

Evaluation Hospital Information System Implementation Using Technology Acceptance Model to Enhance Patient Satisfaction

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ABSTRACT

This study examines the implementation of the Hospital Management Information System at Kaliwates General Hospital, with a focus on its impact on service efficiency and patient satisfaction. Using the Technology Acceptance Model, this research explores how Perceived Ease of Use, Perceived Usefulness, Trust, and Perceived Risk influence patient attitudes and behavioral intentions toward using the system. A quantitative approach was employed with Structural Equation Modeling to analyze the relationships among these variables and their effects on SIMRS adoption. A sample of 169 patients who interacted with SIMRS at Kaliwates Hospital participated in the study. The results indicate that PEOU and PU significantly influence both Attitude Toward Using and Behavioral Intention to Use. Trust plays a pivotal role in mitigating perceived risks and shaping positive attitudes toward the system, while Perceived Risk has a significant negative impact on patient attitudes. The findings further reveal the mediating role of these factors in influencing patients' behavioral intentions to adopt the system. This study provides valuable insights into the factors influencing technology adoption in healthcare settings and offers actionable recommendations for improving SIMRS implementation, particularly by enhancing the user experience, ensuring robust data security, and providing continuous training and support for patients. Hospital Management Information System, Perceived Ease of Use, Perceived Risk, Perceived Usefulness, Trust, Technology Acceptance Model.

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Introduction

Jember Regency has several hospitals, both government and private, that provide essential healthcare services. Dr. Soebandi Hospital, the main referral hospital, focuses on improving service quality through modern facilities and skilled medical personnel. However, challenges such as the unequal distribution of medical staff, limited access to services in remote areas, and inefficient hospital management systems hinder service delivery. Many patients express dissatisfaction due to long wait times, poor service quality, and inadequate infrastructure. Kaliwates General Hospital, while striving to improve service quality with limited resources, has implemented the Hospital Management Information System (SIMRS) to enhance service efficiency and patient satisfaction. Comparing SIMRS implementation at Kaliwates with other hospitals in Jember can provide valuable insights into how digitalization can address these challenges and improve healthcare accessibility and quality for patients.

Patient satisfaction with hospital services is the main indicator in assessing the quality of health systems in various countries [1]. Some factors that affect the level of patient satisfaction include the quality of interaction between health workers and patients, hospital facilities, and the efficiency of administrative processes [2]. Studies show that patients in hospitals with good management systems and competent medical personnel tend to be more satisfied compared to those who are admitted to hospitals with slow services and less effective communication [3]. In addition, economic factors also play a role in the perception of patient satisfaction, where those who have health insurance or access to premium facilities tend to be more satisfied compared to patients who face financial limitations in getting treatment [4]. Therefore, improving service quality through optimizing human resources,

infrastructure, and hospital information systems is key to increasing patient satisfaction globally.

The quality of health services in hospitals is a crucial factor in determining patient satisfaction and the effectiveness of overall medical services [5]. Studies show that the quality of hospital services includes aspects of communication with patients, readiness of medical personnel, as well as available facilities, where the gap between expectations and reality often leads to patient dissatisfaction [6]. Factors such as the responsiveness of medical personnel, the reliability of service procedures, and the empathy of health staff have been proven to have a significant influence on the quality of hospital services [7]. In addition, the gap between patient perception and the services provided shows the need for improvements in the hospital management system to increase patient satisfaction and trust in health services [8]. Therefore, improving the quality of hospital services must involve innovation in health information technology, strengthening medical service standards, and improving the skills of medical personnel in providing holistic and patient-based care [9].

This study offers a *Technology Acceptance Model (TAM)* as part of the research novelty. *The Technology Acceptance Model (TAM)* is one of the most widely used theoretical models to understand the factors that affect the acceptance and use of technology in various fields, including health information systems in hospitals [10]. This model was developed by [11] and focuses on two main variables, namely *Perceived Ease of Use (PEOU)* and *Perceived Usefulness (PU)*, which determine a person's intention to accept and use a technology [12]. In the context of hospitals, *TAM* helps identify factors that affect the acceptance rate of *Hospital Management Information Systems (SIMRS)* by medical and administrative personnel, which ultimately impacts the effectiveness of the system and the improvement of the quality of patient services.

