

THE IMPACT OF HEALTHCARE ADMINISTRATION DIGITALIZATION ON HOSPITAL SERVICE EFFICIENCY WITH HEALTHCARE WORKER SATISFACTION AS A MEDIATING VARIABLE

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Abstract

This study reviews the literature to examine the impact of healthcare administration digitalization on hospital service efficiency, with particular attention to the mediating role of healthcare worker satisfaction. Findings reveal that digitalization enhances efficiency through improved data accuracy, reduced administrative burden, optimized resource allocation, and better interdepartmental coordination. However, these benefits are not automatic; they are strongly mediated by the satisfaction of healthcare workers, who determine the level of adoption, utilization, and sustainability of digital systems. When digitalization initiatives are accompanied by adequate training, managerial support, and user-friendly system design, healthcare worker satisfaction increases, which in turn reinforces engagement, reduces turnover, and strengthens organizational efficiency. Conversely, poorly implemented systems may create dissatisfaction, stress, and new inefficiencies. This highlights the need for hospitals to adopt a holistic approach to digital transformation that balances technological innovation with human resource development. The review concludes that healthcare worker satisfaction is a pivotal mechanism linking digitalization and efficiency, and its integration into hospital management strategies is critical for achieving sustainable improvements in healthcare delivery.

Keywords: *Healthcare digitalization, hospital efficiency, healthcare worker satisfaction*

INTRODUCTION

The rapid advancement of digital technology over the past two decades has brought profound changes across various sectors, including healthcare. Digitalization of health administration, which encompasses the implementation of Hospital Information Systems (HIS), Electronic Medical Records (EMR), and the integration of application-based services, has emerged as a strategic initiative to enhance the overall quality of healthcare delivery. Such digital transformation is expected to streamline workflows, reduce repetitive administrative burdens, and minimize documentation errors that may compromise service effectiveness. Within hospital settings, service efficiency constitutes a crucial performance indicator to ensure that patients receive prompt, accurate, and high-quality care while maintaining manageable operational costs (Amallia, 2024). Although digitalization of health administration is often perceived as a solution to improve efficiency, its impact on service performance is not always linear. Operational efficiency in hospitals is not solely determined by the presence of digital systems, but also by the extent to which healthcare professionals experience satisfaction and support from such systems. As the frontline providers of care, healthcare workers play a central role in utilizing digital administrative tools to support both clinical and non-clinical tasks. When digital systems increase workload complexity or create usability challenges, their contribution to service efficiency may be diminished. Conversely, when healthcare professionals perceive benefits in terms of easier data access, faster administrative processes, and reduced repetitive manual tasks, digitalization is more likely to yield significant improvements in hospital efficiency (Pongtambing et al., 2024). In this regard, healthcare worker satisfaction can be understood as the degree of acceptance, comfort, and perceived usefulness associated with digital administrative systems. Satisfaction is not only shaped by technical aspects such as system reliability and user-friendliness but also by psychological factors including reduced job-related stress, increased productivity, and the creation of a supportive work environment. Prior studies indicate that healthcare worker satisfaction may serve as a mediating variable between digitalization and organizational outcomes, as satisfaction

levels influence the extent to which digital technologies are effectively integrated into daily work practices. Therefore, without considering the mediating role of healthcare worker satisfaction, the potential of administrative digitalization to enhance hospital service efficiency may remain underutilized (Syarifah & Rahayu, 2024). Beyond organizational efficiency, the digital transformation of healthcare aligns with global demands for integrated, data-driven, and accurate medical services. Digital systems enable hospitals to accelerate patient registration, optimize scheduling, expedite insurance claim processing, and improve interdepartmental coordination. However, the effectiveness of these advancements is heavily contingent upon the acceptance and satisfaction of healthcare professionals as primary users. This underscores the importance of examining not only the direct relationship between digital health administration and service efficiency but also the mediating influence of healthcare worker satisfaction (Lukito & Gani, 2024). In the Indonesian context, where hospital digitalization still faces challenges such as limited infrastructure, uneven levels of digital literacy among healthcare workers, and resistance to organizational change, such an inquiry becomes particularly relevant. Findings from this research on the influence of health administration digitalization on service efficiency, with healthcare worker satisfaction as a mediating variable, are expected to provide theoretical contributions to the body of knowledge in healthcare management as well as practical insights for hospital policymakers in designing digital strategies that are effective, adaptive, and responsive to the needs of healthcare professionals

