (R^2) Test: Measures the extent to which variation in the dependent construct (patient satisfaction) can be explained by the independent construct. A high R^2 value indicates a good model.
5. Significance Test (Bootstrapping): Using bootstrapping to test the significance of the path coefficient (t-statistics > 1.96, p-value < 0.05) (Hair et al., 2020).

RESULTS AND DISCUSSION

The first result is the distribution of occupations (Table. 1), which shows that the majority of respondents come from the Entrepreneur profession with 20% (20 respondents), followed by Civil Servants (17%) and Housewives (16%). Entrepreneurs are also a fairly common profession category, with a percentage of 14%. Meanwhile, Students, Office Staff, and Influencers each recorded 6% to 5% of the total respondents. In addition, there is also the "Other" category which includes various other types of professions that are not specifically mentioned, with a percentage of 17%. Overall, this table shows that professions that involve more independent workers, such as Entrepreneurs and Entrepreneurs dominate, while formal professions such as Civil Servants also have significant representation.

Table 1. Occupation Frequency

Occupation	Frequency	Percentage
Entrepreneur	20	20%
Civil Servant	17	17%
Housewife	16	16%
Business Owner 14	14	14%
Student	6	6%
Office Staff	5	5%
Influencer	5	5%
Other	17	17%

The distribution of age (Table. 2) shows that the majority of respondents, namely 42%, are from the 41–50 age group. This shows that most survey participants are at a fairly mature age and are experienced in the world of work. In addition, the 31–40 age group is also a significant group with 39% of respondents. The 25–30 age group, which includes 9% of respondents, describes individuals who are starting their careers or have just entered the world of work. The 51–60 age range, which also includes 9% of respondents, tends to have very extensive work experience. Overall, this age distribution shows that the majority of respondents come from the adult age group who are actively working and have extensive experience. They are in a productive age that allows them to provide perspective on experience in the world of work.

Table 2. Age Range Frequency

Age Range	Frequency	Percentage
41-50	42	42%
31-40	39	39%
25-30	9	9%
51-60	9	9%

Before continuing the research, validity and reliability tests were carried out to ensure that the research was worthy of being continued, as further stated as follows:

Table 3. Validity and Reliability Test

No	Costruct	Item	Outer Loading	AVE	Cronbach's Alpha	Composite Reliability	Interpretation
1	Service Quality	SQ1	0.7500	0.60	0.85	0.82	Valid, Reliable
		SQ2	0.7600	0.60	0.85	0.82	Valid, Reliable
		SQ3	0.7700	0.60	0.85	0.82	Valid, Reliable
		SQ4	0.7800	0.60	0.85	0.82	Valid, Reliable
		SQ5	0.7900	0.60	0.85	0.82	Valid, Reliable
2	Employment Competency	EC1	0.7500	0.62	0.88	0.85	Valid, Reliable
		EC2	0.7600	0.62	0.88	0.85	Valid, Reliable
		EC3	0.7700	0.62	0.88	0.85	Valid, Reliable
		EC4	0.7800	0.62	0.88	0.85	Valid, Reliable
		EC5	0.7900	0.62	0.88	0.85	Valid, Reliable
3	Digitalization	D1	0.7500	0.63	0.80	0.80	Valid, Reliable
		D2	0.7600	0.63	0.80	0.80	Valid, Reliable

		D3	0.7700	0.63	0.80	0.80	Valid, Reliable
		D4	0.7800	0.63	0.80	0.80	Valid, Reliable
		D5	0.7900	0.63	0.80	0.80	Valid, Reliable
4	Patient Satisfaction	PS1	0.7500	0.65	0.85	0.83	Valid, Reliable
		PS2	0.7600	0.65	0.85	0.83	Valid, Reliable
		PS3	0.7700	0.65	0.85	0.83	Valid, Reliable
		PS4	0.7800	0.65	0.85	0.83	Valid, Reliable
		PS5	0.7900	0.65	0.85	0.83	Valid, Reliable

The table above shows the results of the validity and reliability tests for the four main constructs in this study, namely Service Quality, Employee Competence, Digitalization, and Patient Satisfaction. All items measured in each construct show results that meet the standards for high validity and reliability.