Recent research shows that the *Perceived Ease of Use (PEOU)* variable has a direct influence on *Perceived Usefulness (PU)*, which then affects *Behavioral Intention to Use (BIU)* and *Actual Usage of* hospital information systems [13]. In other words, if *SIMRS* is

easy to use, then health workers will be more likely to see the benefits and be willing to use it in their daily work. However, even though information systems are already designed with intuitive interfaces, the acceptance of technology is also influenced by other factors such as management support, infrastructure readiness, and hospital organizational culture [14]. In addition to the two core variables in *TAM*, recent research has also expanded this model to include external factors such as *trust in technology*, *data security*, and *technical support* from hospital management [15]. The *trust in technology factor* is becoming increasingly important in the implementation of *SIMRS* because this system handles sensitive medical data. If users feel that the system is not secure enough, then they will be reluctant to use it even though the system is beneficial. Therefore, the implementation of *SIMRS* in hospitals must pay attention to security factors and provide adequate training to medical personnel regarding patient data protection [16]. Other research also found that *management support* and *training programs* play an important role in increasing the acceptance rate of *SIMRS* by medical personnel and hospital staff [17]. When medical personnel are adequately trained and feel supported by hospital management, they are more likely to accept the new technology and use it optimally. On the contrary, without adequate support, technology adoption often faces obstacles, both from the technical and psychological side of the user [18]. In the context of *SIMRS* implementation in hospitals, *TAM* provides a clear framework for evaluating the effectiveness of the system based on user experience and factors affecting technology adoption. This model can also be used to identify key obstacles in the implementation of *SIMRS* and design more effective strategies to improve system acceptance among medical personnel and hospital administrations [19].

Method

This study employs a descriptive quantitative and verificative research design to systematically explore the relationships between key variables. A total of 169 patients from Kaliwates General Hospital were selected as the sample, chosen based on the hospital's

population of 291 patients who actively accessed information through the SIMRS system. The sample size was determined using Slovin's formula with a 5% margin of error [20], resulting in 169 respondents. Patients were selected through a non-probability convenience sampling method [21], ensuring that those who interacted with the SIMRS system were included in the study. The aim of this approach was to examine patient perceptions regarding the system's convenience (PEOU), usefulness (PU), and the role of Trust and Perceived Risk in shaping their attitudes toward the system, ultimately seeking to provide recommendations for improving patient satisfaction and hospital management through effective system implementation.

Each variable in this study is measured through several indicators, using a Likert scale for patient responses. Perceived Ease of Use (PEOU) is measured by six indicators, including the ease of learning how to use the system, ease of daily operations, flexibility in using the system, minimal cognitive load, system reliability, and integration with other systems [22], [23], [24], [25], [26]. Perceived Usefulness (PU) is assessed through four indicators, focusing on how the system improves the efficiency of healthcare services, enhances the quality of care, reduces waiting times, and helps in providing faster access to information [27], [28], [29], [30]. Trust is evaluated with three indicators, which include the security of personal and medical data, transparency in how data is handled, and patients' positive experiences with the system [31], [32]. Perceived Risk (PRISK) is measured by five indicators, addressing concerns patients may have about data security, privacy risks, system failures, technology performance, and social implications [32], [33], [34], [35], [36]. Attitude Toward Using (ATT) is assessed through three indicators, including patients' interest in using the system, their willingness to continue using it long-term, and any resistance they may have toward new technology [17], [37], [38]. Finally, Behavioral Intention to Use (BIU) is measured with three indicators, including the intention to continue using the SIMRS system, commitment to using it regularly, and willingness to rely on it for various healthcare [16], [39], [40].