LITERATURE REVIEW

Concept of Health Administration Digitalization

Health administration digitalization refers to the transformation of recording, managing, and storing health-related data from manual systems into digital platforms supported by software, hardware, and integrated communication networks. According to the World Health Organization (WHO), the digitalization of healthcare services not only involves the use of information technology to support hospital administrative activities but also creates a standardized, real-time, and interoperable data ecosystem that strengthens both clinical and managerial decision-making. This development is consistent with the global trend toward *smart hospitals*, which emphasize efficiency, transparency, and accuracy in healthcare delivery (Fauzi et al., 2024). Conceptually, health administration digitalization comprises several core components. First, the Hospital Information System (HIS) serves as an integrated platform for managing patient data, service scheduling, drug administration, and financial reporting. Second, the Electronic Medical Record (EMR) facilitates digital documentation of patients' medical histories, thereby reducing information redundancy, improving data security, and enhancing collaboration among healthcare professionals. Third, supporting administrative systems such as *e-billing*, digital insurance claims, and telemedicine integration expand the scope and accessibility of healthcare services. These components indicate that health administration digitalization is not merely a technological innovation, but a paradigm shift in hospital governance and management (Latupeirissa & Herawati, 2025).

The implementation of health administration digitalization is grounded in the principles of efficiency, effectiveness, and accountability. Efficiency is achieved through faster workflows, reduced waiting times, and optimized human resource allocation. Effectiveness arises from improved data accuracy and greater accessibility of information for timely decision-making. Accountability is reflected in enhanced data transparency, protection of patient confidentiality, and the system's capacity to generate reliable, auditable reports. Consequently, digitalization carries strategic implications for improving service quality and strengthening organizational governance within hospitals. From the perspective of healthcare management theory, administrative digitalization is viewed as an organizational innovation that can enhance hospital performance through the utilization of technology. The *Technology Acceptance Model (TAM)* and the *Unified Theory of Acceptance and Use of Technology (UTAUT)* provide useful frameworks for understanding how healthcare workers adopt and utilize digital systems. Factors such as perceived ease of use, perceived usefulness, and organizational support significantly influence healthcare professionals' acceptance of technology. Thus, the successful implementation of digital systems requires not only technological investment but also comprehensive change management strategies, including training, awareness programs, and efforts to improve digital literacy (Andriani et al., 2022). Despite its potential, health administration digitalization also faces several challenges. Common obstacles include limited technological infrastructure, high implementation costs, data security vulnerabilities, and resistance from healthcare professionals unfamiliar with digital systems. Moreover, disparities in digital literacy among healthcare workers may hinder the successful adoption of digital platforms. To overcome these challenges, coordinated efforts among governments, healthcare providers, and private stakeholders are necessary to ensure adequate infrastructure, regulatory frameworks, and technical support. In the Indonesian context, the momentum for digitalizing health administration has been reinforced

by government policies promoting digital health transformation, particularly the nationwide adoption of electronic medical records. This initiative is expected to enhance the efficiency of healthcare service systems, improve data integration across facilities, and facilitate macro-level monitoring of healthcare quality. However, the effectiveness of such initiatives heavily depends on the readiness of hospitals as institutions and the adaptability of healthcare workers as primary users. Therefore, a comprehensive understanding of the concepts, benefits, and challenges of health administration digitalization is crucial as a foundation for further research and policy development in the healthcare sector.

