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Evaluating Permenkes No. 72/2016 Pharmaceutical Service Effectiveness in an Indonesian Referral Hospital

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Abstract

Purpose: This study evaluates the effectiveness of Indonesia's Ministry of Health Regulation No. 72/2016 (Permenkes No. 72/2016) implementation at the Pharmacy Installation of RSUP Prof. Dr. I.G.N.G. Ngoerah, a national referral hospital in Bali, Indonesia, using Steers' organizational effectiveness framework encompassing goal achievement, adaptation, and integrity dimensions.

Research Methodology: A qualitative descriptive study was conducted from January to May 2024. Data were collected through in-depth interviews with key informants including the Head of Pharmacy Installation, pharmacists, pharmacy staff, and patients or visitors, supplemented by direct observation and document analysis, and were examined using thematic analysis organized around the three effectiveness dimensions.

Results: Goal achievement showed partial success through Unit Dose Dispensing system implementation, formulary maintenance, medication error minimization, and standard-compliant waiting times. Adaptation demonstrated digitalization through the Hospital Information System with e-prescribing, emergency procurement mechanisms, and enhanced pharmacist competencies. Integrity revealed adherence to standard operating procedures for High-Alert and LASA drugs alongside interprofessional collaboration, though largely formalistic in character.

Conclusions: Implementation has progressed but optimization remains incomplete, with adaptation emerging as the most crucial element for sustainability.

Limitations: Findings are drawn from a single tertiary referral hospital and a qualitative design that limits statistical generalization.

Contributions: The study offers an organizational effectiveness lens for evaluating pharmaceutical policy implementation in resource-constrained referral hospitals.

Keywords: *Hospital Pharmacy, Medication Safety, Organizational Effectiveness, Pharmaceutical Services, Regulatory Implementation*

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1. Introduction

Pharmaceutical services constitute a critical component of healthcare delivery systems, directly influencing patient safety, treatment outcomes, and overall healthcare quality (Dinianty et al., 2025; Ismayani et al., 2023). In hospital settings, effective pharmaceutical management encompasses the entire medication use process, from selection and procurement to storage, distribution, and clinical pharmacy services, requiring robust regulatory frameworks and systematic implementation strategies (Polii et al., 2022). The World Health Organization emphasizes that well-functioning pharmaceutical systems are essential for achieving universal health coverage and ensuring equitable access to quality-assured medicines (Zaidi et al., 2013; Peacocke et al., 2022).

In Indonesia, the Ministry of Health issued Regulation No. 72 of 2016 to establish comprehensive pharmaceutical service standards in hospitals, replacing previous fragmented guidelines (Ismayani et al., 2023). This regulation mandates hospitals to implement standardized pharmaceutical management practices covering both managerial aspects, such as selection, planning, procurement, receiving, storage, distribution, destruction, withdrawal, control, and administration, and clinical pharmacy services, such as prescription assessment, dispensing, patient counseling, medication therapy monitoring, and adverse drug reaction reporting (Abdissalam et al., 2025). The regulation aims to enhance medication safety, optimize pharmaceutical resource utilization, and strengthen the clinical role of pharmacists in patient care (Hermansyah et al., 2018).

Despite comprehensive regulatory frameworks, implementation challenges persist across Indonesian healthcare facilities. Studies have documented significant gaps between policy mandates and operational realities, including inadequate human resources, infrastructure deficiencies, incomplete digital system integration, and weak enforcement mechanisms (Fanda et al., 2024; Hasnida et al., 2021). Research indicates that many Indonesian hospitals experience essential medicine shortages, while pharmaceutical preparation management often achieves higher compliance rates compared to clinical pharmacy services, which show considerable variation across facilities (Satibi et al., 2020; Abdissalam et al., 2025). Furthermore, the pharmacist shortage remains a critical constraint, with the ratio of pharmacists to population falling below World Health Organization recommendations in many regions (Abdel Rida et al., 2017).

