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Trust in Telemedicine application adoption: Extending the UTAUT model

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ABSTRACT

The adoption of telemedicine applications has garnered increasing scholarly attention, particularly due to the sensitive nature of personal health data and the pivotal role of trust in digital healthcare environments. Grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), this study examines the antecedents and outcomes of trust in the context of telemedicine app acceptance. Utilizing survey data collected from 364 users, the findings reveal that performance expectancy, effort expectancy, and social influence exert significant positive effects on trust, which, in turn, significantly influences users' behavioral intention to use telemedicine applications. Mediation analysis further demonstrates that trust serves as a crucial intervening mechanism linking key UTAUT constructs to usage intention, underscoring its theoretical and practical relevance. This research contributes to the literature on technology acceptance by extending the UTAUT model to explicitly incorporate trust as a central construct in the healthcare domain. The findings provide actionable guidance for policymakers and healthcare service providers, emphasizing the need to design digital health platforms that foster user trust through transparent data practices, intuitive interfaces, and socially endorsed adoption strategies. By highlighting trust's mediating role, this study informs the development of user-centered service designs and effective digital healthcare policies aimed at enhancing telemedicine adoption, especially in contexts where patient data security and service credibility are paramount.

Contribution/Originality: This study contributes to the existing literature by extending the UTAUT model to include trust within the context of telemedicine adoption. It employs hierarchical regression and mediation analysis. It is among the few studies investigating the mediating role of trust in technology acceptance within healthcare.

1. INTRODUCTION

The ongoing acceleration of digital transformation is profoundly reshaping the global healthcare sector. Among various innovations, digital healthcare, defined as the application of information and communication technologies (ICT) in health management and medical services, has emerged as a promising solution to improve medical accessibility, reduce healthcare costs, and enhance patient convenience (Fisher & Magin, 2022). Telemedicine, a representative branch of digital healthcare, refers to the provision of medical services remotely through ICT (Jung et al., 2021). The COVID-19 pandemic significantly accelerated the global adoption of telemedicine, prompting many countries to introduce and scale supportive policies (Fisher & Magin, 2022).

Despite these policy developments, actual user adoption of telemedicine applications remains limited. Numerous studies have identified key barriers, including concerns over information security (Alam, Hu, Hoque, & Kaium, 2020),

issues of system reliability (Lee & Rho, 2013), and disparities in digital literacy (Hincapié et al., 2020). Due to the sensitive nature of medical data, users increasingly prioritize not only functional benefits but also trust in telemedicine platforms. Bahari, Mutambik, Almuqrin, and Alharbi (2024) emphasized that trust is a central factor in telemedicine acceptance, as it reflects users' perceptions of security, consistency, and technological stability. Although previous research suggests that trust can be influenced by performance expectancy, effort expectancy, and social influence, the mechanisms remain inconsistently understood, requiring further empirical investigation (Dwivedi, Rana, Tamilmani, & Raman, 2019; Kuen et al., 2023; Luo, Li, Zhang, & Shim, 2010).

This study aims to fill these gaps by employing the Unified Theory of Acceptance and Use of Technology (UTAUT; Venkatesh, Morris, Davis, and Davis (2003)) as its theoretical framework. The UTAUT provides a more holistic view by integrating multiple predictors of technology adoption. Drawing upon this model, the study investigates how performance expectancy, effort expectancy, and social influence affect user trust in telemedicine apps, and how trust subsequently influences usage intention. By doing so, this research aims to offer practical insights into fostering user trust and promoting the widespread adoption of telemedicine services, especially in the face of ongoing policy uncertainty.

To guide the empirical analysis, four hypotheses were formulated based on the UTAUT framework and prior literature. Specifically, we hypothesize that performance expectancy (H1), effort expectancy (H2), and social influence (H3) each exert a positive effect on users' trust in telemedicine applications. Furthermore, we propose that trust, in turn, positively influences users' intention to adopt telemedicine applications (H4). These hypotheses and their proposed relationships are depicted in the research model shown in Figure 1, which serves as a conceptual roadmap for the study.