Hospital Service Efficiency

Hospital service efficiency refers to the ability of a hospital to convert inputs (e.g., staff, beds, equipment, supplies, and financial resources) into desired outputs (e.g., patient visits, treatments, procedures, health outcomes) while minimizing waste and costs. Efficiency is distinct from effectiveness the latter emphasizes the degree to which health services achieve intended health outcomes and from productivity, which often focuses on output per unit of input without direct cost considerations. In health systems research, efficiency is typically discussed in two complementary forms: *technical efficiency* (producing maximum outputs from given inputs) and *allocative/economic efficiency* (using resources in a way that maximizes value or health gain given budget constraints). A nuanced assessment of hospital efficiency therefore requires attention both to operational workflows and to the broader resource-allocation decisions that shape service delivery (Fadilla, 2021).

Scholars conceptualize hospital service efficiency across multiple dimensions that capture operational, clinical, financial, and managerial facets (Sulistyo & Mulyanti, 2023):

- Operational efficiency: focuses on throughput, length of stay (LOS), bed occupancy rates, patient flow, and waiting times. Operational efficiency targets process bottlenecks, scheduling, and capacity utilization.
- Clinical efficiency: concerns the appropriateness and timeliness of clinical interventions relative to resource use, including diagnostic accuracy, avoidance of redundant testing, and adherence to evidence-based protocols.
- Financial efficiency: examines cost per case, cost per patient-day, and revenue cycle performance (billing, claims, reimbursement rates), emphasizing cost containment without compromising care quality.
- Administrative/organizational efficiency: relates to administrative overhead, documentation, coordination among units, and the effectiveness of management systems (e.g., HIS, supply chain).
- Quality-adjusted efficiency: integrates quality and safety indicators (readmission rates, infection rates, patient safety events) into efficiency assessments to avoid misinterpreting cost-reduction as improved performance when quality falls.

Measuring hospital efficiency employs quantitative and mixed-methods techniques. Common quantitative approaches include:

- Data Envelopment Analysis (DEA): a nonparametric frontier method to estimate technical efficiency scores by comparing multiple input-output combinations across decision-making units (hospitals). DEA is widely used due to its flexibility in handling multiple inputs/outputs without specifying a production function.
- Stochastic Frontier Analysis (SFA): a parametric method that estimates an efficient production frontier while accounting for random noise; SFA requires specification of a functional form (e.g., Cobb–Douglas) and disentangles inefficiency from statistical noise.
- Ratio and benchmark indicators: simpler metrics like bed occupancy rate, average length of stay, cost per discharge, and throughput per clinician provide operational snapshots and facilitate benchmarking across periods or peer hospitals.
- Composite indices: some studies construct composite efficiency indices combining financial, operational, and quality indicators; these facilitate multidimensional comparison but require careful weighting choices.
- Process mapping and time-motion studies: qualitative/quantitative methods that examine specific workflows (e.g., patient admission, discharge, or medication administration) to identify inefficiencies at micro-levels.

Each method has trade-offs: DEA is sensitive to variable selection and outliers; SFA imposes distributional assumptions and may be constrained by data availability; ratio measures are intuitive but may mask complexity and interactions among components.

A large body of research highlights organizational, technological, and contextual factors that influence hospital service efficiency (Rahmayanti et al., 2023):

- Technology and information systems: adoption of Hospital Information Systems (HIS), Electronic Medical Records (EMR), and digital administrative tools can reduce duplication, speed information flow, and

streamline billing all conducive to efficiency. However, technology alone does not guarantee efficiency gains; integration quality, interoperability, and user acceptance are key mediators.

