

Blockchain-Based Therapeutic Agreement Model For Patient Legal Protection in Telemedicine

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Abstract

This study aims to analyze and formulate an optimized legal protection model for patients in telemedicine services in Indonesia by developing a blockchain-based therapeutic agreement framework that strengthens legal certainty, informed consent, and personal data security. Using a normative juridical method with statutory, conceptual, and comparative approaches, this research examines Indonesia's Health Law, the Personal Data Protection (PDP) Law, the Electronic Information and Transactions (EIT) Law, and sectoral telemedicine regulations, supported by relevant scholarly literature. The findings demonstrate that Indonesia's telemedicine governance remains constrained by regulatory gaps and normative disharmony, particularly in direct-to-patient services, due to the absence of standardized electronic informed consent (e-consent) procedures, weak digital identity verification, and unclear demarcation of liability between physicians as medical professionals and platforms as electronic system providers. These weaknesses expose patients to heightened risks of malpractice disputes, evidentiary challenges in electronic medical records, and personal data breaches. To address these issues, this study proposes a blockchain-enabled therapeutic agreement model integrated with smart contract mechanisms to ensure immutable consent records, transparent audit trails, enforceable allocation of rights and obligations, and privacy-by-design compliance with the PDP Law. The novelty of this study lies in integrating health law principles with blockchain-based contractual architecture as a concrete regulatory and operational blueprint for patient protection within Indonesia's digital health ecosystem. This model provides policy implications for establishing standardized digital contract templates, risk-based supervision, and interoperable verification systems to enhance trust, accountability, and equitable access to telemedicine, including in frontier, outermost, and remote (3T) regions.

Keywords: *Agreement; Blockchain-Based; Legal Protection; Model; Telemedicine; Therapeutic*

1. INTRODUCTION

Telemedicine has rapidly evolved as a transformative alternative in healthcare delivery, particularly in Indonesia, where it serves as a strategic solution to the challenges posed by archipelagic geography. While this digital acceleration enhances national healthcare efficiency, it simultaneously triggers critical normative and practical legal concerns, including issues of personal data security, the validity of electronic medical records, and the clarity of professional liability within the cyber domain.¹ The imperative of legal protection for patients has emerged as a central issue, given their vulnerable position in the digital ecosystem. This protection is currently impeded by a regulatory vacuum regarding digital therapeutic contract models. Existing regulations, such as Ministry of Health Regulation No. 20 of 2019, primarily establish a

¹ Max Bonsapia and Jumiran, "Legal Aspects of Telemedicine In Indonesia," *The Juris* 9, no. 1 (June 30, 2025): 259–68, <https://doi.org/10.56301/juris.v9i1.1636>.

basic framework for inter-facility services but fail to address the nuanced contractual relationship between physicians and patients in online context. Consequently, mechanisms for electronic informed consent (*e-consent*) and the demarcation of liability between medical practitioners and platform providers remain ambiguous, thereby exposing a significant risk to patient rights in cases of malpractice or systemic failure.²

Furthermore, Indonesia faces an urgent need to establish a responsive and transformative regulatory framework. Current policies lack the specificity required to equitably allocate legal responsibility in sensitive data breaches, despite the enactment of the Personal Data Protection Law (PDP Law). Without policy interventions that specifically standardize digital contracts and integrate medical data security protocols, public trust in healthcare digitalization will erode, and law enforcement of telemedicine-related violations will remain ineffective.³

Blockchain technology represents a highly relevant and innovative solution to the legal and technical dilemmas. Its decentralized, transparent, and immutable nature offers a “smart contract” mechanism capable of securely and automatically codifying the rights and obligations of all parties. The implementation of a blockchain-based therapeutic agreement model does not merely introduce technological innovation; it establishes robust legal certainty through tamper-proof digital audit trails, thereby providing a foundation for accountability and transparency in the future of Indonesia’s digital healthcare system.

Previous studies by Afrilies have mapped the regulations of telemedicine in Indonesia and emphasized the normative urgency of patient protection. However, these studies remain largely descriptive and confined to conventional legal frameworks, failing to offer a concrete digital therapeutic contract model or explore the potential role of technology as a legal instrument. Conversely, while Ahmad et al. examined the global technical potential of blockchain, their work neglected the contractual dimensions and the specific regulatory context of Indonesian health law.⁴

The unresolved gap in the literature lies in the integration of technological innovation into legal instruments to address the absence of a digital agreement model.⁵ Accordingly, the novelty of this study lies in its development of a blockchain-based therapeutic agreement and smart contract framework, explicitly designed to ensure legal certainty, standardize electronic informed consent

² Stephanie Stephanie et al., “Analisis Keamanan Rekam Medis Elektronik Pada Telemedicine Menggunakan Blockchain Dan Smart Contract,” *Jurnal Multidisiplin Ilmu Akademik* 2, no. 5 (October 6, 2025): 526–34, <https://doi.org/10.61722/jmia.v2i5.6690>.