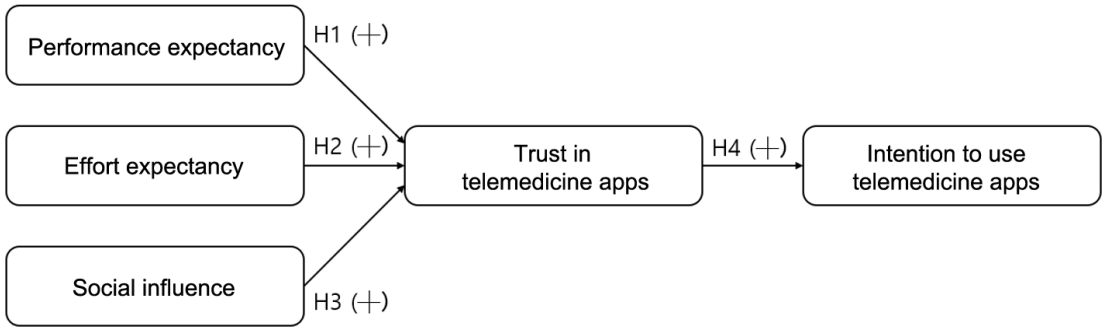

Figure 1. Research model.

2. THEORETICAL BACKGROUNDS AND RESEARCH HYPOTHESES

The UTAUT was proposed as an analytical framework by integrating key factors from major prior theories. UTAUT explains technology adoption multidimensionally through four core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. Performance expectancy is defined as the degree to which an individual believes that using a particular technology will help improve performance in work or daily life. Effort expectancy refers to the perceived ease associated with learning and using technology. Social influence is the extent to which users perceive that important others think they should use a particular technology, and facilitating conditions refer to the perceived availability of infrastructure, resources, and technical support to assist technology use (Dash & Sahoo, 2021; Dwivedi et al., 2019).

UTAUT has demonstrated high explanatory power in the healthcare and digital health domains (Dwivedi et al., 2019; Rouidi, Hamdoune, Choujtani, & Chati, 2022), and recent systematic reviews have evaluated it as the most suitable framework for analyzing healthcare professionals' digital technology acceptance (Alotaibi, Wilson, & Traynor, 2025). UTAUT-based analyses have also been actively conducted in general user contexts. For example, Esber et al. (2023) in a study of German patients reported that performance expectancy, effort expectancy, and social influence all significantly influenced the intention to use telemedicine via video consultation. They particularly

emphasized that acceptance was higher among users with greater digital literacy and prior technology experience. Similarly, Hossain et al. (2023), using an extended UTAUT model in Bangladesh, found that, beyond performance expectancy, information quality and user satisfaction also played important roles in determining behavioral intention. They showed that higher reliability and personalization of health information led to increased satisfaction and sustained usage intention. These findings demonstrate that UTAUT possesses substantial empirical validity in digital healthcare contexts, serving as an analytical framework capable of encompassing multidimensional factors such as utility, social context, technical infrastructure, and user perceptions underlying technology acceptance. In short, recent studies have suggested that, in the context of telemedicine, performance expectancy, effort expectancy, and social influence may influence behavioral intention primarily by reinforcing trust, which then leads to adoption thus, the indirect path via trust may offer greater explanatory power (Kuen et al., 2023; Rouidi et al., 2022).

Performance expectancy refers to the degree to which an individual believes that using a particular technology will improve the efficiency of their work or daily life, and it plays a central role in the technology adoption process (Venkatesh et al., 2003). Previous studies have reported that performance expectancy fosters positive attitudes toward technology and ultimately contributes to the development of trust. For instance, Luo et al. (2010) found in their study on the initial adoption of mobile banking that performance expectancy contributed to the formation of users' trust, which is especially critical during the early stages of IT system adoption. In the healthcare context, research has shown that when users perceive tangible health benefits from using a service, their trust in that service increases. Kuen et al. (2023) argued that trust in the expected therapeutic effects of telemedicine alleviates users' risk perceptions and serves as the basis for trust formation. Bahari, Kurniawan, and Hermawan (2024) further demonstrated that trust is directly linked to perceptions of technological reliability and service effectiveness, both of which are decisive for the intention to adopt telemedicine technologies. Similarly, Lee and Rho (2013) reported that among users of mobile health monitoring services, those who recognized substantial health management benefits from the service exhibited higher levels of trust and lower risk perceptions. Based on these findings, this study hypothesizes that users' belief in the effectiveness of telemedicine apps for managing their health (i.e., performance expectancy) will positively influence their trust in the technology.

