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Why Do People Use Telemedicine Apps in the Post-COVID-19 Era? Expanded TAM with E-Health Literacy and Social Influence

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Abstract: This study delves into the determinants influencing individuals' intentions to adopt telemedicine apps during the COVID-19 pandemic. The study aims to offer a comprehensive framework for understanding behavioral intentions by leveraging the Technology Acceptance Model (TAM), supplemented by e-health literacy and social influence variables. The study analyzes survey data from 364 adults using partial least squares structural equation modeling (PLS-SEM) to empirically examine the internal relationships within the model. Results indicated that e-health literacy, attitude, and social influence significantly impacted the intention to use telemedicine apps. Notably, e-health literacy positively influenced both perceived usefulness and ease of use, expanding beyond mere usage intention. The study underscored the substantial role of social influence in predicting the intention to use telemedicine apps, challenging the traditional oversight of social influence in the TAM framework. The findings will help researchers, practitioners, and governments understand how social influence and e-health literacy influence the adoption of telehealth apps and promote the use of telehealth apps through enhancing social influence and e-health literacy.

Keywords: telemedicine; TAM; e-health literacy; social influence; COVID-19

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1. Introduction

The domain of ICT (information and communications technology)-enabled medical services has been undergoing substantial expansion. Notably, telemedicine, a facet of ICT-enhanced healthcare, has experienced remarkable growth following the advent of the COVID-19 pandemic [1,2]. Telemedicine, involving interactive real-time communication between patients and remote medical personnel, constitutes a technology designed to enhance patients' health [3]. The global telemedicine market, valued at $87.41 billion in 2022, is projected to surge from $94.44 billion in 2023 to $286.62 billion by 2030 [4]. While the evolution of telemedicine has been rapid over recent decades, its integration within the medical framework was previously hindered by regulatory and insurance reimbursement complexities prior to the COVID-19 pandemic [5]. However, in the wake of the pandemic, telemedicine has gained substantial momentum, being actively embraced across multiple countries, attributed to factors such as increased hospitalization of COVID-19 patients, infection concerns, and the mitigation of geographical barriers [5]. For instance, Teladoc Health Inc., a multinational telemedicine corporation headquartered in the United States, reported a 60% upsurge in virtual consultations, reaching 2 million during the January to March 2020 period, compared to the preceding quarter [4].

Nonetheless, telemedicine services encounter persistent challenges, including regional discrepancies in technological resources and limitations in patients' adeptness with telehealth systems [5,6]. In this context, the concept of e-health literacy (electronic health literacy) has gained prominence, manifesting as an emerging field of investigation. E-health literacy encompasses the capacity to search, evaluate, and comprehend health-related information within digital contexts, encompassing web-based resources, for the resolution of

health concerns [7]. Enhancing an individual's e-health literacy proves to be an effective avenue for accessing high-quality web-based health resources [8]. While extant research examines how e-health literacy influences the inclination to employ healthcare apps [9] or exercise apps [10], a noticeable research gap exists within the context of telemedicine apps.

Concurrent with individual-level factors such as e-health literacy, the role of environmental factors has grown in significance as evolving social cognizance surrounding telemedicine aligns with the rapid upswing in its usage during the distinctive COVID-19 pandemic scenario [11]. While some studies have explored the impact of social influence on the intent to employ exercise apps [12], analogous research in the realm of telemedicine apps is conspicuously lacking. Moreover, diverging from the exclusive focus on either individual or environmental perspectives as the driving force behind telemedicine app adoption, an integrated examination of these dual perspectives permits a more comprehensive comprehension of the mechanisms dictating the intent to utilize telehealth apps [13]. At its core, the impetus to adopt telemedicine apps springs from an individual's imperative to enhance their health. Additionally, from an environmental vantage point, individuals absorb cues from their milieu, utilizing these as evaluative criteria in decisions pertaining to the adoption of telemedicine apps. As the result of the interplay between personal and environmental perspectives, individuals arrive at a definitive choice regarding telehealth app utilization after undertaking further assessments of their capabilities and the service landscape.

Please change this sentence as follows: This study aims to analyze the determinants that form the intention to use telemedicine apps from the user's point of view beyond the special situation triggered by the COVID-19 pandemic. While extensive investigation has been carried out examining telemedicine from perspectives such as physicians [14–17], nurses [18], and care facilities [3], research grounded in the vantage point of actual users assumes paramount significance [19].