- Human resources and skill mix: staffing levels, nurse-to-patient ratios, specialists' availability, skill mix (e.g., allied health roles), and staff training influence throughput and quality of care. Overstaffing raises costs; understaffing increases delays and adverse events.
- Clinical governance and protocols: standardized clinical pathways, multidisciplinary teams, and evidence-based guidelines reduce unwarranted variation and create predictable workflows that enhance throughput and lower resource waste.
- Management practices and leadership: effective resource planning, continuous performance monitoring, lean management, and process improvement cultures are positively associated with efficiency outcomes.
- Capacity and infrastructure: physical capacity (bed numbers, operating rooms), availability of diagnostics, and supply-chain robustness shape the hospital's ability to process patients efficiently.
- Payment systems and incentives: reimbursement models (fee-for-service, DRG/case-mix payment, capitation) influence provider behavior; prospective payment systems often incentivize shorter LOS and cost containment but may risk under-provision without safeguards.
- External environment: regulatory requirements, accreditation standards, population case-mix, socio-economic factors, and referral networks alter demand patterns and constrain operational choices.

Healthcare Worker Satisfaction

Healthcare worker satisfaction represents a critical aspect of human resource management in the health sector. Conceptually, job satisfaction among healthcare professionals can be defined as a positive psychological state that arises when individual needs, expectations, and preferences are fulfilled through their work experiences in healthcare institutions. Locke (1976) defined job satisfaction as "a pleasurable or positive emotional state resulting from the appraisal of one's job or job experiences." In hospital contexts, healthcare worker satisfaction extends beyond financial remuneration; it also encompasses non-financial aspects such as interpersonal relationships, recognition, workload balance, managerial support, and the adequacy of facilities and infrastructure that enable them to perform their duties effectively (Irawan & Sitanggang, 2020). Theoretical models provide different frameworks to understand the dimensions of job satisfaction. Herzberg's two-factor theory is particularly relevant, distinguishing between *motivator factors* (career development, achievement, recognition) and *hygiene factors* (salary, working conditions, organizational policies). In the context of healthcare, satisfaction can be mapped across several core dimensions:

1. Satisfaction with core tasks, referring to the meaning and value derived from providing care to patients.
2. Satisfaction with compensation and rewards, including salary, allowances, and non-monetary recognition.
3. Satisfaction with the work environment, which encompasses hospital facilities, technological support, and a safe, supportive atmosphere.
4. Satisfaction with interpersonal relationships, covering collaboration with colleagues, supervisory support, and inter-professional interactions.
5. Satisfaction with growth and development opportunities, including access to training, continuing education, and career advancement pathways.

Healthcare worker satisfaction is shaped by both internal and external factors. Internal factors include intrinsic motivation, professional commitment, and personal values toward the healthcare profession. External factors encompass organizational conditions, managerial support, resource availability, compensation systems, and organizational culture. Increasingly, health administration digitalization has emerged as an influential determinant. Digital systems that streamline administrative tasks, enhance information accessibility, and reduce errors can improve job satisfaction. Conversely, when digital tools are complex, poorly integrated, or add to workloads, they may diminish satisfaction (Aqil, 2020). Healthcare worker satisfaction directly influences both individual and organizational performance. Satisfied healthcare workers tend to demonstrate higher productivity, stronger loyalty to their institutions, and a greater commitment to quality service delivery. Satisfaction is also linked to reduced stress, lower burnout rates, and decreased turnover. On the other hand, dissatisfaction may manifest in reduced motivation, increased workplace conflict, and diminished commitment to patient care. From a hospital management perspective, healthcare worker satisfaction functions as a mediating factor that bridges organizational initiatives (such as digitalization of administrative systems) with organizational outcomes (efficiency, service quality, and patient satisfaction) (Gultom et al., 2023).