RSUP Prof. Dr. I Goesti Ngoerah Gde Ngoerah serves as a national referral hospital and the primary tertiary care facility for Bali province and eastern Indonesia. As a teaching hospital affiliated with Udayana University's Faculty of Medicine, it manages complex cases requiring advanced pharmaceutical services and serves as a model for pharmaceutical practice standards in the region. Evaluating the effectiveness of Permenkes No. 72/2016 implementation at this institution provides valuable insights into both the achievements and persistent challenges of pharmaceutical service standardization in Indonesian referral hospitals.

This study employs Steers' organizational effectiveness framework, which conceptualizes effectiveness through three interrelated dimensions: goal achievement, defined as the extent to which an organization accomplishes its stated objectives; adaptation, defined as the organization's capacity to respond to environmental changes and challenges; and integrity, defined as the degree of internal cohesion and adherence to established procedures (Steers, 1977; Nuti et al., 2013). This multidimensional approach enables comprehensive assessment of pharmaceutical service implementation beyond mere compliance checklists, capturing the dynamic interplay between regulatory mandates, organizational capacity, and operational realities (Sicotte et al., 1998; Arah et al., 2003).

The research addresses two primary questions. The first question asks how effective the implementation of drug distribution systems based on Permenkes No. 72/2016 has been at RSUP Ngoerah's Pharmacy Installation. The second question asks what facilitating and inhibiting factors influence implementation effectiveness. By examining these questions through the lens of organizational effectiveness theory, this study contributes to the growing body of evidence on pharmaceutical policy implementation in resource-constrained settings and offers practical

recommendations for improving pharmaceutical service quality in Indonesian hospitals (Hasnida et al., 2021; Zaidi et al., 2013; Wasir et al., 2018).

2. Literature Review

2.1 Pharmaceutical Service Standards in Hospitals

Hospital pharmaceutical services represent the intersection of regulatory compliance, clinical excellence, and operational efficiency (Akri, 2024; Zaidi et al., 2013). The World Health Organization's concept of pharmaceutical management encompasses selection, procurement, distribution, and use of medicines within healthcare systems, with each component contributing to overall service quality and patient safety (Zaidi et al., 2013). International evidence consistently demonstrates that structured pharmaceutical services reduce medication errors, improve therapeutic outcomes, and optimize resource utilization (Dinianty et al., 2025; Ibrahim, 2010).

In developing countries, the implementation of pharmaceutical service standards faces unique challenges stemming from resource constraints, infrastructure limitations, and governance weaknesses (Fanda et al., 2024; Sani et al., 2023). Research in Indonesian hospitals has documented variable compliance with pharmaceutical management standards, with studies revealing significant gaps in storage conditions, dispensing practices, and clinical pharmacy services (Satibi et al., 2020; Amelia et al., 2022). Specifically, drug distribution problems including inventory discrepancies, delayed deliveries, violation of FIFO and FEFO principles, and insufficient monitoring systems have been identified as common barriers to effective pharmaceutical service provision (Dinianty et al., 2025; Citraningtyas et al., 2025).

The Indonesian pharmaceutical regulatory landscape has evolved significantly with Permenkes No. 72/2016, which aligns national standards with international best practices (Ismayani et al., 2023; Anggriani et al., 2020). However, translating regulatory intent into operational reality requires sustained commitment to workforce development, infrastructure investment, and organizational change management (Hermansyah et al., 2018; Wibowo et al., 2016). Studies on Permenkes No. 72/2016 implementation have found that larger, better-resourced hospitals generally demonstrate higher compliance rates but still face challenges in fully implementing clinical pharmacy services (Ismayani et al., 2023; Abdissalam et al., 2025).

2.2 Steers' Organizational Effectiveness Theory

Steers (1977) proposed one of the most influential frameworks for evaluating organizational effectiveness, moving beyond simplistic goal attainment models to encompass the multidimensional nature of organizational performance. Steers' framework identifies three core dimensions. Goal achievement refers to the degree to which the organization fulfills its stated objectives within defined parameters. Adaptation refers to the organization's capacity to flexibly respond to internal and external environmental changes while maintaining performance. Integrity refers to the coherence of organizational processes, adherence to established standards, and the ethical dimensions of organizational functioning (Steers, 1977; Oghojafor et al., 2012).