In this light, the purpose of this study is to analyze the determinants that influence individuals' intention to introduce telemedicine apps during the COVID-19 epidemic. Specifically, the present study embraces the Technology Acceptance Model (TAM) [20], a well-established framework employed to understand intentions to adopt new information technologies. This study enriches the TAM by integrating supplementary variables, specifically e-health literacy as an individual factor and social influence as an environmental factor. This comprehensive approach aims to offer a holistic lens through which to comprehend individual behavioral intentions. Methodologically, this study employs Partial Least Squares-Structural Equation Modeling (PLS-SEM) to gauge the empirical robustness of relationships within the proposed model. The study's theoretical contribution lies in demonstrating the effects of both social influence and e-health literacy on individuals' intentions to use telemedicine apps, thereby enhancing our insights into user behavior within this domain.

This study initiates a discourse aimed at delving into an expanded Technology Acceptance Model (TAM), encompassing supplementary variables like social influence and e-health literacy, in order to elucidate the determinants underpinning the intention to adopt telemedicine apps. Subsequently, we introduce and scrutinize the formulated research hypotheses while presenting the envisaged research model in Section 2. Section 3 delineates the chosen research methodology, while Section 4 furnishes both descriptive and conceptual findings. Section 5 culminates in a comprehensive discussion, and Section 6 presents a conclusion with potential avenues for future research.

2. Literature Review and Research Hypotheses

2.1. Technology Acceptance Model in the Telemedicine Context

The Technology Acceptance Model (TAM) is a well-established research framework that has garnered empirical validation through numerous examinations of factors influencing individuals' intentions to adopt technology. This model comprises perceived usefulness (hereinafter referred to as PU) and perceived ease of use (hereinafter referred to as PEOU)—

both belief-based constructs, attitude variables that are directly influenced by these beliefs, and technology acceptance intentions, which, in turn, are influenced by attitude variables [20]. In accordance with the tenets of TAM, when users perceive a novel technology as possessing utility and being user-friendly, their overall attitude toward the technology becomes more favorable. This positive perception of utility and ease of use, in turn, is associated with a positive impact on behavioral intentions [20].

The application of this model has found extensive utility in the domain of telemedicine adoption [21]. A plethora of scholars have delved into the factors influencing the adoption of telemedicine apps, expanding upon the original TAM constructs (i.e., PU, PEOU, attitude, and intention to use) by incorporating additional variables. While TAM predominantly examines technology adoption intentions through the prism of individual beliefs and attitudes, numerous investigations have sought to encompass a broader range of factors. For instance, in the realm of nurses' telemedicine adoption, Kowitlawakul (2011) introduced supplementary variables such as years of experience in the hospital, support from physicians, and administrative support [18]. Similarly, in the context of physicians' telemedicine adoption, Rho et al. (2014) introduced novel variables, including clinical accessibility, individual self-efficacy, and perceived regulatory incentives [16]. In light of the COVID-19 pandemic, which has considerably elevated the prominence of telemedicine among the general populace, research endeavors have also shifted towards the general user base. Scholars have introduced new variables capturing the pandemic's context, such as social influence [22], COVID-19-related anxiety [23], and engagement with health information on social media [24].

This investigation extends its purview by incorporating e-health literacy as an individual determinant and social influence as an environmental factor. This comprehensive approach aims to offer a more holistic comprehension of individual behavioral intentions. E-health literacy has garnered scholarly attention and has been recognized as a potential metric in gauging the inclination to use healthcare apps [9], exercise apps [10], and electronic health record systems [25]. Given the distinct dimensions telemedicine apps introduce to general users, this study posits e-health literacy as a critical factor influencing the intention to adopt telemedicine apps. Furthermore, social influence has ascended in significance, spurred by the transformation in societal perspectives on telemedicine driven by its rapid escalation during the exceptional circumstances of the COVID-19 pandemic [11]. Consequently, social influence has been introduced as an additional variable projected to exert an impact on the intention to adopt telemedicine apps.

2.2. Research Hypotheses

The present study devised an expanded research framework by integrating e-health literacy and social influence into the foundational Technology Acceptance Model (TAM). This refined research model, depicted in Figure 1, posits that the inclination to adopt telemedicine apps is shaped by several key factors: perceived usefulness, social influences, e-health literacy, and attitude. Drawing from the conceptual definitions outlined by Davis (1989) [20] and Venkatesh and Morris (2000) [26], the intention to use telemedicine apps was operationally defined as the extent of one's intention to embrace these applications for healthcare purposes. Correspondingly, perceived usefulness encapsulated an individual's recognition of the utility that telemedicine apps provide for their healthcare needs.