METHOD

This study employs a literature review method to analyze the relationship between healthcare administration digitalization, hospital service efficiency, and healthcare worker satisfaction as a mediating variable. The literature review approach was selected because it allows for a systematic exploration, synthesis, and critical evaluation of existing academic studies, reports, and empirical findings relevant to the research topic. The review process was conducted through several stages. First, the identification stage involved determining relevant keywords such as healthcare digitalization, administrative digital transformation in hospitals, hospital service efficiency, healthcare worker satisfaction, and mediating variables in healthcare management. These keywords were applied in multiple electronic databases including Scopus, Web of Science, PubMed, ScienceDirect, SpringerLink, and Google Scholar, ensuring a wide scope of high-quality and peer-reviewed literature. Second, the screening stage was performed to select only sources published between 2010 and 2025 to capture both foundational theories and recent developments in healthcare digitalization and hospital management. The inclusion criteria consisted of: (1) peer-reviewed journal articles, books, or official reports, (2) studies focusing on healthcare settings, especially hospitals, and (3) literature discussing digitalization, efficiency, or healthcare worker satisfaction. Exclusion criteria included non-academic sources, opinion pieces, and studies outside the healthcare context. Third, the analysis stage involved organizing the literature into three thematic clusters: (1) digitalization of healthcare administration, (2) hospital service efficiency, and (3) healthcare worker satisfaction. Within each cluster, the sources were critically examined to identify conceptual definitions, theoretical frameworks, determinants, and implications. Furthermore, special attention was given to empirical studies that examined the interrelationships among these variables. Finally, the synthesis stage integrated the findings to construct a conceptual framework explaining the mediating role of healthcare worker satisfaction between digitalization and hospital efficiency. The synthesis emphasized both converging and diverging perspectives across the literature, highlighting research gaps and potential contributions of this study.

RESULTS AND DISCUSSION

Impact of Healthcare Administration Digitalization

The digitalization of healthcare administration represents a fundamental shift in how hospitals manage information, resources, and service delivery. Traditionally, administrative processes in healthcare such as patient registration, medical record keeping, billing, and reporting were manual and paper-based, often resulting in delays, duplication of tasks, errors, and inefficiencies. The introduction of digital technologies, including Electronic Health Records (EHRs), Hospital Information Systems (HIS), digital billing platforms, appointment scheduling applications, and integrated reporting systems, has significantly transformed the administrative landscape of hospitals. These innovations enable hospitals to streamline processes, reduce paperwork, enhance data accuracy, and ensure the faster flow of information across departments, ultimately contributing to higher organizational efficiency (Rohmah et al., 2025).

One of the most prominent impacts of digitalization is the improvement of data management and accessibility. In a paper-based system, medical records are prone to loss, damage, or misplacement, which can disrupt patient care and delay decision-making. Digital systems centralize and standardize patient data, allowing authorized healthcare professionals to access complete medical histories in real time. This accessibility not only enhances clinical decision-making but also reduces duplication of tests and procedures, thereby lowering costs and saving valuable time. Furthermore, the integration of administrative and clinical data within a single digital platform allows for more accurate billing, insurance claims processing, and performance reporting, reinforcing the financial stability and transparency of hospitals.

Digitalization also brings about substantial time efficiency. Administrative tasks that once required hours of manual work such as compiling patient charts, processing billing, or scheduling procedures can now be executed within minutes through automated systems. Several studies have shown that EHR implementation reduces the average time required for patient documentation and coordination across departments, enabling healthcare workers to focus more on patient care rather than paperwork (Amalia, 2024). Similarly, digital appointment systems reduce patient waiting times by optimizing scheduling and preventing overlaps or errors, which directly improves both patient experience and hospital workflow efficiency. Another critical aspect is the reduction of errors and redundancies. Manual administrative systems are often vulnerable to human error, whether in data entry, coding, or billing. Such errors not only waste resources but may also lead to serious clinical and legal consequences. Digital administrative tools, when properly designed and implemented, employ validation mechanisms and error-checking algorithms that minimize inaccuracies. For instance, automated billing systems reduce the likelihood of miscalculations, while digital record-keeping systems ensure that patient data remains consistent and updated across

all departments. This reliability in administrative processes contributes to smoother hospital operations and enhances trust in the healthcare system.

Beyond efficiency and accuracy, healthcare administration digitalization facilitates better interdepartmental communication and coordination. Digital platforms integrate various hospital units registration, pharmacy, laboratory, radiology, finance, and clinical wards into a single information flow. This integration eliminates silos, enabling seamless coordination and faster service delivery. For example, when laboratory results are uploaded digitally, they become immediately available to physicians without the delays inherent in paper transfers. This interconnectedness accelerates patient care processes, reduces bottlenecks, and enhances the hospital's overall operational performance (Nisa & Deha, 2025).