This framework has been applied extensively in public sector and healthcare organizational research to evaluate performance beyond simple input-output metrics (Nuti et al., 2013; Parkitna & Gadek, 2017). In healthcare settings, Steers' dimensions map onto key performance domains: clinical outcomes and service quality correspond to goal achievement, organizational learning and innovation correspond to adaptation, and compliance with professional and regulatory standards corresponds to integrity (Sicotte et al., 1998; Arah et al., 2003). The framework's strength lies in its recognition that effectiveness is neither static nor unidimensional; organizations may excel in some dimensions while underperforming in others, requiring differentiated improvement strategies (Nuti et al., 2013; Steers, 1977).

Applied to pharmaceutical service evaluation, Steers' framework provides a nuanced lens for assessing whether regulatory standards are merely formally adopted or substantively integrated into organizational practice (Nuti et al., 2013). Goal achievement can be assessed through measurable

pharmaceutical service indicators such as formulary compliance, waiting times, and medication error rates. Adaptation can be assessed through organizational responses to supply disruptions, technology adoption, and workforce development. Integrity can be assessed through adherence to standard operating procedures, interprofessional collaboration quality, and accountability mechanisms (Sicotte et al., 1998; Arah et al., 2003).

2.3 Implementation Challenges in Developing Country Healthcare Systems

Pharmaceutical policy implementation in developing countries is shaped by complex interactions among regulatory capacity, health system financing, human resource development, and supply chain management (Fanda et al., 2024; Hasnida et al., 2021; Peacocke et al., 2022). Research across Southeast Asia has identified common implementation challenges including inadequate pharmacist staffing, poor supply chain governance, weak regulatory enforcement, and limited use of information technology in pharmaceutical management (Satibi et al., 2020; Fanda et al., 2024; Hermansyah et al., 2018).

The transition from traditional dispensing-focused pharmacy to comprehensive pharmaceutical care, including clinical pharmacy services, represents a fundamental shift in professional identity and organizational function that requires sustained cultural change (Hermansyah et al., 2018; Wibowo et al., 2016). International evidence suggests that this transition is most successful when supported by enabling regulatory environments, strong professional associations, adequate financing, and organizational cultures that value pharmaceutical expertise (Fanda et al., 2024; Hermansyah et al., 2018). In Indonesian hospitals, the expanded clinical role mandated by Permenkes No. 72/2016 often confronts traditional hierarchies and resource constraints that limit pharmacist involvement in direct patient care (Ismayani et al., 2023; Wibowo et al., 2016).

Digital health interventions, including electronic prescribing, hospital information systems, and automated dispensing technologies, have demonstrated significant potential for improving pharmaceutical service efficiency and safety (Astuti et al., 2022; Ibrahim, 2010). However, successful implementation requires not only technology investment but also workflow redesign, staff training, and change management support (Dinianty et al., 2025; Astuti et al., 2022). Studies in developing country hospitals have found that partial digital integration, where some processes are automated while others remain manual, can create new coordination challenges and data integrity problems if not carefully managed (Citraningtyas et al., 2025; Satibi et al., 2020).

2.4 Conceptual Framework and Research Propositions

Synthesizing the streams reviewed above, the conceptual framework of this study positions Permenkes No. 72/2016 as the regulatory input, the Pharmacy Installation of RSUP Ngoerah as the organizational unit of analysis, and Steers' three effectiveness dimensions as the evaluative lens through which implementation outcomes are interpreted. Because this study follows a qualitative descriptive design rather than a confirmatory quantitative design, its guiding expectations are expressed as research propositions rather than statistically testable hypotheses.

The first proposition holds that goal achievement under Permenkes No. 72/2016 will be only partially realized, with stronger performance in measurable managerial indicators such as formulary availability and dispensing standards than in clinical pharmacy service coverage. The second proposition holds that adaptation, reflected in digital transformation, emergency procurement capacity, and workforce competency development, will emerge as the dimension in which the Pharmacy Installation demonstrates the strongest organizational response relative to goal achievement and integrity. The third proposition holds that integrity, while formally documented through standard operating procedures and visible compliance artifacts, will show evidence of being more formalistic than substantively internalized within day-to-day operational practice. These propositions are evaluated against the empirical findings presented in Section 4.