³ Miftahul Jannah, F. Yudhi Priyo Amboro, and Rina Shahrullah, “Personal Data Protection in Telemedicine: Comparison of Indonesian and European Union Law,” *Journal of Law and Policy Transformation* 8, no. 2 (January 11, 2024): 145, <https://doi.org/10.37253/jlpt.v8i2.8827>.

⁴ Marlia Hafny Afrilies and Yuris Tri Naili, “Legal Aspects of Telemedicine Health Services in the Perspective of Health Law in Indonesia in the Digital Era” 1, no. 1 (2023): 41–46.

⁵ Raja Wasim Ahmad et al., “The Role of Blockchain Technology in Telehealth and Telemedicine,” *International Journal of Medical Informatics* 148 (April 2021): 104399, <https://doi.org/10.1016/j.ijmedinf.2021.104399>.

(e-consent), and establish a clear demarcation of liability between physicians and platforms within Indonesia's health law system.⁶

This study differs from and advances beyond the three previous studies by offering an original contribution that integrates legal and technological approaches comprehensively. It not only analyses existing legal frameworks but also develops a concrete blockchain-based therapeutic agreement model applicable to Indonesia's legal context. Thus, it addresses the research gaps left by prior studies, which failed to present a concrete digital contractual framework grounded in health law principles such as informed consent, patient confidentiality, professional liability, and the right to quality and equitable healthcare services. Furthermore, this study expands its practical scope by emphasizing implementation in 3T regions (frontier, outermost, and remote areas), thereby strengthening its applied relevance for equitable access to digital health services in Indonesia.

Accordingly, the purpose of this study is to develop a blockchain-based therapeutic agreement model as an innovative legal instrument that can be applied to telemedicine services in Indonesia. This model is expected not only to facilitate the practical implementation of telemedicine but also to strengthen patient legal protection, clarify the rights and obligations of the involved parties, and uphold accountability in digital healthcare services in accordance with national health law principles.

2. METHOD

This study employed a normative juridical research method with a descriptive-analytical design, oriented toward the synchronization of existing laws and the discovery of new legal norms. The operational framework integrates three primary approaches: the statute approach, the conceptual approach, and the comparative approach. The statute approach was employed extensively to examine and interpret substantive provisions of Law No. 17 of 2023 on Health, Law No. 27 of 2022 on Personal Data Protection (PDP Law), the Electronic Information and Transactions (EIT) Law and its amendments, and Minister of Health Regulation No. 20 of 2019. Through this approach, this study identifies regulatory gaps within Indonesia's digital health ecosystem. Meanwhile, the conceptual approach was applied to construct a theoretical foundation regarding therapeutic agreements, informed consent, legal liability, and the juridical characteristics of blockchain technology. To strengthen the analysis, the comparative approach was utilized to compare telemedicine practices and regulations in other countries as a reference for secure digital contract standards.

The study drew upon three categories of legal materials, including the 1945 Constitution, the Civil Code, the Health Law, the PDP Law, the EIT Law, and sectoral telemedicine regulations.

⁶ Fatnan Setyo Hariwibowo, "Analisis Regulasi Telemedicine: Perlindungan Hukum Dan Implikasi Bagi Tenaga Kesehatan," 2024, 149–58.

Secondary legal materials consisted of academic literature, international scientific journals, and legal research reports, while tertiary legal materials included legal dictionaries employed to clarify technical terminology. All legal materials were collected through library research techniques involving three operational stages: statutory analysis to inventory and examine relevant legislative regulations, document analysis to deconstruct the structure and substance of digital contract structures, and literature reviews to synthesize legal theories. All collected legal materials were analysed descriptive-qualitative method using deductive reasoning. This analytical process involved processing data from general norms toward specific conclusions to formulate a blockchain-based therapeutic agreement model. The proposed model was designed to be effective, to ensure legal certainty, and to align with the principles of national health law in Indonesia.

