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Explaining continuance intention to use telemedicine among adult patients in Jakarta, Indonesia: An extended UTAUT2, trust, and satisfaction structural equation modeling

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ABSTRACT

Telemedicine has become a key pillar of Indonesia's digital health transformation, but its long-term impact depends on whether patients keep using it after the urgency of the pandemic fades. Jakarta offers a strong research setting due to its high healthcare demand, solid digital infrastructure, diverse population, and direct exposure to national telemedicine policies. This study proposes a structural equation modeling approach to analyze continuance intention among adult telemedicine users in Jakarta. It integrates the Unified Theory of Acceptance and Use of Technology 2 with additional factors such as telemedicine service quality, eHealth literacy, trust, satisfaction, privacy concern, and affordability. Data will be collected through a cross-sectional survey targeting Jakarta residents aged 18 and above who have used telemedicine at least once in the past 12 months. The study aims to gather 400–500 valid responses through healthcare facilities, community networks, and online patient groups across Jakarta. All variables will be measured using seven-point Likert scales and analyzed with partial least squares structural equation modeling. The measurement model will assess reliability, composite reliability, average variance extracted, discriminant validity, and common method bias. The structural model will evaluate path coefficients, bootstrapped confidence intervals, explained variance, predictive relevance, and mediation effects. The hypotheses suggest that performance expectancy, effort expectancy, facilitating conditions, eHealth literacy, price value, trust, and satisfaction positively influence continuance intention, while privacy concern negatively affects trust and potentially reduces usage intention. Telemedicine service quality is expected to enhance trust and satisfaction, which then mediate continuance intention. Overall, this study contributes practical insights for improving patient-centered telemedicine services in Indonesia's post-pandemic context.

Keywords: telemedicine; UTAUT2; trust; satisfaction; eHealth literacy; continuance intention.

1. INTRODUCTION

Telemedicine has moved from a peripheral health-care option to a central feature of digital health transformation. In Indonesia, distance-based health services became more visible during the COVID-19 pandemic, when patients, providers, insurers, and government agencies needed alternatives to face-to-face consultation. The pandemic accelerated public familiarity with online consultation, electronic prescriptions, remote monitoring, and digital triage. However, crisis-driven exposure does not automatically become sustainable use. Many patients will continue using telemedicine only when it is useful, easy, trustworthy, clinically safe, affordable, and sufficiently integrated with their ordinary care routines. For that reason, the key management question has shifted from whether telemedicine can be deployed to whether patients will voluntarily continue using it when conventional care is again available (Monaghesh & Hajizadeh, 2020; Smith et al., 2020).

Jakarta provides a distinctive setting for studying telemedicine continuance in Indonesia. As the national capital region and one of the country's most densely connected urban health markets, Jakarta contains large public and private hospitals, primary care facilities, corporate clinics, pharmacies, insurers, and technology platforms. It also contains sharp contrasts in income, digital skills, health literacy, mobility constraints, and access to specialist care. Some residents can easily choose between digital and in-person services, whereas others use telemedicine because traffic, work schedules, cost, disability, infectious-disease concerns, or caregiving responsibilities make physical visits burdensome. These mixed motivations make Jakarta a theoretically useful context for testing whether technology acceptance, service quality, trust, satisfaction, privacy concern, and affordability jointly explain continuance intention.

The policy environment also supports the need for empirical research. Indonesia's Minister of Health Regulation No. 20 of 2019 formally addressed telemedicine between health facilities, while pandemic-era decisions expanded public attention to telemedicine as a health-service channel. More recent digital health strategy documents emphasize interoperability, patient access, data governance, and technology-enabled service delivery. These policy developments create an enabling environment but do not resolve behavioral uncertainty. Regulations can authorize telemedicine, platforms can provide software, and providers can offer consultations, yet patient continuance depends on perceived value and confidence. A theoretically grounded SEM study is therefore useful for identifying the strongest behavioral, technological, and service determinants of continued telemedicine use in Jakarta (Badan Pemeriksa Keuangan Republik Indonesia, 2019; Kementerian Kesehatan Republik Indonesia, 2021, 2024).

Existing Indonesian studies indicate that telemedicine adoption is shaped by both technology-related and context-related factors. Research on Indonesian hospital telemedicine acceptance has emphasized user behavior and technological dimensions, while studies on Indonesian virtual health-care services have examined performance expectancy, effort expectancy, social influence, eHealth literacy, and trust. Other Indonesian work has investigated telemedicine intention among consumers in Greater Jakarta and Greater Bandung, showing the relevance of structural equation modeling for understanding patient behavior. These studies provide an important foundation, but additional research is needed to focus specifically on continuance intention among adult Jakarta patients in a post-pandemic environment. The difference between first-time adoption and continuance is important because a service may be tried out of necessity but abandoned if users experience low quality, confusing interfaces, poor provider responsiveness, privacy concerns, or weak perceived clinical value (Alexandra et al., 2021; Alviani et al., 2023; Aji & Ramadani, 2024; Khotimah et al., 2022).

From a business-management perspective, telemedicine is not merely a clinical communication tool. It is a service system that connects patients, physicians, pharmacies, payment mechanisms, digital interfaces, customer support, data infrastructure, and organizational routines. Patient continuance therefore has managerial implications for platform design, service operations, quality assurance, provider training, pricing,

customer relationship management, and trust-building. If performance expectancy is the dominant predictor, managers should emphasize clinical usefulness and care outcomes. If service quality and satisfaction dominate, operations managers should improve waiting time, consultation clarity, follow-up, and problem resolution. If privacy concern weakens trust, governance, transparency, consent, and data-protection communication become central. SEM is appropriate because these constructs are latent, interrelated, and likely to influence intention through both direct and mediated paths (DeLone & McLean, 2003; Parasuraman et al., 2005).

The present manuscript proposes an original empirical study that integrates the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), trust theory, satisfaction, service quality, eHealth literacy, privacy concern, and affordability into a single SEM model. The dependent construct is continuance intention to use telemedicine. Actual use frequency is included as a behavioral outcome that follows intention, while trust and satisfaction are modeled as mediators between service-quality/risk perceptions and continuance. This approach responds to calls in digital health and information-systems research for more context-sensitive models that incorporate social, technological, and service dimensions rather than relying only on general acceptance variables (Venkatesh et al., 2012).