3. Research Methodology

3.1 Research Design

This study employed a qualitative descriptive approach to comprehensively evaluate the effectiveness of Permenkes No. 72/2016 implementation at the Pharmacy Installation of RSUP Prof. Dr. I.G.N.G. Ngoerah. Qualitative methods were deemed appropriate given the complexity of pharmaceutical service implementation, the need to understand contextual factors and organizational dynamics, and the importance of capturing diverse stakeholder perspectives on effectiveness dimensions (Nuti et al., 2013). The qualitative approach enables rich description of implementation processes, identification of facilitating and inhibiting factors, and generation of practical recommendations grounded in organizational reality.

3.2 Study Setting

RSUP Prof. Dr. I Goesti Ngoerah Gde Ngoerah, commonly referred to as RSUP Ngoerah or RSUP Sanglah, is located in Denpasar, Bali, covering an area of 13.5 hectares. It functions as the national referral hospital for Bali Province and a teaching hospital for Udayana University's Faculty of Medicine. The hospital operates as a Public Service Agency (Badan Layanan Umum) under the direct authority of the Ministry of Health. The Pharmacy Installation provides pharmaceutical services to inpatient, outpatient, and emergency departments across the hospital's comprehensive care services.

3.3 Data Collection

Data collection was conducted from January to May 2024 using three complementary methods. In-depth interviews were held with purposively selected key informants including the Head of Pharmacy Installation, senior pharmacists, pharmacy technicians, administrative staff, and patients or visitors. Interview guides were developed based on Steers' three effectiveness dimensions and the specific operational aspects of Permenkes No. 72/2016, and each interview lasted 45 to 90 minutes and was audio-recorded with participant consent. Structured and unstructured observation of pharmacy operations focused on drug distribution workflows, storage conditions, FIFO and FEFO implementation, dispensing processes, and interprofessional interactions. Document analysis covered institutional reports, performance data, standard operating procedures, pharmaceutical management records, and relevant regulatory documents.

3.4 Data Analysis

Qualitative data were analyzed using thematic analysis following the systematic six-phase approach proposed by Braun and Clarke (2021), consisting of data familiarization, generating initial codes, developing themes, reviewing themes, defining and naming themes, and producing the final report. The analysis was organized based on Steers' effectiveness dimensions, including goal achievement, adaptation, and integration, as analytical categories, while facilitating and inhibiting factors were identified as emerging themes. Data triangulation from interviews, observations, and document analysis was applied to enhance the credibility and validity of qualitative findings. Member checking and researcher reflexivity through documentation and peer discussion were conducted to ensure interpretive accuracy and minimize potential bias (Creswell & Creswell, 2023; Braun & Clarke, 2021).

4. Results and Discussions

4.1 Goal Achievement Dimension

The goal achievement dimension assesses the extent to which the Pharmacy Installation fulfills the operational objectives mandated by Permenkes No. 72/2016 (Steers, 1977). Analysis revealed partial goal achievement, with notable strengths in formulary management and distribution systems alongside persistent gaps in clinical pharmacy service coverage. Drug formulary management demonstrated strong performance, with the hospital maintaining near-complete availability of formulary medicines, a critical goal of pharmaceutical service standards (Kristin et al., 2023). The implementation of Unit Dose Dispensing for inpatient services represents a significant achievement aligned with international best practices for medication safety and accuracy (Dinianty et al., 2025; Citraningtyas et al., 2025). Unit Dose Dispensing systems have been demonstrated to reduce medication errors by 80 to 90% compared to traditional floor stock systems, directly supporting patient safety objectives (Dinianty et

al., 2025). The Pharmacy Installation's successful Unit Dose Dispensing implementation, covering all inpatient wards, reflects substantial organizational investment and clinical pharmacy capacity.