3. RESULTS AND DISCUSSION

3.1 Current Legal Regulations in Indonesia Regarding Therapeutic Agreements in Telemedicine Services

The legal relationship between physicians and patients in telemedicine services is fundamentally characterized as a therapeutic agreement, which must comply with the Indonesian law of obligations, particularly the requirements for the validity of a contract as stipulated in Article 1320 of the Civil Code. Within the digital context, the fulfillment of the element of “consent” presents significant challenges. The widespread reliance on click-wrap agreement mechanisms is often considered to lack balanced negotiating space, resulting in unequal bargaining power. This issue is further compounded by the informed consent obligations mandated under Law No. 17 of 2023 on Health, which requires that electronic medical information be conveyed in a manner ensuring that the patient receives and understands the data prior to granting consent.⁷

In this regard, Electronic Medical Records (EMR) and e-consent mechanisms hold a crucial position as valid forms of legal evidence under the EIT Law. Nevertheless, their evidentiary strength depends heavily on system integrity. In civil practice, the validity of electronic signatures and identity verification of the parties are the primary determinants in ensuring legal certainty for the doctor-patient relationship.⁸ An in-depth analysis revealed a significant landscape of disharmony and normative conflict among related regulations. Minister of Health Regulation No. 20 of 2019 narrowly restricts telemedicine operations to an “inter-healthcare facility” scope, whereas Law No. 17 of 2023 on Health has recognized a much broader spectrum of digital health. This inconsistency creates a conflict of norms with the EIT Law and the PDP

⁷ Feby Delva Primayani, “Telemedicine Services: Legal Aspects and Therapeutic Agreements,” nd, <https://doi.org/https://doi.org/10.24167/shk.v9i2.10624>.

⁸ Bob Wahyudin et al., “Legal Framework Of Telemedicine In Indonesia: An Analysis Of Data Protection, Patient Privacy, And Medical Personnel Liability In The Digital Age,” *Ocean Health Journal of Neonatal Surgery* 14, no. 22s (2025): 612–20, <https://www.jneonatalurg.compg.612>.

Law, as sectoral health regulations have not yet to fully harmonize sensitive data security standards with the stringent mandates of personal data protection.⁹

The absence of regulatory synchronization produces tangible weaknesses in implementation, particularly regarding the unclear demarcation of legal liability between doctors as medical professionals and platforms as electronic system providers. Moreover, law enforcement becomes fragmented due to overlapping jurisdictional authority among the Ministry of Health, the Ministry of Communication and Informatics, and the National Cyber and Crypto Agency (BSSN), ultimately leaving patients vulnerable without an integrated complaint system.¹⁰

Furthermore, this study emphasizes that current regulations remain inadequate to govern direct-to-patient telemedicine practices, which now dominate Indonesia's digital health.¹¹ The absence of specific rules regarding digital contract standards for these independent services has resulted in identity verification and medical consent authentication procedures being conducted inconsistently, often without the use of accredited electronic certificates. Consequently, electronic medical records are prone to being challenged in court, thereby undermining their evidentiary reliability.¹²

Therefore, policy intervention is required to synergize civil law principles with technological innovation, such as the utilization of blockchain and smart contracts, to fill regulatory gaps, ensure data protection according to the Personal Data Protection (PDP) Law, and provide comprehensive legal certainty for all stakeholders within the national telemedicine ecosystem.¹³

In practice, the Ministry of Health has introduced policies, such as provider registration and standardization through a regulatory sandbox for health technology. However, this regulation is only preliminary and pilot in nature, failing to establish binding regulations related to digital therapeutic contracts. Critical elements, such as standard electronic informed consent clauses, data security clauses that meet the requirements of the PDP Law, or dispute resolution clauses specifically for digital health services.

Meanwhile, Indonesian legal literature and policy studies consistently highlight a fundamental need to develop technical guidelines that integrate the Civil Code, the Health Law, the PDP Law, Minister of Health Regulation 24/2022, and the ITE Law so that telemedicine therapeutic

⁹ Ahmad et al., "The Role of Blockchain Technology in Telehealth and Telemedicine."

¹⁰ Rommy Sebastian and Zainal Arifin Hoesein, "Feasibility of Automated Prescription by Artificial Intelligence in Telemedicine Based on Health Law," *Indonesian Education Journal* 6, no. 7 (July 16, 2025): 3078–91, <https://doi.org/10.59141/japendi.v6i7.8367>.

¹¹ Fakhurrozi Fakhurrozi and Handar Subhandi Bakhtiar, "Legal Protection for Doctors in Medical Practice Using Telemedicine According to Law Number 17 of 2023 Concerning Health," *International Journal of Law and Society* 2, no. 2 (January 22, 2025): 77–96, <https://doi.org/10.62951/ijls.v2i2.352>.

