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Dynamics of The Privacy Paradox Among Halodoc Users, Trust, Perceived Benefits, and Continuance Intention

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Abstract

The use of telemedicine through Halodoc has increased rapidly in Indonesia, yet privacy concerns remain a major obstacle to continued usage. This study proposes an integrative model examining the effect of *privacy concern* on *continuance intention*, with *trust* as a mediating variable and *perceived benefits* as a moderating variable. The framework combines *privacy calculus theory*, the *expectation–confirmation model*, and the *privacy paradox*, which have not previously been tested simultaneously in the Indonesian telemedicine context. Using a quantitative approach, data were collected from 350 active Halodoc users in Central Java through an online survey and analyzed using PLS-SEM. The results indicate that *privacy concern* negatively affects *trust*, while *trust* significantly enhances *continuance intention*. *Perceived benefits* directly increase continuance intention and strengthen the positive effect of trust on sustained usage. Furthermore, *trust* mediates the relationship between privacy concern and continuance intention, while *perceived benefits* reduce the negative impact of perceived privacy risks. The study's novelty lies in its integrative framework explaining telemedicine users' psychological mechanisms in a developing country context.

Keywords: Continuance intention, HaloDoc, Perceived benefits, Privacy concern, Telemedicine, Trust.
JEL Classification: M15, D83, I11, L86

INTRODUCTION

The rapid advancement of digital technology has triggered a profound transformation in how societies access healthcare services. Telemedicine has gradually evolved into a strategic solution for delivering remote healthcare that is fast, affordable, and flexible. Global studies indicate that the telehealth market surpassed 120 billion United States dollars in 2024 and is projected to grow exponentially, driven by a sustained shift in public preferences toward digital services in the post-pandemic era. Accumulating empirical evidence further demonstrates that telehealth played a crucial role in expanding access to healthcare during the COVID-19 pandemic, particularly in countries with large populations, complex geographical conditions, and pronounced disparities in healthcare service distribution (Monaghesh, E., & Hajizadeh, 2020). In this context, the World Health

Organization, through its Global Strategy on Digital Health 2020–2025, has emphasized digital health as a cornerstone for strengthening health systems at the global level (Monaghesh, E., & Hajizadeh, 2020).

The Asia-Pacific region reflects one of the fastest-growing telemedicine landscapes worldwide. A systematic review by Lu, Y., Wu, J., & Peng, (2023) reveals that telemedicine adoption in this region accelerated significantly as a result of behavioral changes during the pandemic, rising levels of digital literacy, and the widespread use of mobile devices. Similar dynamics are evident across ASEAN countries, characterized by the rapid growth of health technology startups, increasing investment in digital health, and the emergence of national policies that actively promote app-based healthcare services. Within this regional context, Indonesia stands out as one of the countries experiencing the most aggressive growth in telemedicine adoption.

The expansion of telemedicine in Indonesia has been strongly supported by the continuous strengthening of digital infrastructure. Data from the Indonesian Internet Service Providers Association over the past five years indicate a steady rise in national internet penetration, increasing from 64.8 percent in 2018 to 73.7 percent in 2020, 77.0 percent in 2022, 78.19 percent in 2023, and reaching 79.5 percent, or approximately 221 million users, in 2024. This upward trend confirms that the digital user base in Indonesia has become increasingly expansive, creating substantial opportunities for the growth of application-based healthcare services. Moreover, reports from the Indonesian Ministry of Health and ThinkWell (2025) show that telemedicine utilization surged more than tenfold during the pandemic period, with Halodoc emerging as the most widely used telemedicine platform among the Indonesian population.

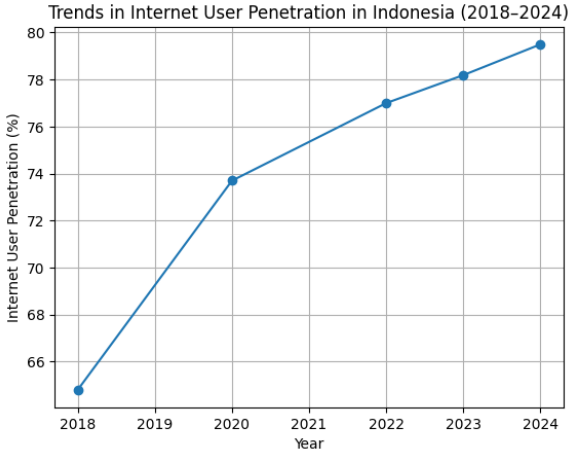


Figure 1. Trends in National Internet Penetration

Halodoc is one of the leading telemedicine service providers for online health consultations and has become a preferred choice among the public, particularly in Indonesia. At present, Halodoc has the largest user base compared with other online healthcare platforms. A survey conducted by Populix found that Halodoc was the most preferred telemedicine service in Indonesia for health consultations. Its share in the online healthcare service market reached 79% (Annur, 2023). The market penetration of online healthcare service providers in Indonesia is presented in Figure 2.

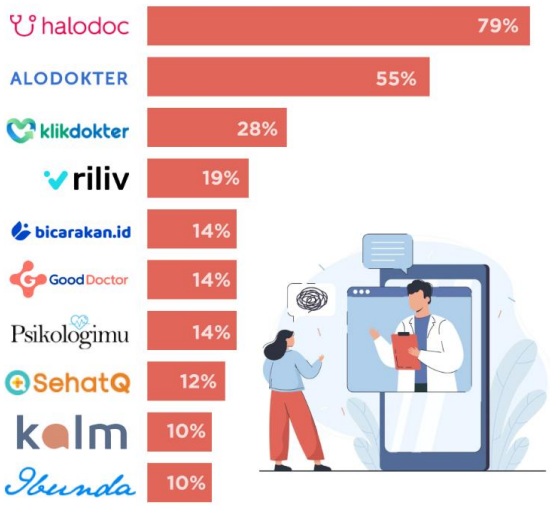


Figure 2. Penetration of Telemedicine Services in Indonesia
(Source: Cindi Mutia Annur, 2023)

The rapid increase in Halodoc usage has been accompanied by growing public concerns regarding personal data security and the protection of sensitive health information. Both domestic and international studies consistently indicate that telemedicine users place privacy issues at the center of their comfort and trust when engaging with digital health services. A survey conducted by Houser, S. H., & Whitten, (2021) reveals that a substantial proportion of telehealth users continue to experience significant concerns about data confidentiality, even as their frequency of service use increases. Paul, M., Kuo, A., & Lee, (2023) emphasize that data security risks represent a structural barrier in the digital transformation of healthcare, with direct implications for public trust. Comparable evidence has emerged within the Indonesian context, particularly in relation to the still-developing regulatory framework for health data protection. These conditions reflect the presence of a privacy paradox, a situation in which users persist in utilizing digital services despite maintaining high levels of privacy concern.

Recent empirical studies examining the relationship between privacy concern and continuance intention reveal mixed and sometimes contradictory patterns. Several studies align with the privacy calculus perspective, suggesting that heightened privacy concerns reduce users' intentions to continue using digital health services. Strong empirical support is provided by Dang, et al. (2021), who find that privacy concerns significantly decrease m-health users' willingness to disclose personal health information. Guo, et al. (2020) further demonstrate that when information credibility and message quality are perceived as low, privacy concerns exert a stronger negative influence on continuance intention. Evidence from Luo, et al. (2025), focusing on elderly users, confirms that perceived risk and associated costs erode perceived value and positive attitudes toward m-health, ultimately suppressing continuance intention.

In contrast, other studies report findings that support the existence of a privacy paradox. Zhu, et al. (2021) show that the effect of privacy concerns often becomes statistically insignificant when the functional benefits of a service are perceived as highly valuable. Fernandes, T., & Costa, (2023) find that personal and

social benefits associated with COVID-19 tracking applications are sufficient to outweigh users' privacy concerns. Similarly, Klossner, et al. (2023) report that users are willing to tolerate privacy risks when healthcare personalization is perceived to deliver substantial value. Collectively, these findings suggest that privacy concerns do not always translate into a direct negative impact on user behavior.

Trust in the platform and service provider emerges as a critical psychological factor that operates as an intervening mechanism. A growing body of literature demonstrates that trust consistently strengthens positive attitudes and continuance intention. Meng, et al. (2022) find that both affective trust and cognitive trust encourage elderly users to continue using m-health services, even in the presence of technology-related anxiety or health uncertainty. Kim, (2021) illustrates that trust is shaped through a combination of functional benefits, self-efficacy, and positive user experiences with health applications. Moreover, Belfrage, et al. (2022) show that public trust in healthcare institutions significantly increases individuals' willingness to permit the use of electronic health data. These patterns reinforce the argument that trust plays a mediating role in bridging the impact of privacy concerns on continuance intention.

Perceived benefits, often conceptualized as perceived value, also play a central role in explaining continuance behavior. Empirical evidence indicates that perceived benefits can function both as a direct predictor and as a moderating variable. Guo, et al. (2020) demonstrate that perceived value serves as a primary driver of attitudes and continuance intention. Kim, (2021) finds that functional and motivational benefits are strong determinants of continued use of health applications. Luo, et al. (2025) further confirm that attitude and perceived value are the most powerful predictors of continuance intention among elderly users. Other studies suggest that when perceived benefits are sufficiently high, the negative effects of privacy concerns may weaken or even disappear. Nevertheless, for certain user segments particularly those with heightened sensitivity to digital surveillance substantial perceived benefits may still be insufficient to fully offset privacy concerns (Fernandes, T., & Costa, 2023). This inconsistency strengthens the rationale for examining perceived benefits as a moderating variable.

Taken together, the existing empirical evidence highlights persistent inconsistencies in the relationships among privacy concerns, trust, perceived benefits, and continuance intention. These inconsistencies open a clear avenue for theoretical advancement by examining the dynamics of the privacy paradox among Halodoc users, with trust positioned as a mediator and perceived benefits as a moderator. This study is therefore expected to make a meaningful contribution to the understanding of digital consumer behavior in the healthcare sector and to provide empirical foundations for the development of privacy protection strategies, service design improvements, and data governance policies in Indonesia.

