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Doctors' performance when using Hospital Information System (HIS) in analysing determinants of mental health

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Abstract

Background: The implementation of hospital information systems is expected to improve employee performance, particularly among doctors as key users. Previous studies have shown that the effectiveness of such systems can positively influence individual performance.

Purpose: To analyze of Mental Health and Performance of Doctors Using the Hospital Information System (HIS).

Method: This quantitative study used a total sampling technique involving 41 doctors at PRIMA Hospital Pekanbaru. Data were analyzed using multiple linear regression to assess the influence of various factors on doctors' performance in using HMIS. The independent variables included knowledge, attitude, experience, doctors' perception, ease of use, system security and reliability, feature-need suitability, data quality and accessibility, hospital policy, training and supervision support, as well as incentives and performance evaluation.

Results: The analysis revealed that only the doctors' perception variable had a statistically significant effect on doctors' performance ($p = 0.010 < 0.05$). Other variables including knowledge, attitude, experience, ease of use, system security, hospital policies, training, and incentives showed no significant influence ($p > 0.05$).

Conclusion: Doctors' perception of HMIS is a key factor in enhancing their performance in using the system. To optimize HMIS implementation, hospitals should focus on improving doctors' understanding and acceptance through strategies such as targeted education and socialization, simplifying and customizing system features, enhancing system speed and interface, and offering performance-based incentives for HMIS utilization.

Keywords: Determinants; Doctors' Performance; Hospital Management Information System; Multiple Linear Regression; Perception.

INTRODUCTION

The digital transformation of healthcare systems has become a global priority, with hospital information systems playing a central role in enhancing service quality and operational efficiency. In Indonesia, the mandatory implementation of Electronic Medical Records (EMRs) by December 31, 2023, as stipulated in Ministry of Health Regulation No. 24 of 2022, marked a significant milestone toward this digital shift. 1) The World Health Organization recognizes Health Information Systems (HIS) as foundational to achieving universal health coverage. 2) Hospital Information Systems

such as the Hospital Management Information System (HMIS) are designed to improve healthcare delivery by integrating clinical, administrative, and support services into a cohesive, accurate, and timely system (Rahimi, Nadri, Afshar, & Timpka, 2018). Despite their potential, the effective implementation of HIS in Indonesia remains a challenge. Several studies highlight that the success of HIS is influenced by three key dimensions: human, technological, and organizational factors. Human factors such as user perception, knowledge, attitude, and experience play a vital role in determining the

level of adoption and performance outcomes. Technological dimensions include system ease of use, security, functionality, and speed. Organizational support, policy clarity, training, and incentives also shape the success of HMIS adoption (Wijaya, 2025).

For instance, found that effective information systems enhance individual performance (Kia, Beheshti, & Shahmoradi, 2021). Emphasized the significance of training and incentives in improving medical staff performance (Ahuja, Hanlon, Chisholm, Semrau, Gurung, Abdulmalik, & Jordans, 2019). Resistance among users especially senior physicians with limited IT familiarity and perceptions of system complexity and inefficiency often hinder optimal utilization.¹ This was also reflected in anecdotal evidence from RS Prima Pekanbaru, where senior doctors expressed dissatisfaction with HIS DHealth due to its perceived technical limitations and lack of task-technology fit. To date, few studies have quantitatively explored the comprehensive determinants affecting doctor performance in using HIS, particularly in the Indonesian context. This study aims to fill that gap by examining a range of factors spanning from personal attributes to systemic and institutional influences that may impact doctors' performance as HIS users (Alaiad, Alsharo, & Alnsour, 2019). The novelty of this research lies in its integrative model that simultaneously assesses human, technological, and organizational factors within a real hospital environment in Indonesia. By using a multiple linear regression approach, this study identifies which variables significantly affect performance, with particular focus on doctors' perception of HIS a factor that has shown significant predictive power in previous studies (Astuti, Herdiyanti, & Iriandani, 2015).

Understanding these determinants is vital for healthcare institutions striving to optimize HIS implementation and align with national digital health mandates. The findings of this study contribute not only to the literature on health information systems in developing countries but also to practical strategies for improving hospital performance, data accuracy, and patient care through better HMIS adoption. Ultimately, this research supports Indonesia's broader goal of digital transformation in healthcare and highlights the critical role of physician engagement in that process (Pardamean, Gazali,

Muljo, Suparyanto, & Mahesworo, 2021).

RESEARCH METHOD

A quantitative analytic survey design with a cross-sectional approach. The study was conducted at Hospital Prima Pekanbaru, Riau Province, Indonesia, from February 25 to March 11, 2025. The research was designed to analyze the determinants that influence doctors' performance in using the Hospital Management Information System (HMIS). The target population consisted of all doctors working in clinical services at Hospital Prima Pekanbaru who had used the HMIS DHealth application. The study population was 95 doctors, including general practitioners, dental doctors, and medical specialists. A total sampling technique was applied, considering the relatively small and accessible population. The inclusion criteria were doctors who had actively used HMIS DHealth for at least six months, while exclusion criteria included doctors who were on extended leave or not using the system regularly. Based on the total number of eligible respondents ($n = 95$), a sample of 41 doctors was obtained after applying the eligibility criteria. This sample size exceeds the minimum recommendation for parametric statistical analysis, which typically requires at least 30 participants.