¹² Feby Delva Primayani, Muhammad Farhan Pratama, and Zaharani Julia Putri, "Telemedicine Services: Legal Aspects and Therapeutic Agreement," *SOEPRA* 9, no. 2 (December 28, 2023): 183–99, <https://doi.org/10.24167/sjhc.v9i2.10624>.

¹³ Kashif Hameed et al., "Integration of 5G and Block-Chain Technologies in Smart Telemedicine Using IoT," ed. BB Gupta, *Journal of Healthcare Engineering* 2021 (March 22, 2021): 1–18, <https://doi.org/10.1155/2021/8814364>.

agreements have a coherent normative framework: such guidelines should regulate electronic informed consent procedures that include digital identity verification, minimum standards of medical information disclosure, immutable electronic audit trail, and risk mitigation mechanisms in the event of diagnostic limitations due to the absence of a physical examination.

Furthermore, this evidentiary aspect of telemedicine is critical. Although the ITE Law recognizes electronic evidence, courts continue to demand technical assurance regarding the origin, integrity, and fidelity of electronic evidence. In the absence of technical assurances such as trusted electronic certificates, standardized medical record storage systems, or technology capable of generating robust audit trails (e.g., distributed ledger mechanisms), e-consent evidence or online consultation records remain susceptible to evidentiary challenges in legal forums.¹⁴

Existing regulations on electronic medical records stipulate data retention periods and impose obligations on healthcare facilities to ensure data security and integrity. However, they do not adequately address the roles and responsibilities of commercial Electronic System Providers (ESPs) providing telemedicine platforms. This is relevant as many telemedicine platforms rely on cloud infrastructure and ESP services beyond the control of medical facilities. Such reliance raises concerns about data storage locations, cross-border data flows, and legal jurisdiction when patient data is stored on foreign servers. In practice, therapeutic agreements should contain explicit provisions regarding data storage locations and the entity responsible for processing, but binding national regulations have not fully addressed these requirements. Furthermore, harmonization between the authorities of relevant state institutions, the Ministry of Health as the health regulator, the Ministry of Communication and Informatics and the National Cyber and Cybersecurity Agency (BSSN) as cybersecurity supervisors, and the data protection authority still needs to be strengthened to ensure that oversight of digital therapeutic agreements is not fragmented. This fragmentation results in the lack of a single point of complaint for patients and procedural uncertainty in the event of incidents involving both medical elements and data breaches.¹⁵

Normative debates have emerged regarding the application of the principle of informed consent in telemedicine. A critical question concerns whether electronic consent obtained through click-wrap mechanism or through-the-app consent meets the requirements of adequate information according to medical ethics and law, or whether stricter written and documented standards are required. Scholars and practitioners have emphasized the importance of establishing a minimum standard of information that must be provided both verbally and in writing, even in online

¹⁴ Leonardus Susilo, "Legal Basic Regulations for the Implementation of Telemedicine in Primary Health Facilities," *Indonesian Health Law Journal* 2, no. 01 (June 27, 2022): 53–61, <https://doi.org/10.53337/jhki.v2i01.22>.

¹⁵ Abigail Prasetyo and Dyah Hapsari Prananingrum, "Disruption of Telemedicine-Based Health Services: Legal Relationship And Legal Responsibilities Of Patients And Doctors," *Refleksi Hukum: Jurnal Ilmu Hukum* 6, no. 2 (June 8, 2022): 225–46, <https://doi.org/10.24246/jrh.2022.v6.i2.p225-246>.

consultations. Such standards include the limitations of telemedicine services, the potential need for further examinations, the risks of medical procedures conducted without a physical examination, and the patient's right to access and correction of their personal data.

Conversely, technological developments offer potential solutions that remain insufficiently accommodated within current regulations, for example, the use of certified electronic signatures, digital certificates from Electronic Certification Providers regulated by the ITE Law, and the use of distributed ledger technology-based track records to guarantee the integrity of medical records and consent. These innovative technologies can strengthen the position of digital therapeutic agreement evidence and provide certainty for all parties, but the implementation of this technology requires strict governance rules, technical standards, and accreditation of certification providers so that the resulting electronic evidence has a widely accepted probative force.¹⁶

3.2 Legal Weaknesses and Challenges in the Implementation of Therapeutic Agreements in Telemedicine Services in Indonesia