H_1: Performance expectancy has a positive effect on trust in telemedicine apps.

Effort expectancy refers to the degree to which users perceive a particular technology as easy to learn and use, and it plays a critical role in reducing psychological resistance during the technology adoption process (Venkatesh et al., 2003). The more clearly and intuitively users perceive a system, the more they expect predictable and controllable interactions, which in turn reduces anxiety and perceived uncertainty associated with technology use (Gefen, Karahanna, & Straub, 2003). This reduction in perceived uncertainty forms the psychological foundation for building trust in the technology or its provider; higher perceived ease of use enhances evaluations of system stability and predictability, thereby fostering trust (Kim, Ferrin, & Rao, 2008). In complex, non-face-to-face environments such as telemedicine, perceiving procedures and functions as easy to understand and use provides psychological assurance for users, contributing not only to trust in the technology itself but also to trust in the broader healthcare service. Indeed, previous studies have shown that the perception of a technology as easy to learn and use lowers users' psychological barriers and, consequently, facilitates the formation of trust in the technology or service (Dwivedi et al., 2019; Rouidi et al., 2022). In telemedicine contexts, where users are sensitive to information accessibility and procedural clarity, the perception of an intuitively designed system is likely to strengthen overall trust in the service. Based on these considerations, the following hypothesis is proposed:

H_2: Effort expectancy has a positive effect on trust in telemedicine apps.

Social influence refers to the impact that the opinions or behaviors of significant others (such as family, friends, or professionals) have on an individual's decision to use a particular technology (Venkatesh et al., 2003). This effect is particularly pronounced in emerging technological domains that involve sensitive decision-making, such as telemedicine apps, where recommendations from peers and the social reputation of a service can directly shape user

perceptions. Prior studies have shown that social endorsement and positive evaluations from others play a crucial role in enhancing trust in a service. For example, Cao, Feng, Lim, Kodama, and Zhang (2024), in a study of young adults in China, empirical evidence demonstrated that social influence is a key factor in building trust in telemedicine services, which in turn positively affects usage intention. This effect was especially prominent among first-time users, who tended to rely on recommendations and experiences of others to form trust. Social influence thus operates as an indirect driver of behavioral intention via the mediation of trust. In another study, Kung, Yan, and Kung (2024) identified trust as a central determinant of users' positive attitudes and noted that social influence, together with trust, functions as a form of social capital that can shape attitudes toward telemedicine adoption. Both studies underscore the pivotal role of trust in telemedicine acceptance and highlight social influence as a key antecedent of trust formation. Accordingly, the following hypothesis is proposed:

H_3: Social influence has a positive effect on trust in telemedicine apps.

Trust functions as a key psychological factor in the technology adoption process by mitigating uncertainty and perceived risk (Bahari et al., 2024; Luo et al., 2010). Numerous prior studies have established that users who possess higher levels of trust in a technology-based service are more likely to continue using it over time (Bahari et al., 2024; Kuen et al., 2023; Luo et al., 2010). This tendency is especially pronounced in services involving sensitive personal and health information, such as telemedicine, where trust in not only the technology itself but also the platform and healthcare professionals becomes a critical determinant of user acceptance. For example, Hou, Li, and Wang (2024) found that, in virtual health agent counseling settings, users' intention to continue using the service increased significantly as their trust in the agent grew. Similarly, Kuen et al. (2023) demonstrated that users form trust in both the technology and expected treatment outcomes, grounded in their preexisting trust in physicians, and that this multidimensional trust ultimately influences their intention to accept telemedicine.