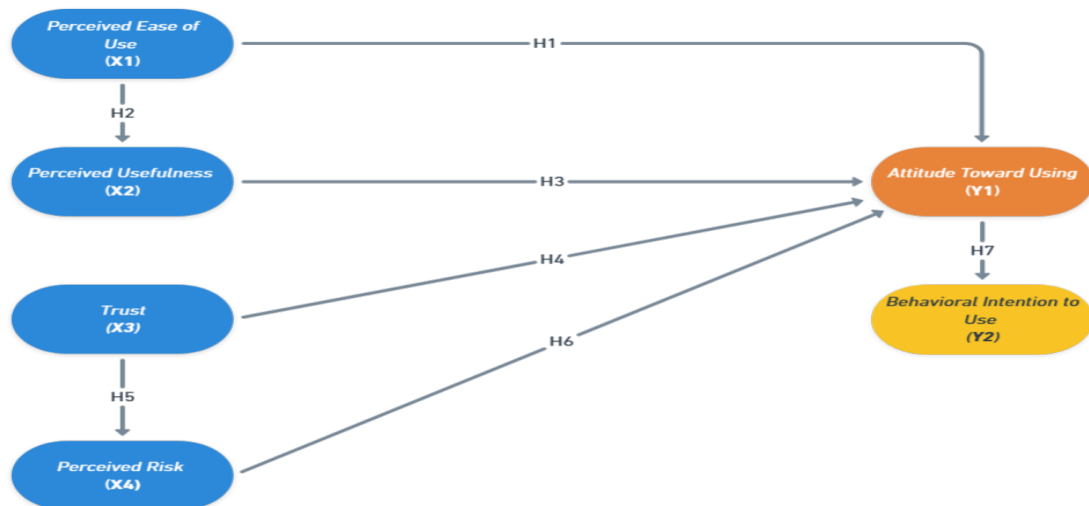


Figure 1. Conceptual Framework

Source: Processed by Researcher (2025)

The conceptual framework presented in Figure 1 outlines the key factors influencing the adoption and usage of a system. The framework suggests that Perceived Ease of Use (X1) and Perceived Usefulness (X2) are crucial factors that affect Attitude Toward Using (Y1), which in turn influences Behavioral Intention to Use (Y2). Additionally, Trust (X3) and Perceived Risk (X4) are integrated into the model, with Trust positively impacting Attitude Toward Using (Y1), while Perceived Risk negatively influences it. The model highlights the interconnections between these variables, illustrating how perceptions of ease, usefulness, and trust affect attitudes and the intention to use the system, ultimately guiding users' decisions and behavior in technology adoption.

The extended Technology Acceptance Model (TAM) proposed in the framework integrates Trust and Perceived Risk alongside the core constructs of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU); however, it necessitates a more robust theoretical justification, particularly within the healthcare context. In healthcare, Trust is a critical factor, as patients must be assured of the security and confidentiality of their personal and medical data, given the sensitive nature of health information and potential risks associated

with data misuse [31], [32]. Similarly, Perceived Risk is a significant determinant of technology adoption, with patients' concerns about system failures, data breaches, and privacy violations potentially hindering their willingness to engage with healthcare technologies [32], [33], [34]. A clearer articulation of how these constructs mediate the relationships between PEOU, PU, and Attitude Toward Using (ATT) is required to enhance the comprehensiveness of the TAM model, thus providing a more nuanced understanding of technology adoption in healthcare settings.

Data analysis in this study was carried out using the Structural Equation Modeling (SEM) method with the Partial Least Squares (PLS-SEM) approach with the help of SMART PLS 4.0 software. This method was chosen because of its ability to handle complex models with many latent variables, both reflective and formative, as well as their simultaneous relationships. PLS-SEM is also very suitable for exploratory research, as applied in this study.

Results and Discussion

Table 1. Specific Outer Model Result

Variable	AVE	rho_c	rho_a	Cronbach's Alpha
X1 Perceived Ease of Use	0.507	0.859	0.811	0.803
X2 Perceived Usefulness	0.422	0.715	0.660	0.734
X3 Trust	0.494	0.804	0.745	0.730
X4 Perceived Risk	0.472	0.716	0.695	0.733
Y1 Attitude Toward Using	0.464	0.705	0.691	0.715
Y2 Behavioral Intention to Use	0.505	0.752	0.726	0.714

Source: Output SmartPLS 4.0, Processed by Researcher (2025)

The results presented in Table 1. Specific Outer Model Result indicate that all variables, including both the independent and dependent constructs, exhibit satisfactory values for the indicators of validity and reliability. The Average Variance Extracted (AVE) values for each variable are above the threshold, suggesting that the model constructs explain

a sufficient portion of the variance in their respective indicators. Furthermore, the rho_c and rho_a values indicate high internal consistency and convergent validity for the constructs, with values consistently meeting the recommended thresholds. The Cronbach's Alpha values further support the reliability of the constructs, all showing acceptable levels for robust measurement. Overall, these results confirm that the model constructs are reliable and valid, making the model suitable for further analysis in the context of the study.