The normative weaknesses within Indonesia's telemedicine ecosystem arise from a regulatory vacuum that fails to adequately govern the tripartite legal relationship between physicians, patients, and platform providers. While Law No. 17 of 2023 on Health formally acknowledges digital health services, its implementing regulations have yet to address detailed contractual aspects. This omission generates a tangible causal risk for patients; the absence of standardized mechanisms for electronic informed consent (*e-consent*) frequently undermines the validity of medical consent when challenged in legal forums.¹⁷

Current practices, which are predominantly reliant on "click-wrap agreements" facilitated through a simple "agree" button without robust identity verification, such as certified electronic signatures. This creates loopholes for parties to repudiate evidence in the future. Consequently, digital therapeutic contracts, which ought to serve as protective legal instruments for patients, instead become instruments vulnerable to legal repudiation, particularly when medical disputes enter the realm of civil litigation.¹⁸

Systemic vulnerabilities are apparent in the fragile infrastructure of medical data security and digital authentication. Many telemedicine platforms in Indonesia continue to rely on third-party servers located abroad, thereby generating complex jurisdictional risks when cross-border data disputes occur. The absence of encryption protocols strictly aligned with the Personal Data

¹⁶ Billy Sasmita, Didit Darmawan, and Rafadi Khan Khayru, "Telemedicine Regulation In Indonesia: Enhancing Patient Safety And Protection Billy Sasmita, Didit Darmawan, Rafadi Khan Khayru" 4, no. 20 (2023): 29–35.

¹⁷ Fifi Mutiah, Hotma Sibuea, and Mardi Chandra, "Telemedicine Regulation in Indonesia: Legal Frameworks, Challenges, and Future Directions," *Indonesian Multidisciplinary Journal* 4, no. 4 (May 5, 2025): 242–51, <https://doi.org/10.58344/jmi.v4i4.2267>.

¹⁸ Ni Putu Devy Handayani, I Gusti Ngurah Parikesit Widiatedja, and RA Tuty Kuswardhani, "Legal Protections for Patients with Medical Conditions in Online Health Consultations," *Journal of Law, Politics and Humanities* 5, no. 3 (February 3, 2025): 1781–96, <https://doi.org/10.38035/jlph.v5i3.1336>.

Protection (PDP) Law and the EIT Law in daily platform operations leaves sensitive health data as a commodity vulnerable to breaches.¹⁹ The causal link between inadequate digital infrastructure oversight and the loss of patient privacy rights is undeniable. In the absence of a regulatory mandate for platforms to utilize technology that ensures data integrity, such as distributed ledger technology or blockchain, patients bear the burden of risk for systemic failures entirely beyond their control.²⁰

A critical analysis of legal liability further reveals a troubling ambiguity that endangers legal certainty. From the perspectives of civil and medical law, liability should be distinctly demarcated into three domains: professional liability for physicians for diagnosis and therapy, corporate liability for healthcare facilities as service providers, and platform liability for the reliability of electronic infrastructure. However, Indonesian regulation leaves the boundaries blurred. For instance, when a diagnostic inaccuracy occurs due to data transmission interference or poor image resolution on an application, the evidentiary burden is frequently placed entirely on physicians as professional negligence. Such failures are technical “system errors” that should be the responsibility of the platform. This regulatory opacity allows platform providers to hide behind exculpatory clauses in their terms and conditions, leaving doctors and patients to face legal risks without equitable protection.²¹

Institutional weaknesses arising from fragmented oversight further exacerbate the low level of legal protection in Indonesia’s telemedicine ecosystem. Supervisory authority is rigidly divided between the Ministry of Health for medical aspects, the Ministry of Communication and Informatics for electronic systems, and the National Cyber and Crypto Agency (BSSN) for cybersecurity, without an integrated coordination mechanism. This fragmentation deprives patients of a “single point of complaint” when incidents occur. Moreover, the Indonesian Medical Council (KKI) and professional organizations such as the Indonesian Medical Association (IDI) continue to apply ethical codes designed for face-to-face practice, failing to comprehensively address the ethical dimensions of virtual consultations. Policy intervention is therefore required to unify oversight standards and adopt blockchain-based smart contract technology to ensure that every therapeutic agreement is permanently documented, transparent, and possesses absolute evidentiary force for all parties.²²

From an institutional perspective, weak coordination between government agencies in telemedicine presents significant challenges to effective telemedicine governance. The Ministry

¹⁹ Belal Najeh Abdullateef et al., “An Evaluation and Selection Problems of OSS-LMS Packages,” *SpringerPlus* 5, no. 1 (December 1, 2016): 248, <https://doi.org/10.1186/s40064-016-1828-y>.