Prescription waiting times for both ready-made medications and compounded medications generally met the minimum service standards, demonstrating operational efficiency in dispensing workflows (Ibrahim, 2010). However, informant interviews revealed significant variation in waiting times during peak demand periods, suggesting that staffing levels and workflow design remain suboptimal for consistent standard compliance across all service conditions. This finding is consistent with evidence from comparable hospitals in developing countries, where staffing constraints create bottlenecks that undermine service quality during high-demand periods (Yuniarti et al., 2019; Abdel Rida et al., 2017).

Medication error minimization efforts, including double-checking protocols, pharmacist verification of prescriptions, and systematic adverse drug reaction reporting, demonstrated commitment to patient safety objectives. However, incomplete documentation of near-miss events and limited systematic medication error analysis suggest that error learning systems require strengthening to achieve the continuous improvement goals of Permenkes No. 72/2016 (Dinianty et al., 2025; Ismayani et al., 2023). This mirrors findings from evaluations of pharmaceutical service quality for patients with chronic conditions in other Indonesian regional hospitals, where documentation completeness was similarly identified as an area requiring improvement (Putri, 2022).

4.2 Adaptation Dimension

The adaptation dimension, assessed as the most crucial element in this study, evaluates the Pharmacy Installation's capacity to flexibly respond to environmental changes, technological opportunities, and emerging challenges (Steers, 1977). RSUP Ngoerah's Pharmacy Installation demonstrated notable adaptive capacity across several domains. Digital transformation represented the most visible adaptation achievement. The implementation of the Hospital Information System with integrated electronic prescribing functionality has fundamentally transformed the prescription management process (Astuti et al., 2022). By enabling direct digital transmission of prescriptions from prescribers to the pharmacy, e-prescribing has reduced transcription errors, shortened prescription processing times, and improved workflow efficiency. This aligns with global evidence on e-prescribing benefits in hospital settings and represents a significant advance over paper-based systems (Dinianty et al., 2025; Astuti et al., 2022).

Emergency procurement mechanisms demonstrate organizational resilience in responding to supply disruptions, which are prevalent in Indonesian pharmaceutical supply chains (Arrasily et al., 2025; Anggriani et al., 2020). The ability to activate legal emergency procurement when regular supply channels fail ensures continuous medicine availability for patients requiring critical medications, reflecting strong adaptive capacity and commitment to patient welfare. Evidence suggests that 34.7% of Indonesian hospitals experience essential medicine shortages at least annually, making emergency procurement capacity a critical organizational capability (Arrasily et al., 2025).

Continuous competency development for clinical pharmacy services reflects strategic adaptation to the expanded pharmacist role mandate under Permenkes No. 72/2016 (Hermansyah et al., 2018; Wibowo et al., 2016). Informants described structured training programs designed to equip pharmacists with clinical skills for patient counseling, medication therapy monitoring, and interprofessional collaboration in patient care rounds. This workforce development investment is essential for transitioning from traditional dispensing-focused pharmacy to comprehensive pharmaceutical care, though complete role transformation remains an ongoing process (Hermansyah et al., 2018).

The adaptation of FIFO and FEFO principles from manual to digital inventory management represents another significant adaptive achievement, improving accuracy and auditability of pharmaceutical stock management (Dinianty et al., 2025; Satibi et al., 2020). This digital adaptation has partially addressed the stock discrepancy and expired medication problems identified as recurring challenges in Indonesian hospital pharmacies (Citraningtyas et al., 2025; Polii et al., 2022).

4.3 Integrity Dimension

The integrity dimension evaluates the coherence of organizational processes, adherence to established standards, and the ethical underpinning of pharmaceutical service operations (Steers, 1977). This study found that while formal integrity mechanisms are in place, substantive integration of integrity values into organizational culture remains incomplete. Standard operating procedure compliance for High-Alert and LASA (Look Alike Sound Alike) medications demonstrated strong formal integrity (Dinianty et al., 2025). These drug categories require special handling due to their elevated potential for catastrophic patient harm if administered incorrectly. The Pharmacy Installation's documented protocols for double verification, prominent labeling, and storage segregation reflect adherence to international patient safety standards and commitment to medication error prevention. Interprofessional collaboration in patient care rounds provides another integrity indicator, with pharmacists actively contributing to treatment decisions alongside physicians and nurses (Wibowo et al., 2016).

