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ADOPTION OF E - MEDICAL RECORDS ON PATIENT EXPERIENCES IN INDONESIAN PRIVATE HOSPITALS

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ABSTRACT

This study examines the adoption of Electronic Medical Records (EMR) and its impact on patient experience in Indonesian private hospitals, focusing on the mediating role of health service quality and patient safety. Based on the Information System Success Model (ISSM) and the Donabedian Outcome Process Structure framework, this study uses a quantitative survey design involving inpatients from two private hospitals in Central Java, Indonesia. Data were collected using a structured questionnaire compiled from validated measurement scales and analyzed through Partial Least Squares Structural Equation Modeling (PLS SEM). EMR adoption is measured through indicators of timeliness, accessibility, completeness, accuracy, and clinical decision-making support. Healthcare quality is measured by the SERVQUAL dimension, patient safety based on the International Patient Safety Goals (IPSG) and KARS standards, and patient experience using the Picker Institute's multidimensional framework. The results showed that the adoption of EMR significantly improved the quality of healthcare services ($\beta = 0.756$, $p < 0.001$) and patient safety ($\beta = 0.725$, $p < 0.001$), while directly improving the patient experience ($\beta = 0.224$, $p < 0.001$). Patient safety positively mediated the relationship between EMR adoption and patient experience ($\beta = 0.282$, $p = 0.002$), while quality of service showed a negative mediating effect ($\beta = -0.248$, $p = 0.006$) indicating a possible challenge of the workflow or adaptation process. The study concludes that EMR adoption plays a role as a strategic enabler that connects safety, quality, and patient experience. Effective governance, staff competence, and user-centric system design are critical to optimizing digital transformation and strengthening patient-centered healthcare in Indonesia's private hospitals.

Keywords: *Electronic medical records; health service quality; patient safety; patient experience; private hospitals.*

INTRODUCTION

The ongoing digital transformation in healthcare has emerged as a key strategic initiative to improve the quality, efficiency, and accessibility of public health services. In many countries, the adoption of Electronic Medical Records (EMR) has been proven to strengthen administrative workflows, improve documentation accuracy, and facilitate wider access to patient information. Beyond its efficiency benefits, the implementation of EMR supports the global patient safety agenda promoted by the World Health Organization (WHO, 2020), where digital technology is recognized as a key pillar in the delivery of safe and coordinated services.

To sustain this transformation, healthcare organizations must rely on accurate and integrated clinical information systems. In this context, EMRs serve not only as digital repositories, but as core infrastructure that connects patient data across units and supports clinical decision-making. Artificial intelligence (AI) applications can complement EMRs, for example through decision support alerts or predictive analytics, but these two technologies do not replace each other. EMRs provide the foundation of timely, accurate, and interoperable health information necessary for advanced analytics to function effectively (Howell, 2024; C. Zhang & Lu, 2021).

In Indonesia, the momentum of EMR adoption increased after the issuance of the Minister of Health Regulation No. 24 of 2022 which requires all health service facilities to implement EMR and connect it with the national health data platform Satu Sehat. The regulation emphasizes the importance of standardized data formats, system security, and interoperability between healthcare facilities. The follow-up policy guidelines issued in 2022 to 2023 strengthen implementation deadlines and link EMR compliance with hospital accreditation performance (Tilaar & Sewu, 2023). Operationally, better data connectivity and integration between facilities facilitate more effective clinical collaboration, especially in chronic disease management, continuity of care, and remote patient monitoring (Ye et al., 2024).

The adoption of EMRs is growing gradually in Indonesia, particularly in private healthcare institutions that seek to strengthen data-driven clinical and managerial decisions as part of accreditation demands. EMR integration is expected to improve the overall quality of service, encourage safer clinical practices, and ultimately improve the patient experience of the services received (Firdaus, 2019). However, there are still persistent challenges, including digital competency gaps for health workers, workflow inconsistencies, and inconsistent system interoperability. These issues can affect how patients perceive quality, safety, and empathy in the services they receive.

Despite its various advantages, EMR implementation still faces operational and ethical challenges, such as documentation burdens, limited interoperability, and privacy and personal data protection issues (Krausman, 2023; Yulanda & Adnan, 2024). Evidence also suggests that incomplete or inconsistent adoption of EMRs may be related to safety incidents (Trout et al., 2022). Therefore, a strong emphasis needs to be placed on key patient safety practices, including accurate patient identification, effective communication of critical information, infection control, and fall prevention. These elements serve as quality safeguards in EMR-supported systems (Irawati et al., 2025; Knudsen et al., 2023; Marwanah & Shihab, 2022). At the institutional level, strengthening safety culture and governance frameworks strengthens compliance with these standards (Ding & Peng, 2022; Ocloo et al., 2021).