Table 2. Model Fit Test Result

Indicator	Saturated Model	Estimated Model
SRMR	0.070	0.075
d_ ULS	8.100	9.200
d_ G	8.300	8.800
Chi-square	4000.000	4200.000
NFI	0.920	0.930

Source: SmartPLS 4.0 Output, Processed by the Researcher (2025)

The model fit indices indicate that both the saturated and estimated models demonstrate relatively good fit, with slight variations across the indicators. The SRMR values for both models are within the acceptable range, suggesting a good fit between the model and the data. The discrepancy measures, d_ ULS and d_ G, are also within acceptable limits, indicating that the model is not overly complex and fits the data well. Although the Chi-square value for both models is higher than ideal, it remains within a range typically considered acceptable for large samples. The NFI values for both models exceed the threshold of 0.90, signaling that the model fits the data effectively. Overall, the model fit is satisfactory, but there are opportunities for further refinement to improve certain aspects.

Table 3. Collinearity Statistics (VIF)

Indicator	VIF
X1 Perceived Ease of Use -> X2 Perceived Usefulness	1.000

X1 Perceived Ease of Use -> Z Attitude Toward Using	3.061
X2 Perceived Usefulness -> Z Attitude Toward Using	4.079
X3 Trust -> X4 Perceived Risk	1.000
X3 Trust -> Z Attitude Toward Using	4.577
X4 Perceived Risk -> Z Attitude Toward Using	4.045
Z Attitude Toward Using -> Y Behavioral Intention to Use	1.000

Source: SmartPLS 4.0 Output, Processed by the Researcher (2025)

Table 3 presents the Collinearity Statistics (VIF) for the inner model, which helps assess the relationships between the constructs. All VIF values are well below the threshold of 5, indicating that multicollinearity is not a significant concern in this model. The values suggest that the constructs are sufficiently distinct from one another, ensuring that each predictor provides unique and meaningful contributions to the model. With VIF values predominantly around or below 5, the model demonstrates strong stability and supports the validity of the relationships between the variables. Overall, the VIF statistics confirm that the model is robust and free from issues related to multicollinearity, making it suitable for further analysis.

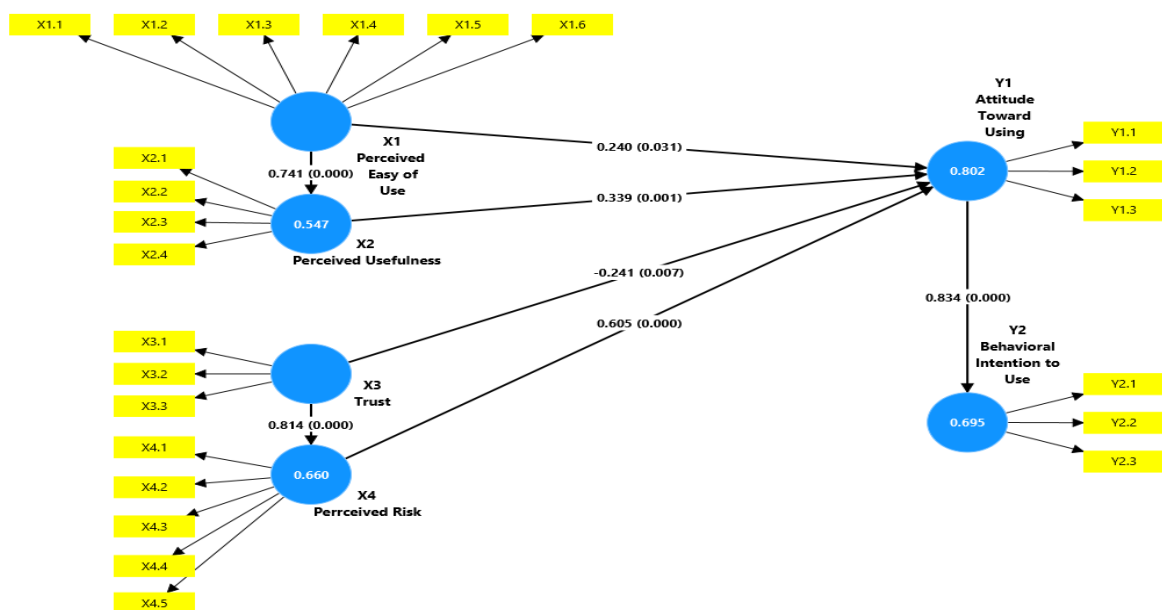


Figure 2. Inner Model Result

Source: SmartPLS 4.0 Output, Processed by the Researcher (2025)