Trust is notable not only as a direct predictor but also as a mediating pathway linking various cognitive and experiential factors to the intention to use. According to the meta-analysis by Li, Liu, Wang, and Zhao (2022), the quality of mHealth services affects users' intention to use primarily through trust, which serves as a central connecting mechanism between service perceptions and user behavior. Similarly, Adebesin and Mwalugha (2020) empirically demonstrated that, in the acceptance of wearable health devices, security and privacy concerns do not directly diminish the intention to use; rather, they exert an indirect effect by undermining trust. This indicates that, in digital healthcare environments where sensitive information is involved, the formation of trust serves to buffer risk perceptions and plays a decisive role in sustaining acceptance intentions. Furthermore, Zhu, Jiang, and Cao (2023) found, in a study of telemedicine users, user satisfaction and perceived usefulness influenced continued usage intention via trust in the platform, healthcare providers, and system. This study highlights that trust operates as a mediating mechanism spanning multiple actors rather than being limited to a single target. Building on these theoretical and empirical discussions, this study proposes the following hypothesis:

H_4: Trust in telemedicine apps positively influences the intention to use telemedicine apps.

3. METHODOLOGY

3.1. Research Design

To test the research model, an online survey was conducted through a professional research agency, Entrust (entrustsurvey.com), over a ten-day period from January 17 to January 27, 2023. The target population consisted of men and women aged 20 and above who had experience using telemedicine applications either for themselves or on behalf of family members (e.g., children or parents). To minimize sampling bias, stratified sampling based on age and gender was employed, and a total of 364 valid responses were used for the final analysis. Responses that were insincere or incomplete were excluded from the analysis. The respondents were evenly distributed by gender and age group. The majority held at least a university degree (73.1%), and the proportion of employed individuals was also high (73.9%). These demographic characteristics were included as control variables in the final model analysis.

Additionally, to assess the general level of information technology (IT) use, data were collected on IT use frequency and IT use confidence, both measured using a 7-point Likert scale (1 = not at all, 7 = always). IT tools were categorized into hardware and software. Hardware included desktop computers, smartphones, tablet PCs, laptops, and wearable devices (e.g., smartwatches, Fitbit, etc.). Software included Microsoft Office, email, Internet, messenger, and social media services (e.g., KakaoTalk, Facebook, Instagram, Twitter), and photo/video editing programs.

Regarding the inclusion of ethical considerations, this study was conducted in full compliance with established ethical principles for research involving human participants. Given the nature of the study, it was classified as minimal risk, involving no procedures that could cause physical, psychological, or social harm. No invasive methods were employed, and no personally identifiable or sensitive information was collected at any stage. Prior to participation, all individuals were provided with clear and sufficient verbal information regarding the study's purpose, procedures, and their rights, after which informed verbal consent was obtained. All survey responses were recorded anonymously, and every effort was made to protect the confidentiality and welfare of participants.

3.2. Variables Measurement

The operational definitions of the five variables included in the research model (Performance Expectancy, Effort Expectancy, Social Influence, Trust, and Intention to Use) were adapted and refined based on previous studies to suit the context of telemedicine apps, which is the scope of this research. The development of measurement items followed these operational definitions, using as many of the measurement items as possible from previous studies that have demonstrated reliability and validity. The measurements were conducted using a 7-point Likert scale, ranging from 'Strongly Disagree (1)' to 'Strongly Agree (7).'

The conceptual definitions and measurement items for each variable are as follows. First, *performance expectancy* (PE) is defined as the degree to which users perceive that using telemedicine apps improves their health management outcomes. This construct was measured using three items: "The telemedicine application is useful to me"; "The telemedicine application allows me to receive medical services when I need them"; and "The telemedicine application enables me to receive medical services more quickly"(Baek, Choi, & Lee, 2015; Jeon, Koo, Yoo, & Shim, 2023; Nunes, Limpo, & Castro, 2019; Venkatesh, Thong, & Xu, 2012).