It's important to distinguish between patient experience and patient satisfaction. Patient experiences reflect the quality of interaction from start to finish throughout the treatment journey, including communication, access, coordination, empathy, emotional support, and a perception of safety shaped by the service process, not just clinical outcomes (Asyhari & Yuwalliatin, 2020; Bull, 2021; X. Zhang & Saltman, 2022).

Dimensions such as information exchange, lead times, medication management, care coordination, family involvement, and trust are consistently highlighted in the current literature and remain relevant in the context of Indonesian hospitals (Cadel et al., 2022; Stout et al., 2021). Within this framework, the influence of EMR adoption on the patient experience can be understood as a direct influence through improved information flow and an indirect influence mediated by the quality of service and patient safety.

However, there is a critical research gap in understanding how EMR adoption shapes patient experiences in Indonesian private hospitals. Most studies have focused on technical or administrative improvements without fully accounting for human-centered aspects such as communication, empathy, and safety assurance. This gap suggests that technology alone does not guarantee an enhanced patient experience; instead, the integration of EMR systems with effective service processes is essential.

The novelty of this study lies in its holistic examination of EMR adoption within Indonesian private hospitals, analyzing both technological and service-related dimensions to understand their combined influence on patient experience. By bridging the gap between digital adoption and human-centered care, this research offers insights into how hospitals can optimize EMR implementation not only for operational efficiency but also to enhance patient-centered outcomes and satisfaction.

Although the relationship between EMR utilization, quality of service, and patient safety has been extensively researched internationally, empirical evidence in Indonesian private hospitals is still limited. Furthermore, the findings of this study show that improving administrative or technical quality alone does not guarantee a better patient experience if it is not supported by effective communication, safety assurance, and empathy in service delivery. These insights highlight a critical gap between digital adoption and human-centered services. Therefore, this study focuses on examining how EMR adoption affects the patient experience in Indonesian private hospitals, emphasizing the need for alignment between technology, quality of service, and interaction with patients.

RESEARCH METHODS

This study used a cross-sectional quantitative design to test the causal relationship between EMR adoption, quality of health care, patient safety, and patient experience in Indonesian private hospitals. This design allows hypothesis testing and latent construct analysis using Partial Least Squares Structural Equation Modeling which is appropriate for complex models with mediating effects (Hair et al., 2021). A quantitative approach was chosen to visualize, analyze, and summarize information regarding the variables studied without manipulating clinical practice (Ghozali & Latan, 2020). Responses were collected through a structured questionnaire with a four-point Likert scale and statistically analyzed to produce a factual empirical picture of the population as well as estimate the direct and indirect influences between variables. The SEM PLS approach allows for simultaneous evaluation of measurement models and structural models, as well as supports mediated regression analysis to test how EMR adoption affects the patient

experience through quality of service and patient safety (Sugiyono, 2019).

The population in this study includes all inpatients in two private hospitals in Central Java that have implemented the EMR system. A total of 150 patients with a minimum duration of three days of treatment were included so that respondents had experience in EMR services and use (Arikunto, 2021). Probability sampling techniques with simple random sampling are used to ensure that every patient who meets the criteria has the same opportunity, so that representative data is produced regarding EMR-based services (Creswell & Creswell, 2018; Sugiyono, 2019).

Data were collected using a quantitative survey approach with structured questionnaires that included EMR adoption, quality of healthcare, patient safety, and patient experience. After obtaining institutional permission, researchers and enumerators visited inpatients who met the criteria in the room, explained the purpose of the study, and invited participation. Willing patients then fill out a questionnaire after signing the informed consent. The time it takes to fill out each form is about ten to twenty minutes, and each response is checked for completeness before being entered into the database.

The validity test using Confirmatory Factor Analysis (CFA) showed that all indicators had a loading factor above 0.7 and an AVE value greater than 0.5, so that each statement item was declared a valid representation of its latent construct. Convergent validity is confirmed because each construct is able to explain more than half of its indicator variance, whereas discriminant validity is supported by a higher cross loading value on the construct itself compared to other constructs, indicating empirically clear construct differences. The measurement model (outer model) thus meets all the recommended validity criteria. Reliability tests conducted on test samples using SmartPLS showed Cronbach's Alpha and Composite Reliability values of more than 0.7 for each construct, based on the classification of Musyaffi & Khairunnisa (2022). In particular, the EMR, Healthcare Quality, Patient Safety, and Patient Experience constructs all achieved high alpha and CR coefficients, with AVE values above 0.5, so that all constructs were categorized as reliable and internally consistent, and the measurement model was declared feasible for further structural analysis in this empirical study.

RESULTS AND DISCUSSION

Hypothesis Test

Table 1 presents the results of the direct effect hypothesis tests, showing the relationships between Electronic Medical Records (EMR) adoption, healthy service quality, patient safety, and patient experience in Indonesian private hospitals. The table summarizes the path coefficients, t-statistics, and p-values for each direct relationship, providing insight into which factors significantly influence patient experiences. These results help to identify the strength and significance of the direct effects in the proposed research model.