However, a critical finding emerged regarding the substantive versus formalistic nature of integrity implementation. While physical manifestations of integrity, such as banner displays, poster campaigns, and formal documentation, are abundant throughout the facility, these external signals do not fully translate into deeply internalized organizational values and consistent behavioral standards. This observation aligns with broader public sector integrity challenges identified in Indonesian governance research (Muazzinah et al., 2022). The distinction between performative compliance and genuine organizational integrity has significant implications for sustainable pharmaceutical service quality.

The digital FIFO and FEFO inventory management system represents a structural integrity mechanism that, when fully implemented, should prevent expired medication dispensing and ensure systematic stock rotation (Dinianty et al., 2025; Satibi et al., 2020). However, field observations revealed instances of inconsistent application, particularly during high-volume periods when staff prioritized throughput over protocol adherence. This gap between formal system capability and operational consistency suggests that integrity enhancement requires not only technical systems but also supervisory reinforcement, performance monitoring, and accountability mechanisms (Sicotte et al., 1998; Arah et al., 2003).

4.4 Implementation Barriers

Five critical implementation barriers emerged from analysis across all data sources, constraining full achievement of the pharmaceutical service vision embodied in Permenkes No. 72/2016.

The most fundamental barrier concerns human resource inadequacy. The pharmacist-to-workload ratio represents the most pressing implementation constraint, as high patient volumes and complex case mix at a national referral hospital demand extensive clinical pharmacy involvement that current staffing levels cannot fully support (Abdel Rida et al., 2017). The World Health Organization recommends minimum pharmacist-to-bed ratios for comprehensive pharmaceutical services, but many Indonesian hospitals, including teaching and referral hospitals, fall short of these thresholds (Abdel Rida et al., 2017). The consequence is that pharmacists must prioritize dispensing functions over clinical pharmacy services, perpetuating the traditional pharmacy role that Permenkes No. 72/2016 seeks to transform (Wibowo et al., 2016).

A second barrier involves infrastructure and facility constraints. Suboptimal pharmacy warehouse layout and storage facilities create operational inefficiencies and compliance risks (Sani et al., 2023). Physical space constraints limit proper implementation of drug storage standards, particularly temperature-controlled storage requirements, isolation of High-Alert medications, and ergonomic design for accurate dispensing workflows. Infrastructure investments require capital commitments that compete with other hospital priorities in resource-constrained environments (Satibi et al., 2020).

A third barrier is incomplete digital integration. Despite significant progress in e-prescribing and digital inventory management, the pharmaceutical information system is not fully integrated across all

hospital functions (Citraningtyas et al., 2025; Astuti et al., 2022). Interfaces between the pharmacy system, clinical information system, and supply chain management software remain incomplete, creating data silos that undermine coordinated pharmaceutical management. Medication reconciliation, real-time stock visibility, and automated reordering functions require further system development (Dinianty et al., 2025; Astuti et al., 2022).

A fourth barrier concerns interprofessional coordination challenges. Effective clinical pharmacy services depend on collaborative relationships between pharmacists, physicians, nurses, and other healthcare providers (Wibowo et al., 2016). Informants described variable quality of interprofessional collaboration, with some clinical units demonstrating strong pharmacist integration while others maintained traditional hierarchies that marginalize pharmaceutical expertise in patient care decisions. Cultural and educational factors contribute to these variations, suggesting that interprofessional education and relationship-building require systematic attention (Hermansyah et al., 2018; Wibowo et al., 2016).

The fifth barrier is limited periodic training. Rapid evolution of pharmaceutical knowledge, drug information, and regulatory requirements necessitates continuous professional development. However, budget constraints and workload demands limit the frequency and comprehensiveness of training opportunities for pharmacy staff. This training gap particularly affects staff capacity to implement new clinical pharmacy functions, utilize updated digital systems, and maintain awareness of evolving drug safety information (Hermansyah et al., 2018).