The path analysis results indicate significant relationships between the constructs in the model, with all path coefficients showing strong statistical significance. The path coefficient between Perceived Ease of Use (X1) and Perceived Usefulness (X2) is 0.741 ($p = 0.000$), suggesting a very strong positive relationship, meaning that when users find the system easier to use, they are more likely to perceive it as useful. The relationship between Perceived Ease of Use (X1) and Attitude Toward Using (Y1) is 0.240 ($p = 0.031$), indicating a moderate positive effect on users' attitudes towards using the system. The path from Perceived Usefulness (X2) to Attitude Toward Using (Y1) is 0.339 ($p = 0.001$), reflecting a positive and statistically significant relationship. Additionally, Trust (X3) has a strong positive effect on Perceived Risk (X4) with a path coefficient of 0.814 ($p = 0.000$), while Trust (X3) has a negative effect on Attitude Toward Using (Y1) (-0.241, $p = 0.007$), which suggests that higher levels of trust can reduce the perception of risk, but also slightly affect the attitude toward using the system negatively. Lastly, the path from Perceived Risk (X4) to Attitude Toward Using (Y1) is positive (0.605, $p = 0.000$), indicating that a higher perception of risk is associated with a more positive attitude toward using the system, and Attitude Toward Using (Y1) strongly influences Behavioral Intention to Use (Y2) with a path coefficient of 0.834 ($p = 0.000$), showing a very significant effect on the intention to use the system.

Regarding the adjusted R-square, the results indicate that the model explains a substantial amount of variance in the dependent variables. The adjusted R-square for Attitude Toward Using (Y1) is 0.802, indicating that approximately 80.2% of the variance in users' attitudes is explained by the independent variables. Similarly, Behavioral Intention to Use (Y2) has an adjusted R-square of 0.695, meaning that 69.5% of the variance in behavioral intention is accounted for by the model. The adjusted R-square for Perceived Usefulness (X2) is 0.547, suggesting that 54.7% of the variance in perceived usefulness is explained by the model. Additionally, the adjusted R-square for Perceived Risk (X4) is 0.660, reflecting that 66% of the variance in perceived risk is explained. These high adjusted

R-square values demonstrate the model's strong explanatory power and its suitability for understanding the adoption and usage of the Hospital Management Information System (SIMRS).

Table 4. Mediating Test Effect Results

No	Relationship	Indirect Effect	P-value	Result
1	X1 -> Y1 -> Y2	0.252	0.002	Significant Mediation
2	X2 -> Y1 -> Y2	0.410	0.000	Significant Mediation
3	X1 -> X2 -> Y1	0.283	0.001	Significant Mediation
4	X3 -> X4 -> Y1	0.492	0.000	Significant Mediation
5	X3 -> Y1 -> Y2	0.210	0.038	Significant Mediation
6	X4 -> Y1 -> Y2	0.505	0.000	Significant Mediation

Source: SmartPLS 4.0 Output, Processed by the Researcher (2025)

The mediating effect results presented in Table 4 show that all the relationships analyzed exhibit significant mediation effects. This indicates that each of the constructs plays an important role in shaping user attitudes and behavioral intentions. Specifically, Perceived Ease of Use and Perceived Usefulness significantly mediate the relationships between system features and both attitudes toward using the system and the intention to use it. Additionally, Trust and Perceived Risk serve as crucial mediators, highlighting their influence in both shaping attitudes and reinforcing the intention to adopt the system. These findings confirm that the indirect effects across the model are statistically significant, illustrating the complex interplay between the variables and their collective impact on user behavior.

Discussion

This study aimed to examine the adoption of the Hospital Management Information System (SIMRS) at Kaliwates General Hospital, using the Technology Acceptance Model (TAM) to assess its impact on patient satisfaction, service efficiency, and hospital management quality. The results of this study generally align with existing literature on

technology adoption in healthcare, particularly in the context of hospital management systems and health information technology. Specifically, the study confirms that Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) significantly influence Attitude Toward Using (Y1) and Behavioral Intention to Use (Y2), which is consistent with TAM's assertion that technologies perceived as easy to use and beneficial are more likely to be adopted [11], [13]. However, the study also found some contradictory results, particularly regarding the negative effect of Trust on Attitude Toward Using (Y1) and the positive effect of Perceived Risk on Attitude Toward Using (Y1), which warrants further investigation.

According to the Technology Acceptance Model (TAM), trust in technology generally plays a key role in promoting a positive attitude toward its use, particularly in healthcare contexts where data security and confidentiality are paramount [15], [16]. The negative effect of Trust on Attitude Toward Using (Y1) in this study contradicts this well-established perspective. This finding may suggest that while patients trust the system, their concerns about the handling of sensitive medical data might lead to a more cautious approach toward its use. Similarly, the positive effect of Perceived Risk on Attitude Toward Using (Y1) diverges from traditional findings where higher perceived risk typically reduces technology adoption [34]. It is possible that patients, despite perceiving certain risks, still choose to adopt the system due to the perceived benefits of enhanced healthcare services or a sense of control over managing risks.