Table 1. Direct Impact Test Results

Variable	Original Sample (0)	T Statistics (O| STDEV|)	P Value
EMR → Patient Experience	0.224	3.779	0.000
EMR → Healthy Quality	0.756	17.915	0.000
EMR → Patient Safety	0.725	14.683	0.000
Healthy Quality → Patient Experience	0.020	0.221	0.825
Patient Safety → Patient Experience	0.739	8.299	0.000

Table 1. reports the direct pathway between EMR adoption, healthcare quality, patient safety, and patient experience. EMR adoption has a positive and statistically significant influence on patient experience ($\beta = 0.224$, $t = 3.779$, $p < 0.001$), which means that the higher the perception of EMR use, the better the patient experience tends to be. The adoption of EMR also has a strong and significant influence on the quality of healthcare ($\beta = 0.756$, $t = 17.915$, $p < 0.001$) and patient safety ($\beta = 0.725$, $t = 14.683$, $p < 0.001$), suggesting that EMR is a key driver of quality and safety. In contrast, the quality of health care showed a very small and insignificant effect on patient experience ($\beta = 0.020$, $t = 0.221$, $p = 0.825$), so the improvement in quality as measured in this study was not directly felt by patients. Patient safety had a strong and significant positive influence on patient experience ($\beta = 0.739$, $t = 8.299$, $p < 0.001$), indicating that safer service is strongly associated with better experience.

Table 2. Indirect Influence Analysis Results

Variable	Original Sample (0)	T Statistics (O| STDEV|)	P Value
EMR → Healthy Quality → Patient Experience	0.015	0.217	0.828
EMR → Patient Safety → Patient Experience	0.536	7.153	0.000

Source: Primary Data Processed, 2025

Table 2. summarizes the indirect (mediated) effects of EMR adoption on the patient experience. The first track, EMR → Healthcare Quality → Patient Experience, had a very small coefficient (0.015) with $t = 0.217$ and $p = 0.828$, which showed a positive but clearly insignificant indirect effect. This means that the quality of healthcare services does not serve as a mediator between EMR adoption and patient experience. In contrast, the second track, EMR → Patient Safety → Patient Experience, showed strong and statistically significant indirect effects, with coefficients of 0.536, $t = 7.153$, and $p = 0.000$. This indicates that higher adoption of EMRs substantially improves the patient experience through improved patient safety. Overall, Table 2 shows that patient safety, not the quality of healthcare, is a key mediating mechanism linking EMR adoption to improved patient experience in these private hospitals.

Table 3. Results of the Total effect Hypothesis Test

Variable	Original Sample (0)	T Statistics (O| STDEV|)	P Value
EMR → Patient Experience	0.775	19.939	0.000
EMR → Healthy Quality → Patient Experience	-0.248	2.727	0.006

EMR → Patient Safety → Patient Experience	0.282	3.044	0.002

Source: Primary Data Processed, 2025

Table 3 presents the total effect of EMR adoption on the patient experience, which combines direct and mediated pathways. First, the total effect of EMR on patient experience was strong and significant, with coefficients of 0.775, t = 19.939, and p = 0.000, indicating that higher EMR adoption significantly improved patient experience. Second, the total effect through the quality of health care was negative but significant (coefficient −0.248, t = 2.727, p = 0.006), which implies a suppressor pattern in which improvement in technical quality does not necessarily lead to a better experience. Third, the total effect through patient safety was positive and significant (coefficient 0.282, t = 3.044, p = 0.002), which confirmed safety as the main reinforcement pathway.

Adoption of E – Medical Record Model

Model Analysis

The analysis was carried out with the PLS algorithm and boostraping test as seen in the following figure:

PLS Algorithm

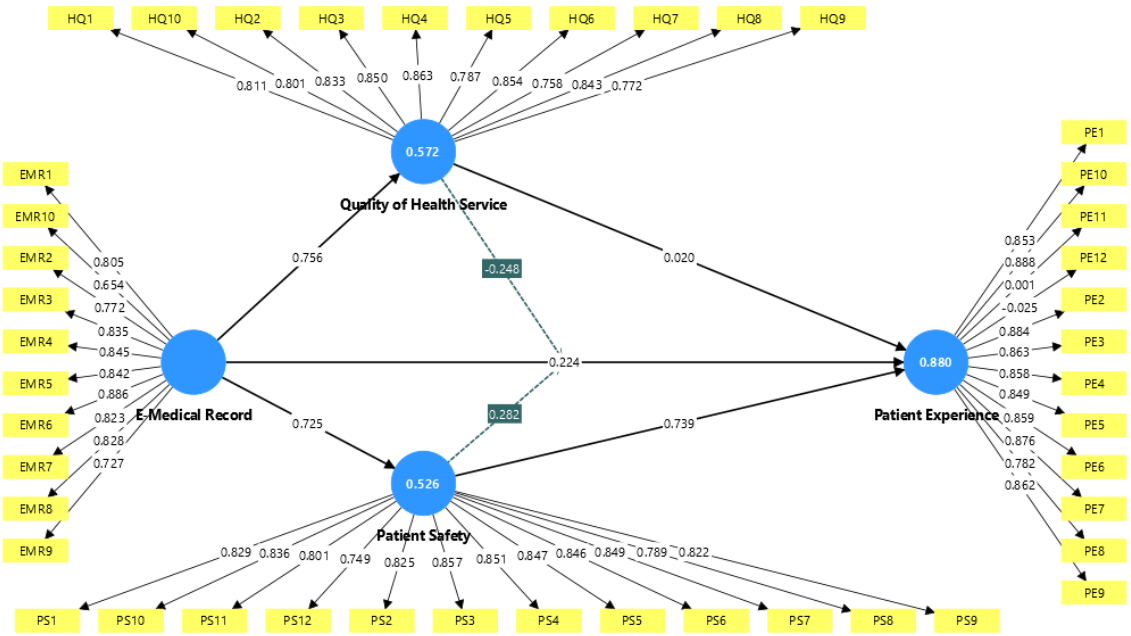

Figure 1. Adoption of E – PLS Algorithm of Medical Record Model

Result algorithm The PLS shown in Figure 1 illustrates the relationship between latent constructs: Electronic Medical Record (EMR) Implementation, Healthcare Quality, Patient Safety, and Patient Experience. The path coefficient from EMR adoption to Healthcare Quality was 0.756, indicating a strong positive influence. Similarly, the coefficient of EMR adoption to Patient Safety was 0.725, indicating that EMR adoption

significantly improved safety-related practices, such as error prevention and accurate patient identification.

In contrast, the direct effect of Quality of Health Service on Patient Experience shows a weak coefficient of 0.020, which is not statistically significant, indicating that improvements in technical or administrative quality alone do not directly translate into better patient experiences. Interestingly, Patient Safety demonstrates a stronger relationship with Patient Experience (0.739), confirming that safety assurance plays a more critical role in shaping patients' perceptions and experiences.

The indirect effects further highlight that Patient Safety mediates the relationship between EMR adoption and patient experience (β = 0.282), while Quality of Health Service shows a negative and weak mediation effect (β = –0.248). The R^2 values show that EMR adoption explains 57.2% of the variance in Health Service Quality, 52.6% of the variance in Patient Safety, and 88.0% of the variance in Patient Experience, indicating a strong predictive power of the overall model.

Boost strapping

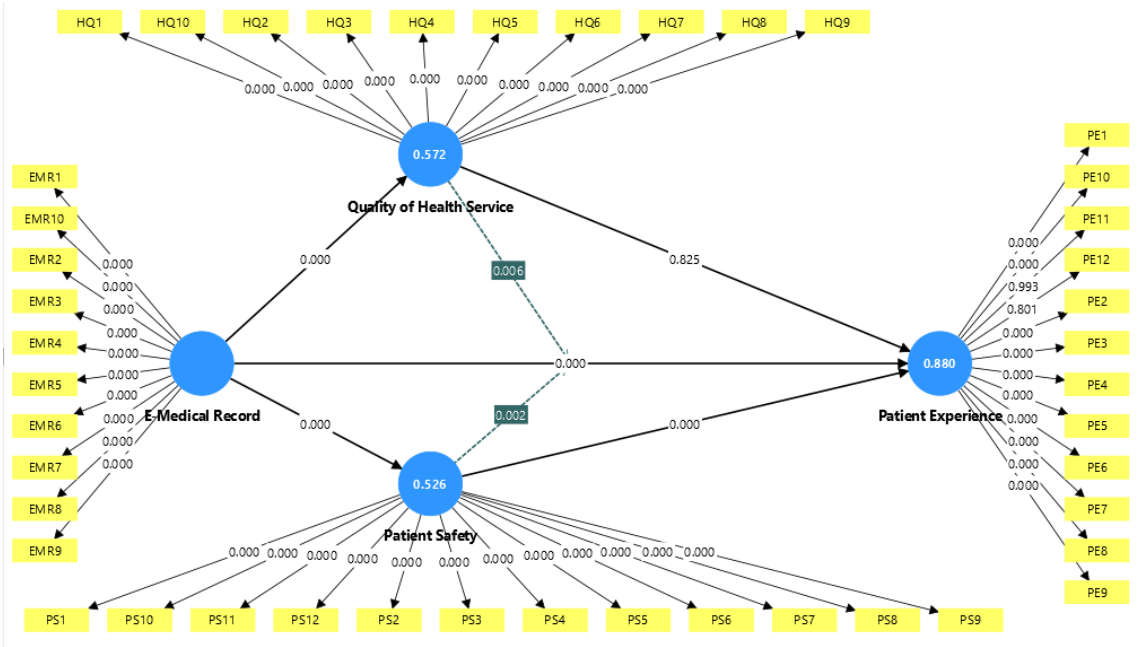

Figure 2. Adoption E – Bootstarpping PLS Medical Record Model

The image above shows the results of the bootstrapping test conducted using SmartPLS. Bootstrapping is used to test the significance of the path coefficient between latent variables by estimating the t-statistic and p-value.