Continuance Intention (CI)

Continuance intention refers to a user's intention to persist in using a technology or digital service after the initial adoption phase. Within the framework of the Expectation–Confirmation Model (ECM), continuance intention emerges as the outcome of a post-adoption evaluation process in which users compare their prior expectations with their actual experiences. When a service is perceived to

meet or exceed initial expectations, users tend to develop favorable attitudes and a willingness to maintain continued usage (Bhattacherjee, 2001). In the context of digital health services such as telemedicine, continuance intention represents a critical construct, as platform success relies not merely on initial adoption but on sustained and repeated use over time.

In mHealth and telemedicine settings, a growing body of literature emphasizes that continuance intention is shaped not only by technical characteristics but also by psychological and social factors. (Xu, et al. 2021) demonstrate that middle-aged and older users' intentions to continue using digital health services are influenced by perceived usefulness, ease of use, social support, and post-use satisfaction. These findings suggest that continuance intention reflects an interplay between cognitive evaluations and affective responses to digital healthcare experiences (Xu, et al. 2021).

Similarly, Hsieh et al. identify user attitude toward telehealth as the most powerful determinant of continuance intention. This attitude is formed through perceived usefulness, perceived behavioral control, satisfaction, and confirmation of expectations. When telemedicine experiences align with users' expectations and deliver tangible benefits, users are more likely to sustain their intention to continue usage in the long term (Hsieh, et al. 2022).

Other studies extend this perspective by focusing on specific user populations. Ma et al. examine patients with chronic illnesses and find that expectation confirmation and perceived usefulness significantly influence satisfaction, which in turn plays a dominant role in shaping continuance intention. For this population, consistent service performance and clear clinical benefits become decisive factors in maintaining long-term engagement with telemedicine services (Ma, et al, 2025).

From a perceived value perspective, Zhang et al. argue that perceived usefulness, perceived value, and service quality jointly foster trust and satisfaction, which subsequently drive continuance intention. These findings indicate that users evaluate whether a digital health service delivers benefits that are commensurate with the effort, time, and potential risks involved. Continuance intention, therefore, reflects a rational yet experience-based assessment of value exchange between users and service providers (Zhang, et al. 2024).

Psychological dimensions also play a meaningful role in sustaining usage behavior. Lu, et al. (2023) find that psychological proximity to both healthcare providers and digital platforms positively influences users' intention to continue using online medical consultation services. A reduced sense of psychological distance strengthens relational attachment and encourages ongoing engagement. In related work, Lu, et al. (2023) further demonstrate that health-related stress enhances perceived usefulness and satisfaction, which subsequently reinforce continuance intention toward digital health services (Lu, et al. 2023).

Service quality constitutes another important determinant of continuance intention. Amin, et al. (2022) reveal that information quality, system quality, and interaction quality with healthcare professionals significantly enhance user engagement and satisfaction. These dimensions ultimately increase users' intention to reuse telemedicine services, underscoring the importance of intuitive system

design, responsive service delivery, and effective communication between providers and users (Amin, et al. 2022).

Evidence from hospital-based telehealth services supports similar conclusions. Vannelli et al. show that visit experience quality, platform usability, and perceived security play substantial roles in strengthening users' intentions to reuse telehealth services. These findings reinforce the view that continuance intention arises from the combined effects of user experience, technical service quality, psychological comfort, and trust in healthcare institutions.

Taken together, these studies suggest that continuance intention represents the final outcome of a comprehensive evaluative process, encompassing utilitarian dimensions such as perceived benefits and ease of use, as well as psychological dimensions including satisfaction, trust, and interaction quality. For telemedicine platforms such as Halodoc, sustaining user engagement over time requires careful attention to all of these interrelated dimensions to ensure long-term usage continuity.

Privacy Concern (PC) and Its Relationship with Trust (TR)

Privacy concern refers to the degree to which individuals feel worried about how their personal data particularly sensitive information such as health records are collected, stored, processed, shared, or potentially misused by digital service providers, including telemedicine applications. Within the information systems literature, privacy concern is commonly examined through the lens of the privacy calculus framework, which posits that individuals engage in a rational evaluation by weighing perceived "privacy costs" or risks against anticipated benefits before deciding whether to adopt or continue using a digital service (Malhotra, et al. 2004; Smith, et al. 1998).

In the context of digital health services such as telemedicine and mobile health (mHealth), privacy concerns tend to be more pronounced due to the highly sensitive nature of health-related data. Unauthorized disclosure or misuse of such information may expose individuals to social stigma, discrimination, or psychological harm. Consequently, users with elevated privacy concerns often become more reluctant to disclose personal data. This hesitation may negatively affect user experience and, over time, weaken users' long-term commitment to digital health platforms.

A growing body of empirical research supports the existence of a negative relationship between privacy concern and continuance-related outcomes. For example, Kato-Lin, et al. (2022), in their study of telemedicine users during the COVID-19 pandemic, find that privacy concern significantly reduces continued use intention. Among predominantly first-time users, apprehension regarding data confidentiality contributed to hesitation in pursuing further online consultations after the initial encounter. Similarly, Zhu, et al. (2023) report that privacy concern serves as a negative predictor of reuse intention in non-face-to-face telemedicine services, particularly when users exhibit low levels of trust and perceive limited benefits from the service.

Related findings have also emerged from the mHealth literature. Schroeder, et al. (2022) demonstrate that concerns about personal data protection heighten perceived risk and subsequently reduce user loyalty toward digital health

applications. In a mixed-methods study focusing on mental health applications, Brunnermeier, et al. (2021) reveal that privacy concerns undermine users' willingness to continue using such services, especially when uncertainty exists regarding who can access their data and for what purposes.

However, not all studies report a uniformly strong negative effect of privacy concern. Recent literature suggests that privacy concern does not always translate directly into discontinuance behavior. Contextual factors most notably trust in the service provider and perceived benefits may moderate or even neutralize the adverse impact of privacy concerns. A longitudinal study by Zhang, et al. (2021) shows that although users periodically express privacy-related apprehensions, they often continue using digital health services when their initial experiences are positive and the perceived benefits remain high.

Several studies further highlight the contextual nature of privacy concern. Houser, et al. (2023) find that during health emergencies, users tend to downplay privacy-related worries and prioritize rapid access to care over data protection concerns. Under conditions of heightened need, the benefit–risk calculus shifts, and privacy concern may lose its strength as a negative predictor of continued usage intention.

Taken together, these converging and sometimes contradictory findings suggest that the relationship between privacy concern and continuance-related outcomes is not linear. Rather, it is contingent upon mediating and moderating conditions, particularly users' trust in service providers and the magnitude of perceived benefits. Within this theoretical framework, privacy concern is expected to exert its influence on continuance intention indirectly, through its effect on trust. Based on the foregoing theoretical arguments, this study proposes the following hypothesis:

H_1: Privacy concern has a negative effect on users' trust in telemedicine services.

Trust (TR) in the Context of Privacy Concern (PC) and Continuance Intention (CI)

In the context of digital health services, trust refers to users' belief that service providers are capable of acting competently, ethically, and responsibly in safeguarding the security and confidentiality of their personal data. This belief reflects users' expectations that telemedicine providers not only deliver reliable technical services but also demonstrate integrity and accountability in managing sensitive health information. Within the information systems literature, trust is widely recognized as a fundamental element that supports technology acceptance and sustained usage, particularly in settings characterized by high perceived risk or uncertainty regarding data security.

Trust assumes heightened importance in telemedicine because users are required to disclose personal health information while receiving services without physical interaction. This situation creates a pronounced condition of information asymmetry, rendering users inherently vulnerable to potential privacy risks. Under such conditions, trust functions as a psychological mechanism that helps mitigate perceived vulnerability. When users believe that telemedicine platforms ensure data

security, implement transparent privacy policies, and maintain professional service standards, they tend to exhibit lower resistance toward digital risks and greater openness to continued use.

The relationship between privacy concern and trust has received considerable attention in recent empirical studies. Privacy concern, which reflects users' apprehension about the collection, storage, and use of personal data, is generally associated with a decline in trust, as users become uncertain about providers' ability to protect their information adequately. Zhu, et al. (2023) demonstrate that higher levels of privacy concern are associated with lower trust in telemedicine providers. This finding is reinforced by Schroeder, et al. (2022), who show that privacy concerns weaken perceived security and reduce trust in digital health applications and wearable devices. Such negative effects arise because privacy concerns are often interpreted as signals of ambiguous data governance, insufficient security safeguards, or a lack of transparency on the part of service providers.

Additional studies offer convergent evidence. Trkman, P., & Popović, (2023) find that users who express heightened privacy concerns toward health-tracking applications tend to report lower trust in the governmental or institutional entities managing these systems. In the context of elderly mHealth users, Meng, et al. (2022) explain that privacy concerns diminish trust because older users, who are often more psychologically and physically vulnerable, exhibit heightened sensitivity to perceived privacy risks. On a broader scale, a global study by Alhammad, et al. (2024) confirms that perceptions of data security serve as a direct determinant of trust in digital health applications; users who believe their data are inadequately protected consistently report lower levels of trust.

Beyond its role as a response to privacy concern, trust also functions as a critical predictor of continuance intention. Users are more likely to continue using telemedicine services when they trust that providers can meet their healthcare needs in a consistent, ethical, and secure manner. Wang, et al. (2025) show that trust is the strongest predictor of long-term continuance intention among elderly users of mHealth applications. Consistent results are reported by Meng, et al. (2022), who find that trust enhances users' confidence in the service's ability to deliver meaningful benefits, thereby strengthening intentions to reuse the service.