4.5 Summary of Findings

Table 1 presents a comprehensive summary of findings across Steers' three effectiveness dimensions, identifying key achievements, persistent gaps, and priority recommendations for each dimension. The table synthesizes the qualitative findings reported in Sections 4.1 through 4.4 into a structured overview that highlights where implementation has been strongest and where the most urgent improvement efforts should be directed.

Table 1. Summary of Pharmaceutical Service Effectiveness at RSUP Prof. Dr. I.G.N.G. Ngoerah based on steers' framework

Dimension	Key Achievements	Identified Gaps	Priority Recommendations
Goal Achievement	UDD implementation; formulary maintenance; medication error reduction protocols; standard-compliant dispensing	Suboptimal service consistency during peak demand; incomplete medication error documentation; variable clinical pharmacy coverage	Optimize staffing levels; strengthen error reporting systems; expand clinical pharmacy services
Adaptation	SIRS with e-prescribing; emergency procurement mechanisms; pharmacist clinical competency development; digital FIFO/FEFO systems	Incomplete system integration; partial digital transition; limited continuous learning culture	Complete digital system integration; institutionalize continuous professional development; strengthen supply chain governance
Integrity	SOP compliance for High-Alert/LASA drugs; interprofessional collaboration in patient care; FIFO/FEFO audit capability	Formalistic integrity (banner/poster-based); inconsistent SOP adherence under workload pressure; limited accountability mechanisms	Cultivate genuine integrity culture; strengthen performance monitoring; enhance accountability systems

As Table 1 indicates, the adaptation dimension shows the most consistent alignment between formal achievements and functioning organizational practice, whereas the integrity dimension shows the widest gap between documented compliance and observed day-to-day behavior. This pattern supports the second and third research propositions outlined in Section 2.4, suggesting that organizational flexibility in the face of resource constraints has outpaced the deeper cultural embedding of accountability and ethical practice.

4.6 Policy Implications and Recommendations

The findings of this study carry significant implications for pharmaceutical policy and hospital management at multiple governance levels. At the national level, the Ministry of Health should review Permenkes No. 72/2016 implementation support mechanisms, including developing standardized pharmaceutical workforce planning tools, allocating dedicated financing for hospital pharmaceutical service infrastructure, establishing national pharmaceutical information system standards, and creating a national pharmaceutical service performance monitoring framework with regular reporting obligations (Khasanah et al., 2023; Fanda et al., 2024).

At the health system level, hospital licensing and accreditation bodies should incorporate pharmaceutical service effectiveness indicators into routine assessment frameworks. Pharmaceutical service financing should be explicitly included in national health insurance reimbursement structures to incentivize quality improvement (Wasir et al., 2018; Anggriani et al., 2020).

At the hospital level, RSUP Ngoerah and similar national referral hospitals should pursue several parallel efforts. These include developing strategic pharmaceutical workforce plans with defined recruitment targets and competency frameworks, prioritizing pharmacy infrastructure investments in annual capital budgets, completing digital pharmaceutical system integration to eliminate data silos, establishing interprofessional collaborative practice committees that include pharmacist representation, and implementing integrity-based performance management systems for pharmaceutical services (Yuliasih et al., 2025; Kristin et al., 2023).

At the practice level, pharmaceutical professionals should engage in continuous quality improvement cycles, systematically document and analyze medication errors and near-miss events, actively participate in interprofessional education programs, and contribute to evidence generation through operational research on pharmaceutical service effectiveness (Akri, 2024; Khasanah et al., 2023).