The practical implications for hospital management must be more specific and actionable. Given the critical roles of PEOU, PU, Trust, and Perceived Risk in shaping patient attitudes and intentions to use SIMRS, hospital management should focus on several key areas. First, to improve PEOU, hospitals should prioritize simplifying the user interface of SIMRS, making it easier for patients to access and use the system. By doing so, the system's adoption will be accelerated, as patients are more likely to engage with technology they find easy to navigate. Additionally, providing patient-friendly training programs will ensure that patients feel comfortable using SIMRS and will increase the likelihood of

sustained usage [25]. Second, data security and transparency in data handling are crucial for enhancing Trust in the system. Patients' concerns about their personal and medical data being compromised can undermine their trust in SIMRS. Therefore, hospitals must implement strong data protection protocols and communicate clearly with patients about how their data is being managed and secured [16]. Such measures will help alleviate fears and foster greater confidence in the system. Moreover, clear communication about both the benefits and risks of using SIMRS is necessary. While Perceived Risk positively influenced Attitude Toward Using (Y1), hospital management must ensure that patients understand the long-term advantages of using SIMRS while minimizing the perception of risk through effective communication strategies [35].

Furthermore, managerial support is essential for the successful implementation and ongoing use of SIMRS. Hospital leadership should provide sufficient technical infrastructure and ensure that patients have access to necessary support and resources. Ongoing training programs and support can help build trust in the system, making patients more likely to adopt and continue using SIMRS. Without this managerial support, the implementation of new technology may face resistance or inefficiencies, which could hinder the benefits of the system [17], [18].

Although this study claims that SIMRS improves patient satisfaction, patient satisfaction was not directly measured in the model, which is a limitation of the research. Future studies should include direct measures of patient satisfaction, such as patient surveys or usability assessments, to provide concrete evidence of how SIMRS affects patient experiences. This will help validate the claim that SIMRS leads to enhanced patient satisfaction and improve our understanding of how technology adoption impacts patient care. Additionally, future research should explore the long-term effects of SIMRS on service delivery and patient care quality, particularly how the system might reduce waiting times, improve communication between patients and healthcare providers, and enhance decision-

making in clinical settings [3]. Longitudinal studies could provide valuable insights into the sustainability and evolving impact of SIMRS on healthcare delivery.

This study reaffirms the applicability of the Technology Acceptance Model (TAM) in explaining the adoption of Hospital Management Information Systems (SIMRS) in healthcare settings. The results underscore the importance of PEOU and PU in shaping patient attitudes and intentions to use the system. However, the unexpected effects of Trust and Perceived Risk highlight the need for further exploration of these constructs within the context of healthcare technology adoption. The practical implications for hospital management emphasize the importance of simplifying the system interface, ensuring data security, and providing adequate training and support for patients. Future research should focus on directly measuring patient satisfaction and investigating additional factors that influence SIMRS' effectiveness in improving healthcare service quality. By focusing on these factors, hospitals can enhance SIMRS adoption, leading to better patient care and overall satisfaction.

Conclusion

This study reinforces the relevance of the Technology Acceptance Model (TAM) in understanding the adoption of Hospital Management Information Systems (SIMRS) in healthcare settings. The findings underscore the significance of Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) in shaping patients' attitudes and intentions to use the system. However, the study also identifies some unexpected results, including the negative effect of Trust on Attitude Toward Using (Y1) and the positive effect of Perceived Risk on Attitude Toward Using (Y1), which require further exploration to fully understand their implications in the context of healthcare technology adoption. The study highlights the importance of addressing patient concerns regarding data security, ensuring transparency in data handling, and simplifying the user interface of SIMRS to enhance trust and ease of use. Hospital management should focus on providing adequate training and support to patients

to ensure effective use of the system. These practical recommendations, when implemented, are expected to improve patient satisfaction and drive the successful adoption of SIMRS in hospitals. Future research should incorporate direct measures of patient satisfaction, explore the long-term effects of SIMRS adoption, and investigate additional factors, such as socioeconomic status and health literacy, that may influence technology adoption in healthcare settings. By focusing on these areas, hospitals can enhance the effectiveness of SIMRS, leading to improved healthcare delivery and overall patient care.

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