Empirical evidence increasingly supports the mediating role of trust in the relationship between privacy concern and continuance intention. In the mediation model tested by Zhu, et al. (2023), privacy concern does not always exert a direct effect on reuse intention; instead, its influence operates through trust. When privacy concern intensifies, trust deteriorates, which subsequently reduces users' willingness to continue using the service. This pattern aligns with the findings of Schroeder, et al. (2022), who identify trust as the primary pathway through which perceived privacy risks undermine user engagement with digital health services. Trkman, P., & Popović (2023) further emphasize that trust can buffer users' sensitivity to privacy risks, thereby functioning as a psychological safeguard that supports sustained service usage.

Taken together, these consistent findings underscore the integral role of trust in explaining the interplay between privacy concern and telemedicine usage behavior. While privacy concern tends to erode trust, trust itself strengthens

continuance intention. When trust operates as a mediating variable, the negative effect of privacy concern on continuance intention may be attenuated or even rendered insignificant. This phenomenon provides a strong theoretical foundation for incorporating trust as a mediating construct in studies of telemedicine user behavior in Indonesia.

Based on the theoretical framework and empirical evidence discussed above, the hypotheses of this study are formulated as follows:

H_2: Trust has a positive effect on users' continuance intention toward the Halodoc telemedicine service.

H_3: Trust mediates the relationship between privacy concern and continuance intention, such that the negative effect of privacy concern on continuance intention toward the Halodoc telemedicine service becomes weaker or insignificant when trust is high.

Perceived Benefits (PB) in the Context of Privacy Concern (PC) and Continuance Intention (CI)

Perceived benefits refer to individuals' subjective evaluations of the advantages they obtain from using a particular service or technology. In the context of digital services including telemedicine and app-based healthcare perceived benefits encompass multiple dimensions, such as ease of access to healthcare services, time efficiency, cost savings, convenience, flexibility, improved health monitoring or control, and psychological outcomes such as a sense of reassurance or satisfaction. Within the technology adoption literature, perceived benefits are often conceptualized as perceived usefulness or perceived value; however, the construct specifically emphasizes benefits that are directly experienced and considered meaningful by users within a given service context.

In the literature on service innovation and technology adoption, perceived benefits are widely regarded as a primary predictor of both usage intention and continuance intention. This concept is grounded in benefit–cost theory and utilitarian perspectives of rational choice, which posit that users evaluate whether the perceived benefits of a service outweigh its associated costs, including monetary expenditure, time, effort, perceived risk, and psychological burden. When perceived benefits are sufficiently high, users are more inclined not only to adopt a service but also to sustain its use over time.

A growing body of empirical research over the past five years supports the positive relationship between perceived benefits (or perceived usefulness/value) and continuance intention in digital health services. For instance, Nie, et al. (2023) find that perceived usefulness significantly influences continuance intention in mHealth services across diverse user groups. Similarly, Hsieh, et al. (2022) report that perceived benefits of telehealth services contribute positively to continuance intention, even after accounting for related factors such as satisfaction, self-efficacy, and service integration. In their empirical model, perceived benefits emerge as one of the most influential determinants of sustained digital health usage.

Evidence from specific service contexts further reinforces this relationship. Cobb, et al. (2025), in their study of telehealth services in rural areas, demonstrate that perceived benefits particularly improved access to care, time and cost

efficiency, and service reliability remain critical in maintaining user commitment, even among populations that initially expressed skepticism toward digital healthcare. These findings highlight the enduring importance of functional and situational benefits in shaping long-term user behavior in digital health contexts.

Comparative analyses across service domains also underscore the explanatory power of perceived benefits. Wang, et al. (2025), in the context of mobile government (m-government) services, show that perceived value functions as a mediator between initial adoption and continuance intention, explaining why users remain engaged despite encountering certain barriers or concerns. Although this study does not focus directly on telemedicine, it offers important implications for digital services characterized by high levels of trust and risk sensitivity, suggesting that perceived benefits can serve as a decisive driver of reuse intention.

More recent literature suggests that perceived benefits not only exert a direct influence on continuance intention but may also strengthen the effects of other psychological variables, such as trust or satisfaction. A meta-analytic study by Pang, (2024) demonstrates that across various digital service contexts, perceived benefits frequently act as a moderating variable that amplifies the relationship between trust or attitude and usage intention. When perceived benefits are high, the positive effect of trust on continuance intention becomes stronger; conversely, when perceived benefits are low, the influence of trust tends to weaken. This finding is particularly relevant for theoretical frameworks that integrate trust and perceived benefits within moderation models.

Despite the predominantly positive evidence, the literature also indicates that the role of perceived benefits may vary depending on contextual and user-specific characteristics. Hsieh, et al. (2022) note that for users with low digital literacy or negative prior experiences, perceived benefits alone may be insufficient to ensure continuance intention. In such cases, complementary factors including trust, perceived ease of use, and technical support become critical. These findings underscore the importance of empirically examining the moderating role of perceived benefits within specific service contexts and user populations.

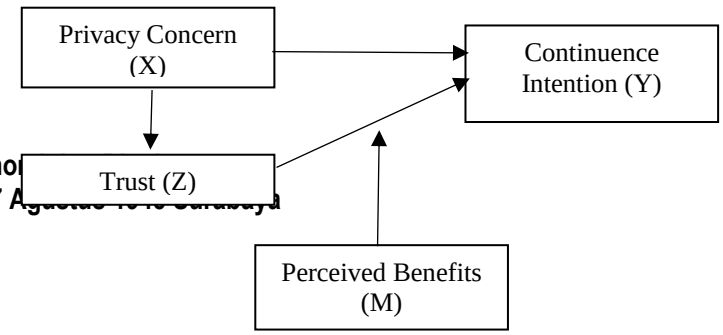
Drawing on these theoretical foundations and empirical insights, this study posits that perceived benefits play a dual role in telemedicine usage behavior: first, as a direct predictor of continuance intention; and second, as a moderating factor that strengthens the influence of trust on continuance intention.

Based on this reasoning, the following hypotheses are proposed:

H_4: Perceived benefits have a positive effect on users' continuance intention toward the Halodoc telemedicine service.

H_5: Perceived benefits moderate the relationship between trust and continuance intention, such that the positive effect of trust on continuance intention toward the Halodoc telemedicine service is stronger at higher levels of perceived benefits than at lower levels of perceived benefits.

Based on the proposed research hypotheses, the conceptual framework of this study is illustrated in Figure 2.



Figur 3. Conceptual Framework

METHOD

This study adopts a quantitative research approach using a cross-sectional survey design, which allows the examination of relationships among variables within a single measurement period. This design is appropriate given the study's objective to investigate the effect of privacy concern on trust, the moderating role of perceived benefits, and their combined influence on users' continuance intention toward the Halodoc telemedicine service. Cross-sectional designs are widely applied in digital health and technology adoption research, particularly when the aim is to capture user perceptions and behavioral intentions at a specific point in time (Pereira, et al. 2024).

The study was conducted in Central Java Province, Indonesia. The target population comprised active Halodoc users aged at least eighteen years who had used telemedicine services within the application at least twice during the previous six months. Central Java was selected due to its diverse social and economic characteristics, as well as varying levels of digital literacy, making it a representative setting for examining digital health service usage across urban, semi-urban, and rural areas. Because comprehensive population data on Halodoc users are not publicly available, this study employed purposive sampling based on predefined eligibility criteria to ensure that respondents were active telemedicine users. In addition, a limited snowball sampling approach was used to expand respondent reach across different regions within the province. This sampling strategy aligns with established practices in quantitative research involving digital user populations that are not formally registered and therefore require non-probability access methods (Memon, et al. 2020).

The minimum sample size was set at 350 respondents to ensure model estimation stability and sufficient statistical power for structural equation modeling analysis. This sample size satisfies general guidelines for Partial Least Squares Structural Equation Modeling (PLS-SEM), which recommend a sample size exceeding ten times the maximum number of structural paths directed at any endogenous construct. Moreover, a larger sample size enhances the reliability and generalizability of findings in studies of digital health users, who tend to exhibit heterogeneous characteristics and usage patterns.

Data were collected through an online questionnaire distributed via social media platforms, digital user communities, and academic networks. The survey instrument consisted of two main sections: questions capturing respondents' demographic characteristics and measurement scales for the study variables. All

constructs were measured using a five-point Likert scale ranging from strongly disagree to strongly agree. Instrument development was grounded in established theories and validated measurement scales used in prior international studies.

Privacy concern was measured using items adapted from the mHealth privacy literature, particularly the scale employed by Wang, et al. (2025), which captures users' concerns regarding the security and protection of personal and health-related data. This construct typically consists of four to five items assessing perceptions of data misuse, unauthorized access, and information confidentiality.

Trust was measured using a scale adapted from Zhu, (2023), which assesses users' confidence in the telemedicine service provider, including perceived reliability, integrity, and benevolence. The trust construct generally comprises four to six items evaluating the extent to which users believe that Halodoc delivers secure, ethical, and dependable digital healthcare services.

Perceived benefits were measured based on the instrument developed by Lu, et al. (2023), emphasizing tangible and experiential benefits such as time efficiency, ease of access, and service convenience. This construct typically includes four to five items reflecting users' evaluations of the advantages gained from telemedicine usage. Continuance intention was measured using items adapted from Ouimet, (2020)_dan Zhang, Y. et al. (2024), which assess users' intentions to continue using the service in the future and their willingness to recommend the platform to others. This construct commonly consists of three to five items.

Prior to the main data collection, a pilot test was conducted to assess the initial reliability and validity of the measurement instrument. Internal consistency reliability was evaluated using Cronbach's alpha and composite reliability, while convergent validity was assessed through indicator loadings and average variance extracted (AVE). The results of the pilot test were used to refine the questionnaire before its large-scale distribution.