Primary data were collected through structured questionnaires distributed directly to respondents. The questionnaire consisted of items measuring eleven independent variables (knowledge, attitude, experience, perception, ease of use, system security, feature-task fit, data quality and accessibility, hospital policy, training and supervision, and incentives and evaluation) and one dependent variable (performance of doctors as users). Each item was rated using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The instrument had been previously tested for validity and reliability. Data were processed using SPSS version 25.0. The analysis included univariate descriptive statistics, bivariate analysis using partial t-tests, and multivariate analysis using multiple linear regression. Statistical significance was set at a p-value of <0.05 and confidence interval at 95%. This study was approved by the Health Research Ethics Committee of STIKes Hang Tuah Pekanbaru, with ethical clearance number: 118/KEPK/UHTP/II/2025. All participants received a written explanation of the study and provided informed consent before completing the questionnaire. Participation was voluntary, and anonymity and confidentiality of data were strictly maintained throughout the research process.

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RESEARCH RESULTS

Table 1. Characteristics of Respondents (N = 41)

Variable	Results
Age (Mean±SD)(Range)(Year)(n%)	(38.3±8.8)(28-60)
<30	6/14.6
30 - 40	21/51.2
41 - 50	9/22.0
≥50	5/12.2
Gender (n%)	
Male	26/63.4
Female	15/36.6
Position (n%)	
Medical Specialists	25/61.0
General Practitioners	12/29.3
Dental Doctors	4/9.8

The table presents respondents' demographic characteristics. The average age was 38.3 ± 8.8 years with an age range of 28–60 years, dominated by those aged 30–40 years (51.2%). Most respondents were male (63.4%) and worked as medical specialists (61.0%), followed by general practitioners (29.3%) and dental doctors (9.8%).

Table 2. Distribution of Research Variables

Variable	Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)
Knowledge (X1)	2	5	9	72	35
Attitude (X2)	3	11	16	56	37
Experience (X3)	4	12	18	54	35
Physicians' Perception (X4)	14	16	29	39	25
Ease of Use (X5)	5	11	32	65	10
System Security and Reliability (X6)	10	21	38	42	12
Feature-Need Suitability (X7)	2	13	36	56	16
Quality and Accessibility (X8)	4	23	38	50	8
Hospital Policy (X9)	6	15	34	52	16
Training and Supervision Support (X10)	1	21	38	50	13
Incentives and Performance Evaluation (X11)	11	20	32	43	17

The table shows respondents' distribution based on agreement levels toward eleven variables related to system implementation. Overall, most respondents tended to agree or strongly agree across all variables, indicating positive perceptions. The highest agreement was found in Knowledge (X1) and Attitude (X2), while Physicians' Perception (X4) and System Security and Reliability (X6) showed more diverse responses, suggesting varying opinions among respondents.

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Table 3. Result of Bivariate and Multivariat Analysis

Independent Variable	Regression Coefficient (β)	Sig.	Conclusion
Knowledge (X1)	- 0.94	0.593	Not significant
Attitude (X2)	0.101	0.725	Not significant
Experience (X3)	0.032	0.904	Not significant
Physicians' Perception (X4)	0.455	0.010	Significant
Ease of Use (X5)	0.100	0.557	Not significant
System Security and Reliability (X6)	0.047	0.723	Not significant
Feature-Need Suitability (X7)	0.177	0.321	Not significant
Quality and Accessibility (X8)	0.049	0.774	Not significant
Hospital Policy (X9)	0.216	0.217	Not significant
Training and Supervision Support (X10)	-0.27	0.841	Not significant
Incentives and Performance Evaluation (X11)	-0.10	0.939	Not significant

Among the eleven variables tested, only physicians' perception (X4) showed a statistically significant association with performance ($\beta = 0.455$; $p = 0.010$). This indicates that doctors who perceive the system positively tend to perform better in utilizing SIMRS. Other variables such as knowledge, attitude, experience, ease of use, system security, feature-need suitability, quality and accessibility, hospital policy, training and supervision support, and incentives and performance evaluation were not significantly associated with performance, as indicated by p - values greater than 0.05. These results suggest that perception plays a central role in influencing doctors' performance, while other organizational and system-related factors may have less direct impact.

DISCUSSION

The present study found that physicians' perception of the Hospital Management Information System (HMIS) was the only variable that significantly influenced physician performance in utilizing HMIS ($p = 0.010 < 0.05$). Other variables—knowledge, attitude, experience, perceived ease of use, system security, feature suitability, data quality, hospital policies, training, and incentives—were not statistically significant ($p > 0.05$). Doctors' perceptions ($p = 0.010$) toward HMIS are associated with greater acceptance and optimal utilization, which in turn improve efficiency and performance. This result aligns with the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use are key determinants of system acceptance. Perceived usefulness and ease

of use play a mediating role in enhancing user performance with health information systems (Bagherian & Sattari, 2022). Their study involving 395 HIS users found that positive perceptions significantly improved individual performance.