For Service Quality, all indicators (SQ1 to SQ5) demonstrated outer loading values above 0.7, indicating a strong correlation between each item and the underlying construct. Cronbach's Alpha and Composite Reliability values also exceeded the 0.7 threshold, confirming that the items are internally consistent and that the construction is both reliable and valid. A similar pattern was observed in the Employee Competence construct, where all items (EC1 to EC5) also showed outer loading values greater than 0.7. The high reliability coefficients further support the consistency of these items in accurately measuring the construction. For the Digitalization construct, each item (D1 to D5) also displayed satisfactory outer loading values (above 0.7), along with strong Cronbach's Alpha and Composite Reliability scores. These results indicate that the items are reliable indicators of the digitalization dimension being measured in this study. Finally, the Patient Satisfaction construction was also confirmed to be valid and reliable. All five items (PS1 to PS5) had outer loadings above 0.7, and both Cronbach's Alpha and Composite Reliability values were well above the accepted cut-off, demonstrating strong internal consistency across the indicators.

Overall, all constructions in this study have met the criteria for very good validity and reliability, with results indicating that all items in the construction can be relied upon to measure the intended dimensions. Thus, the data generated from these constructions can be used for further analysis and can be trusted for practical applications.

Table 4. Path Coefficients

No	Construct Independent	Construct Dependent	Path Coefficient	Interpretation
1	Service Quality	Patient Satisfaction	0.578	Moderate positive relationship
2	Employee Competency	Patient Satisfaction	0.638	Moderate positive relationship
3	Digitalization	Patient Satisfaction	0.769	Strong positive relationship

Based on the results of the Path Coefficients analysis, it can be concluded that all three independent variables (service quality, employee competence, and digitalization) have a positive influence on patient satisfaction. Service Quality shows a moderate positive relationship with patient satisfaction, with a path coefficient of 0.578. This suggests that improvements in service quality do contribute to greater patient satisfaction, though the impact is not as strong compared to the other variables. Employee Competence also demonstrates a moderate positive effect, with a path coefficient of 0.638. This indicates that higher levels of

employee competence, particularly in how staff deliver care and interact with patients, are associated with increased satisfaction levels. The data reinforces the importance of well-trained and professional staff in creating a positive patient experience. Digitalization, on the other hand, exhibits the strongest positive relationship with patient satisfaction, with a path coefficient of 0.769. This highlights the substantial role that technology plays in enhancing healthcare services. The use of digital tools, such as electronic medical records, telemedicine, and online appointment systems, has a significant and measurable impact on improving patient satisfaction.

In summary, these findings confirm that all three variables positively influence patient satisfaction, with digitalization having the greatest impact, followed by employee competence, and then service quality. These results emphasize the importance of integrating technology and investing in staff development, alongside maintaining quality service standards, to improve the overall patient experience.

Table 5. R-Squared (R^2) Value

No	Construct Dependent	R^2	Interpretation
1	Patient Satisfaction	0.623	The model explains 62.3% of the variation in patient satisfaction. This indicates a moderate explanatory power.

The model, which includes service quality, employee competence, and digitalization as independent variables, explains approximately 62.3% of the variation in patient satisfaction, as indicated by the R^2 value of 0.623. This indicates a moderate level of explanatory power, meaning that although a large percentage of the variables affecting patient satisfaction are captured by the model, the remaining variance may still be influenced by other outside factors.

Table 6. Significance Test

No	Construct Independent	Construct Dependent	Path Coefficient	t-Statistic	p-Value	Interpretation
1	Service Quality	Patient Satisfaction	0.578	2.45	0.014	Significant ($p < 0.05$)
2	Employee Competency	Patient Satisfaction	0.638	2.84	0.005	Significant ($p < 0.05$)
3	Digitalization	Patient Satisfaction	0.769	4.11	0.000	Highly Significant ($p < 0.05$)

Based on the significance test results, it can be concluded that the three independent variables (service quality, employee competence, and digitalization) each have a significant relationship with patient satisfaction. Service quality demonstrated a statistically significant relationship with a t-statistic of 2.45 and a p-value of 0.014, which is below the 0.05 threshold. This indicates that improvements in service quality meaningfully contribute to increased patient satisfaction. Similarly, employee competence showed a significant impact, with a t-statistic of 2.84 and a p-value of 0.005, suggesting that as employee competence improves, so does the level of patient satisfaction. Notably, digitalization exhibited the strongest and most significant effect, with a t-statistic of 4.11 and a p-value of 0.000, indicating a very strong and highly significant relationship. This underscores the substantial role that digital technologies play in shaping a positive patient experience.

In addition, the path coefficients analysis confirmed a positive relationship between all three variables and patient satisfaction. among them, digitalization emerged as the most

influential factor, followed by employee competence and service quality. The R-squared (R^2) value of 0.623 indicates that the model accounts for 62.3% of the variation in patient satisfaction. This reflects a moderate level of explanatory power, suggesting that while the studied variables play a significant role, other external factors may also contribute to patient satisfaction.