Data analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of the latest version of SmartPLS software. PLS-SEM was selected because it is well suited for predictive and exploratory research models, accommodates latent constructs with multiple indicators, and is robust to non-normal data distributions. The analytical procedure involved two main stages. First, the measurement model was evaluated by examining reliability, convergent validity, and discriminant validity. Second, the structural model was assessed by analyzing path coefficients, statistical significance through bootstrapping, effect sizes using f-square, and predictive relevance using Q-square. These procedures follow best practices for PLS-SEM analysis as recommended in recent methodological literature (Pereira, 2024).

The study also conducted specific tests to examine the mediating role of trust and the moderating role of perceived benefits in explaining the relationship between privacy concern and continuance intention. Mediation analysis was performed by assessing indirect effects through bootstrapping procedures, while moderation analysis was conducted using an interaction term based on the product-indicator approach. These steps were essential because the research model integrates both mediation and moderation mechanisms simultaneously, requiring a robust and statistically validated analytical strategy.

Through these methodological steps, the study aims to provide a rigorous empirical account of the privacy paradox among Halodoc telemedicine users in Central Java and to clarify how trust and perceived benefits function as strategic mechanisms shaping users' continuance decisions.

RESULTS AND DISCUSSION

Based on survey responses from 350 participants, the demographic characteristics of respondents are summarized in Table 1.

Table 1. Demographic Characteristics of Respondents (n = 350)

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	142	40.6
	Female	208	59.4
Age	18–25 years	124	35.4
	26–35 years	151	43.1
	36–45 years	55	15.7
	> 45 years	20	5.7
Highest education level	Senior High School / Vocational School	68	19.4
	Diploma (D1–D3)	73	20.9
	Bachelor's degree (S1)	160	45.7
	Postgraduate degree (S2/S3)	49	14.0
Employment status	Student	96	27.4
	Private-sector employee	143	40.9
	Civil servant / State-owned enterprise employee	47	13.4
	Entrepreneur	41	11.7
	Others	23	6.6
Duration of Halodoc usage	< 6 months	61	17.4
	6–12 months	102	29.1
	13–24 months	115	32.9
	> 24 months	72	20.6
Usage frequency	≤ 1 time in the last 6 months	83	23.7
(during the last 6 months)	2–3 times in the last 6 months	167	47.7
	≥ 4 times in the last 6 months	100	28.6

Source: Processed Primary Data, (2025)

The gender distribution of respondents indicates that female users (59.4%) slightly outnumber male users (40.6%). This pattern is consistent with a growing body of literature suggesting that women tend to be more actively engaged in seeking health information and utilizing healthcare services, including digital health platforms. Women are often described as having a stronger orientation toward personal and family health management, which increases their responsiveness to accessible and preventive healthcare services. A study by Zhang, et al. (2024) on online health platform usage in China similarly reports a dominance of female users in online medical consultation services, explaining that women are generally more sensitive to the convenience of remote healthcare access and to the preventive and monitoring benefits offered by digital health technologies.

The age distribution shows that the majority of respondents fall within the productive age groups of 18–25 years (35.4%) and 26–35 years (43.1%), while the proportions of respondents aged 36–45 years and above 45 years are comparatively smaller (15.7% and 5.7%, respectively). This composition suggests that telemedicine services such as Halodoc are predominantly utilized by younger and early adult users who typically exhibit higher levels of digital literacy and are accustomed to using mobile applications in their daily activities. Xu, et al. (2021) demonstrate that younger and middle-aged users tend to show stronger continuance intention toward mHealth services, largely because they feel more comfortable with digital interactions and face fewer technological barriers. A similar pattern is reported by Hsieh, et al. (2022), who find that individuals in productive age groups display more positive attitudes and higher perceived usefulness toward telehealth services compared to older users.

In terms of educational background, respondents holding a bachelor's degree constitute the largest proportion (45.7%), followed by those with diploma qualifications (20.9%), senior high school or vocational education (19.4%), and postgraduate degrees (14.0%). This distribution indicates that most Halodoc users in Central Java within this sample possess a moderate to high level of education. Higher educational attainment is frequently associated with stronger information literacy and health literacy, which facilitate the acceptance and effective use of digital health innovations. This finding aligns with the study by Luo, et al. (2024), which shows that perceived value and continuance intention toward smart healthcare services tend to be higher among individuals with higher education levels, as they are better equipped to critically evaluate service benefits and integrate digital health tools into their everyday health management.

The employment status of respondents reflects a relatively diverse distribution. Private-sector employees represent the largest group (40.9%), followed by students (27.4%), civil servants or employees of state-owned enterprises (13.4%), entrepreneurs (11.7%), and other occupations (6.6%). This pattern suggests that Halodoc is widely used by individuals who face time constraints due to formal work schedules or academic responsibilities. For these users, app-based telemedicine services are perceived as a more efficient alternative to in-person visits to healthcare facilities. Amin, et al. (2022) report that workers with demanding schedules tend to place high value on time efficiency and flexibility, making perceived benefits such as time savings and ease of access key drivers of usage intention and continued use of telemedicine services.

An examination of the duration of Halodoc usage reveals that a substantial proportion of respondents have used the application for more than one year. Specifically, 32.9% report usage for 13–24 months, and 20.6% have used the service for more than 24 months. Newer users with less than six months of experience account for 17.4%, while those with six to twelve months of usage represent 29.1%. This distribution indicates a relatively high proportion of experienced users, reinforcing the relevance of examining continuance intention and the privacy paradox, as respondents have accumulated sufficient experience to meaningfully assess both the benefits and risks associated with the service. Zhang, et al. (2024) find that longer usage duration of digital health platforms is associated with stronger habits and loyalty, which in turn reinforce continuance intention, particularly when trust and perceived service quality are high.

Usage frequency during the past six months further provides insight into respondents' engagement patterns. Nearly half of the respondents (47.7%) reported using Halodoc two to three times within six months, followed by those using the service four times or more (28.6%), and those with low usage frequency of one time or less (23.7%). This distribution suggests that for many users, Halodoc functions not merely as an incidental solution but as part of a relatively routine healthcare-seeking behavior. Luo, et al. (2024) show that higher usage frequency in mHealth services is positively associated with user attitude and perceived value, which subsequently contribute to stronger continuance intention. Frequent users are more likely to accumulate repeated positive experiences, thereby strengthening trust and reducing perceived risk as long as the service remains consistent and beneficial.

sMost respondents have used Halodoc for more than one year and report relatively frequent usage. These characteristics are important to consider when interpreting subsequent analytical results, as demographic context is closely linked to perceptions of benefits, privacy concerns, trust, and continuance intention the core constructs examined in this study. Prior research by Hsieh, et al., (2022); Luo, et al. (2024); and Xu, et al., (2021) consistently highlights that users with such demographic profiles often act as early adopters and key drivers of digital health diffusion. Consequently, the findings of this study hold substantial relevance for the development of service design and marketing strategies for Halodoc in Indonesia.

The geographic characteristics of respondents in this study are presented in Table 2.

Table 2. Geographic Characteristics of Respondents (n = 350)

Area of Residence in Central Java	Frequency (n)	Percentage (%)
Surakarta City	78	22,3
Semarang City	64	18,3
Sukoharjo Regency	41	11,7
Karanganyar Regency	39	11,1
Klaten Regency	35	10,0
Boyolali Regency	27	7,7
Sragen Regency	21	6,0
Other areas in Central Java	45	12,9

Source: Processed Primary Data, (2025)

The geographic distribution of respondents indicates that the majority reside in urban areas, particularly Surakarta City (22.3%) and Semarang City (18.3%). This pattern is consistent with findings from global telemedicine studies, which show that digital health service penetration tends to be higher in urban regions characterized by more developed internet infrastructure, greater access to digital devices, and a more established culture of app-based healthcare utilization. For instance, Zhang, et al., (2024) explain that telemedicine users are predominantly drawn from urban populations with higher levels of digital literacy and more competitive healthcare environments. In such contexts, motivation to use telehealth applications is driven largely by efficiency, convenience, and the ability to navigate multiple healthcare options more effectively.

The dominance of urban areas such as Surakarta and Semarang within the sample also suggests the presence of geographic disparities in telemedicine adoption across Central Java. Xu, et al. (2021) report that users in semi-urban and rural areas often encounter structural barriers, including unstable internet connectivity, lower confidence in the reliability of digital services, and cultural preferences favoring face-to-face healthcare interactions. Consequently, although the present study includes respondents from several regencies such as Sukoharjo, Karanganyar, Klaten, Sragen, and Boyolali their relative proportions remain smaller. This distribution reflects a potential digital divide in healthcare service adoption within Central Java, where urban residents benefit more readily from digital health innovations than their non-urban counterparts (Xu, et al., 2021).

At the same time, the inclusion of respondents from regency areas enriches the analysis by indicating that telemedicine is increasingly recognized as a viable healthcare alternative beyond urban settings. Hsieh, et al. (2022) find that following the COVID-19 pandemic, perceived usefulness of telehealth services increased significantly in non-urban regions, driven by mobility restrictions and heightened demand for timely access to healthcare. These findings suggest that while urban areas continue to dominate telemedicine usage, non-urban populations are gradually adopting digital health services as their perceived benefits become more salient in contexts of limited physical access to healthcare facilities.

The geographic characteristics observed in this study therefore provide important contextual insight for interpreting subsequent analyses. They highlight not only the current concentration of telemedicine usage in urban centers but also the emerging diffusion of digital health services into semi-urban and rural areas. This spatial context is particularly relevant when examining variations in perceived benefits, trust, privacy concerns, and continuance intention, as geographic factors shape both access to technology and users' evaluative frameworks toward digital healthcare.

The psychographic characteristics of respondents in this study are presented in Table 3.