Physicians' positive perceptions of the usefulness and ease of medical record systems increased their intention to use them fully (Walle, Demsash, Ferede, & Wubante, 2023). The presence of efficient and accessible medical records accelerated documentation processes. User perceptions of HMIS benefits and convenience significantly shaped attitudes and increased effective system use (Mondal, Arnab, Retina, Bushra, Roy, Tisa, & Ferdous, 2024). Confidence in using a system also contributes to better individual performance, as noted in previous studies. Our findings support these studies, indicating that doctors' perceptions—including perceived usefulness and perceived organizational support significantly influenced their HMIS-related performance ($p < 0.05$). Doctors who believed HMIS enhanced their efficiency and were supported by hospital leadership showed better system engagement. This confirms that user motivation and institutional encouragement are essential for maximizing HMIS outcomes (Yu, Huang, Tian, Yang, Ning, & 2024). On the other hand, challenges in HMIS implementation remain. Christasani et al. and Sumiyem and Hartayu identified infrastructure limitations and low user readiness as barriers. Strategies to socialize HMIS benefits and engage users, such as focus group discussions and user-centered design improvements, may help build more favorable

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perceptions. Overall, enhancing doctors' perceptions especially regarding system usefulness and organizational support—may be more impactful in improving performance than technical interventions alone (Lin, Lin, & Roan, 2022).

This study found that knowledge, attitude, experience, perceived ease of use, system security, feature-fit, data quality, hospital policies, training, and incentives did not significantly influence doctors' performance in using HMIS ($p > 0.05$). These findings suggest that technical and administrative factors alone are insufficient to enhance user performance. Although most doctors understood the functions of HMIS, knowledge ($p = 0.593$), attitude ($p = 0.725$), and experience ($p = 0.904$) did not significantly impact performance. These findings align with Ismawati et al., who reported that knowledge did not guarantee improved performance in medical record completion. Attitude influenced behavioral intention to use health IT (Popescu, El-Chaarani, El-Abiad, & Gigauri, 2022). Perceived ease of use ($p = 0.557$) and feature-fit ($p = 0.321$) showed no significant influence, despite generally positive responses. Usability and task-technology fit positively impacted system use and performance (El-Yafouri, Klieb, & Sabatier, 2022).

Although supported by an IT team, system reliability ($p = 0.723$) and data quality ($p = 0.774$) were not significant predictors. Emphasized the role of security and data accessibility in supporting HIS adoption and satisfaction (Sanjuluca, de Almeida, & Cruz-Correia, 2022). Hospital policies ($p = 0.217$), training ($p = 0.841$), and incentives ($p = 0.939$) also had no significant effect. Limited training and lack of structured incentives may have contributed to this. These results are inconsistent with previous studies highlighting the importance of supportive leadership and reward systems in health IT implementation. Overall, these findings emphasize the need to go beyond structural interventions and address user perceptions and acceptance to improve HMIS utilization (Alsharo, Alnsour, & Alabdallah, 2020).

This study offers several strengths that enhance the validity and relevance of its findings. First, the use of total sampling among physicians actively using the Hospital Management Information System (HMIS) ensures that the results accurately represent real conditions in the field (Bernburg, Vitzthum, Groneberg, & Mache, 2016). Second, the study employed a quantitative design with multiple linear

regression analysis, which enables an objective examination of relationships between variables. The use of validity testing, reliability testing, and classical assumption testing adds credibility to the results. The regression model applied in this study was statistically valid and could be interpreted clearly (Luo, Ahmad, Alyaemeni, Irshad, Alyafi-Alzahri, & Unnisa, 2024).

However, the study also has several limitations. The respondents were limited to physicians in a single hospital setting, which may restrict the generalizability of the findings to other institutions with different characteristics and HMIS usage contexts (Chimbo & Motsi, 2024). In addition, external factors such as technical support from the HMIS vendor and potential system limitations were not examined, although they may have an impact on physicians' performance when using the system. Furthermore, qualitative aspects such as physicians' underlying perceptions and motivations regarding HMIS usage were not explored, leaving room for further investigation in future studies (Sıcakyüz & Yüregir, 2020).

CONCLUSION

Several factors examined, only physicians' perceptions significantly influenced their performance in using HMIS (β positive, sig. $0.010 < 0.05$). Physicians with positive perceptions toward the system tended to use it more effectively, while those with negative perceptions felt that HMIS hindered their work. Contributing issues included lack of confidence in using the system, insufficient training, perceived inefficiency, complex interface design, absence of incentives, and frequent technical disruptions due to unstable servers. These findings suggest that enhancing user perception through targeted support, interface improvements, and incentive structures may lead to better system utilization. Future research could focus on designing and evaluating interventions aimed at improving system usability and user motivation across broader healthcare settings.

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