Effort expectancy (EE) is defined as the extent to which users perceive telemedicine apps as easy to learn and use. This was measured using seven items: "It is simple to use the telemedicine application"; "Using the telemedicine application, one can easily receive medical consultations"; "It is easy to become accustomed to using the telemedicine application"; "Learning how to operate the telemedicine application is easy"; "Using the telemedicine application is not difficult"; "There is no discomfort at all when using the telemedicine application"; and "It is easy to understand how to use the telemedicine application" (Baek et al., 2015; Jeon et al., 2023; Nunes et al., 2019; Venkatesh et al., 2012).

Social influence (SI) refers to the degree to which individuals perceive that important others expect them to use telemedicine apps. Four items were used: "People who are important in my life think it is acceptable for me to use telemedicine apps"; "People who are important in my life think it is desirable for me to use telemedicine apps"; "Most people who are important to me think that I should use telemedicine apps"; and "People who influence my behavior think I should use telemedicine apps"(Baek et al., 2015; Venkatesh & Morris, 2000; Venkatesh et al., 2012).

Technology-based trust in telemedicine apps (Trust) is defined as the belief that the app will operate reliably, deliver accurate and consistent services, and perform its functions as expected by the user. Five items were used to measure this variable: "The functions provided by the telemedicine application are trustworthy"; "The telemedicine application is reliable"; "The telemedicine application operates in a consistent manner"; "The telemedicine application provides accurate and error-free services"; and "The telemedicine application provides services at the promised time" (Califf, Sarker, & Sarker, 2020).

Intention to use (Use) is defined as the degree of users' willingness to accept and use telemedicine apps. This was measured with four items: "I will use the telemedicine application frequently"; "I would like to use the telemedicine

application regularly"; "I will continue to use the telemedicine application in the future"; and "I would recommend the telemedicine application to my friends" (Baek et al., 2015; Jeon et al., 2023; Nunes et al., 2019; Venkatesh et al., 2012).

To enhance the robustness of the analysis, several demographic variables were included as control variables, namely age, gender, education level, and income. Age was measured as the respondent's age at the time of the survey. Gender was coded as a binary variable, with male coded as 1 and female as 0. Education was assessed based on the highest level of education completed, categorized into seven distinct levels. Income was measured using seven categorical levels. To account for the potential non-linear relationship between income and the dependent variable, six dummy variables were created based on income categories, using the lowest income group as the reference category. These variables were incorporated to account for potential confounding effects on users' behavioral intention to use telemedicine applications. By controlling for these individual differences, the study aims to isolate the unique effects of the primary independent variables and provide a more accurate estimation of their influence on trust and subsequent behavioral intention.

4. ANALYSES AND RESULTS

4.1. Validity Test of the Measurement

To evaluate the reliability of the measurement instruments for the latent variables in the research model, Cronbach's alpha and composite reliability (CR) were calculated. In addition, convergent validity was assessed using the average variance extracted (AVE) and factor loadings. As shown in Table 1, all latent variables had Cronbach's alpha values greater than 0.7, and the composite reliability (CR) for each construct also exceeded 0.7, confirming the reliability of the measures (Chin, 1998; Hair, Risher, Sarstedt, & Ringle, 2019). Furthermore, the AVE for all latent variables was above the threshold of 0.5, and all item factor loadings were above 0.7. Each item also showed a higher loading on its intended latent variable than on any other, as indicated by the cross-loadings, supporting strong associations with the intended constructs. These results indicate that the measurement instruments in this study satisfy the requirements for convergent validity (Gefen & Straub, 2005).

Table 1. Validity and reliability of the main variables.

Variables	Indicator	Factor loading	Cronbach's alpha	Composite reliability	Average variance extracted
Performance expectancy (PE)	PE1	0.893	0.842	0.895	0.683
	PE2	0.901			
	PE3	0.867			
Effort expectancy (EE)	EE1	0.814	0.915	0.932	0.663
	EE2	0.809			
	EE3	0.842			
	EE4	0.847			
	EE5	0.812			
	EE6	0.794			
	EE7	0.781			
Social Influence (SI)	SI1	0.873	0.901	0.931	0.772
	SI2	0.910			
	SI3	0.885			
	SI4	0.845			
Technology-based trust in telemedicine applications (Trust)	Trust1	0.863	0.893	0.921	0.701
	Trust2	0.865			
	Trust3	0.821			
	Trust4	0.808			
	Trust5	0.826			
Intention to use (Use)	Use1	0.900	0.921	0.944	0.808
	Use2	0.895			
	Use3	0.914			
	Use4	0.887			