5. Conclusions

5.1 Conclusion

This study evaluated the effectiveness of Permenkes No. 72/2016 pharmaceutical service standard implementation at RSUP Prof. Dr. I.G.N.G. Ngoerah using Steers' organizational effectiveness framework. The findings reveal a complex implementation landscape characterized by significant achievements alongside persistent gaps that constrain full regulatory compliance and optimal pharmaceutical service quality. Across three effectiveness dimensions, the Pharmacy Installation has made substantial progress. Goal achievement is reflected in Unit Dose Dispensing implementation, formulary management, and patient safety protocols. Adaptation is reflected in digital health infrastructure, emergency procurement capability, and clinical pharmacy development. Integrity is reflected in standard operating procedure compliance and interprofessional collaboration frameworks. However, each dimension also reveals important limitations, including inconsistent service quality under workload pressure, incomplete digital integration, and largely formalistic integrity expression.

Five critical barriers, namely human resource inadequacy, infrastructure constraints, incomplete digital integration, interprofessional coordination challenges, and limited training opportunities, emerge as priority targets for intervention. Addressing these barriers through coordinated multi-level policy responses is essential for translating the comprehensive pharmaceutical service vision of Permenkes No. 72/2016 into sustainable operational reality.

Adaptation emerged as the most critical effectiveness dimension, demonstrating that organizational flexibility and innovation capacity can generate meaningful progress even in challenging resource environments. This finding suggests that change management strategies focusing on organizational learning, process innovation, and strategic technology adoption can yield significant service improvements in the near term, while longer-term investments in workforce development, infrastructure, and governance systems address the deeper structural constraints.

The integrity dimension's largely formalistic character, reflected in banner-based integrity expressions rather than deeply internalized organizational values, signals an important frontier for quality improvement. Moving from performative compliance to genuine organizational commitment to pharmaceutical service excellence requires sustained leadership engagement, professional development, and organizational learning systems that translate quality monitoring data into meaningful improvement action. This research contributes to the limited empirical literature on pharmaceutical service effectiveness in Southeast Asian referral hospitals, providing evidence-based insights relevant to pharmaceutical policy implementation in resource-constrained settings across the developing world.

5.2 Research Limitations

Several limitations qualify the interpretation and generalizability of this study's findings. The research was conducted at a single national referral hospital, and the specific organizational dynamics, resource levels, and institutional culture observed at RSUP Ngoerah may not directly transfer to smaller regional hospitals or primary care facilities with different resource profiles. The qualitative descriptive design, while well suited to capturing contextual nuance, does not permit statistical generalization or quantification of the relative magnitude of each identified barrier. Data collection occurred over a five-month period, which may not fully capture seasonal variation in patient volume, medicine supply disruptions, or staffing fluctuations that could influence effectiveness assessments at other times of the year. Additionally, reliance on informant self-report for certain indicators, particularly regarding integrity and interprofessional collaboration, introduces the possibility of social desirability bias, even though triangulation with observation and document analysis was employed to mitigate this risk.

5.3 Suggestions and Directions for Future Study

Future research should employ mixed methods approaches to quantify effectiveness indicators identified in this study, allowing statistical comparison across hospitals of varying size, resource level, and geographic location. Longitudinal designs tracking the same institution over multiple years would help clarify whether adaptation gains observed here translate into sustained improvement or represent transitional responses to specific circumstances. Comparative multi-site studies across referral hospitals in different provinces would strengthen the generalizability of findings regarding human resource adequacy, infrastructure constraints, and digital integration progress.

Further work should also examine the relationship between pharmaceutical service effectiveness and patient health outcomes directly, moving beyond process and structural indicators toward outcome-based evaluation. Cost-effectiveness analysis of specific improvement interventions, such as expanded pharmacist staffing or full digital system integration, would provide decision-makers with clearer guidance on resource allocation priorities. Finally, future studies could explore the integrity dimension in greater depth through organizational culture assessment instruments, examining how leadership practices and accountability mechanisms might be strengthened to move pharmaceutical service integrity from a formalistic to a substantively embedded organizational value.

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Author Contributions

NS contributed to conceptualized the study, conducted data collection and thematic analysis, and drafted the original manuscript. IWA contributed to supervised the research design, contributed to interpretation of findings within Steers' framework, and reviewed and edited the manuscript. INS contributed to methodology validation, data triangulation, and critical revision of the manuscript. All authors read and approved the final version of the manuscript.

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