The extended components of the research model, namely social influence and e-health literacy, were postulated to exert direct influences on the intention to use telemedicine apps. In accordance with the conceptual constructs described by Venkatesh, Thong, and Xu (2012) and Venkatesh and Morris (2000), social influence indicates the extent to which an individual perceives significant others in their life should engage with telemedicine apps [26,27]. Additionally, in alignment with Norman and Skinner (2006), e-health literacy delineated an individual's competence in seeking, locating, evaluating, and comprehending health information sourced from electronic platforms like the Internet, mobile applications, or digital health platforms [7].

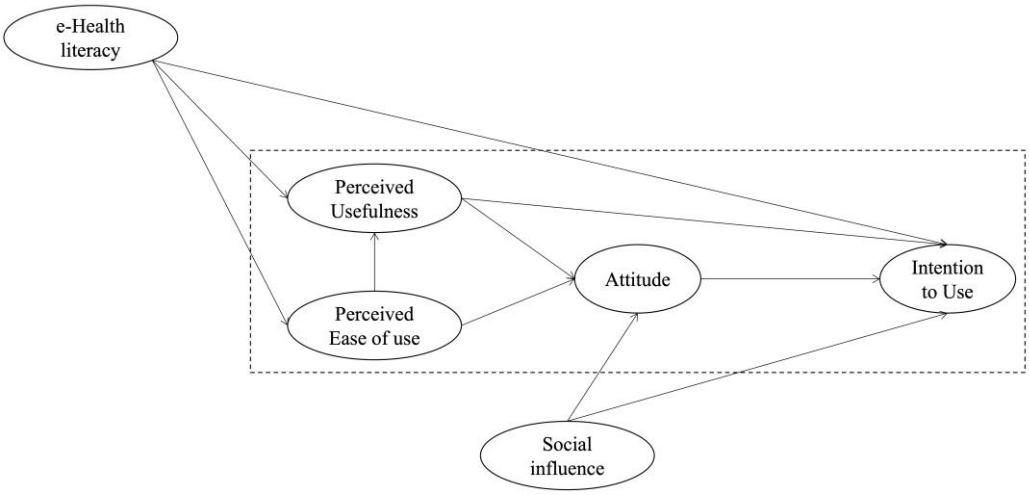

Figure 1. Research model.

Furthermore, the model highlighted that attitude functioned as a mediator between underlying beliefs and the intention to use telemedicine apps. An individual's attitude toward telemedicine apps was construed as a favorable or unfavorable emotional stance consistently directed toward these applications, as elucidated by Davis (1989) [20] and Venkatesh and Morris (2000) [26]. This attitude was subject to influence by key beliefs, encompassing perceived usefulness, perceived ease of use, and social influence.

Perceived ease of use, denoting the anticipation of users to employ telemedicine apps with minimal effort, adhered to the conceptual definitions articulated by Davis (1989) [20] and Venkatesh and Morris (2000) [26]. Notably, this study postulated a direct influence of e-health literacy on perceived ease of use, which subsequently extended to affecting perceived usefulness and attitude.

The prevailing body of research highlights the affirmative influence of elevated e-health literacy levels on consistent and frequent online information-seeking behaviors [28]. This pattern is expected to extend to the realm of telemedicine apps, wherein individuals possessing proficient e-health literacy are more inclined to engage with such applications. This heightened e-health literacy level is demonstrably associated with the acquisition of accurate health-related information, adept evaluation of information quality, and effective interaction with healthcare professionals [29,30].

In the specific context of telemedicine apps, individuals endowed with advanced e-health literacy are better positioned to discern the advantages of using these applications. Notably, individuals possessing heightened e-health literacy exhibit enhanced capabilities in comprehending intricate health information from diverse sources [31]. Within the domain of telemedicine apps, this elevated e-health literacy level is postulated to foster a positive correlation with the perceived ease of use associated with these applications. Consequently, amalgamating these elucidations, the ensuing hypotheses concerning e-health literacy are posited:

H1. *E-health literacy is positively related to the intention to use telemedicine apps.*

H2. *E-health literacy is positively related to the perceived usefulness of telemedicine apps.*

H3. *E-health literacy is positively related to the perceived ease of use of telemedicine apps.*