The study is designed around three research questions. First, which technology-acceptance factors most strongly explain continuance intention to use telemedicine among adult patients in Jakarta? Second, how do telemedicine service quality, trust, satisfaction, privacy concern, eHealth literacy, and affordability extend the explanatory power of UTAUT2? Third, do trust and satisfaction mediate the relationship between service experience and continuance intention? These questions are suitable for SEM because they involve multiple constructs, theoretical paths, and indirect effects. The answers can support academic theory development and provide practical guidance for Indonesian telemedicine platforms, hospitals, clinics, insurers, and policy makers.

The remainder of this manuscript is organized as follows. The next section reviews the theoretical and empirical literature on telemedicine adoption, UTAUT2, trust, satisfaction, eHealth literacy, service quality, privacy concern, and affordability. The conceptual model and hypotheses are then developed. The methodology section describes the target population, sampling strategy, instrument design, ethical safeguards, and SEM procedures. The results section is written as a transparent reporting template because actual numerical estimates require real survey data. The discussion then explains the expected theoretical and managerial contributions, limitations, and future research directions.

2. LITERATURE REVIEW AND THEORETICAL FOUNDATION

Telemedicine can be understood as the delivery of health services over distance using information and communication technologies. Its scope includes synchronous video consultation, telephone consultation, asynchronous messaging, electronic prescribing, remote monitoring, and provider-to-provider consultation. The practical promise of telemedicine is that it can reduce travel burden, improve convenience, expand access to specialists, support chronic-disease management, and provide continuity when physical access is limited. At the same time, telemedicine introduces new service challenges, including diagnostic uncertainty, technology failure, patient identity verification, uneven digital literacy, provider workload, privacy risk, and the need to coordinate digital interactions with physical care pathways (Intan Sabrina & Defi, 2021; Macariola et al., 2021).

Systematic reviews show that telemedicine acceptance is not explained by a single determinant. Patients may value convenience and faster access, but they also judge whether telemedicine is clinically appropriate, whether physicians communicate clearly, whether platforms are reliable, whether personal information is protected, and whether digital consultation is worth the cost. During public health emergencies, adoption may be driven by necessity, but after restrictions decline, patients compare telemedicine with face-to-face care. This comparison makes satisfaction and continuance intention especially important. Continuance

is more demanding than initial acceptance because it depends on cumulative experience, confirmation of expectations, and trust in the service system (Almathami et al., 2020; Harst et al., 2019; Kruse et al., 2017).

Technology Acceptance Model (TAM) research provides an early foundation for explaining health-technology use. TAM argues that perceived usefulness and perceived ease of use influence behavioral intention. Perceived usefulness is closely related to whether telemedicine helps patients solve health problems, obtain advice faster, access prescriptions, or manage chronic conditions. Perceived ease of use reflects whether patients can register, book consultations, upload information, communicate with physicians, pay, and receive prescriptions without excessive effort. Although TAM remains influential, telemedicine adoption is more complex than many traditional information-system contexts because health decisions involve vulnerability, clinical risk, and professional trust (Davis, 1989; Kamal et al., 2020).

UTAUT and UTAUT2 provide broader acceptance frameworks. UTAUT identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as determinants of intention and use. UTAUT2 extends this logic to consumer contexts by adding hedonic motivation, price value, and habit. For telemedicine in Jakarta, performance expectancy, effort expectancy, facilitating conditions, and price value are especially relevant. Hedonic motivation is less central because telemedicine is not primarily entertainment-oriented, while habit may matter only after repeated use. Performance expectancy captures the expected clinical and practical benefits of telemedicine. Effort expectancy captures the simplicity of digital interaction. Facilitating conditions capture whether users have internet access, devices, payment support, and help when problems occur. Price value captures whether users perceive fees, transport savings, time savings, and insurance coverage as worthwhile (Venkatesh et al., 2003, 2012).

eHealth literacy is particularly important in emerging-market telemedicine. Patients need skills to search for health information, judge credibility, describe symptoms clearly, understand medical advice, use digital interfaces, and make decisions based on remote consultation. Low eHealth literacy can reduce perceived ease of use and weaken the translation of telemedicine availability into meaningful use. In Jakarta, digital access may be higher than in many regions of Indonesia, but access does not guarantee skill. Older adults, lower-income patients, and patients with limited formal education may own smartphones yet still face difficulty navigating health platforms, reading medical instructions, or assessing provider credibility. Therefore, eHealth literacy should be modeled not merely as a demographic background factor but as a substantive determinant of telemedicine acceptance (Norman & Skinner, 2006; Zobair et al., 2021).

Service quality is another central construct. Telemedicine platforms provide a digital service encounter in which interface reliability, responsiveness, information quality, privacy protection, physician communication, waiting time, and problem resolution shape experience. E-service quality research suggests that digital services are evaluated through efficiency, system availability, fulfillment, and privacy, among other dimensions. In telemedicine, these service-quality dimensions become clinically meaningful. For example, poor system availability may interrupt consultation, weak fulfillment may delay electronic prescriptions, and unclear information quality may cause patient confusion. Service quality is therefore expected to influence both satisfaction and trust (DeLone & McLean, 2003; Parasuraman et al., 2005).

Trust is critical because telemedicine involves uncertainty. Patients cannot always physically examine the provider environment, observe clinical equipment, or obtain immediate diagnostic tests. They must trust the physician, the platform, the data system, and the broader health organization. Trust reduces perceived vulnerability and supports willingness to follow advice, share personal information, and continue using a service. Prior digital-health research has shown that trust and privacy concerns influence technology acceptance in health-care contexts. In Jakarta, trust may be especially important because patients encounter multiple providers and platforms with varying reputations. A patient may trust a large hospital's telemedicine service more than a platform with unclear credentials, or may trust a platform more when it offers transparent physician profiles, secure payment, and clear complaint mechanisms (Dhagarra et al., 2020; Gefen et al., 2003).

Satisfaction is a post-use evaluation based on whether the service experience meets or exceeds expectations. Continuance theory argues that users continue information-system use when they are satisfied and perceive ongoing usefulness. In telemedicine, satisfaction may reflect whether the consultation solved the problem, whether the physician listened, whether advice was clear, whether prescriptions arrived, whether cost was reasonable, and whether the platform was reliable. Satisfaction is distinct from trust: a user may trust a provider's competence but still be dissatisfied with waiting time or customer service, while another user may be satisfied with convenience but uncertain about data protection. Modeling both constructs allows the study to separate affective service evaluation from confidence in the system (Bhattacherjee, 2001; Kruse et al., 2017).