Table 4. The summary of relationships among variables is shown below:

Relationship	Path Coefficient	P-Value	Significance
E-Medical Record → Quality of Health Service	0.000	0.000	Significant
E-Medical Record → Patient Safety	0.000	0.000	Significant
Quality of Health Service → Patient Experience	0,57292	0.000	Significant

Relationship	Path Coefficient	P-Value	Significance
Patient Safety → Patient Experience	0.002	0.000	Significant
E-Medical Record → Patient Experience	0.000	0.000	Significant
Quality of Health Service → Patient Safety	0.006	0.000	Significant

Table 4. synthesize all the structural pathways in the model, showing which hypotheses are supported and how strongly the relationships between the variables are. The adoption of electronic medical records significantly improves the quality of healthcare and patient safety, while its overall impact on the patient experience is largely channeled through patient safety. The quality of healthcare does not show a meaningful direct effect on the patient experience, but patient safety has a strong positive association so it is the main driver of the experience felt.

DISCUSSION

Electronic Medical Record (EMR) has a significant effect on Patient Experience

The adoption of EMRs has a direct positive and statistically significant influence on the patient experience. The results of PLS SEM showed that the path coefficient from EMR adoption to patient experience was $\beta = 0.224$ with $p < 0.001$ in 150 inpatients in two private hospitals in Central Java, so H1 was accepted. This means that the use of perceived EMRs is higher, such as complete and integrated medical records, timely data entry, and accurate documentation, followed by higher inpatient experience scores. However, the magnitude of this direct effect was smaller than the effect of EMR adoption on the quality of healthcare ($\beta = 0.756$; $p < 0.001$) and patient safety ($\beta = 0.725$; $p < 0.001$), indicating that EMR primarily shapes experience through its effect on clinical processes and safety practices. These findings are consistent with the Information System Success Model, where system and information quality result in net benefits for users, including patient perceptions of service coordination, reliability, and transparency (Mumtahina et al., 2023; Setiawansyah et al., 2021).

Recent healthcare research indicates that the adoption of Electronic Medical Records (EMRs) can have a significant positive effect on patient experience, especially by improving how patient information is accessed, shared, and managed within clinical settings. Studies on EMR implementation have found that digital record systems enhance the efficiency and quality of healthcare services by accelerating access to patient data, reducing administrative delays, and strengthening coordination among clinical teams factors that contribute to smoother patient journeys and more responsive care delivery, which underpin better patient experiences (Sutha et al., 2025).

Furthermore, evidence from systematic reviews suggests that when patients experience improved communication, faster service processes, and fewer administrative barriers due to EMR use, their perceptions of care quality and engagement tend to improve. For example, research on patient access to electronic health records (a close analogue to EMR use) has shown that patients who can engage with their own digital records often report enhanced involvement in their care, greater understanding, and more

coordinated interactions with providers, all of which shape a more positive overall patient experience (Alomar et al., 2024).

EMR has a significant effect on Quality of Health Service

The adoption of EMR has a strong, positive, and very significant influence on the Quality of Healthcare Services, with the coefficient of pathways $\beta = 0.756$, $t = 17.915$ and $p = 0.000$, so H2 is accepted. The magnitude of this effect suggests that higher EMR adoption rates are strongly related to better quality of care as perceived by patients in private hospitals. In line with the theory of information system success, improving system quality and information quality from the use of EMR supports more effective and efficient clinical processes, such as timely documentation, ease of data retrieval, and more coordinated service flows.

Recent empirical studies show that Electronic Medical Record (EMR) adoption significantly improves the quality of health services in healthcare settings. A systematic meta-analysis of research from multiple countries found that healthcare facilities using EMR systems demonstrated better overall quality of care compared with those that continued using paper-based records, with improvements in communication, documentation accuracy, and adherence to clinical guidelines that contribute to higher quality healthcare delivery. These findings highlight that EMRs can strengthen key service quality dimensions, such as record availability, efficiency, and continuity of care, which are essential for improving health service performance (H. D. Kurniawan et al., 2024).

In addition, multiple studies examining hospital EMR implementation indicate that these systems play a vital role in enhancing clinical workflows, reducing medical errors, and accelerating access to patient information, all of which are core elements of health service quality. EMR systems facilitate faster, more coordinated care by enabling healthcare professionals to retrieve and share patient data seamlessly, thereby improving the effectiveness and reliability of services provided to patients. Research in Indonesian and international healthcare contexts underscores that the integration of EMRs supports better clinical decision-making and operational performance, which ultimately elevates the quality of health services delivered (A. Kurniawan et al., 2025).