Our research framework employs the Technology Acceptance Model (TAM), which encapsulates the interplay between beliefs, attitudes, and intentions. TAM has gained substantial prominence in investigations pertaining to the inclination to adopt telemedicine practices. To illustrate, Saigi-Rubió et al. (2016) harnessed TAM as a determinant of telemedicine utilization within clinical contexts, surveying 398 medical practitioners across

a Spanish medical institution [17]. Pikkemaat et al. (2021) leveraged a theory-grounded approach to predict behavioral intent and pinpoint factors influencing primary care physicians' proclivity to adopt telemedicine [15]. Similarly, Kowitlawakul (2011) scrutinized the factors influencing nurses' willingness to embrace eICU technology, drawing on the foundations of TAM [18]. As such, the ensuing hypotheses concerning the dimensions of TAM are postulated:

H4. *Perceived ease of use is positively related to attitude toward using telemedicine apps.*

H5. *Perceived ease of use is positively related to the perceived usefulness of telemedicine apps.*

H6. *Perceived usefulness is positively related to attitude toward using telemedicine apps.*

H7. *Perceived usefulness is positively related to the intention to use telemedicine apps.*

H8. *Attitude is positively related to the intention to use telemedicine apps.*

It is widely acknowledged that social influence exerts a favorable impact on the adoption of information technology [26], as well as on one's attitude toward technology [32]. This affirmative influence of social factors is equally manifest in the domain of telemedicine. Illustratively, Saigi-Rubió et al. (2016) delineated the constructive role of social norms in shaping physicians' inclination to adopt telemedicine practices [17]. Kamal et al. (2020) further substantiated this trend, revealing the constructive influence of social factors on the intention to engage with telemedicine in developing nations [22]. Consequently, the ensuing hypotheses concerning the role of social influence are posited:

H9. *Social influence is positively related to attitude toward using telemedicine apps.*

H10. *Social influence is positively related to the intention to use telemedicine apps.*

3. Methodology

3.1. Research Instrument Development

This study utilizes partial least squares structural equation modeling (PLS-SEM) to assess the empirical strength of the relationships in the proposed model. The operational definitions of the six variables encompassed within the research model, namely e-health literacy, social influence, perceived usefulness, perceived ease of use, attitude, and intention to use telemedicine apps, were refined and extended to align with the specific context of this study, focusing on telemedicine apps. To formulate measurement items for these operational definitions, previously established items that have exhibited reliability and validity in prior research were adapted. Employing a 7-point Likert scale ranging from "Disagree strongly" (1) to "Agree strongly" (7), the measurement instrument was designed. A comprehensive depiction of the operational definitions and corresponding specific measures for each variable is provided in Table 1.

Table 1. Survey items.

Construct	Operational Definition	Measurement Items	Source
e-Health literacy	The capability to search, locate, assess, and comprehend health-related information acquired from electronic sources, encompassing platforms such as the Internet, mobile apps, and digital health platforms	(1) I know how to find helpful health resources from electronic sources, such as the Internet, mobile apps, or digital health platforms. (2) I know how to use electronic sources to answer my health questions. (3) I know what health resources are available on electronic sources. (4) I know where to find helpful health resources from electronic sources. (5) I know how to use the health information I find from electronic sources to help me. (6) I have the skills I need to evaluate the health resources I find on the Internet. (7) I can tell high quality from low quality health resources on the Internet. (8) I feel confident in using information from the Internet to make health decisions.	Norman and Skinner (2006) [7]
Social influence	The extent to which an individual believes that individuals who hold significance to them should engage with telemedicine apps	(1) Most important people in my life think it's okay for me to use telemedicine apps. (2) Most important people in my life think it's advisable for me to use telemedicine apps. (3) Most of the people who matter to me think I should use telemedicine apps. (4) People who influence my behavior think I should use telemedicine apps. (5) In general, people around me help me use telemedicine apps.	Venkatesh, Thong, and Xu (2012); Venkatesh and Morris (2000) [26,27]
Perceived usefulness	The level of awareness regarding the usefulness of telemedicine apps in relation to one's own healthcare needs	(1) Telemedicine apps are useful to me. (2) Telemedicine apps allow me to receive care services when I need them. (3) Telemedicine apps enable faster access to care services.	Davis (1989); Venkatesh and Morris (2000) [20,26]
Perceived ease of use	The extent to which users anticipate being able to utilize telemedicine apps with minimal effort or difficulty	(1) The way to use telemedicine apps is simple. (2) It is easy to learn how to operate telemedicine apps. (3) I can easily get used to using telemedicine apps. (4) It's easy to understand how to use telemedicine apps. (5) Using a telemedicine apps don't have to be difficult. (6) I don't feel uncomfortable using telemedicine apps at all.	Davis (1989); Venkatesh and Morris (2000) [20,26]
Attitude	Positive or negative emotional states that consistently emerge in response to telemedicine apps	(1) Using telemedicine apps is good for me. (2) It is wise to use telemedicine apps. (3) It is positive about using telemedicine apps. (4) It is in my interest to use telemedicine apps. (5) Using telemedicine apps is recommended. (6) I like to use telemedicine apps.	Davis (1989); Venkatesh and Morris (2000) [20,26]
Intention to use	The extent of intention to accept and use telemedicine apps	(1) I will use the telemedicine apps often. (2) I want to use the telemedicine apps regularly. (3) I will continue to use telemedicine apps. (4) I will continue to use telemedicine apps. (5) I will recommend my friends to use telemedicine apps.	Davis (1989); Venkatesh and Morris (2000) [20,26]