Privacy concern and perceived risk are also important in digital health. Telemedicine users may disclose symptoms, diagnoses, prescriptions, photographs, identity information, payment data, and family health information. Concerns about unauthorized access, misuse of data, unclear consent, or data sharing with third parties can reduce trust and intention. Privacy concern is not only a legal issue; it is a behavioral issue because patients who fear data misuse may avoid telemedicine or limit the information they provide. In a market where digital platforms increasingly combine health, payment, and customer data, privacy communication can directly affect patient trust (Dhagarra et al., 2020; Van Dyke et al., 2007).

The Indonesian literature supports the need for an integrated model. Indonesian hospital telemedicine acceptance research has emphasized that user behavior and technological dimensions shape acceptance. Studies of telemedicine adoption for virtual health-care services in Indonesia have incorporated performance expectancy, effort expectancy, eHealth literacy, and trust. Consumer studies in Greater Jakarta and Greater Bandung have shown that SEM can reveal the antecedents of intention to use telemedicine. Recent Indonesian work on chronic and rare disease management and national health survey evidence also indicates that adoption remains uneven, especially outside digitally advantaged groups. Taken together, these studies justify a Jakarta-focused SEM model that extends technology acceptance with service quality, trust, satisfaction, privacy concern, and affordability (Alexandra et al., 2021; Alfarizi, 2022; Alfian et al., 2026; Pratama et al., 2026; Wati et al., 2021).

The proposed model also aligns with the business-management view of telemedicine as a service ecosystem. Telemedicine value is co-created by patients, clinicians, platform designers, health-care organizations, payers, and regulators. Continuance intention therefore reflects more than individual willingness; it reflects perceived alignment between technology, service process, provider credibility, and patient resources. SEM can estimate these relationships and identify which managerial levers deserve priority. For instance, if service quality has a strong indirect effect through satisfaction, then operational improvements may be more valuable than promotional campaigns. If privacy concern strongly reduces trust, then transparent governance and secure design should be treated as strategic assets rather than compliance-only activities.

3. CONCEPTUAL MODEL AND HYPOTHESES

The conceptual model positions continuance intention as the focal dependent variable. Continuance intention refers to a patient's conscious plan or willingness to keep using telemedicine for appropriate health needs in the future. It is different from initial intention because it is informed by actual experience or concrete awareness of service performance. Actual use frequency is included as a behavioral outcome because repeated use is expected to follow intention, although actual use may also be constrained by illness frequency, insurance coverage, provider availability, and clinical appropriateness. The model therefore focuses on explaining intention while acknowledging that behavior depends on both motivation and opportunity (Bhattacherjee, 2001).

Performance expectancy is expected to have a positive effect on continuance intention. Patients are more likely to continue using telemedicine when they believe it helps them obtain timely advice, manage minor conditions, renew prescriptions, consult specialists, reduce travel time, or decide whether a hospital visit is

necessary. In Jakarta, performance expectancy may be strengthened by traffic congestion and the opportunity cost of visiting facilities. The more telemedicine is perceived as a useful complement to in-person care, the stronger the intention to continue. H1: Performance expectancy positively influences continuance intention to use telemedicine (Venkatesh et al., 2003, 2012).

Effort expectancy is also expected to influence continuance intention. Even a useful service may be abandoned if registration, scheduling, video connection, symptom description, payment, or prescription retrieval is difficult. Ease of use matters because patients may access telemedicine during stress, illness, caregiving, or time pressure. Simple interfaces, clear instructions, responsive customer support, and intuitive language can reduce cognitive burden. H2: Effort expectancy positively influences continuance intention to use telemedicine (Venkatesh et al., 2003).

Facilitating conditions refer to the resources and support that enable telemedicine use. These include smartphone access, stable internet, digital payment options, insurance integration, help from family members, customer support, and availability of health records. In Jakarta, digital infrastructure is relatively strong, but facilitating conditions can still vary across income, age, employment, and neighborhood. Patients with better support are more likely to continue because they can solve technical and administrative obstacles. H3: Facilitating conditions positively influence continuance intention to use telemedicine (Venkatesh et al., 2003, 2012).

eHealth literacy is modeled as a determinant of effort expectancy and continuance intention. Patients with higher eHealth literacy should find telemedicine easier to use because they can navigate digital interfaces, communicate symptoms, interpret instructions, and evaluate online health information. They may also be more confident that telemedicine can be used appropriately for selected conditions. Conversely, patients with low eHealth literacy may feel confused, fear miscommunication, or avoid digital consultation. H4a: eHealth literacy positively influences effort expectancy. H4b: eHealth literacy positively influences continuance intention to use telemedicine (Norman & Skinner, 2006).

Price value and affordability are included because telemedicine is a consumer-facing service that competes with other health-care options. Patients consider consultation fees, time savings, transportation savings, prescription costs, insurance reimbursement, and perceived fairness. For some Jakarta residents, telemedicine may be attractive because it reduces travel and waiting costs. For others, digital consultation fees may appear expensive if they believe face-to-face care provides more diagnostic certainty. H5: Price value positively influences continuance intention to use telemedicine (Venkatesh et al., 2012).

Telemedicine service quality is expected to influence satisfaction and trust. Service quality includes platform reliability, physician responsiveness, information clarity, appointment timeliness, prescription fulfillment, customer support, and privacy assurance. High-quality service encounters should increase satisfaction because the patient experience meets expectations. Service quality should also strengthen trust because reliable processes signal competence and integrity. H6a: Telemedicine service quality positively influences patient satisfaction. H6b: Telemedicine service quality positively influences trust in telemedicine (Parasuraman et al., 2005).

Privacy concern is expected to reduce trust and may also reduce continuance intention directly. When patients worry that health data, identity information, payment details, or consultation content may be misused, they are less likely to trust the service provider. Some patients may still use telemedicine when benefits are high, but privacy concern can create reluctance to share complete information or to continue using the service. H7a: Privacy concern negatively influences trust in telemedicine. H7b: Privacy concern negatively influences continuance intention to use telemedicine (Dhagarra et al., 2020; Van Dyke et al., 2007).