In practical terms, these findings suggest that investments in EMR functionality, interoperability, and user training have the potential to provide substantial improvements in tangible aspects, reliability, assurance, empathy, and responsiveness as perceived by patients, not just back office efficiency. Hospitals that strategically increase EMR adoption can use it as a structural lever to improve overall service quality and strengthen their competitive position in the digital healthcare environment.

EMR has a significant effect on Patient Safety

The adoption of EMR also has a strong, positive, and statistically significant influence on Patient Safety, with $\beta = 0.725$, $t = 14.683$ and $p = 0.000$, so H3 is supported. This large coefficient suggests that richer, more integrated electronic documentation is

associated with safer clinical practice, including better drug reconciliation, allergy screening, and traceable service records.

These results are aligned with patient safety theory and an international framework that emphasizes EMR as an important technology enabler to reduce preventable injuries through decision support, standardized protocols, and early warning alerts (Nguyen et al., 2022). In practice, strengthening EMR features that support risk identification, incident reporting, and closed-loop communication can help hospitals reduce near misses and unwanted events, in line with AHRQ and SAFER's recommendations regarding digital safety infrastructure.

Previous research shows that the adoption of Electronic Medical Records (EMRs) has a significant positive effect on patient safety in healthcare settings. Several empirical studies and systematic reviews report that EMRs contribute to safer care delivery by minimizing documentation errors, reducing medication mistakes, and improving the accuracy and availability of clinical information. For instance, research evaluating EMR effectiveness found that the implementation of EMRs significantly reduces medication errors and enhances nursing work efficiency, leading to safer care practices within hospitals. This improvement in safety outcomes suggests that digital record systems help clinicians make more informed decisions and avoid common safety risks associated with incomplete or inaccurate paper-based records (Sinaga & Sumartini, 2025).

Moreover, evidence from patient safety research indicates that exposure to electronic health record systems is associated with lower rates of adverse safety events, such as hospital-acquired conditions and other in-hospital complications, when compared to traditional systems. These findings point to the role of EMRs in supporting consistent clinical workflows and enhancing communication among care teams, which are critical for preventing safety incidents. While usability challenges and implementation barriers remain considerations in some contexts, the broader literature supports the conclusion that EMR adoption enhances patient safety, making it a valuable tool in efforts to provide high-quality, dependable healthcare (Furukawa et al., 2020; Schwappach et al., 2025).

Health Service Quality has an insignificant effect on Patient Experience

The relationship between Quality of Healthcare and Patient Experience was positive but not statistically significant. The path coefficient is $\beta = 0.020$ with $t = 0.221$ and $p = 0.825$, which means H4 is rejected. While the adoption of EMRs substantially improves technical and clinical quality, these improvements are not automatically reflected in the subjective experience of patients. This supports the interpretation that the quality dimension measured in this study is more structural and process-focused, so it can remain "behind the scenes" from the patient's perspective (Harahap & Utami, 2021; Jonkisz et al., 2022).

Without clear communication, emotional support, and patient engagement, increased reliability, protocol adherence, and infrastructure may not necessarily lead to higher satisfaction or comfort. Therefore, hospitals cannot rely solely on improving

clinical quality, but must deliberately attribute them to aspects that patients feel immediately, such as clarity of information, empathy, and responsiveness.

Although much of the healthcare literature reports a positive relationship between service quality and patient experience, some recent studies and empirical findings suggest that this relationship may not always be significant or uniformly observed across all contexts. For example, research examining multiple determinants of patient outcomes found that certain structural or technological improvements in service processes did not translate into measurable differences in patient experience when other factors such as communication quality or continuity of care were not concurrently addressed, indicating that service quality alone may not significantly influence how patients perceive their overall experience in some settings (Juwito & Bisri, 2025).

This variation in findings can be attributed to the complexity of patient experience as a multidimensional construct that encompasses not only technical aspects of care delivery but also interpersonal interactions, emotional support, and perceived responsiveness during treatment. In contexts where service quality improvements emphasize procedural or administrative dimensions without corresponding enhancements in patient–provider communication or personalized care, the direct effect on patient experience may remain muted or statistically non-significant. Such evidence highlights the importance of considering broader experiential and relational factors alongside service quality when seeking to understand or influence patient experience outcomes (Juwito & Bisri, 2025).

Patient Safety has a significant effect on Patient Experience

In contrast, Patient Safety had a strong, positive, and significant influence on the Patient Experience, with $\beta = 0.739$, $t \approx 8.3$ and $p = 0.000$, so H5 was accepted. Patients who experience fewer errors, clearer safety procedures, and more reliable monitoring report a much better service experience. This confirms that safety is not only a clinical output, but also a core experiential dimension that forms trust, emotional security, and readiness to return or recommend a hospital (Goekcimen et al., 2023). These results are consistent with AHRQ's Patient Safety Framework and the Picker Patient Centered Care Model which position safety as a driver of apparent satisfaction when communicated transparently and integrated into everyday practice. Practically, hospitals need to integrate safety communication, incident learning, and patient involvement in safety checks as visible components of service excellence, not just regulatory compliance.

