

FACTORS ASSOCIATED WITH THE EFFECTIVENESS OF HOSPITAL MANAGEMENT INFORMATION SYSTEM IMPLEMENTATION

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ABSTRACT

The Hospital Management Information System (HMIS) is a critical component in improving hospital service quality, operational efficiency, and decision-making processes. Effective implementation of HMIS supports accurate data management, integrated services, and timely information for healthcare providers and hospital management. However, variations in system utilisation, human resource competence, and organisational support may affect the effectiveness of HMIS implementation. This study aimed to analyse factors associated with the effectiveness of Hospital Management Information System implementation at Alimuddin Umar Regional Public Hospital, West Lampung Regency, in 2025. A quantitative study with a cross-sectional design was conducted involving hospital employees who utilised the Hospital Management Information System in their daily work. Respondents were selected using purposive sampling. Data were collected using structured questionnaires. Data analysis included univariate analysis, bivariate analysis using the chi-square test, and multivariate analysis using logistic regression to identify dominant associated factors. The results indicated that the effectiveness of Hospital Management Information System implementation was significantly associated with user competence, system quality, organisational support, and infrastructure availability ($p < 0.05$). The effectiveness of Hospital Management Information System implementation is influenced by human resource competence, system quality, organisational support, and infrastructure. Strengthening user training, improving system reliability, and enhancing organisational commitment are recommended to optimise system effectiveness.

Keywords: hospital management information system; hospital performance; information system effectiveness; system quality; user competence

INTRODUCTION

The rapid development of information technology has significantly transformed healthcare systems, particularly in hospital management and service delivery. The Hospital Management Information System (HMIS) has become an essential tool for improving administrative efficiency, clinical documentation, data integration, and decision-making processes. Effective implementation of HMIS enables hospitals to provide timely, accurate, and reliable information to support patient care and organisational performance (DeLone & McLean, 2003; WHO, 2021).

In hospital settings, HMIS plays a critical role in integrating clinical, administrative, and financial data into a single information platform. Proper utilisation of HMIS can reduce medical errors, shorten service time, improve coordination among healthcare units, and enhance overall service quality (Kim et al., 2016; Handayani et al., 2018). Conversely, ineffective implementation of HMIS may lead to system inefficiencies, data inaccuracies, user resistance, and increased workload for healthcare staff.

Previous studies have identified several factors influencing the effectiveness of HMIS implementation, including user competence, system quality, organisational support, and infrastructure availability (Hotchkiss et al., 2015; Rahimi et al., 2018). Human resource competence, particularly user knowledge and skills, is a crucial determinant of system utilisation

and acceptance. Additionally, system reliability, ease of use, and technical support are essential to ensure sustained system performance.

In Indonesia, the implementation of HMIS is mandated by the Ministry of Health as part of hospital accreditation standards and digital health transformation initiatives (Kemenkes RI, 2022). Despite this policy support, many hospitals continue to face challenges in achieving effective HMIS implementation due to limited training, inadequate infrastructure, and organisational constraints.

At Alimuddin Umar Regional Public Hospital, West Lampung Regency, HMIS has been implemented to support hospital operations and service delivery. However, variations in system utilisation and perceived effectiveness have been observed among hospital staff. Empirical evidence regarding factors associated with the effectiveness of HMIS implementation in this setting remains limited. Therefore, this study aimed to analyse factors associated with the effectiveness of Hospital Management Information System implementation at Alimuddin Umar Regional Public Hospital in 2025.

METHOD

This study employed a quantitative analytic observational design with a cross-sectional approach (Creswell & Creswell, 2018). The study was conducted at Alimuddin Umar Regional Public Hospital, West Lampung Regency, in 2025.

The study population consisted of hospital employees who routinely used the Hospital Management Information System in their daily work activities. A total of respondents were selected using purposive sampling based on inclusion criteria, including active HMIS users and willingness to participate in the study.

Data were collected using structured questionnaires developed from validated information system evaluation frameworks. The dependent variable was the effectiveness of HMIS implementation, while the independent variables included user competence, system quality, organisational support, and infrastructure availability. Responses were measured using a Likert scale and categorised into effective and ineffective implementation levels.

Data analysis was conducted using statistical software. Univariate analysis was used to describe respondent characteristics and variable distributions. Bivariate analysis using the chi-square test was performed to identify associations between independent variables and HMIS effectiveness. Multivariate analysis using logistic regression was applied to determine the most dominant factors associated with HMIS implementation effectiveness. Statistical significance was set at $p < 0.05$ (Hosmer et al., 2013).

Ethical approval was obtained prior to data collection. All respondents provided informed consent, and confidentiality was maintained throughout the research process in accordance with ethical research standards (World Medical Association, 2013).

RESULT AND DISCUSSION

The analysis included respondents who actively utilised the Hospital Management Information System (HMIS) in their routine work activities at Alimuddin Umar Regional Public Hospital. Overall, more than half of the respondents perceived the implementation of HMIS as effective,

while the remaining respondents reported varying levels of system-related challenges that affected daily operational activities. Similar approaches to reporting HMIS effectiveness using user perceptions have been widely applied in previous health information system studies (DeLone & McLean, 2003; Rahimi et al., 2018).