Trust is expected to positively influence continuance intention. Trust reflects confidence that the telemedicine provider and platform are competent, benevolent, reliable, and protective of patient interests. Trust is especially relevant when patients must share sensitive information and rely on remote clinical advice. A trusted telemedicine service can reduce perceived uncertainty and increase willingness to use the platform

for future health needs. H8: Trust positively influences continuance intention to use telemedicine (Gefen et al., 2003).

Satisfaction is expected to positively influence continuance intention. Patients who are satisfied with prior telemedicine experiences are more likely to reuse the service and recommend it to others. Satisfaction may summarize multiple aspects of experience, including usefulness, communication, waiting time, technical stability, price fairness, and problem resolution. H9: Patient satisfaction positively influences continuance intention to use telemedicine (Bhattacherjee, 2001).

Continuance intention is expected to influence actual use frequency. Although health-care use depends on need, patients with stronger intention should be more likely to choose telemedicine when relevant symptoms or administrative needs arise. H10: Continuance intention positively influences actual telemedicine use frequency.

The model also proposes mediation effects. Telemedicine service quality may influence continuance intention indirectly through satisfaction and trust because good service experiences build positive evaluation and confidence. Privacy concern may reduce continuance intention indirectly by lowering trust. These indirect effects are important because management interventions may not always operate directly on intention. For example, improving response time may raise satisfaction, which then increases continuance. Clarifying data-protection policies may increase trust, which then supports continuance. H11a: Satisfaction mediates the relationship between telemedicine service quality and continuance intention. H11b: Trust mediates the relationship between telemedicine service quality and continuance intention. H11c: Trust mediates the relationship between privacy concern and continuance intention.

Figure 1 summarizes the proposed SEM model. The model is intentionally parsimonious enough for empirical testing while broad enough to capture Jakarta's technology, service, and trust environment. Demographic variables such as age, gender, education, income, insurance status, chronic-disease status, and prior telemedicine experience should be included as controls or used for multigroup analysis if sample size permits.

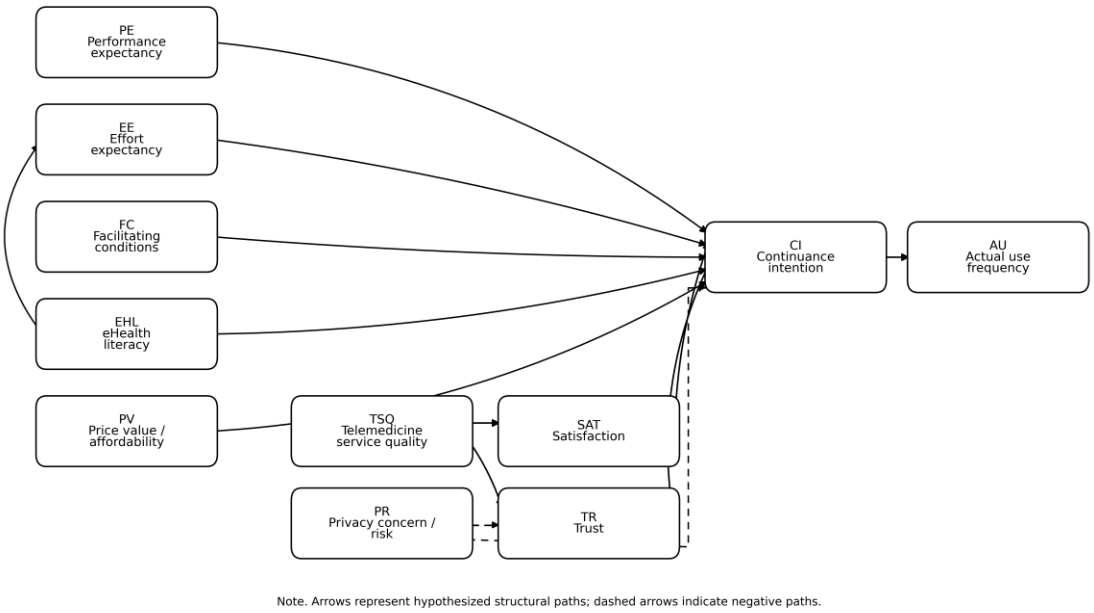

Figure 1. Proposed SEM Model for Telemedicine Continuance in Jakarta

4. METHOD

This study is designed as a quantitative, explanatory, cross-sectional survey using structural equation modeling. The unit of analysis is the individual adult patient who has used telemedicine at least once in the previous 12 months. A cross-sectional design is appropriate because the research questions concern perceived determinants of continuance intention at a specific stage of digital health adoption. A longitudinal design would be stronger for causal inference, but it would require repeated measurement of the same patients. The present design is therefore positioned as an efficient first-stage empirical test for Jakarta, with future longitudinal research recommended (Hair et al., 2019).

The target population is adult residents of DKI Jakarta aged 18 years or older who have used telemedicine for themselves or for dependent family members during the preceding 12 months. Telemedicine use may include video consultation, chat-based consultation, telephone consultation provided through an organized health platform, hospital teleconsultation, or digital consultation linked to electronic prescription. The study excludes respondents who have never used telemedicine because the focus is continuance rather than awareness or first-time adoption. Respondents who are health professionals answering as providers rather than patients should also be excluded to maintain a patient-centered perspective.

A multi-channel sampling strategy is recommended. Recruitment can be conducted through cooperating clinics, hospitals, digital health communities, patient associations, university networks, workplace health programs, and social media groups. Because a fully random sampling frame of Jakarta telemedicine users may not be available, quota-based purposive sampling can improve coverage across Jakarta's administrative cities: Central Jakarta, North Jakarta, West Jakarta, South Jakarta, East Jakarta, and, where feasible, Kepulauan Seribu. Quotas should also be monitored for gender, age group, education, and chronic-disease status. This strategy does not eliminate sampling bias, but it is more transparent and balanced than relying only on convenience recruitment from a single online channel.

The minimum sample size should be determined using both statistical and practical criteria. For PLS-SEM, researchers often consider the number of indicators, the maximum number of structural paths entering a construct, expected effect sizes, and the need for bootstrapping. A target of 400-500 valid responses is recommended because the model includes multiple latent constructs and potential mediation effects. This sample range also supports subgroup exploration if demographic quotas are reasonably balanced. Before final analysis, incomplete responses, duplicate entries, patterned responses, and responses failing attention checks should be removed. The final sample characteristics should be reported in detail.