To assess discriminant validity, the Heterotrait-Monotrait ratio of correlations (HTMT), an alternative approach based on the multi-trait multi-method matrix, was calculated. The analysis showed that most HTMT values between constructs were below 0.9, indicating that discriminant validity was established (Hair, Hult, Ringle, & Sarstedt, 2022; Henseler, Ringle, & Sarstedt, 2015). Next, to evaluate the potential impact of multicollinearity on the structural model, intervariable correlation coefficients and variance inflation factors (VIF) were examined. Correlation coefficients ranged from 0.56 to 0.80, and since values above 0.7 may indicate the possibility of multicollinearity (Malhotra, Kim, & Patil, 2006), VIF values for all variables were checked and found to range between 1.99 and 3.41, well below the commonly accepted threshold of 5.0, suggesting a low risk of multicollinearity.

The goodness-of-fit of the structural model was assessed using the standardized root mean square residual (SRMR), which was 0.07 for the present model, meeting the recommended cut-off of less than 0.08 and thus indicating an acceptable level of model fit (Henseler, Hubona, & Ray, 2016; Hu & Bentler, 1998). The explanatory power of the path model was evaluated using the R^2 values for the endogenous variables, which were 0.635 for trust and 0.464 for intention to use, both exceeding the recommended minimum threshold of 0.26 (Gefen & Straub, 2005), indicating a high level of explanatory power for the model.

Lastly, to check for potential common method bias, the maximum inter-construct correlation was examined and found to be below 0.9, suggesting that the risk of bias due to the use of the same measurement method for independent and dependent variables was low (Pavlou, Liang, & Xue, 2007).

4.2. Descriptive Analysis and Correlation Matrix

Table 2 presents the descriptive statistics and correlation matrix for all variables. The mean values for the main constructs behavioral intention to use (Use), trust, performance expectancy (PE), effort expectancy (EE), and social influence (SI), ranged from 4.68 to 5.17, indicating generally positive perceptions among respondents. All main variables showed strong and statistically significant positive correlations with each other ($p < 0.001$), with the highest correlation observed between PE and Use ($r = 0.738$), suggesting close relationships among key factors influencing telemedicine app acceptance. Among the control variables, education and income exhibited significant positive correlations with most of the main constructs, while age and gender showed weaker associations.

Table 2. Mean, SD, and correlation matrix.

Variables	1	2	3	4	5	6	7	8
1. Use	(0.921)							
2. Trust	0.641***	(0.893)						
3. PE	0.738***	0.738***	(0.842)					
4. EE	0.615***	0.698***	0.705***	(0.915)				
5. SI	0.678***	0.654***	0.693***	0.597***	(0.901)			
6. Age	0.041	0.086	0.038	-0.031	0.071	1.000		
7. Gender	0.070	0.143**	0.135**	0.045	0.109*	0.057	1.000	
8. Edu	0.215***	0.144**	0.144**	0.165**	0.160**	-0.112*	0.091	1.000
Mean	4.918	4.933	5.024	5.167	4.683	3.890	0.498	5.620
SD	1.333	0.996	0.989	0.953	1.191	1.329	0.500	0.815

Note: N = 364. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4.3. Hypothesis Testing

Hypothesis testing was performed through hierarchical regression analysis employing the Ordinary Least Squares (OLS) technique. To explore mediation, we drew on the approach of Baron and Kenny (1986), evaluating the significance of associations among the independent variables, trust as a mediator, and the dependent variable. In this way, both direct and indirect effects in the model were systematically assessed. The hierarchical regression analysis results presented in Table 3 support all four proposed hypotheses. First, Hypothesis 1, which posits that performance expectancy (PE) positively affects trust in telemedicine apps, is supported. In Model 2, PE has a significant positive

effect on trust (β = 0.358, p < 0.001). Similarly, Hypothesis 2 is supported, as effort expectancy (EE) also shows a significant positive relationship with trust (β = 0.310, p < 0.001). Hypothesis 3, which predicts a positive effect of social influence (SI) on trust, is likewise supported. SI significantly predicts trust in Model 2 (β = 0.176, p < 0.001), even when controlling for other variables. Lastly, Hypothesis 4, which proposes that trust positively influences behavioral intention to use telemedicine apps, is also supported. In Model 5, trust shows a significant positive effect on usage intention (β = 0.163, p < 0.05), even after accounting for performance expectancy, effort expectancy, and social influence.