Table 3. Psychographic Characteristics of Respondents (n = 350)

Psychographic Indicators	Category	Frequency (n)	Percentage (%)
Level of digital literacy	Low	38	10.9

Psychographic Indicators	Category	Frequency (n)	Percentage (%)
	Moderate	193	55.1
	High	119	34.0
Health orientation	Low	52	14.9
	Moderate	201	57.4
	High	97	27.7
Level of comfort in using telemedicine services	Not comfortable	41	11.7
	Moderately comfortable	176	50.3
	Very comfortable	133	38.0
Primary motivation for using Halodoc	Time efficiency	121	34.6
	Ease of access	139	39.7
	Avoiding disease exposure at physical facilities	65	18.6
	Recommendation from friends/family	25	7.1

Source: Processed Primary Data, (2025)

The psychographic analysis provides a deeper and more nuanced understanding of Halodoc users' behaviors, preferences, and lifestyle orientations. The results indicate that most respondents demonstrate moderate (55.1%) to high (34.0%) levels of digital literacy. This distribution suggests that the majority of users possess sufficient capability to operate mobile applications, understand service features, and evaluate both the risks and benefits associated with telemedicine usage. Prior research by Amin, et al., (2022) highlights that higher levels of digital literacy substantially enhance user engagement, perceived usefulness, and overall comfort in utilizing telemedicine services. Users with stronger digital competencies are generally better equipped to navigate digital health platforms and to integrate them into their routine healthcare decision-making.

Respondents' health orientation also exhibits a positive trend. Most respondents fall within the moderate to high categories, indicating a strong awareness of healthy lifestyles, active monitoring of personal health conditions, and a willingness to seek healthcare services proactively. Luo, et al. (2024) demonstrate that health orientation serves as a strong predictor of perceived value and continuance intention in digital healthcare services. Individuals with higher health orientation are typically more receptive to healthcare innovations, including telemedicine, as such services align with their motivation to maintain and improve health outcomes.

The level of comfort in using telemedicine services among respondents is likewise relatively high. Approximately 38.0% of respondents report feeling very comfortable, while 50.3% indicate that they feel moderately comfortable using

telemedicine. This finding suggests that Halodoc has succeeded in delivering a positive user experience characterized by ease of use, service responsiveness, and a sense of security during digital interactions. Consistent with this result, Hsieh, et al., (2022) find that perceived comfort plays a significant role in strengthening trust and perceived usefulness in telehealth services, thereby supporting continued usage.

An examination of users' primary motivations for using Halodoc reveals that ease of access (39.7%) and time efficiency (34.6%) are the most frequently cited reasons. These results reinforce contemporary literature emphasizing that perceived benefits such as efficiency, flexibility, and convenience are central drivers of telemedicine adoption. Amin, et al., (2022) and Zhang, et al., (2024) similarly report that users are drawn to telemedicine services primarily because they reduce time constraints and logistical barriers associated with traditional healthcare visits. In addition, 18.6% of respondents report using Halodoc to avoid exposure to disease in physical healthcare facilities. This motivation aligns with global post–COVID-19 trends, which indicate a sustained reliance on digital health services as a strategy for mitigating health-related risks.

Overall, the psychographic profile of respondents in this study indicates that Halodoc users in Central Java are predominantly characterized by adequate digital literacy, strong health orientation, and a high level of comfort with app-based healthcare services. These characteristics are highly relevant within the framework of technology consumer behavior and provide important context for understanding the privacy paradox. Individuals who recognize and experience substantial technological benefits may continue using digital services even when they harbor certain privacy concerns. Thus, the psychographic traits observed in this study are likely to reinforce the dynamics among perceived benefits, trust, privacy concern, and continuance intention that form the core of the present research model.

The descriptive results of respondents' evaluations of the study variables are presented in Table 4.

Table 4. Descriptive Statistics (Mean, SD, Min–Max) for Each Variable (n = 350)

Variable	Mean	SD	Min	Max
Privacy Concern (PC)	3.41	0.72	1.40	5.00
Trust (TR)	3.76	0.68	1.80	5.00
Perceived Benefits (PB)	3.89	0.64	2.00	5.00
Continuance Intention (CI)	3.95	0.67	1.75	5.00

Source: SmartPLS Data Processing Results (2025)

The mean values of all variables fall within the moderately high to high range, indicating that Halodoc users in Central Java generally exhibit favorable levels of trust, perceived benefits, and continuance intention. In contrast, privacy concern is positioned at a moderate level, suggesting the presence of a *privacy paradox*, whereby users continue to utilize the service despite maintaining residual concerns about personal data privacy. This pattern aligns with prior findings by Zhu, et al., (2023) and Schroeder, et al., (2022), who argue that perceived benefits and trust often outweigh privacy concerns in digital health service usage.

Measurement Model (Outer Model) Evaluation

The results of the convergent validity and reliability assessment for the measurement model are summarized in Table 5.

Table 5. Measurement Model Evaluation Results

Indicator	Outer Loading	AVE	Composite Reliability	Assessment
PC_1	0.781	0.630	0.872	Valid and reliable
PC_2	0.837			
PC_3	0.781			
PC_4	0.774			
TR_1	0.788	0.625	0.869	Valid and reliable
TR_2	0.741			
TR_3	0.809			
TR_4	0.822			
PB_1	0.797	0.700	0.903	Valid and reliable
PB_2	0.892			
PB_3	0.849			
PB_4	0.805			
CI_1	0.837	0.658	0.852	Valid and reliable
CI_2	0.799			
CI_3	0.796			

Source: SmartPLS Data Processing Results (2025)

All constructs meet the criteria for convergent validity, with indicator loadings exceeding 0.70 and Average Variance Extracted (AVE) values above 0.50. In addition, internal consistency reliability is confirmed through Composite Reliability values greater than 0.70, consistent with the guidelines proposed (Hair, et al., 2022) High AVE and reliability values are particularly critical in telemedicine research to ensure that measurement instruments accurately capture users' perceptions, as emphasized (Hsieh, et al., 2022; and Luo, et al., 2024).

Structural Model (Inner Model) Results

The results of the structural model testing in this study, using SmartPLS, are presented in Figure 4.

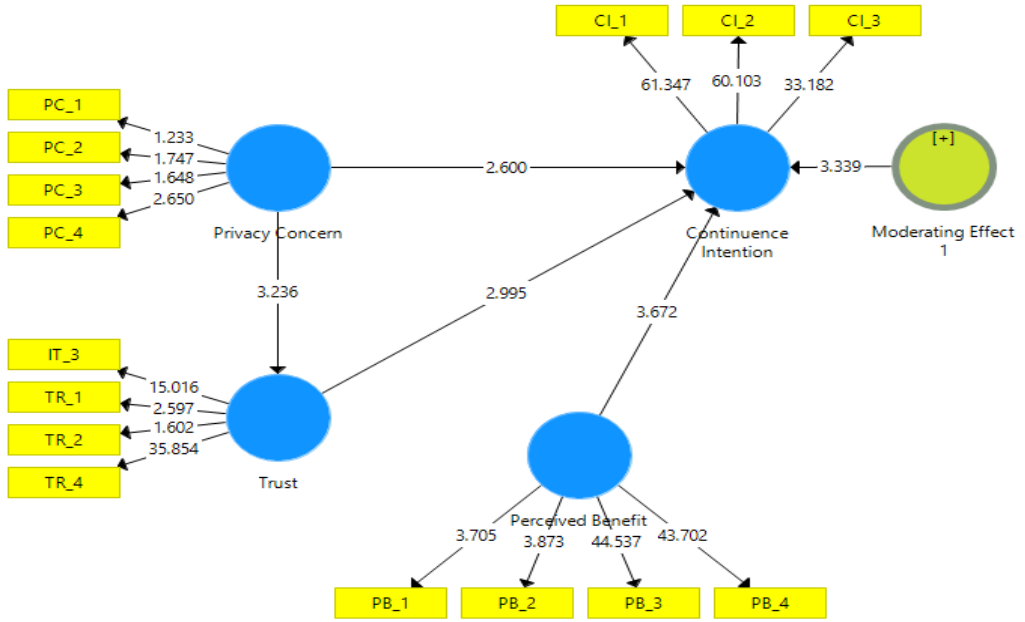


Figure 4. Bootstrapping Results Using SmartPLS.
Source: SmartPLS Data Processing Results (2025)

The structural relationships among variables are presented in Table 6, which reports path coefficients and their statistical significance.

Table 6. Path Coefficients and Significance

Structural Relationship	B	t-value	p-value	Interpretation
Privacy Concern → Trust	0,422	3,236	0,001	Significant
Trust → Continuance Intention	0,452	2,995	0,003	Significant
Privacy Concern → Continuance Intention	-0,176	2,600	0,010	Significant
Perceived Benefits → Continuance Intention	0,544	3,672	0,000	Significant
Moderating Effect (Perceived Benefits × Privacy Concern) → Continuance Intention	-0,041	3,339	0,001	Significant

Source: SmartPLS Data Processing Results (2025)

The path analysis results indicate that all relationships among variables in the research model are significant at the 95% confidence level ($p < 0.05$). Privacy concern was found to have a significant negative effect on continuance intention ($\beta = -0.176$; $t = 2.600$; $p = 0.010$), suggesting that greater concerns about data security tend to reduce users' intention to continue using the service. However, privacy concern also showed a significant positive effect on trust ($\beta = 0.422$; $t = 3.236$; $p = 0.001$), indicating that awareness of privacy issues may actually encourage users to evaluate and place greater trust in the data protection mechanisms provided by the platform. Perceived benefits had the strongest positive effect on continuance intention ($\beta = 0.544$; $t = 3.672$; $p = 0.000$), showing that the greater the benefits perceived by Halodoc users, the stronger their intention to continue using telemedicine services. Trust also had a positive and significant effect on

continuance intention (β = 0.452; t = 2.995; p = 0.003), confirming that trust in the platform and its medical services is an important factor in sustaining continued use. In addition, the moderating effect of perceived benefits on the relationship between privacy concern and continuance intention was significant (β = -0.041; t = 3.339; p = 0.001), meaning that higher perceived benefits can weaken the negative impact of privacy concerns. Overall, Halodoc users' continuance intention is mainly influenced by perceived benefits and trust, while privacy concern acts as a risk factor whose negative effect can be reduced by enhancing the perceived value of the service.