The questionnaire should be administered in Bahasa Indonesia. Items should be adapted from validated scales and translated using a translation and back-translation procedure. A panel consisting of information-systems researchers, health-care management scholars, clinicians, and patient representatives should review the instrument for content validity. A pilot test with approximately 30-50 Jakarta telemedicine users should evaluate clarity, response time, item ambiguity, and preliminary reliability. Feedback from the pilot should be used to simplify wording, reduce redundancy, and ensure that items are understandable for respondents with different education levels.

All main constructs are measured with reflective indicators using a seven-point Likert scale ranging from 1 = strongly disagree to 7 = strongly agree. Performance expectancy items assess whether telemedicine improves access, saves time, supports health decisions, and helps resolve appropriate health needs. Effort expectancy items assess whether the service is easy to learn, easy to navigate, and easy to complete. Facilitating conditions items assess whether respondents have devices, internet access, payment support, and help when needed. eHealth literacy items assess the ability to find, evaluate, and use online health information. Service quality items assess system reliability, physician responsiveness, information clarity, privacy assurance, and prescription or follow-up fulfillment. Trust items assess confidence in provider competence, platform reliability, honesty, and data protection. Satisfaction items assess overall evaluation of prior telemedicine

experience. Privacy concern items assess worry about data misuse, unauthorized access, and lack of control over personal health information. Price value items assess whether telemedicine is worth its cost considering time and travel savings. Continuance intention items assess future willingness to reuse telemedicine and recommend it for suitable health needs. Actual use frequency can be measured using ordered categories, such as one time, two to three times, four to six times, or more than six times in the past 12 months (Davis, 1989; Norman & Skinner, 2006; Venkatesh et al., 2012).

The study should obtain institutional ethics approval before data collection. The first page of the online or paper questionnaire should provide informed consent information, including the study purpose, voluntary participation, anonymity, data-protection procedures, expected completion time, risks, benefits, and contact details. Respondents should be informed that the survey is not medical advice and that declining participation will not affect access to care. No directly identifiable medical records should be collected. If the study asks about health status or chronic disease, the items should be general and optional where appropriate. Data should be stored securely, accessible only to the research team, and reported in aggregate form.

Data screening should begin with descriptive statistics, missing data analysis, outlier checks, and response-quality assessment. Cases with excessive missing values should be removed. If missingness is minimal and appears random, appropriate imputation may be considered; however, listwise deletion may be acceptable when the valid sample remains large. Normality should be described, although PLS-SEM does not require multivariate normality in the same way as covariance-based SEM. Common method bias should be addressed procedurally by assuring anonymity, separating predictor and criterion items, using clear wording, avoiding evaluation apprehension, and varying item order. Statistical checks may include examining inter-construct correlations, variance inflation factors, and additional common-method tests appropriate to the selected software (Podsakoff et al., 2003).

Partial least squares structural equation modeling is recommended because the model combines prediction-oriented aims, multiple latent variables, possible non-normality, and mediation testing. Software options include SmartPLS, WarpPLS, ADANCO, or R packages such as seminr. The measurement model should first be assessed. Indicator loadings should ideally exceed .70, although items between .40 and .70 may be retained when theoretically important and when reliability and validity remain adequate. Cronbach's alpha and composite reliability should generally exceed .70. Average variance extracted should exceed .50 for convergent validity. Discriminant validity should be assessed using the heterotrait-monotrait ratio, with values below .85 or .90 depending on construct similarity. The Fornell-Larcker criterion and cross-loadings may be reported as supplementary evidence (Fornell & Larcker, 1981; Hair et al., 2019; Henseler et al., 2015).

The structural model should then be assessed using bootstrapping with at least 5,000 resamples. The analysis should report standardized path coefficients, standard errors, t values, p values, and confidence intervals. Variance inflation factors should be examined to detect multicollinearity. The explanatory power of the model should be evaluated using R-squared values for trust, satisfaction, continuance intention, and actual use frequency. Predictive relevance can be assessed using Q-squared or prediction-oriented procedures where available. Effect sizes should be reported to indicate the substantive contribution of individual paths. Mediation should be evaluated using bootstrapped indirect effects rather than relying only on whether direct paths are significant.

Robustness checks should be planned. If sample size allows, multigroup analysis can compare younger and older respondents, male and female respondents, chronic-disease and non-chronic-disease users, or high and low eHealth literacy groups. These comparisons can reveal whether the model operates differently across patient segments. However, multigroup analysis should be conducted only after checking measurement invariance. Sensitivity analysis can also test whether excluding first-time users, including only video-consultation users, or controlling for insurance status changes the results. Such checks improve the credibility of the study and make it more attractive for high-ranking journals.

4.1. Measurement Instrument

Table 1 presents the proposed construct definitions and representative indicators. The final questionnaire should include at least three indicators for each reflective construct. Items should be adapted to the telemedicine context and written in patient-friendly Bahasa Indonesia. Researchers should avoid double-barreled items, vague clinical claims, and overly technical terms. For example, an item such as 'telemedicine is useful and safe' should be separated because usefulness and safety are distinct perceptions. Similarly, privacy and trust should not be combined in one item, because privacy concern is modeled as an antecedent of trust.

All items should refer to a clear time frame. Because the study focuses on continuance, respondents should be asked to answer based on their most recent or overall telemedicine experience during the past 12 months. When respondents have used multiple platforms, they may be instructed to consider the platform they used most often or most recently. This instruction reduces ambiguity and helps ensure that service-quality and satisfaction items refer to a specific experience rather than a general opinion about digital health.

The questionnaire should also collect demographic and usage variables. Demographic variables include age, gender, education, monthly household income category, employment, marital status, and administrative city of residence. Health and telemedicine variables include chronic-disease status, health insurance status, type of telemedicine used, number of uses in the past 12 months, main reason for use, preferred consultation channel, and whether the respondent received an electronic prescription. These variables enable sample description, control-variable analysis, and possible segmentation.