Table 3. Hierarchical regression analysis.

Variables	Trust		Use		
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	4.557***	1.252**	2.325**	-1.699**	-1.904***
	(0.626)	(0.400)	(0.787)	(0.564)	(0.569)
Age	0.032	0.032	0.026	0.010	0.005
	(0.038)	(0.024)	(0.052)	(0.034)	(0.033)
Gender	0.218*	0.079	0.120	-0.084	-0.097
	(0.102)	(0.063)	(0.136)	(0.088)	(0.088)
Edu	0.091	-0.015	0.263**	0.129*	0.132*
	(0.065)	(0.040)	(0.087)	(0.056)	(0.056)
Income	Included	Included	Included	Included	Included
PE		0.358***		0.628***	0.569***
		(0.050)		(0.071)	(0.076)
EE		0.310***		0.142*	0.091
		(0.048)		(0.068)	(0.071)
SI		0.176***		0.300***	0.272***
		(0.037)		(0.052)	(0.053)
Trust					0.163*
					(0.074)
R-squared	0.127	0.664	0.538	0.629	0.634
Adj. R-squared	0.102	0.652	0.576	0.616	0.620
F-value	5.16***	57.85***	50.47***	49.60***	46.65***

Note: $N = 364$. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4 outlines how performance expectancy (PE), effort expectancy (EE), and social influence (SI) affect the intention to use telemedicine, both directly and indirectly through trust. For PE, the results reveal a significant direct association (b = 0.570, p < 0.001) as well as a significant indirect path mediated by trust (b = 0.059, p < 0.05). The Sobel test (z = 2.094, p < 0.05) provides additional support for partial mediation. With EE, the direct effect on intention is not significant (b = 0.092, p = 0.199). However, the indirect path through trust is significant (b = 0.051, p < 0.05), and the Sobel statistic (z = 2.075, p < 0.05) indicates a case of full mediation. For SI, both the direct influence (b = 0.272, p < 0.001) and the mediated influence through trust (b = 0.029, p < 0.05) reach statistical significance, with the Sobel test (z = 1.990, p < 0.05) suggesting partial mediation.

Table 4. Direct and indirect effects.

Variables	Path	b	S.E.	z	Sobel-test
Performance expectancy	Direct	0.570**	0.076	7.478	2.094*
	Indirect	0.059*	0.058	2.094	
Effort expectancy	Direct	0.092	0.072	1.284	2.075*
	Indirect	0.051*	0.024	2.075	
Social influence	Direct	0.272**	0.054	5.061	1.990*
	Indirect	0.029*	0.015	1.990	

Note: * $p < .05$, ** $p < .001$.

Taken together, these results provide clear evidence that trust serves as a significant mediator in the relationships between key UTAUT constructs and the intention to use telemedicine applications. Depending on the variable, the mediating role of trust is either partial (PE and SI) or full (EE), underscoring its pivotal function in technology acceptance within digital healthcare contexts.

5. DISCUSSION

5.1. Research Implications

First, the finding that performance expectancy has a positive effect on trust is consistent with previous research. Performance expectancy reflects users' beliefs that telemedicine apps can deliver tangible benefits such as enhanced health management efficiency, time savings, and improved access to care. These expectations naturally reinforce trust in the technology (Dwivedi et al., 2019; Venkatesh et al., 2003). In particular, Bahari et al. (2024) empirically demonstrated that higher anticipated therapeutic effects and service efficiency in telemedicine contexts are associated with greater trust in the technology, a finding echoed by the present study. These results suggest that performance-driven user expectations serve as a core factor in the initial formation of trust.