3.2. Sample and Data Collection

To validate the research model proposed in this study, an online survey was conducted using an online survey agency (Entrust) over a period of ten days, from 17 January to 27 January 2023. The survey included individuals aged 20 and above, comprising both men and women. The selection process involved a random sampling of those who had firsthand experience using a telemedicine app or had utilized a telemedicine app for a child or parent. To ensure a representative sample, the survey respondents were evenly distributed across different age groups and genders. A total of 370 responses were collected from the survey, out of which 364 valid responses were used for the final analysis after excluding 6 responses due to non-responsiveness or multiple missing values. The demographic characteristics of the sample are summarized in Table 2. The survey responses were well distributed across gender and age groups, with a significant proportion of participants holding a college degree or higher (73.1%), being employed (73.9%), and earning an annual income of 36,000 USD or more (61.8%).

Table 2. Characteristics of the sample.

	Category	Frequency	Percentage (%)
Gender	Male	181	49.7
	Female	183	50.3
Age	20s	63	17.3
	30s	94	25.8
	40s	87	23.9
	50s	60	16.5
	Above 60s	60	16.5
Educational Background	High school or less	54	14.8
	Some college	44	12.1
	Bachelor's degree or higher	266	73.1
Monthly Pre-tax Household Income	<9000 USD	18	4.9
	9000–18,000 USD	21	5.8
	18,000–27,000 USD	43	11.8
	27,000–36,000 USD	57	15.7
	36,000–45,000 USD	67	18.4
	>45,000 USD	158	43.4
Occupation	Salaried employee	269	73.9
	Self-employed	30	8.2
	Housewife	34	9.3
	Not employed	20	5.5
	Misc.	11	3.0

4. Results

4.1. Survey Validation

The assessment of the proposed research model involved a comprehensive review and comparison of both the measurement and structural models. Standard protocols for Partial Least Squares-Structural Equation Modeling (PLS-SEM) analysis, as outlined in the work of Hair et al. (2017), were meticulously followed to ensure the soundness of the analytical outcomes [33]. The measurement model's reliability and validity were rigorously evaluated using criteria such as factor loadings, composite reliability (CR), and average variance extraction (AVE). The calculated values for both CR and AVE surpassed the recommended thresholds of 0.70 and 0.50, respectively, attesting to the robustness of the measurement model. Table 3 presents detailed findings of the construct reliability assessment.

Table 3. The results of construct reliability.

Construct	No. of Items	Cronbach's α	CR	AVE
e-Health literacy	8	0.932	0.944	0.678
Social influence	5	0.926	0.944	0.772
Perceived usefulness	3	0.865	0.917	0.787
Perceived ease of use	6	0.917	0.936	0.708
Attitude	6	0.942	0.954	0.774
Intention to use	5	0.942	0.956	0.811

Note: CR = composite reliability; AVE = average variance extraction.

To assess discriminant validity, the square root of the average variance extraction (AVE) was computed for each latent variable, following the approach outlined by Fornell and Larcker (1981) [34]. As indicated in Table 4, the computed square root of AVE for each construct exceeded the correlations between the latent variables. This outcome supports the established discriminant validity within the dataset.

Table 4. The results of discriminant validity.

Construct	EHL	SI	PU	PEOU	ATT	ITU
e-Health literacy	0.823					
Social influence	0.521	0.879				
Perceived usefulness	0.547	0.635	0.887			
Perceived ease of use	0.621	0.543	0.673	0.841		
Attitude	0.577	0.779	0.758	0.704	0.88	
Intention to use	0.55	0.68	0.729	0.581	0.768	0.901

Note: EHL = e-Health literacy; SI = social influence; PU = perceived usefulness; PEOU = perceived ease of use; ATT = attitude; and ITU = intention to use.