Table 1. Proposed Constructs, Definitions, and Representative Indicators

Construct	Definition	Representative indicators
Performance expectancy	Belief that telemedicine improves access, saves time, and supports health decisions.	PE1 Telemedicine helps me obtain health advice quickly. PE2 Telemedicine is useful for appropriate health problems. PE3 Telemedicine saves time compared with visiting a facility.
Effort expectancy	Perceived ease of learning, navigating, and completing telemedicine tasks.	EE1 The platform is easy to learn. EE2 Booking and consultation are simple. EE3 I can complete telemedicine tasks without difficulty.
Facilitating conditions	Resources and support that enable use.	FC1 I have the device and internet needed. FC2 I can get help when technical problems occur. FC3 Payment and prescription processes are available to me.
eHealth literacy	Ability to find, evaluate, and use digital health information.	EHL1 I know where to find useful online health information. EHL2 I can judge whether online health information is reliable. EHL3 I can use digital information to make health decisions.
Telemedicine service quality	Reliability, responsiveness, clarity, privacy assurance, and fulfillment of the digital service encounter.	TSQ1 The service is reliable. TSQ2 Physicians respond clearly. TSQ3 Follow-up and prescription processes are handled well. TSQ4 The platform protects patient information.
Trust	Confidence in the competence, integrity, and reliability of the telemedicine provider and platform.	TR1 I trust the telemedicine provider. TR2 I believe the platform acts in patients' interests. TR3 I trust the service to protect my information.
Satisfaction	Overall evaluation of previous telemedicine experience.	SAT1 I am satisfied with my telemedicine experience. SAT2 The service met my expectations. SAT3 I made a good decision using telemedicine.
Privacy concern	Concern about misuse, unauthorized access, or loss of control over personal health information.	PR1 I worry about who can access my health data. PR2 I worry my data may be misused. PR3 I feel limited control over data shared during telemedicine.
Price value	Perceived fairness and value of telemedicine costs relative to benefits.	PV1 Telemedicine is worth the cost. PV2 The price is reasonable considering time and travel savings. PV3 Telemedicine provides good value.

Continuance intention	Willingness to keep using telemedicine for suitable health needs.	CI1 I intend to continue using telemedicine. CI2 I will choose telemedicine again when appropriate. CI3 I would recommend telemedicine for suitable needs.
Actual use frequency	Self-reported frequency of telemedicine use in the past 12 months.	AU1 Number of uses in the last 12 months. AU2 Main type of telemedicine used. AU3 Most recent use category.

4.2. SEM Analysis and Results Reporting Template

This section is intentionally written as a reporting template. It should not be presented as empirical findings until real survey data have been collected and analyzed. After data cleaning, the first results subsection should describe the sample. A complete report should include the number of invitations distributed, responses received, excluded responses, and valid responses. The sample table should report age, gender, education, income, insurance status, chronic-disease status, telemedicine platform type, and use frequency. For Jakarta-focused research, the table should also report residence by administrative area to demonstrate geographic coverage.

The measurement-model results should be presented before the structural model. The report should state whether all indicator loadings met the required threshold or whether any items were removed. It should report Cronbach's alpha, composite reliability, and average variance extracted for each construct. A defensible article should not merely state that reliability was acceptable; it should present the values in a table and explain any deviations. For example, if an indicator loading falls between .60 and .70, the authors should justify retaining or deleting it based on theory and the effect on composite reliability and AVE. Discriminant validity should be reported using HTMT values, with the full matrix provided in the manuscript or supplementary materials (Fornell & Larcker, 1981; Henseler et al., 2015).

The structural-model subsection should report the direct effects for all hypotheses. A typical sentence would read: 'Performance expectancy had a positive and significant effect on continuance intention, supporting H1.' This sentence should be followed by the coefficient, confidence interval, and significance level. The report should avoid overinterpreting small but statistically significant effects. Effect sizes should be used to distinguish practically important determinants from statistically detectable but managerially minor relationships. The model's R-squared value for continuance intention is especially important because it indicates how much variance the proposed model explains.

Mediation results should be reported separately. The authors should present indirect effects from service quality to continuance intention through satisfaction and trust, and from privacy concern to continuance intention through trust. Bootstrapped confidence intervals should be used because indirect effects are often non-normally distributed. The report should describe whether mediation is full, partial, or not supported, but the substantive interpretation should focus on mechanisms. For example, if service quality affects continuance mostly through satisfaction, service managers should prioritize experience improvement. If service quality affects continuance through trust, provider credibility and platform reliability may be more central (Hair et al., 2019).

A high-quality SEM article should include transparency checks. The manuscript should state the software version, estimator, bootstrapping settings, missing-data treatment, item deletion decisions, and robustness tests. It should also disclose any deviations from the preregistered or planned hypotheses. If the data are shared, the authors can provide anonymized data, syntax, and measurement items in an online repository, subject to ethical constraints. These practices increase credibility and align with the expectations of international journals.

Table 2 provides a concise reporting checklist for the final empirical article. Researchers can use it to ensure that the manuscript satisfies common PLS-SEM expectations before journal submission. The checklist is not a substitute for disciplinary judgment, but it reduces the risk of under-reporting reliability, validity, common method bias, and mediation procedures.

Table 2. Hypotheses for Empirical Testing

Hypothesis	Path	Expected direction
H1	Performance expectancy -> continuance intention	Positive
H2	Effort expectancy -> continuance intention	Positive
H3	Facilitating conditions -> continuance intention	Positive
H4a	eHealth literacy -> effort expectancy	Positive
H4b	eHealth literacy -> continuance intention	Positive
H5	Price value -> continuance intention	Positive
H6a	Service quality -> satisfaction	Positive
H6b	Service quality -> trust	Positive
H7a	Privacy concern -> trust	Negative
H7b	Privacy concern -> continuance intention	Negative
H8	Trust -> continuance intention	Positive
H9	Satisfaction -> continuance intention	Positive
H10	Continuance intention -> actual use frequency	Positive
H11a	Service quality -> satisfaction -> continuance intention	Positive indirect effect
H11b	Service quality -> trust -> continuance intention	Positive indirect effect
H11c	Privacy concern -> trust -> continuance intention	Negative indirect effect

5. DISCUSSION

The proposed study is expected to advance telemedicine adoption research by shifting attention from emergency adoption to sustained use. Much of the early pandemic discussion focused on whether telemedicine could replace or supplement face-to-face care during movement restrictions. The more durable research question is whether patients will continue using telemedicine when they have choices. By focusing on continuance intention in Jakarta, the study addresses a practical problem faced by health-care organizations and digital platforms: how to convert initial exposure into a stable service relationship without compromising clinical quality, privacy, or equity.