The finding that effort expectancy also significantly affects trust aligns with the core assumptions of TAM and UTAUT, which posit that perceived ease of use reduces psychological resistance and fosters the development of trust (Davis, 1989; Rouidi et al., 2022). This relationship is particularly salient in services targeting general users with varying levels of digital literacy, where intuitive interfaces and ease of access function as prerequisites for establishing trust in the technology (Lee & Rho, 2013). While telemedicine offers the advantage of bridging time and distance between patients and providers, trust formation can be hindered if app usage is complex or if technical barriers exist. The present findings can thus be interpreted as reflecting these practical realities.

The finding that social influence significantly affects trust highlights the importance of social trust formation in the acceptance of new services such as telemedicine. This result is consistent with the work of Dash and Sahoo (2021), who argued that, in digital healthcare services, social influence not only shapes users' behavioral intentions but also impacts their attitudes and trust in the service. In fields like healthcare, which are characterized by high levels of expertise and risk perception, positive recommendations or shared experiences from trusted others such as acquaintances, professionals, or family members can serve as important reference points in the formation of individual trust judgments. In line with previous research, the present findings suggest that the indirect trust-building effects arising from the social context are indeed salient.

The finding that trust exerts a strong positive effect on the intention to use telemedicine apps is highly consistent with numerous previous studies Luo et al. (2010) and Kuen et al. (2023). In services such as telemedicine, which are characterized by high medical risk and sensitive information, repeated evidence indicates that the intention to use cannot be meaningfully formed in the absence of trust in the technology or service itself. The present study reconfirms that trust is not merely a mediating factor but serves as the most powerful single predictor of usage intention.

These findings support previous UTAUT-based studies on telemedicine acceptance, while providing empirical evidence for the importance of trust-centric design by clearly elucidating the path structure mediated by trust. Notably, this study reinforces the logic that the initial antecedents of technology acceptance influence the intention to use not merely through direct effects, but primarily via the emotional and cognitive mediation of trust.

From a practical perspective, this study offers meaningful implications. The significant effects of performance expectancy and effort expectancy on trust underscore the importance of trust-centered service design as a core strategy. Beyond mere functional provision, intuitive usability, system reliability, and accurate information delivery are all critical factors in securing user trust.

5.2. Limitations and Future Research

This study has several limitations. First, the analysis was conducted using cross-sectional data collected through an online survey, which limits the ability to capture changes in trust formation and intention to use over time. Second, although UTAUT was empirically tested in this study, contextual factors can moderate the relationship among main variables. For example, other social and personal factors such as age, gender, occupation, health status, and digital literacy may have restricted the comprehensive capture of user heterogeneity. Therefore, future research should employ longitudinal analyses using panel data, structural modeling that considers multi-level, or mixed-method research designs integrating quantitative and qualitative approaches to more precisely understand the dynamic processes of trust formation and contextual diversity.

6. CONCLUSION

This study provides new insights into the process of acceptance of technology. While prior research based on the UTAUT model has mainly emphasized the direct effects on acceptance intention, this study demonstrates that trust plays a mediating role in shaping users' intention to adopt technology. This suggests that technology acceptance is not merely based on functional evaluation but involves a multilayered cognitive process in which a trust-based relationship between users and technology is formed. Furthermore, the findings reaffirm the applicability of the UTAUT model in the sensitive context of healthcare services. Performance expectancy, effort expectancy, and social influence were shown to remain effective predictors of acceptance, even in the practical and emerging context of telemedicine apps. These results underscore the relevance of UTAUT in understanding user behavior in digital healthcare environments. For future research, we suggest expanding the model to different cultural contexts to examine potential variations in trust dynamics, as well as integrating additional trust-related variables to deepen the understanding of technology acceptance in healthcare.

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Institutional Review Board Statement: The study involved minimal risk and adhered to ethical guidelines for social science fieldwork. Formal approval from an Institutional Review Board was not required under the policies of Kangwon National University, College of Business Administration, Republic of Korea. Informed verbal consent was obtained from all participants, and all data were anonymized to ensure participant confidentiality.
Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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