Moreover, digitalization provides a strong foundation for strategic decision-making. Hospitals equipped with digital administrative systems can generate comprehensive reports and analytics that offer insights into patient demographics, service utilization, financial performance, and workforce productivity. These data-driven insights enable hospital administrators to plan resources more effectively, identify inefficiencies, and implement evidence-based improvements. In the era of value-based healthcare, where performance measurement and accountability are increasingly important, digitalization allows hospitals to respond quickly to regulatory demands and continuously improve their service delivery models.

Despite these advantages, it is important to acknowledge that digitalization also presents implementation challenges. High upfront investment, system integration issues, and the need for continuous technical support can initially create resistance among hospitals and healthcare workers. Inadequate training or user-unfriendly platforms may cause frustration, reduce staff productivity, and even offset the intended efficiency gains. Therefore, successful digitalization requires not only technological readiness but also robust change management strategies, including stakeholder involvement, capacity building, and long-term support mechanisms (Dayar et al., 2025).

In summary, the digitalization of healthcare administration has a profound and transformative impact on hospital efficiency. By streamlining data management, saving time, reducing errors, facilitating communication, and enabling data-driven decisions, digital technologies directly enhance the effectiveness of hospital operations. However, the extent of these benefits depends largely on the quality of implementation, integration, and adoption within the hospital ecosystem. Hospitals that approach digital transformation holistically balancing technology with human resources and organizational culture are more likely to realize the full potential of digitalization in driving efficiency and sustainability in healthcare delivery.

Determinants of Hospital Service Efficiency

Hospital service efficiency is a multidimensional concept that reflects the optimal use of resources to deliver high-quality healthcare services in a timely, cost-effective, and patient-centered manner. Efficiency in this context does not solely pertain to financial savings, but also to the ability of hospitals to maximize outputs such as the number of patients treated, quality of care delivered, and level of patient satisfaction while minimizing unnecessary inputs, such as redundant procedures, administrative delays, and waste of resources. A review of the literature reveals that hospital service efficiency is influenced by an interplay of structural, organizational, technological, and human resource-related determinants, each of which contributes differently to the overall performance of healthcare institutions (Lukito & Gani, 2024)

A primary determinant of hospital efficiency lies in resource allocation and utilization. Hospitals are resource-intensive organizations, requiring significant inputs in terms of labor, capital, equipment, and pharmaceuticals. Efficient allocation of these resources ensuring that they are deployed in areas of greatest need and utilized without waste is fundamental to achieving service efficiency. Misallocation, such as overstaffing in certain departments and understaffing in others, or poor inventory management leading to stockouts or overstocking of medicines, can generate bottlenecks and inefficiencies that compromise patient care. Studies have shown that hospitals with systematic resource planning and lean management approaches achieve higher efficiency scores by reducing waste and enhancing workflow balance (Latupeirissa & Herawati, 2025). Another key determinant is workforce performance and productivity. Human resources are the backbone of hospital operations, and their effectiveness directly influences service efficiency. Adequate staffing levels, equitable workload distribution, ongoing training, and the availability of supportive supervision are critical factors that shape healthcare workers' capacity to deliver care efficiently. High levels of burnout, turnover, and absenteeism among healthcare professionals not only reduce productivity but also place additional strain on available staff, thereby undermining efficiency. Conversely, motivated and well-supported healthcare workers are more likely to engage in collaborative practices, reduce delays, and ensure smooth patient flow within the hospital. The adoption of technology and digital systems

also plays an increasingly significant role in determining hospital efficiency. Hospitals that implement electronic health records (EHRs), hospital information systems (HIS), digital billing systems, and automated diagnostic platforms tend to experience streamlined administrative processes, reduced medical errors, and improved coordination across departments. Digital platforms enhance the timeliness and accuracy of information transfer, leading to faster diagnoses, more effective treatments, and reduced duplication of services. However, the efficiency gains from digitalization depend on successful integration, user training, and the degree to which systems are designed to complement existing workflows. Without these supporting factors, digitalization may create new inefficiencies, such as system downtime or staff resistance due to perceived complexity.