Theoretically, the model extends UTAUT2 by integrating trust, satisfaction, service quality, eHealth literacy, and privacy concern. This extension is important because telemedicine is both a technology and a health service. Performance expectancy and effort expectancy capture technology value and usability, but they cannot fully represent the clinical vulnerability and service-process complexity of remote health care. Trust captures confidence in providers and platforms. Satisfaction captures experienced service evaluation. Privacy concern captures perceived risk in handling sensitive health information. eHealth literacy captures patient capability. Together, these constructs provide a richer explanation of continuance intention than technology acceptance variables alone (Harst et al., 2019; Venkatesh et al., 2012).

If the empirical results show that performance expectancy is the strongest direct predictor, the interpretation would be that Jakarta patients continue telemedicine primarily when they perceive concrete health and convenience benefits. In that case, health-care managers should communicate the conditions for which telemedicine is clinically appropriate, integrate digital consultation with prescriptions and referrals, and ensure that patients receive actionable advice. Telemedicine should not be marketed only as a modern technology; it should be presented as a reliable path to timely care for appropriate needs.

If effort expectancy and facilitating conditions are strong predictors, the implication would be that usability and access support remain central even in a digitally connected city. Managers should reduce registration friction, simplify appointment booking, support multiple payment methods, provide clear language, and offer responsive assistance. Hospitals and platforms should pay attention to older adults and

patients with lower digital confidence. Training videos, family-assisted use, call-center support, and integration with community clinics may help convert digital access into practical usability.

If eHealth literacy has a significant effect, the study would highlight the need to treat literacy as a strategic service issue. Health-care organizations often assume that smartphone ownership indicates readiness for digital health. This assumption is weak. Patients may own devices yet struggle to describe symptoms, upload documents, evaluate physician advice, or understand electronic prescriptions. Telemedicine platforms can respond by using plain language, symptom checklists, visual explanations, and follow-up summaries. Public health agencies can support digital health literacy through community education, particularly for chronic-disease patients who may benefit most from remote follow-up.

If service quality strongly influences satisfaction and trust, the findings would reinforce the view that telemedicine is a managed service ecosystem. Digital health organizations should measure waiting time, consultation duration, physician responsiveness, prescription completion, complaint resolution, and follow-up reliability. Quality should not be reduced to technical uptime. The interpersonal dimension of physician-patient communication also matters. Patients may judge telemedicine quality by whether the provider listens, explains, asks relevant questions, and gives clear next steps. Therefore, provider training for remote consultation should be part of service-quality management.

If trust mediates the effect of privacy concern or service quality on continuance intention, the study would underline the strategic role of governance. Trust can be built through transparent physician credentials, visible institutional affiliation, secure data practices, clear consent, and consistent service delivery. Privacy policies should be understandable rather than hidden in legal language. Patients need to know what data are collected, why they are collected, who can access them, and how they are protected. In digital health, trust-building is not only a legal obligation but also a competitive differentiator.

Affordability and price value may be particularly important in Jakarta because telemedicine competes with multiple health-care alternatives. Some patients may see telemedicine as cost-saving because it reduces travel, waiting time, and work disruption. Others may view digital consultation as less valuable than face-to-face care if fees are similar. Platforms and hospitals should therefore design pricing that reflects perceived value. Bundled services, insurance integration, prescription delivery, and follow-up support may increase price value. Price communication should clarify what is included in the consultation to reduce perceived unfairness.

The managerial implications extend to hospitals, stand-alone telemedicine platforms, insurers, and policy makers. Hospitals can use telemedicine to improve continuity of care, triage, chronic-disease follow-up, and post-discharge monitoring. Stand-alone platforms can focus on user experience, provider network quality, privacy assurance, and customer support. Insurers can encourage telemedicine when it reduces unnecessary facility visits while maintaining quality. Policy makers can support interoperability, clinical standards, data protection, and digital literacy. The SEM results would help each stakeholder prioritize interventions based on empirical effect sizes rather than assumptions.

The study also has equity implications. Jakarta's digital infrastructure is relatively advanced, but digital health benefits may still be uneven. Older adults, lower-income residents, people with limited education, and patients with low eHealth literacy may be less likely to benefit from telemedicine. If the model shows that facilitating conditions and eHealth literacy matter, policy should not simply promote telemedicine as a universal solution. Instead, telemedicine should be integrated with assisted digital access, community health support, and inclusive design. Digital transformation should widen health-care access rather than deepen existing inequalities.

5.1. Theoretical, Managerial, and Policy Contributions

The first theoretical contribution is the integration of acceptance, service, and trust perspectives in a single telemedicine continuance model. Many technology-adoption studies explain intention through perceived usefulness and ease of use, while service-management studies emphasize satisfaction, quality, and

loyalty. Telemedicine requires both perspectives because patients evaluate a digital interface and a health-care encounter at the same time. By combining UTAUT2 with service quality, trust, satisfaction, eHealth literacy, privacy concern, and affordability, the proposed model offers a more complete explanation of why patients continue or discontinue telemedicine. This integration is especially important for emerging-market settings, where digital capability, price sensitivity, and institutional trust may vary substantially across patient segments (Davis, 1989; Venkatesh et al., 2003, 2012).

The second theoretical contribution is the focus on continuance rather than initial adoption. Initial adoption can be caused by novelty, promotion, peer influence, pandemic restrictions, or urgent need. Continuance is a stricter test because patients have experience and can compare telemedicine with face-to-face care. A continuance model can therefore reveal whether telemedicine has become a valued part of the patient journey or remains a temporary substitute. This distinction matters for the future of digital health in Indonesia because sustainable telemedicine requires repeated use, integration with care pathways, and confidence in service quality (Bhattacherjee, 2001).

The methodological contribution lies in the application of a transparent PLS-SEM design that includes measurement validation, mediation analysis, common method bias controls, and robustness checks. Many applied digital-health studies report significant paths without sufficient attention to measurement quality or indirect mechanisms. The present design specifies reliability, convergent validity, discriminant validity, collinearity, bootstrapped confidence intervals, predictive relevance, and mediation procedures before data collection. This planned transparency can improve the manuscript's credibility and make it more suitable for journals that expect rigorous quantitative methods (Hair et al., 2019; Henseler et al., 2015).