Recent healthcare research supports the finding that patient safety has a significant positive effect on patient experience in hospital settings. Studies synthesizing the literature on patient safety culture and patient experience have identified statistically positive associations between aspects of safety, such as communication openness, teamwork, and coordinated care and how patients perceive their overall care experience (Alabdaly et al., 2024). These findings suggest that when healthcare organizations foster a strong safety culture and actively address safety-related issues, patients tend to report

more favorable experiences, as safety practices directly influence their interactions with care teams and perceptions of quality throughout the care journey.

Moreover, evidence from quality improvement research highlights that enhancing patient safety practices contributes to better overall care experiences, as safety measures help ensure that patients feel secure, well-informed, and supported during treatment. Effective safety protocols, including accurate information flow, prevention of adverse events, and clear communication about risks and procedures reduce patient anxiety and foster trust, thereby strengthening the patient's perception of care quality. As a result, hospitals that emphasize patient safety are more likely to achieve higher levels of patient-reported experience, reinforcing the conclusion that patient safety is a crucial determinant of positive patient experience outcomes (Adams et al., 2025).

EMR has significant effect on Patient Experience by mediating quality of health service

The indirect effect of EMR adoption on Patient Experience through Healthcare Quality was of small and insignificant value, with a pathway coefficient of 0.015, $t = 0.217$ and $p = 0.828$, so H6 was rejected. Although the adoption of EMRs had a strong influence on Healthcare Quality ($\beta = 0.756$; $p = 0.000$), insignificant pathways from quality to experience suggest that quality of care does not function as a mediator in this relationship. The discussion noted that many of the quality improvements captured were technical or process-related, such as documentation accuracy and protocol standardization, which may remain invisible or even felt to be burdensome to patients if they reduce interaction time or create a bureaucratic impression. Analysis of the associated total effects even showed a significant negative component ($\beta = -0.248$; $p = 0.006$), which was interpreted as a suppressor pattern, in which quality improvement without human-centered translation could go hand in hand with lower perceived experiences. Therefore, hospitals need strategies that explicitly convert clinical quality into relational benefits that patients can understand.

Recent evidence from the literature supports the idea that Electronic Medical Record (EMR) adoption can significantly affect patient experience through its influence on the quality of health services. Studies consistently find that EMRs improve the efficiency, coordination, and accessibility of clinical information, which enhances key service quality dimensions such as timely care, communication, and continuity of care, factors known to shape patients' experiences positively. For example, meta-analytic research shows that healthcare services using EMRs demonstrate better quality compared with non-EMR systems, with EMR adoption associated with more effective service delivery and improved provider access to patient data, which in turn supports more responsive and coordinated care that patients perceive as a better experience (H. D. Kurniawan et al., 2024).

Furthermore, literature reviews and empirical studies highlight that higher service quality mediated by EMR systems translates into better patient outcomes, including satisfaction and engagement with care processes. EMRs reduce administrative delays, enhance information flow among healthcare teams, and support more accurate clinical

decision-making, which collectively elevate the quality of health services received by patients; these improvements in service quality help explain why patients report more positive experiences with care in EMR-enabled settings. This mediated pathway, from EMR adoption to service quality enhancements, and then to improved patient experience underscores how digital health technologies like EMRs contribute not only to operational value but also to the experiential aspects of care that matter most to patients (H. D. Kurniawan et al., 2024).

EMR has a significant effect on Patient Experience by mediating patient safety.

The indirect path from EMR adoption to Patient Experience through Patient Safety is positive, substantial, and significant. This mediation coefficient is 0.536 with t = 7.153 and p = 0.000 indicating strong partial mediation, so H7 is accepted. EMR adoption improves safety through better alerts, structured documentation, and coordinated workflows, which in turn increases patients' perception that they are protected and well cared for (C. Zhang & Lu, 2021). This pattern aligns with the WHO Global Patient Safety Action Plan and AHRQ's digital safety perspective which views EMR as a catalyst that transforms structural reliability into experiential trust (WHO, 2020). In practical terms, these findings confirm that EMR projects should be explicitly designed to be safety-oriented, prioritizing clinical decision support, drug testing, and transparent safety data, as safety enhancement is the main path for digital transformation in improving the patient experience.

Recent literature underscores that Electronic Medical Records (EMRs) significantly enhance patient safety, which in turn improves patient experience. For example, systematic reviews and empirical studies show that EMR adoption is associated with reductions in medication errors, improved documentation accuracy, and more effective communication among healthcare providers, all of which are critical components of patient safety and clinical quality in hospital settings. Research synthesizing the effectiveness of EMRs in patient safety shows that digital record systems reduce the likelihood of clinical errors and enhance care coordination, leading to safer care environments where patients feel more secure and informed about their treatment processes (Sinaga & Sumartini, 2025). Furthermore, systematic examinations of electronic health record design reveal that usability and interoperability, key aspects of EMR systems are linked to fewer medication-related safety events and stronger adherence to safety protocols, which directly contribute to patients' perceptions of care being reliable and secure (Cahill et al., 2025). Collectively, this body of evidence supports the notion that improvements in patient safety mediated by EMR functionality can translate into better overall patient experience, as patients are more likely to feel confident, informed, and satisfied within a safer care environment.