Hospital service efficiency is also shaped by organizational management and leadership practices. Effective governance, clear decision-making processes, and accountability mechanisms ensure that resources are used judiciously and that services remain aligned with institutional goals. Leadership styles that emphasize participatory management and continuous quality improvement have been shown to foster a culture of efficiency, as they encourage frontline staff to identify inefficiencies and propose solutions. Conversely, rigid bureaucratic structures and lack of transparency in hospital governance may stifle innovation and perpetuate inefficiencies in service delivery (Fadilla, 2021). Furthermore, infrastructure and facility readiness represent another determinant of efficiency. Adequate hospital infrastructure, including modern medical equipment, well-designed layouts, and sufficient bed capacity, enables smoother patient flow and reduces waiting times. Poor infrastructure, overcrowding, or inadequate maintenance of facilities, on the other hand, often leads to delays, longer hospital stays, and reduced service quality. The COVID-19 pandemic highlighted how infrastructural readiness such as the availability of intensive care units, ventilators, and isolation wards was critical in determining the efficiency and resilience of hospitals in responding to surges in demand.

An often-overlooked but important determinant is patient flow management and demand forecasting. Hospitals that manage admissions, referrals, and discharges effectively are able to maintain smooth operations even during peak demand. Efficient patient flow reduces congestion in emergency departments, minimizes waiting times for outpatient visits, and ensures that inpatient care is delivered in a timely manner. Tools such as predictive analytics and appointment management systems allow hospitals to anticipate patient volume and adjust staffing and resources accordingly (Rahmayanti et al., 2023). Lastly, external factors such as policy environment and regulatory frameworks also affect hospital service efficiency. Government regulations, reimbursement mechanisms, and accreditation requirements shape hospital operations and resource allocation decisions. For instance, performance-based financing models incentivize efficiency by linking hospital funding to measurable outcomes, whereas rigid regulatory environments without performance incentives may create disincentives for innovation and cost-effectiveness.

The Role of Inter-Unit Coordination as a Mediating Variable between Management Policy Innovation and the Quality of Clinical Services

Healthcare worker satisfaction plays a pivotal role in shaping the quality, efficiency, and sustainability of hospital services. As frontline providers of care, healthcare workers including physicians, nurses, and allied health professionals serve as the primary drivers of hospital performance. Their level of satisfaction with their job, work environment, and organizational support directly influences not only their individual productivity and commitment but also the collective capacity of hospitals to deliver efficient and high-quality care. In this regard, healthcare worker satisfaction functions both as an outcome of organizational practices and as a mediating mechanism that links institutional strategies such as digitalization of healthcare administration to broader efficiency outcomes (Aqil, 2020). At its core, healthcare worker satisfaction reflects the degree to which professional and personal needs are fulfilled within the work environment. It encompasses dimensions such as fair compensation, manageable workload, recognition and respect, opportunities for career development, supportive supervision, adequate facilities, and a safe workplace. Research consistently demonstrates that when these factors are positively perceived, healthcare workers exhibit higher motivation, stronger organizational commitment, and greater willingness to engage in continuous improvement. Conversely, dissatisfaction arising from excessive workload, insufficient resources, lack of recognition, or poor management practices often leads to burnout, absenteeism, turnover, and declining service quality (Gultom et al., 2023). From an organizational performance perspective, healthcare worker satisfaction serves as a determinant of efficiency in several ways. First, satisfied employees demonstrate greater task engagement, meaning they are more likely to perform duties effectively, reduce errors, and provide timely care to patients. This directly supports hospital efficiency by minimizing delays, preventing redundancies, and ensuring smoother patient flow. Second, satisfaction reduces turnover intentions and absenteeism, which lowers the costs associated with recruitment, training, and overtime coverage, thereby contributing to financial and operational efficiency. Third,