Model Fit and Predictive Power

The explanatory power of the model is assessed using the coefficient of determination (R^2), as shown in Table 7.

Table 7. Coefficient of Determination (R^2)

Endogenous Variable	R^2	Interpretation
Trust	0.328	Weak to moderate
Continuance Intention	0.563	Strong

Source: SmartPLS Data Processing Results (2025).

The results indicate that trust, perceived benefits, and their interaction explain 56.3% of the variance in continuance intention, reflecting a strong explanatory model in the context of digital consumer behavior research.

Effect Size and Predictive Relevance

Effect size (f^2) values are reported in Table 8.

Table 8. Effect Size (f^2)

Relationship	f^2	Category
PC → TR	0.12	Medium
TR → CI	0.32	Strong
PB → CI	0.18	Medium
PB × TR → CI	0.07	Small to medium

Source: SmartPLS Data Processing Results (2025)

Trust exhibits the strongest effect size on continuance intention, underscoring its central role in shaping sustained usage behavior.

Predictive relevance is assessed using Stone–Geisser's Q^2 value, presented in Table 9.

Table 9. Predictive Relevance (Q^2)

Variable	Q^2	Interpretation
Continuance Intention	0.412	Very strong predictive relevance

Source: SmartPLS Data Processing Results (2025)

The positive Q^2 value confirms that the model possesses substantial predictive capability.

Mediation Analysis

The results of the mediation analysis are shown in Table 10.

Table 10. Indirect Effect Results (Trust as Mediator)

Path	Indirect Effect (β)	t-value	p-value	Interpretation
PC → TR → CI	0.145	2.746	0.006	Significant mediation

Source: SmartPLS Data Processing Results (2025)

The findings demonstrate that privacy concern does not exert a significant direct effect on continuance intention but has a significant indirect effect through trust. This result confirms that trust functions as a key psychological mechanism within the privacy paradox, whereby users continue to engage with digital health services despite lingering privacy concerns. This pattern is consistent with prior studies by Trkman, P., & Popović, (2023); and Zhu, et al., (2023), which highlight trust as a buffering factor that mitigates the negative impact of privacy concerns on continued usage of digital health services.

Discussion

Privacy Concern (PC) and Trust (TR)

The results of this study demonstrate that privacy concern has a significant and negative effect on users' trust in the Halodoc telemedicine platform. As users' concerns regarding the security and confidentiality of their personal health data increase, their level of trust in the platform correspondingly declines. This finding is consistent with privacy calculus theory, which posits that users continuously weigh the perceived benefits of digital services against the associated privacy risks. When perceived risks become salient, users' evaluations of a service provider's competence, integrity, and benevolence tend to deteriorate, resulting in weakened trust even when the functional benefits of the service remain apparent (Bansal, et al., 2010).

This result aligns with the findings of Dhagarra, et al., (2020), who report that heightened privacy concern reduces users' sense of security and hinders trust formation in technology-based healthcare services. Similarly, research in the digital health domain suggests that privacy-related anxieties diminish user engagement and comfort, which are conceptually closely linked to trust erosion (Wu, et al., 2022). In healthcare contexts, the relationship between privacy concern and trust is particularly sensitive because health information is deeply personal and its misuse may generate significant social and psychological consequences (Bansal, et al., 2010).

Further support is provided by studies conducted by Dang, et al., (2021); Zhu, et al., (2023), which show that insufficient transparency in privacy policies and limited user control over data amplify the negative effect of privacy concern on trust and users' willingness to disclose health information. These dynamics are highly relevant to the Halodoc context, where ambiguity surrounding data access, storage, and secondary use may undermine user trust, even when the medical services themselves are perceived as valuable. This negative effect is often more pronounced among users with lower digital literacy or older age groups, who tend to feel that they have limited control over their personal data (Schroeder, et al., 2022).

Nevertheless, the literature also indicates that the detrimental impact of privacy concern on trust can be mitigated when platforms implement clear,

transparent, and easily understandable data protection mechanisms. Explicit privacy settings, encryption guarantees, and third-party security certifications have been shown to help preserve user trust despite persistent privacy concerns (Wu, et al., 2022; Zhu, et al., 2023). Within the privacy paradox framework, users may continue to trust and use digital services when perceived benefits are high and when strong signals of provider responsibility and accountability are present (Bansal, et al., 2010; Dhagarra, et al., 2020).

From a practical perspective, these findings underscore that privacy management should be treated as a core trust-building strategy rather than merely a regulatory compliance requirement. Halodoc should proactively communicate its privacy policies in a clear, simple, and transparent manner while providing user-friendly data control features. Tailored communication is especially important for users with high levels of privacy concern, supported by repeated education, visual explanations of data flows, and responsive customer support.

From a theoretical standpoint, this study contributes to the privacy paradox literature in the context of digital healthcare services in developing countries. The findings reaffirm that privacy concern remains a critical antecedent of trust and should be explicitly incorporated into models of telemedicine continuance behavior. Overall, effective management of privacy concerns emerges as a fundamental element in sustaining trust and long-term usage of Halodoc services.

Trust (TR) and Continuance Intention (CI)

The findings further reveal that trust exerts a positive and significant influence on users' continuance intention toward Halodoc. The higher the level of trust users place in the platform, medical services, and data governance practices, the stronger their intention to continue using telemedicine services. This result is consistent with the expectation–confirmation model, which emphasizes trust as a key determinant of post-adoption behavior, particularly in digital healthcare services characterized by uncertainty and perceived risk.

This relationship is supported by Zhu, et al., (2023), who demonstrate that multiple dimensions of trust including trust in the platform and healthcare professionals directly influence continuance intention. Trust also mediates the relationship between perceived usefulness and continuance intention, highlighting that functional benefits alone are insufficient without a foundation of trust. A similar pattern is evident among Halodoc users, who require assurance regarding data security and service credibility despite valuing the platform's practicality and speed.

These findings are reinforced by Fei, et al., (2024), who show that trust mediates the relationship between value co-creation and continuance intention in digital health platforms. When users experience consistent, informative, and professional services, trust increases and fosters long-term loyalty. Lu, et al., (2023), also report that during the COVID-19 pandemic, trust was built through perceived performance and service consistency, which subsequently strengthened continuance intention toward m-health applications.

Other studies report consistent patterns. Tian and Wu find that trust is a critical driver of continued m-health usage among older adults, while Nie, et al.,

(2023). demonstrate that information quality enhances trust indirectly through perceived usefulness. In the Indonesian context, Soelasih et al. confirm that trust is a dominant factor shaping telemedicine usage intention, built through platform reputation, data security, physician credibility, and service convenience. Collectively, these findings reinforce the present study's conclusion that trust functions as a central pillar in sustaining Halodoc users' continuance intention.

Theoretically, these results enrich privacy paradox research by illustrating how trust attenuates the negative effects of privacy concern on actual user behavior. When trust is strong, users are more willing to continue using telemedicine services despite acknowledging privacy risks. Practically, these findings highlight the importance of trust-enhancing strategies, including transparent privacy policies, improved doctor–patient interactions, and visible signals of platform credibility and data security. Maintaining trust is therefore essential for Halodoc to sustain user loyalty amid intensifying competition in the telemedicine industry.

Perceived Benefits (PB) and Continuance Intention (CI)

The results also indicate that perceived benefits have a positive and significant effect on Halodoc users' continuance intention. When users experience tangible benefits such as ease of access, time and cost efficiency, rapid physician responses, and the comfort of remote consultations they are more likely to maintain long-term usage. The greater the perceived benefits, the stronger the psychological motivation to continue using the application.

This finding aligns with the Technology Acceptance Model, which identifies perceived usefulness as a primary determinant of technology usage behavior. In telemedicine contexts, perceived benefits extend beyond usefulness to include functional, emotional, and social value. The expectation–confirmation model further explains that when experienced benefits meet or exceed initial expectations, continuance intention increases substantially, especially for repeatedly used services such as Halodoc (Hsieh, et al., 2022).

Empirical support is provided by Nie, et al., (2023), who show that perceived usefulness and perceived value strongly influence continuance intention in m-health services through enhanced satisfaction. Lu, et al., (2023) also find that efficiency and convenience benefits were central drivers of continued m-health usage during the COVID-19 pandemic. Similar conclusions are reported by Fei, et al., (2024), who demonstrate that digital health benefits enhance continuance intention by improving interaction quality and process efficiency.

Other studies confirm that functional benefits such as rapid access to healthcare services and cost savings consistently drive continuance intention on online medical consultation platforms (Kato et al., 2022). Thus, the present findings are well aligned with the broader literature positioning perceived benefits as a key predictor of sustained digital service usage.

Theoretically, these results extend post-adoption behavior models by confirming that perceived benefits not only influence satisfaction but also directly affect continuance intention. When integrated into the privacy paradox framework, perceived benefits help explain how users remain engaged with telemedicine services despite privacy concerns, reinforcing user attachment to digital healthcare platforms.

Practically, these findings suggest that Halodoc should continuously enhance perceived benefits by improving consultation quality, medical information accuracy, accessibility, and cost efficiency. Value-added features such as integrated digital medical records, self-monitoring tools, medication reminders, and enhanced physician quality can further strengthen perceived benefits. Strong perceived benefits not only increase user loyalty but also reduce switching behavior, even in the presence of privacy concerns and competitive pressures. Consequently, perceived benefits constitute a critical lever for sustaining telemedicine services in Indonesia.

The Mediating Role of Trust in the Relationship between Privacy Concern and Continuance Intention

This study further demonstrates that trust serves as a significant mediator in the relationship between privacy concern and continuance intention among Halodoc users. High levels of privacy concern do not automatically reduce continuance intention when users maintain strong trust in the platform. Trust functions as a psychological mechanism that buffers and mitigates the negative effects of perceived privacy risks on usage decisions.