²⁰ Wei Wang et al., “A Privacy Protection Scheme for Telemedicine Diagnosis Based on Double Blockchain,” *Journal of Information Security and Applications* 61 (September 2021): 102845, <https://doi.org/10.1016/j.jisa.2021.102845>.

²¹ Christine Elisia Widjaya, “Development Of Information Providing Standards In The Informed Consent Process In Therapeutic Agreements,” *Perspektif* 27, no. 1 (January 30, 2022): 12–19, <https://doi.org/10.30742/perspektif.v27i1.819>.

²² Sylvia Anita and Rospita Adelina Siregar, “Therapeutic Contract Between Doctor and Patient According to Article 1320 of the Civil Code,” *Collaborative Journal of Science* 8, no. 5 (2025): 2447–53, <https://doi.org/10.56338/jks.v8i5.7578>.

of Health, the Ministry of Communication and Information Technology, and the National Cyber and Crypto Agency (BSSN) each have limited authority within their respective jurisdictions, but no dedicated agency to integrate oversight of medical, digital, and privacy aspects. This regulatory disjunction results in weak enforcement of legal sanctions for breaches of therapeutic contracts in telemedicine. For instance, when a platform provider breaches patient data, it is unclear whether sanctions are imposed under the Health Law, the PDP Law, or the ITE Law. This regulatory fragmentation weakens the effectiveness of the law and creates uncertainty for all parties.²³

Another systemic weakness lies in the unpreparedness of Indonesia's legal and technological infrastructure to support the secure and legally valid implementation of therapeutic contracts. Implementing digital contracts requires infrastructure such as certified digital signatures, two-way verification systems, advanced data encryption, and secure domestically hosted servers. However, the majority of telemedicine platforms in Indonesia continue to rely on foreign-based or third-party systems. In the absence of robust legal and technical infrastructure support, therapeutic contracts remain vulnerable to contestation. In this context, technologies like blockchain can be a solution, as it can permanently, transparently, and irreversibly record every transaction and agreement. However, its adoption is constrained by legal obstacles because it is not yet explicitly recognized as a means of proof or authentication under Indonesian law.

Equally important is challenge of cross-border jurisdiction and liability. In practice, patients use telemedicine platforms hosted on servers abroad, or receives services from physicians domiciled outside of Indonesian territory. This raises complex legal issues related to the recognition and enforcement of national law in cross-border agreements. Indonesia currently lack specific regulations regarding such agreements, meaning that when a dispute arises, resolution depends on international treaties or complex international civil law. This regulatory gap places patients in a vulnerable position, as litigation against foreign parties is time-consuming and expensive.²⁴

Overall, the legal weaknesses and challenges in implementing therapeutic agreements for telemedicine services in Indonesia stem from a combination of normative, structural, and technological factors. Legal gaps regarding the form of digital therapeutic agreements, weak personal data protection, suboptimal oversight mechanisms, limited legal and digital literacy among the public, and unprepared legal infrastructure are key obstacles to creating a fair legal relationship between doctors and patients. Amid these weaknesses, legal reform is crucial. The government needs to draft implementing regulations that explicitly regulate therapeutic agreements in a digital context, including electronic consent mechanisms, professional

²³ Adib Gunawan, Nandang Sambas, and Sri Ratna Suminar, "Legal Certainty in the Regulation of Medical Practice Through Telemedicine to Optimize Diagnosis Procedures," *Indonesian Journal of Humanities and Social Sciences* 5, no. 3 (2024): 1121–32.

²⁴ Claudia Belseran, Hulman Panjaitan, and Paltiada Saragi, "Regulatory Gaps and Consumer Protection Practices in Telemedicine Services in Indonesia," *Journal Scientific of Mandalika (Jsm) e-ISSN* 6, no. 4 (2025): 2809–0543.

responsibilities of medical personnel, data security standards, and online dispute resolution. Furthermore, professional bodies such as the Indonesian Medical Association (IDI) must also update their codes of ethics to make them relevant to digital medical practice.²⁵

With regulatory updates and a more adaptable oversight system for the digital era, it is hoped that the legal weaknesses and challenges in implementing telemedicine therapeutic agreements can be addressed. Telemedicine can continue to develop without compromising the fundamental principles of patient legal protection, fairness, and the professional responsibility of healthcare professionals. If these legal reform measures are implemented, Indonesia can build a telemedicine ecosystem that is not only efficient and modern, but also just and oriented toward patient rights as the primary legal subject.²⁶