satisfied healthcare workers are more likely to engage in teamwork and interdepartmental collaboration, which improves coordination across the hospital and further enhances service efficiency (Rohmah et al., 2025). Moreover, healthcare worker satisfaction has been increasingly recognized as a mediating variable in the relationship between hospital strategies such as digitalization and efficiency outcomes. The introduction of digital administrative tools, while aimed at streamlining workflows, often requires significant adaptation by healthcare staff. If the digitalization process is accompanied by adequate training, technical support, and participatory management, it tends to enhance worker satisfaction by reducing administrative burdens, improving access to information, and enabling healthcare workers to focus more on direct patient care. In such cases, satisfaction strengthens the positive effect of digitalization on hospital efficiency. However, if digital systems are poorly designed, overly complex, or insufficiently supported, they may increase workload and stress, thereby diminishing satisfaction and neutralizing or even reversing efficiency gains. Thus, healthcare worker satisfaction is not only an outcome of digital transformation but also a critical factor that determines whether such transformation translates into tangible efficiency improvements.

Beyond its direct link to efficiency, healthcare worker satisfaction is also closely tied to quality of care and patient outcomes. Studies show that satisfied healthcare workers tend to demonstrate higher empathy, better communication, and stronger patient-centeredness, which translates into improved patient satisfaction and trust in healthcare institutions. Since patient satisfaction is often a key performance indicator in hospitals and is closely associated with operational efficiency, the indirect role of worker satisfaction in enhancing patient experience further underscores its strategic importance (Nisa & Deha, 2025). In the broader context of healthcare systems, healthcare worker satisfaction also contributes to organizational resilience and adaptability. Hospitals operate in environments characterized by high uncertainty, increasing demand, and rapid technological change. Satisfied and motivated staff are better positioned to embrace innovations, adapt to policy reforms, and respond effectively to crises such as pandemics. For example, during the COVID-19 pandemic, healthcare worker satisfaction shaped by the availability of protective equipment, managerial support, and recognition was a crucial determinant of hospital responsiveness and continuity of care (Fadilla, 2021). Healthcare worker satisfaction is not merely a peripheral concern of hospital management but a central determinant of organizational efficiency, service quality, and system sustainability. It functions as both a direct driver of efficiency and a mediating factor that shapes the success of strategic initiatives such as healthcare administration digitalization. Hospitals that prioritize worker satisfaction through fair compensation, supportive leadership, adequate resources, and inclusive change management are more likely to foster a motivated and resilient workforce capable of driving efficiency gains and sustaining long-term improvements in healthcare delivery.

CONCLUSION

The review of literature demonstrates that the digitalization of healthcare administration constitutes a transformative force in hospital management, offering substantial opportunities to enhance efficiency through improved data accuracy, reduced administrative burden, optimized patient flow, and better interdepartmental coordination. However, the realization of these efficiency gains is not automatic; it is strongly mediated by the satisfaction of healthcare workers who serve as the primary users and implementers of digital systems. Hospitals that implement digital tools without considering the experiences, needs, and capacities of healthcare professionals may inadvertently create new inefficiencies, such as workflow disruptions, increased workload, or staff resistance. Conversely, when digitalization initiatives are supported with adequate training, managerial support, participatory decision-making, and user-friendly design, they enhance healthcare worker satisfaction, which in turn reinforces engagement, motivation, and productivity. Hospital service efficiency thus emerges as the outcome of a dynamic interaction between technological innovation and human resource satisfaction. This highlights the necessity of adopting a holistic approach to hospital management, where digital transformation is not only viewed as a technological intervention but as an organizational change process that must align with the needs of healthcare professionals. In contexts such as Indonesia, where national policies are accelerating the adoption of electronic medical records and integrated digital health systems, the ability of hospitals to sustain efficiency will depend heavily on how effectively they integrate human-centered strategies with technological innovation.

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