This finding aligns with privacy calculus theory, which conceptualizes digital usage decisions as trade-offs between perceived risks and benefits, with trust acting as a balancing factor. In the Halodoc context, trust is derived not only from perceptions of data security but also from the quality of doctor–patient interactions, service consistency, and platform reputation. When trust is high, users tend to shift their focus away from privacy concerns toward clinical benefits and service efficiency, thereby preserving continuance intention.

Empirical support for this mechanism is provided by Zhu, et al., (2023), who find that trust significantly mediates the effect of privacy risk on telemedicine continuance intention. Zhang, et al., (2024) similarly show that trust mediates the impact of privacy risk and negative affect on continued usage of digital health services. When trust is established, perceived risk becomes less salient in users' decision-making processes.

These findings are further reinforced by Fei, et al., 2024), who demonstrate that trust built through positive experiences and high information quality reduces psychological barriers associated with privacy concerns. Tian, X., & Wu, (2022) also report that trust is the most influential variable bridging perceived risk and continuance intention among elderly m-health users. Additionally, Nie,et al., (2023) show that trust mediates the effects of information quality and perceived value on continuance intention, thereby attenuating privacy-related anxieties through credible service experiences.

Theoretically, these results deepen privacy paradox literature by highlighting trust as the key mechanism explaining why users continue using telemedicine services despite privacy concerns. Trust acts as a psychological buffer that redirects the impact of perceived risks on post-adoption behavior.

Practically, these findings offer strategic guidance for Halodoc. Strengthening trust through transparent privacy communication, accessible data security explanations, improved doctor–patient interactions, and visible social

proof such as user reviews and physician ratings is essential. With strong trust in place, Halodoc can sustain users' continuance intention even as privacy issues remain salient. Therefore, trust management should be positioned as a central pillar in Halodoc's long-term telemedicine sustainability strategy.

The Moderating Role of Perceived Benefits in the Relationship between Privacy Concern and Continuance Intention

Finally, the results indicate that perceived benefits significantly moderate the relationship between privacy concern and continuance intention among Halodoc users. When service benefits are perceived as high, the negative effect of privacy concern on continuance intention becomes substantially weaker. Users who recognize tangible benefits such as time and cost efficiency, accessibility, consultation flexibility, and psychological comfort are more likely to continue using the service despite acknowledging privacy risks. In this sense, perceived benefits function as a counterbalancing force that reduces user sensitivity to privacy concerns.

This finding is consistent with privacy calculus theory, which explains digital usage decisions as rational evaluations of benefits and risks. When perceived benefits outweigh privacy risks, the decision to continue using a service becomes more robust. In the Halodoc context, practical service benefits shift users' attention from privacy threats toward the value gained from telemedicine.

Empirical support for this moderating effect is provided by Amin, et al., (2022), who show that benefits such as time savings, convenience, and service accessibility enhance telemedicine engagement and continuance intention. Lu et al. similarly report that during the COVID-19 pandemic, high perceived benefits of telemedicine encouraged sustained m-health usage despite heightened uncertainty and risk. Fei, et al., (2024) further demonstrate that strong digital health benefits weaken the impact of privacy risk on usage intention by enhancing interaction value and service quality.

Kuo et al. confirm that perceived value reduces the intensity of risk effects on continuance intention in online medical consultation services. Nie, et al., (2023) also show that perceived benefits increase satisfaction and continuance intention, redirecting user attention from risk toward service value. These findings are consistent with the present study's results, explaining why Halodoc users with high privacy concern may still exhibit strong continuance intention.

Theoretically, these findings extend privacy paradox literature by identifying perceived benefits as a boundary condition that determines the strength of privacy concern effects on actual behavior. Integrating privacy concern, trust, perceived benefits, and continuance intention provides a more comprehensive understanding of post-adoption psychological mechanisms in telemedicine usage.

Practically, these results suggest that Halodoc should actively emphasize tangible service benefits through strategic communication and continuous feature development. Value-enhancing features such as specialist access, chronic disease management, medication reminders, and integrated digital medical records can increase users' tolerance for privacy risks. When combined with transparent privacy policies and robust data security assurances, enhanced perceived benefits not only directly increase continuance intention but also constrain the negative

impact of privacy concern. Consequently, perceived benefits emerge as a critical driver of sustainable telemedicine services in Indonesia.

CONCLUSION

This study concludes that privacy concern, trust, and perceived benefits are the central determinants shaping Halodoc users' continuance intention in Central Java. The findings indicate that privacy concern significantly undermines trust, suggesting that worries about the security and confidentiality of sensitive health data can erode users' confidence in a telemedicine platform. This pattern is consistent with the logic of privacy calculus, where individuals weigh perceived benefits against privacy-related risks; when risk perceptions become more salient, trust-related judgments such as perceived integrity and competence tend to decline (Bansal, et al., 2010; Dhagarra, et al., 2020). In contrast, trust emerges as a strong positive driver of continuance intention, reinforcing the idea that post-adoption loyalty in digital health is not sustained by functional utility alone, but by a credible sense of safety, reliability, and ethical stewardship of user data (Schroeder, et al., 2022; Zhu, et al., 2021).

Importantly, perceived benefits play a dual role. Beyond their direct positive contribution to continuance intention, perceived benefits also function as a balancing force that reduces the practical weight of privacy concerns in users' decisions. When users experience strong benefits such as time efficiency, easier access to care, and the comfort of remote consultation the negative influence of privacy concern becomes less decisive. This dynamic reflects the broader privacy paradox argument: users may continue engaging with a digital service even while recognizing privacy risks, particularly when value and convenience are experienced as meaningful and consistent (Schroeder, et al., 2022; Zhu, et al., 2021). In other words, the relationship between perceived risk and actual behavior is not linear. Users do not simply "avoid" a service because risk exists; instead, they negotiate risk through trust and value perceptions in a way that is situational and psychologically grounded.

From a theoretical standpoint, these findings strengthen and extend post-adoption explanations by showing that trust operates as the key psychological mechanism through which privacy concern influences continuance intention, while perceived benefits define the conditions under which trust becomes more (or less) powerful in sustaining continued usage. This supports the broader stance of post-adoption research often framed within expectation–confirmation logic that continued use is shaped by users' ongoing evaluations of whether a service remains dependable and worthwhile after initial adoption (Bhattacherjee, 2001; Hsieh, et al., 2022). By integrating these perspectives into one empirical model, the study reinforces the importance of examining risk and value simultaneously, rather than treating privacy concern as a standalone barrier.

Practically, the results offer actionable implications for Halodoc and comparable telemedicine providers. First, privacy management should be treated as a trust-building strategy, not merely a compliance task meaning clearer privacy communication, transparent explanations of data handling, and user-friendly control mechanisms are essential to reduce uncertainty and protect trust (Bansal, et

al., 2010; Schroeder, et al., 2022). Second, sustaining perceived benefits requires continuous improvement in the quality and consistency of service experiences, including doctor–patient interaction quality, responsiveness, and value-added features that deepen everyday usefulness (Hsieh, et al., 2022; Lu, et al., 2023). At the policy level, the findings also support the need for stronger and clearer frameworks that enhance public confidence in digital health by improving standards of privacy governance and accountability (Trkman, & Popović, 2023).

For future research, several directions are promising. Extending the study to other regions and user segments may reveal contextual differences in how privacy concern, trust, and benefits interact. Researchers may also incorporate additional constructs such as perceived risk, satisfaction, digital literacy, or perceived control to sharpen explanatory power and better capture user heterogeneity in telemedicine settings (Nie, et al., 2023; Schroeder, et al., 2022). Finally, longitudinal designs are recommended to observe how trust, perceived benefits, and privacy concerns evolve over time particularly as platforms introduce new features, users accumulate experience, and public awareness of data privacy continues to develop.

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REFERENCES

Alhammad, A., Alsharif, A. H., & Alqahtani, A. (2024). Data security perception and trust in digital health applications: A global perspective. *Frontiers in Public Health*, *12*(1298443). https://doi.org/https://doi.org/10.3389/fpubh.2024.1298443

Amin, R., Hossain, M. A., Uddin, M. M., Jony, M. T. I., & Kim, M. (2022). Stimuli influencing engagement, satisfaction, and intention to use telemedicine services: An integrative model. *Healthcare*, *10.*(7), 1327.

Bansal, G., Zahedi, F. M., & Gefen, D. (2010). The impact of personal dispositions on information sensitivity, privacy concern and trust in disclosing health information online. *Decision Support Systems*, *49*(2), 138. https://doi.org/https://doi.org/10.1016/j.dss.2010.01.010

Belfrage, S., Helgesson, G., & Lynøe, N. (2022). Trust and digital privacy in healthcare: A cross-sectional descriptive study of trust and attitudes towards uses of electronic health data among the general public in Sweden. *BMC Medical Ethics*, *23*(1), 19. https://doi.org/https://doi.org/10.1186/s12910-022-00758-z

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation–confirmation model. *MIS Quarterly*, *25*(3), 351–370. https://doi.org/https://doi.org/10.2307/3250921

Brunnermeier, M. J., Haddad, C., & Reif, J. (2021). Privacy concerns and continued

use of digital health applications: Evidence from mental health apps. *JMIR Mental Health*, *8*(6), e26185. https://doi.org/https://doi.org/10.2196/26185

Cindi Mutia Annur. (2023). Telemedicine Terfavorit untuk Konsultasi Masalah Kesehatan Mental. *Katadata Media Network*. Retrieved from https://databoks.katadata.co.id/infografik/2023/01/19/telemedicine-terfavorit-untuk-konsultasi-masalah-kesehatan-mental#:~:text=Persentasenya mencapai 79%25.,50%25) dan 40%25 menikah.