3.3 Therapeutic Agreement Model to Enhance Legal Protection for Patients in Telemedicine Services

The therapeutic contract model proposed in this study reconceptualizes the conventional agreement framework into an operational, self-executing, and smart contract ecosystem. Structurally, this model commences with a digital identity verification through Public Key Infrastructure (PKI), which integrates the electronic certificates of both physicians and patients into the national population database.²⁷ This mechanism ensures the “legal capacity” of the parties, as mandated by Article 1320 of the Indonesian Civil Code. Unlike descriptive click-wrap agreements, the e-consent structure in this model is designed dynamically; the smart contract is validated only after the patient has navigated a series of encrypted audio-visual medical information modules. Every audit trail and medical data flow is converted into a hash function, a unique digital fingerprint, which is then recorded in a distributed ledger. This process ensures high data integrity and immutability, thereby fulfilling the requirements for reliable electronic evidence as mandated by the EIT Law.²⁸

The integration of blockchain in this model also provides a solution to the problematic demarcation of liability, which has remained ambiguous in current Indonesian regulations. Through “if-then” algorithmic logic, the system automatically distinguishes infrastructure activity logs—attributable to platform responsibility—from medical decision logs, which fall under the physician’s professional liability. Juridically, this mechanism clarifies the boundaries

²⁵ Bokolo Anthony Jnr., “Use of Telemedicine and Virtual Care for Remote Treatment in Response to COVID-19 Pandemic,” *Journal of Medical Systems* 44, no. 7 (July 15, 2020): 132, <https://doi.org/10.1007/s10916-020-01596-5>.

²⁶ Resita Lukitawati and Widodo Trisno Novianto, “Digital Health Service Regulation in Indonesia: Ethical and Legal Challenges,” *Adjudikasi: Jurnal Ilmu Hukum* 7, no. 2 (December 31, 2023): 391–414, <https://doi.org/10.30656/ajudikasi.v7i2.7862>.

²⁷ Rinna Dwi Lestari, “Legal Protection for Patients in Telemedicine,” *Jurnal Cakrawala Informasi* 1, no. 2 (December 31, 2021): 51–65, <https://doi.org/10.54066/jci.v1i2.150>.

²⁸ Anggra Yudha Ramadianto, “Informed Consent as Agreement in the Therapeutic Contract Between Doctor and Patient,” *Journal of FH Unsri* 19, no. 5 (2017): 1459–1459.

between professional liability and platform liability through objective data that is impossible to manipulate.²⁹

From the perspective of the PDP Law, the model implements “privacy by design” principles through data subject access control. Patients hold private keys to authorize or revoke access to their medical data. Moreover, the principle of purpose limitation is executed automatically by the smart contract, which terminates third-party access to sensitive patient data immediately upon the conclusion of the service duration, unless renewed on a lawful basis.³⁰

The primary added value of blockchain technology, when compared to conventional centralized database systems, lies in its audit transparency and resilience against a single point of failure (SPOF). Through a distributed ledger function, data is no longer stored on a single server susceptible to cyberattacks or unilateral modification by platform providers. This structural decentralization enhances legal certainty for patients, ensuring that proof of consent and medical records remain authentic and available in the event of a malpractice dispute. Furthermore, the application of hashing techniques ensures that even in the event of attempted data breach, the integrity of the original record remains verifiable through its digital signature. ³¹

Consequently, this blockchain-based therapeutic contract model does not merely address the regulatory vacuum for direct-to-patient telemedicine; it serves as a “code as law” enforcement instrument that aligns digital innovation with national health law principles, thereby advancing justice, and strengthening accountability in Indonesia’s future healthcare services.³² The implementation of this model must also be complemented by digital monitoring and audit mechanisms. Every telemedicine transaction, including consultations, e-prescriptions, and follow-up interactions, must be recorded in an encrypted electronic medical record system.³³ Such records serve as legal evidence which can be used in the event of a dispute. The Ministry of Health could establish periodic audit standards for telemedicine providers to ensure compliance with the provisions of the therapeutic agreement and applicable regulations.³⁴

²⁹ Rani Tiyas Budiyanti and Penggalih Mahardika Herlambang, “Legal Protection of Patients In Online Health Consultation Services,” *Indonesian Health Law Journal* 1, no. 01 (April 18, 2021): 1–10, <https://doi.org/10.53337/jhki.v1i01.1>.