Univariate analysis demonstrated variations in respondent perceptions across HMIS-related dimensions. Most respondents reported having adequate competence in using HMIS for basic operational tasks such as data entry, patient registration, and routine reporting. However, a proportion of respondents indicated limitations in utilising advanced system features, including data analysis and system integration functions. This pattern of differential user competence has also been reported in previous hospital information system evaluations (Handayani et al., 2018; Kim et al., 2016).

Regarding system quality, the majority of respondents perceived HMIS as accessible and functional, particularly in terms of system availability and data processing speed. Nevertheless, several respondents reported experiencing intermittent technical disruptions, such as system downtime and slow response times during peak service hours. Similar technical challenges have been identified in hospital information system implementations in comparable settings (Aldosari et al., 2018; Luna et al., 2014).

Organisational support was generally rated as moderate. Respondents acknowledged the presence of managerial supervision and technical assistance, although limitations were reported in the frequency and depth of formal training programmes. Comparable findings regarding the role of organisational support in information system utilisation have been documented in previous studies (Hotchkiss et al., 2015; McAlearney et al., 2014).

Infrastructure availability, including hardware adequacy and network connectivity, was perceived as sufficient by most respondents. However, variations were observed across service units, with some respondents reporting outdated equipment and unstable network connections. Similar disparities in infrastructure readiness have been reported in hospital information system studies, particularly in regional healthcare facilities (Braa et al., 2004; Sligo et al., 2017).

Bivariate analysis using the chi-square test revealed statistically significant associations between the effectiveness of HMIS implementation and user competence ($p < 0.05$), system quality ($p < 0.05$), organisational support ($p < 0.05$), and infrastructure availability ($p < 0.05$). This analytical approach is consistent with previous quantitative studies assessing determinants of health information system effectiveness (Hosmer et al., 2013; Petter et al., 2013).

Multivariate logistic regression analysis identified user competence as the most dominant factor associated with the effectiveness of HMIS implementation. System quality, organisational support, and infrastructure availability remained significantly associated with HMIS effectiveness after adjustment for other variables. Logistic regression has been widely used to determine dominant factors in health information system evaluations (Hosmer et al., 2013; Rahimi et al., 2018).

The findings of this study indicate that user competence is the most influential factor associated with the effectiveness of Hospital Management Information System (HMIS) implementation. This result supports previous research emphasising that user knowledge, technical skills, and system

familiarity are critical determinants of information system success in healthcare settings (Rahimi et al., 2018; Handayani et al., 2018; Kim et al., 2016). Adequate user competence enables healthcare personnel to utilise system functionalities optimally, reduces operational errors, and improves data accuracy (Petter et al., 2008; Alshahrani et al., 2019). Conversely, insufficient competence may lead to underutilisation of system features, workarounds, and resistance to system adoption (Yusof et al., 2008; Heeks, 2006).

System quality was also found to be significantly associated with HMIS effectiveness. Reliable system performance, ease of use, system integration, and minimal technical disruptions contribute to positive user perceptions and sustained system utilisation (DeLone & McLean, 2003; Seddon, 1997). High system quality improves workflow efficiency and supports timely decision-making, which are essential in hospital environments characterised by high service demand (Zhang et al., 2017; Aldosari et al., 2018). These findings reinforce the DeLone and McLean Information System Success Model, which identifies system quality as a core dimension influencing system use and net benefits (DeLone & McLean, 2003; Petter et al., 2013).

Organisational support, including leadership commitment, policy alignment, and training provision, played an important role in influencing HMIS effectiveness. Strong managerial support creates a supportive organisational climate that encourages system adoption and continuous system use (Hotchkiss et al., 2015; Lorenzi & Riley, 2000). Leadership involvement has been shown to positively affect staff motivation, compliance with system procedures, and organisational readiness for technological change (Cresswell & Sheikh, 2013; McAlearney et al., 2014). Regular training and technical support further enhance user confidence and competence, thereby improving system effectiveness (WHO, 2021; Ifinedo, 2011).

Infrastructure availability was another significant factor associated with HMIS effectiveness. Adequate hardware, stable network connectivity, and sufficient technical resources are essential for ensuring uninterrupted system access and data integrity (Braa et al., 2004; Luna et al., 2014). Inadequate infrastructure may result in system downtime, data loss, and reduced user trust, ultimately hindering system performance and effectiveness (Agarwal et al., 2010; Sligo et al., 2017). These findings highlight the importance of aligning technological infrastructure with system requirements and service demands.

Overall, the findings of this study underscore the importance of integrated strategies that address human, technical, and organisational dimensions in optimising HMIS implementation. Effective HMIS implementation requires not only robust system design but also competent users, strong organisational commitment, and adequate infrastructure support (Yusof et al., 2008; DeLone & McLean, 2016). Strengthening these dimensions is essential to maximise the benefits of HMIS and support sustainable hospital performance in the context of digital health transformation (WHO, 2021; Kemenkes RI, 2022).

CONCLUSION

The effectiveness of Hospital Management Information System implementation at Alimuddin Umar Regional Public Hospital is significantly associated with user competence, system quality, organisational support, and infrastructure availability. User competence is identified as the most dominant factor influencing system effectiveness. Strengthening user training programmes,

improving system reliability, and enhancing organisational commitment are recommended to optimise HMIS implementation and support sustainable hospital performance.

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