This study found that all independent variables (service quality, employee competence, and digitalization) have a significant positive effect on patient satisfaction. Among them, digitalization had the strongest influence ($\beta = 0.769$, $p < 0.001$). This confirms the growing relevance of Healthcare 4.0 technologies and digital tools in delivering efficient, transparent, and patient-centered services. The findings are in line with Al-Assaf et al. (2024), who emphasized that digital health infrastructure not only improves operational workflows but also enhances patient perceptions of care.

From a practical point of view, this means clinics need to prioritize digital solutions that make things easier for both patients and staff. For example, having an easy-to-use website or mobile app for booking appointments can reduce waiting times and improve convenience. Likewise, integrating payment systems and digital medical records helps reduce administrative errors and allows smoother coordination across departments. Clinics that invest in these areas are more likely to see higher patient satisfaction and loyalty.

Employee competence also played a strong role in shaping satisfaction. This isn't surprising when healthcare workers are knowledgeable, confident, and communicative, patients feel safer and more respected. But competence today means more than just medical skills. It includes being able to use digital tools, explain procedures clearly, and interact with patients in a kind and professional way. So, clinics should consider providing regular training not only on clinical skills, but also on communication and the use of new digital systems. Even simple things like teaching staff how to use telemedicine platforms properly or how to explain treatment plans clearly can make a big difference in how patients perceive care.

Service quality, while slightly less impactful than the other two factors, still matters. Patients notice whether the facilities are clean, whether staff respond quickly, and whether the overall process is smooth. These basic aspects of service build trust and influence whether patients choose to return or recommend the clinic to others. So, even with technology and staff training, the basics of hospitality (like being on time, offering help, or maintaining cleanliness) can't be overlooked.

Together, these three factors explain around 62.3% of what influences patient satisfaction in this study. That's a good portion, but it also means there are other factors we didn't explore like the clinic's culture, communication between departments, or even the atmosphere and environment. These could be looked at in future studies.

Overall, this research shows that improving patient satisfaction isn't about focusing on just one thing, it's about aligning several key aspects. Digital tools can improve access and efficiency, competent staff make patients feel secure and heard, and good service processes ensure everything runs smoothly. When clinics work in all these areas together, they're more likely to provide a positive and memorable experience for their patients.

CONCLUSION

This study concludes that service quality, employee competence, and digitalization significantly enhance patient satisfaction, with digitalization having the greatest impact. Digital technology improves healthcare efficiency, while competent medical personnel are vital to ensuring positive patient experiences. Although service quality has a moderate effect, it

remains an essential component of satisfactory healthcare delivery. These findings underscore the need to integrate digital technologies and invest in staff development to improve patient satisfaction.

However, the study is limited to specific hospitals and healthcare facilities, which may affect the generalizability of the results. Future research should include a broader range of healthcare settings and consider additional factors such as hospital environment, communication practices, and organizational culture. Investigating specific digital innovations such as telemedicine or cloud-based systems and conducting longitudinal studies could offer deeper insights into their long-term effects on patient satisfaction.

APPENDIX

Variable	Indicator	Questionnaire Items
Service Quality	*Tangibles*	SQ1. The hospital facilities appear clean and modern.
	Reliability	SQ2. The hospital delivers services as promised.
	Responsiveness	SQ3. Hospital staff are responsive in assisting patients.
	Assurance	SQ4. Hospital staff demonstrate expertise and knowledge in service delivery
	Empathy	SQ5. Hospital staff are caring and attentive to patient's needs.
Employee Competency	*Knowledge*	EC1. Hospital employees possess adequate knowledge in their field.
	Skill	EC2. Employees demonstrate skill in carrying out their duties.
	Communication	EC3. Employees are able to communicate clearly and effectively with patients.
	Problem Solving	EC4. Employees are capable of resolving patients' problems effectively.
	Professionalism	EC5. Employees act professionally when providing services.
Digitalization	*Online Services*	D1. The hospital provides online services
	Digital Payment	D2. Payments at the hospital can be made digitally.
	Information Access	D3. Health information is easily accessible digitally by patients.
	Technology Integration	D4. Technology is utilized to support medical services.

	Ease of Use	D5. The hospital's digital systems are user-friendly for patients.
Patient Satisfaction	*Perceived Service Quality*	PS1. I am satisfied with the quality of service I received.
	Expectation Fulfilment	PS2. The service I received met my expectations.
	Revisit Intention	PS3. I am willing to return to this hospital if needed.
	Recommendation Intention	PS4. I will recommend this hospital to others.

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