The managerial contribution is the identification of actionable levers for telemedicine providers. The model can help managers decide whether to prioritize clinical usefulness, user-interface simplification, digital literacy support, privacy communication, price redesign, physician responsiveness, or follow-up quality. For example, a strong service-quality-to-satisfaction path would support investment in operational processes and physician communication training. A strong privacy-concern-to-trust path would support investment in data governance, transparent consent, and patient-facing privacy explanations. A strong price-value path would support bundled pricing, insurance collaboration, or clearer communication of time and travel savings.

The policy contribution is the model's ability to connect patient behavior with digital health governance. Indonesia's telemedicine policy environment has created room for digital service delivery, but patient adoption depends on everyday experience. Evidence from Jakarta can inform standards for privacy, platform reliability, physician credentials, digital literacy, and integration with primary care. Policy makers should not evaluate telemedicine only by the number of platforms or consultations. They should also evaluate whether patients trust the service, understand how to use it, receive adequate follow-up, and experience equitable access. A patient-centered SEM study can provide empirical evidence for these policy priorities.

5.2. Limitations and Future Research

Several limitations should be acknowledged. First, the proposed cross-sectional design cannot establish strong causal relationships. SEM can test whether the observed data are consistent with the theoretical model, but causal claims require longitudinal or experimental evidence. Future research could track patients over time to examine whether satisfaction and trust after one consultation predict actual reuse in subsequent months. Second, self-reported use frequency may be affected by recall error. Linking survey data with anonymized platform usage records would strengthen behavioral measurement, although it would also require careful ethics and privacy procedures.

Third, quota-based purposive sampling may limit generalizability. The study should transparently report recruitment channels and sample characteristics. Future studies could compare Jakarta with other Indonesian provinces, including regions with lower digital infrastructure and different health-care access constraints. Fourth, telemedicine is not a single service. Video consultation, chat consultation, telephone

consultation, remote monitoring, hospital-based teleconsultation, and marketplace-style doctor consultation may produce different user experiences. Future research can test whether the proposed model differs by service type or clinical condition.

Fifth, the proposed model focuses on patient perceptions. Provider-side factors such as clinician workload, reimbursement, diagnostic confidence, malpractice concern, and organizational readiness are also critical to telemedicine sustainability. Future research should integrate patient and provider perspectives using multilevel or mixed-method designs. Qualitative research can further explore why patients distrust telemedicine, how they interpret privacy policies, and what makes remote consultation feel clinically adequate.

6. CONCLUSION

Telemedicine in Indonesia has moved beyond emergency experimentation and now requires evidence about sustained patient use. This manuscript develops an original SEM research design for Jakarta that integrates UTAUT2, service quality, eHealth literacy, trust, satisfaction, privacy concern, and affordability. The proposed model recognizes that telemedicine continuance is shaped by technological usefulness, usability, resources, patient capability, service experience, governance, and perceived value. By collecting survey data from adult Jakarta telemedicine users and applying rigorous PLS-SEM procedures, researchers can identify the strongest determinants of continuance intention and provide actionable recommendations for hospitals, platforms, insurers, and policy makers. The central contribution is a context-sensitive model that treats telemedicine as both a digital technology and a patient-centered service system.

7. APPENDIX

Appendix A

Draft Survey Items for Jakarta Telemedicine Users

All items should be translated into Bahasa Indonesia, back-translated into English, reviewed by experts, and pilot tested before field deployment. Respondents should answer using a seven-point scale from 1 = strongly disagree to 7 = strongly agree unless otherwise stated.

Code	Item
PE1	Using telemedicine helps me obtain health advice more quickly.
PE2	Telemedicine is useful for health problems that do not require immediate physical examination.
PE3	Telemedicine helps me decide whether I need to visit a clinic or hospital.
PE4	Telemedicine saves time compared with visiting a health facility.
EE1	Learning to use telemedicine services is easy for me.
EE2	It is easy for me to book and complete a telemedicine consultation.
EE3	The telemedicine platform is clear and understandable.
EE4	I can use telemedicine without needing much help from others.
FC1	I have the device and internet connection needed to use telemedicine.
FC2	I can get technical help when I experience problems using telemedicine.
FC3	The payment options for telemedicine are accessible to me.
FC4	The prescription or follow-up process is available when I use telemedicine.
EHL1	I know how to find useful health information online.
EHL2	I can judge whether online health information is reliable.
EHL3	I can use digital health information to support my health decisions.
EHL4	I can explain my symptoms clearly during an online consultation.
TSQ1	The telemedicine platform works reliably during consultation.
TSQ2	The physician or health professional responds clearly to my concerns.
TSQ3	The service provides clear instructions after consultation.

TSQ4	The service handles prescriptions, referrals, or follow-up well.
TSQ5	The telemedicine service protects patient information appropriately.
TR1	I trust the telemedicine service provider.
TR2	I believe the physician or health professional is competent.
TR3	I trust the platform to protect my personal health information.
TR4	The telemedicine service acts in patients' interests.
SAT1	Overall, I am satisfied with my telemedicine experience.
SAT2	My telemedicine experience met my expectations.
SAT3	I made a good decision by using telemedicine.
SAT4	I am satisfied with the communication I received during consultation.
PR1	I worry that my personal health information may be accessed by unauthorized parties.
PR2	I worry that my telemedicine data may be misused.
PR3	I feel uncertain about who can see my telemedicine information.
PR4	I am concerned about sharing sensitive health information through telemedicine.
PV1	Telemedicine is worth the price I pay.
PV2	Telemedicine provides good value when considering time and travel savings.
PV3	The cost of telemedicine is reasonable for the benefits I receive.
CI1	I intend to continue using telemedicine for suitable health needs.
CI2	I will choose telemedicine again when it is appropriate for my condition.
CI3	I would recommend telemedicine to others for suitable health needs.
CI4	Telemedicine will remain one of my options for accessing health care.

Ethical Approval

This study did not require ethical approval because it is based exclusively on published literature and did not involve human participants, animals, or identifiable personal data.

Informed Consent Statement

Not applicable because this study is a systematic literature review and did not involve direct data collection from participants.

Authors' Contributions

Not applicable

Disclosure Statement

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