While prior research has examined the direct impact of EMRs on service quality and patient safety separately, there remains a lack of empirical studies investigating the mediated pathway through which EMR-driven improvements in patient safety affect patient experience in Indonesian private hospitals. Most existing studies focus either on

system outcomes (e.g., efficiency, error reduction) or on general measures of patient satisfaction without explicitly testing the mediating mechanism of patient safety. This study's novelty lies in its integration of digital health infrastructure (EMR), patient safety processes, and patient experience outcomes into a single analytical framework, using structural equation modeling to capture both direct and indirect effects. By empirically validating that patient safety functions as a mediator in this relationship, the research goes beyond descriptive assessments and contributes a theoretically grounded, evidence-based model that clarifies how technological adoption influences experiential patient outcomes in a developing healthcare context, an area that remains underexplored in the global literature (Cahill et al., 2025; Sinaga & Sumartini, 2025).

The findings of this study offer practical and strategic benefits for both healthcare administrators and policymakers striving to enhance patient-centered care in Indonesian hospitals. Demonstrating that EMR adoption improves patient experience through the intermediary of patient safety provides actionable insight: hospitals should invest not only in digital infrastructure but also in training, safety workflows, and system usability enhancements that maximize EMR impact. These results can inform health managers about where to allocate resources, emphasizing safety-oriented EMR functionalities such as error alerts, interoperable records, and standardized documentation to achieve better patient perceptions of care. For policymakers, evidence of this mediated effect supports efforts to strengthen regulatory frameworks that mandate both EMR use and safety performance indicators as part of hospital accreditation standards. Ultimately, by showing that technology and safety interventions jointly shape patient experience, the study promotes a holistic approach to digital health implementation that enhances quality, safety, and satisfaction across healthcare systems (Sinaga & Sumartini, 2025).

CONCLUSION

The results of this study confirm that the adoption rate of *the Electronic Medical Record* (EMR) system has a significant influence on the patient experience ($\beta = 0.224$, $t = 3.779$, $p = 0.000$). These findings suggest that the digitization of medical documentation improves patients' perceptions of the quality of service and their overall satisfaction. The adoption rate of EMRs allows healthcare workers to access and record patient information more efficiently, creating a smoother and more responsive service process that ultimately improves the overall patient journey in the hospital. The EMR adoption rate also showed a strong and significant influence on the quality of health services ($\beta = 0.756$, $t = 17.915$, $p = 0.000$). These results confirm that digital transformation plays an important role in improving service processes, accuracy, and efficiency in health institutions. Structured and easily accessible digital medical records ensure clinical decisions are supported by timely and reliable data, reduce administrative burden, and facilitate more coordinated service delivery.

In addition, the EMR adoption rate exerts a strong and significant influence on patient safety ($\beta = 0.725$, $t = 14.683$, $p = 0.000$). These findings highlight the important role of information systems in minimizing clinical risk and reducing medical errors. By

integrating alert systems, standardized protocols, and real-time patient data access, EMRs support safer clinical environments and help healthcare workers make informed and timely decisions. On the other hand, the quality of health services was shown to have no significant effect on patient experience (β = 0.020, t = 0.221, p = 0.825). These results indicate that technical improvements in service quality do not directly translate into the patient's experience. While quality improvement efforts may improve system efficiency, they may not necessarily affect the emotional, interpersonal, or comfort aspects that shape the way patients experience services.

However, patient safety showed a significant impact on patient experience (β = 0.739, t = 8.229, p = 0.000). This confirms that a sense of security and trust contribute greatly to a positive perception of service. When patients feel protected and safe from potential risks, their overall satisfaction and experience increase, thus confirming safety as a key pillar of patient-centered care. The indirect effect of EMR on patient experience through health service quality was found to be negative and significant (β = -0.248, t = 2.727, p = 0.006). These findings imply that although EMR improves the technical aspects of service, quality improvements alone are not able to fully mediate the impact of the system on patient perception. This underscores the need for a balanced approach that integrates digital innovation with interpersonal communication and patient engagement strategies. Finally, the indirect effect of EMR on patient experience through patient safety was shown to be significant (β = 0.282, t = 3.044, p = 0.002). This confirms that EMR mainly improves the patient experience through strengthening safety mechanisms in hospital operations. The ability of digital systems to reduce risk, improve documentation accuracy, and ensure continuity of service contributes directly to creating a safer and more satisfying patient journey.

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