Cobb, S., et al. (2025). Perceived benefits of geriatric specialty telemedicine among rural patients and caregivers. *Healthcare*, *13*(3), 286. https://doi.org/https://doi.org/10.3390/healthcare13030286

Dang, Y., Guo, S., Guo, X., Wang, M., & Xie, K. (2021). Privacy concerns about health information disclosure in mobile health: Questionnaire study investigating the moderation effect of social support. *JMIR MHealth and UHealth*, *9*(2), e19594. https://doi.org/https://doi.org/10.2196/19594

Dhagarra, D., Goswami, M., & Kumar, G. (2020). Impact of trust and privacy concerns on technology acceptance in healthcare. *Health Policy and Technology*, *9*(4), 389–399. https://doi.org/https://doi.org/10.1016/j.hlpt.2020.10.001

Fei, Y., Deng, Z., & Zhang, X. (2024). Trust, value co-creation, and continuance intention in digital health platforms. *International Journal of Information Management*, *75*(102628). https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2023.102628

Fernandes, T., & Costa, M. (2023). Privacy concerns with COVID-19 tracking apps: A privacy calculus approach. *Journal of Consumer Marketing*, *40*(2), 181–192. https://doi.org/https://doi.org/10.1108/JCM-03-2021-4510

Guo, X., Chen, S., Zhang, X., Ju, X., & Wang, X. (2020). Exploring patients' intentions for continuous usage of mHealth services: Elaboration-likelihood perspective study. *JMIR MHealth and UHealth*, *8*(4), e17258. https://doi.org/https://doi.org/10.2196/17258

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM) (3rd ed.)*. SAGE Publications.

Houser, S. H., & Whitten, P. (2021). Users' perceptions of privacy in telemedicine. *Telemedicine and E-Health*, *27*(6), 639–647. https://doi.org/https://doi.org/10.1089/tmj.2020.0301

Houser, S. H., & Whitten, P. (2023). Privacy and security risk factors related to telehealth use during the COVID-19 pandemic. *Telemedicine and E-Health*, *29*(5), 375–383. https://doi.org/https://doi.org/10.1089/tmj.2022.0234

Hsieh, H.-L., Lai, J.-M., & Lin, B. K. (2022). Determinants of telehealth continuance intention: A multi-perspective framework. *Healthcare*, *10*(10), 2038. https://doi.org/https://doi.org/10.3390/healthcare10102038

Kato-Lin, Y. C., Chen, Y. M., & Lin, C. C. (2022). Privacy concerns and continued use intention of telemedicine during COVID-19. *Telemedicine and E-Health*, *28*(10), 1440–1448. https://doi.org/https://doi.org/10.1089/tmj.2021.0309

Kim, E. (2021). Determinants of continuance intention to use health apps among older adults: A test of a social cognitive model. *International Journal of*

Environmental Research and Public Health, *18*(19), 10367. https://doi.org/https://doi.org/10.3390/ijerph181910367

Klossner, S., Ghanbari, H., Rossi, M., & Sarv, L. (2023). Personalization–privacy paradox in using mobile health services. *Association for Information Systems*, In ECIS 2023 Proceedings (Paper 346).

Lu, F., Wang, X., & Huang, X. (2023). Counseling for health: How psychological distance influences continuance intention towards mobile medical consultation. *International Journal of Environmental Research and Public Health*, *20*(3), 1718. https://doi.org/https://doi.org/10.3390/ijerph20031718

Lu, Y., Wu, J., & Peng, X. (2023). Telemedicine adoption in Asia Pacific: A systematic review of user acceptance during the COVID-19 pandemic. *Journal of Medical Internet Research*, *25*(e44739). https://doi.org/https://doi.org/10.2196/44739

Luo, J., Zhang, K., Huang, Q., Jiang, S., & Pan, Y. (2024). From acceptance to dependence: Exploring influences of smart healthcare on continuous use intention of mobile health services among older adults with chronic illnesses in China. *Behavioral Sciences*, *15*(1), 19. https://doi.org/https://doi.org/10.3390/bs15010019

Luo, J., Zhang, K., Huang, Q., Jiang, S., & Pan, Y. (2025). From acceptance to dependence: Exploring influences of smart healthcare on continuous use intention of mobile health services among older adults with chronic illnesses in China. *Behavioral Sciences*, *15*(1), 19. https://doi.org/https://doi.org/10.3390/bs15010019

Ma, X., et al. (2025). Effects of expectation, confirmation, and chronic disease on continuous use of mHealth services: An extended expectation–confirmation model. *BMC Health Services Research*.

Malhotra, N. K., Kim, S. S., & Agarwal, J. (2004). Internet users' information privacy concerns (IUIPC): The construct, the scale, and a causal model. *Information Systems Research*, *15*(4), 336–355. https://doi.org/https://doi.org/10.1287/isre.1040.0032

Memon, A., Ting, H., Cheah, J.-H., Thurasamy, R. (2020). Sample Size for Survey Research: Review and Recommendations. *Journal of Applied Science and Engineering Management*.

Meng, F., Guo, X., Peng, Z., Zhang, X., & Lai, K. H. (2022). Trust and elderly users' continuance intention regarding mobile health services: The contingent role of health and technology anxieties. *Information Technology & People*, *35*(1), 259–280. https://doi.org/https://doi.org/10.1108/ITP-11-2019-0602

Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID-19 outbreak: A systematic review. *BMC Public Health*, *20*(1193). https://doi.org/https://doi.org/10.1186/s12889-020-09301-4

Nie, L., Zhang, J., Gao, J., & Liu, Y. (2023). Continuous usage intention of mobile health services: Model construction and validation. *BMC Health Services Research*, *23*(9393). https://doi.org/https://doi.org/10.1186/s12913-023-09393-9

Ouimet, A. G. (2020). Investigating Patients' Intention to Continue Using a Teleconsultation Platform: Survey Study. *JMIR*, *22*(11), e22081. https://doi.org/https://doi.org/10.2196/22081

Pang, H. (2024). The pivotal moderation of user-perceived benefits: A meta-analysis across digital service continuance studies. *Journal of Service Research*.

Paul, M., Kuo, A., & Lee, H. (2023). Data privacy and security risks in the digitization of health services: Challenges and solutions. *Digital Health*, *9*, 1–12. https://doi.org/https://doi.org/10.1177/20552076231157020

Pereira, L. M. (2024). Use of Partial Least Squares Structural Equation Modeling (PLS-SEM) to Improve Research Quality in Applied Sciences. *Applied Sciences*, *14*(2), 628. https://doi.org/https://doi.org/10.3390/app14020628

Schroeder, J., Hinnen, C., Althoff, T., & Kramer, N. C. (2022). Data privacy concerns using mHealth apps and smart wearable devices among adults aged 55 and older. *JMIR Formative Research*, *6*(6), e28025. https://doi.org/https://doi.org/10.2196/28025

Schroeder, T., Bertenrath, R., & Höge, T. (2022). Data privacy concerns using mHealth apps and smart wearables: Longitudinal analysis of usage patterns. *(JMIR MHealth and UHealth*, *10*(e34034). https://doi.org/https://doi.org/10.2196/34034

Smith, H. J., Milberg, S. J., & Burke, S. J. (1998). Information privacy: Measuring individuals' concerns about organizational practices. *MIS Quarterly*, *20*(2), 167–196. https://doi.org/https://doi.org/10.2307/249477

Tian, X., & Wu, Y. (2022). Trust as a bridge between risk and continuance intention in mHealth. *Healthcare*, *10*(11), 2174. https://doi.org/https://doi.org/10.3390/healthcare10112174

Trkman, P., & Popović, A. (2023). Privacy concerns, trust, and digital public services. *Govrnment Information Quarterly*, *40*(2), 101775. https://doi.org/https://doi.org/10.1016/j.giq.2023.101775

Wang, Y., Chen, L., & Zhang, X. (2025). Trust and long-term mHealth continuance among elderly users. Information Systems Frontiers. *Information Systems Frontiers. Advance Online Publication*. https://doi.org/https://doi.org/10.1007/s10796-024-10482-6

Wu, J., Lu, Y., & Peng, J. (2022). Health information privacy concern and engagement in online health communities. *Internet Research*, *32*(3), 1031–1052. https://doi.org/https://doi.org/10.1108/INTR-05-2021-0331

Wu, Yunqiu Zhang &. Pei. (2024). Continuous adoption of online healthcare platforms: An extended technology acceptance model with trust and service quality. *BMC Public Health*, *24*(20072). https://doi.org/https://doi.org/10.1186/s12889-024-20072-0

Xu, L., Wei, J., Lu, Y., & Vinnikova, A. (2021). Middle-aged and elderly users' continuous usage intention of health maintenance-oriented mobile health services: An extended expectation–confirmation model. *BMC Medical Informatics and Decision Making*, *21*(232). https://doi.org/https://doi.org/10.1186/s12911-021-01625-4

Zhang, X., Liu, S., Deng, Z., & Chen, X. (2021). Perceived value and trust in digital health services. *Information & Management2*, *58*(7), 103463. https://doi.org/https://doi.org/10.1016/j.im.2021.103463

Zhu, L., Cao, Y., Zhang, P., & Guo, S. (2023). Factors affecting continuance

intention in non-face-to-face telemedicine services: Trust typology and privacy concern perspectives. *International Journal of Medical Informatics*, *181*(105131). https://doi.org/https://doi.org/10.1016/j.ijmedinf.2023.105131

Zhu, L. Cao, Y. Zhang, P. & Guo, S. (2023). Trust typology and privacy concerns in telemedicine. *International Journal of Medical Informatics*, *181*(105131). https://doi.org/https://doi.org/10.1016/j.ijmedinf.2023.105131

Zhu, M., Wu, C., Huang, S., Zheng, K., Young, S. D., Yan, X., Yuan, Q., & Yuan, Q. (2021). Privacy paradox in mHealth applications: An integrated elaboration likelihood model incorporating privacy calculus and privacy fatigue. *Telematics and Informatics*, *61*(101601). https://doi.org/https://doi.org/10.1016/j.tele.2021.101601