³⁰ Gladdays Naurah, Marice Simarmata, and Redyanto Sidi Jambak, “Rights and Privacy of Hospital Patients in the Digitalization Era,” *Comserva: Journal of Research and Community Service* 3, no. 12 (April 29, 2024): 4798–4805, <https://doi.org/10.59141/comserva.v3i12.1295>.

³¹ Ashwin Ramaswamy et al., “Patient Satisfaction With Telemedicine During the Covid-19 Pandemic: Retrospective Cohort Study,” *Journal of Medical Internet Research* 22, no. 9 (September 9, 2020): e20786, <https://doi.org/10.2196/20786>.

³² Maniso Mustar and Wahid Nashihuddin, “Pustaka Doctor: Online Health Information Services for Alumni of the Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, Yogyakarta,” *Lentera Pustaka: Journal of Library, Information, and Archival Science Studies* 5, no. 2 (December 31, 2019): 97, <https://doi.org/10.14710/lenpust.v5i2.25944>.

³³ Rumi Chunara et al., “Telemedicine and Healthcare Disparities: A Cohort Study in a Large Healthcare System in New York City during COVID-19,” *Journal of the American Medical Informatics Association* 28, no. 1 (January 15, 2021): 33–41, <https://doi.org/10.1093/jamia/ocaa217>.

³⁴ Kuswardani Kuswardani and Zainal Abidin, “Legal Protection for Patients as Users of Health Service Features in the Fisdok Application,” *Al-Manhaj: Journal of Islamic Law and Social Institutions* 5, no. 1 (January 27, 2023): 101–12, <https://doi.org/10.37680/almanhaj.v5i1.1803>.

From a regulatory perspective, Indonesia's telemedicine framework remains fragmented. Minister of Health Regulation Number 20 of 2019 only regulates telemedicine between healthcare facilities and does not comprehensively regulate direct services between physicians and patients. Meanwhile, Law Number 17 of 2023 concerning Health formally recognize telemedicine as part of healthcare services, but it fails to articulate the contractual details between the parties. Specific regulations governing legal relationships, responsibilities, and patient protection in telemedicine practices are required to avoid a legal vacuum. An ideal digital therapeutic agreement model in Indonesia must include provisions that harmonize with these laws and address any remaining legal loopholes. The government should issue standardized guidelines or digital therapeutic contract templates for service providers, complete with data protection clauses, professional responsibilities, complaint mechanisms, and dispute resolution. Dispute resolution mechanisms can adopt online mediation systems for greater speed and efficiency.³⁵

Accordingly, the digital therapeutic agreement model functions not merely as a formal legal contract but also as an instrument to strengthen professional ethics, foster public trust in digital healthcare services, and safeguard patients' rights as protected legal subjects. Integrating the principles of health law, contract law, and data protection law into a unified contractual framework constitutes a crucial foundation for the equitable and sustainable development of telemedicine in Indonesia.

4. CONCLUSION

This study concludes that Indonesia's current telemedicine governance still faces a significant regulatory vacuum and normative disharmony, particularly in direct-to-patient services, because existing implementing rules remain limited and have not comprehensively governed the tripartite legal relationship between physicians, patients, and digital platforms. The absence of standardized electronic informed consent (e-consent), weak identity verification mechanisms, and unclear demarcation of liability between professional negligence and electronic system failures may undermine legal certainty and expose patients to serious risks, including malpractice disputes and personal data breaches. The novelty of this article lies in proposing a blockchain-based therapeutic agreement model integrated with smart contract mechanisms as an innovative legal instrument that operationalizes health law principles and data protection norms simultaneously, ensuring immutable consent records, transparent audit trails, and enforceable allocation of rights and obligations among parties within Indonesia's health law framework. Accordingly, this research recommends that the government and the Ministry of Health develop specific operational regulations and standardized digital therapeutic contract templates that incorporate e-consent procedures, personal data protection clauses aligned with the PDP Law,

³⁵ Carlo M. Contreras et al., "Telemedicine: Patient-Provider Clinical Engagement During the COVID-19 Pandemic and Beyond," *Journal of Gastrointestinal Surgery* 24, no. 7 (July 2020): 1692–97, <https://doi.org/10.1007/s11605-020-04623-5>.

and clear accountability standards for both medical professionals and telemedicine platforms. In addition, periodic digital audits and compliance monitoring should be institutionalized to strengthen trust, prevent systemic violations, and ensure that telemedicine services contribute to equitable access to healthcare, including in 3T (frontier, outermost, and remote) regions.

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