Table 5 presents the descriptive statistics and correlation analysis results of measurements for e-health literacy, social influence, perceived usefulness, perceived ease of use, attitude, and intention to use telemedicine apps.

Table 5. Descriptive statistics and correlation analysis results.

Construct	Mean	S.D.	EHL	SI	PU	PEOU	ATT	ITU
e-Health literacy	5.35	1.01	1					
Social influence	4.68	1.19	0.523	1				
Perceived usefulness	5.30	1.06	0.542	0.628	1			
Perceived ease of use	5.19	0.98	0.620	0.540	0.670	1		
Attitude	5.07	1.09	0.577	0.778	0.753	0.703	1	
Intention to use	4.92	1.33	0.550	0.679	0.721	0.578	0.767	1

Note: EHL = e-Health literacy; SI = social influence; PU = perceived usefulness; PEOU = perceived ease of use; ATT = attitude; and ITU = intention to use.

4.2. Hypothesis Testing

The hypotheses were tested through PLS-SEM, and the findings are illustrated in Figure 2. The model accounted for 65% of the variance in intention to use telemedicine apps and 76% of the variance in attitude toward telemedicine apps. Path analysis revealed significant relationships between variables. Specifically, the SEM outcomes demonstrated that e-health literacy had a direct positive impact on perceived ease of use (β = 0.621,

$p < 0.001$), perceived usefulness (β = 0.210, $p < 0.01$), and intention to use (β = 0.621, $p < 0.05$), affirming the support for H1, H2, and H3. Concerning the TAM constructs and their interrelations, the SEM results aligned with previous research findings. Perceived ease of use significantly influenced perceived usefulness (β = 0.543, $p < 0.001$) and attitude (β = 0.260, $p < 0.001$). Moreover, perceived ease of use exerted a substantial influence on attitude (β = 0.298, $p < 0.001$) and intention to use (β = 0.304, $p < 0.001$). Attitude was found to directly impact intention to use (β = 0.361, $p < 0.001$), thus supporting H4-H8. Additionally, social influence was observed to have a direct positive impact on attitude (β = 0.448, $p < 0.001$) and intention to use (β = 0.157, $p < 0.001$), substantiating H9 and H10.

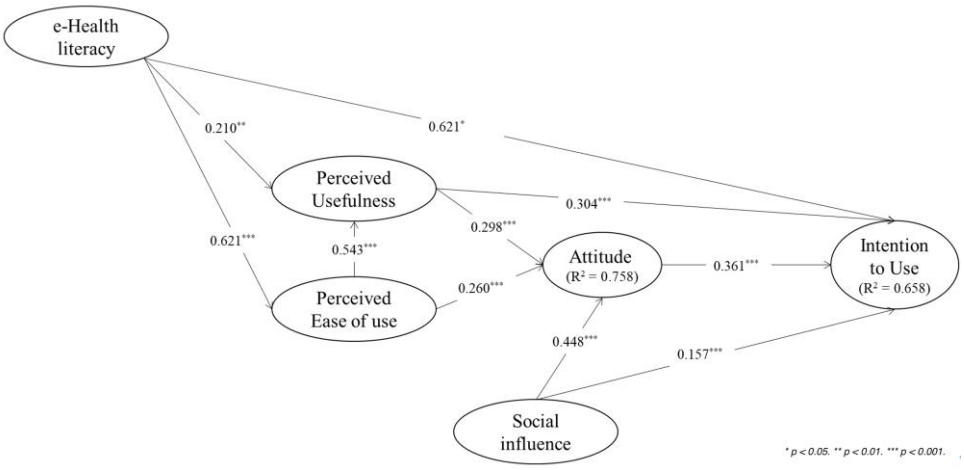

Figure 2. Structural model results.

5. Discussion

5.1. Discussion of the Results

This study formulated an advanced theoretical model for gauging the acceptance of telemedicine, an innovation in healthcare, by incorporating supplementary constructs, namely E-health literacy and social influence, into the Technology Acceptance Model (TAM). This enhancement was grounded in prior research insights. The research aimed to identify the determinants influencing the intentions of potential users to adopt telemedicine. To achieve this, a structural relationship model was constructed, followed by the collection of survey data from a cohort of 364 Korean adults, after which a rigorous analysis using structural equation modeling was conducted.

Upon confirming the model's compatibility and scrutinizing the structural model's effectiveness, several significant outcomes were obtained. Specifically, e-health literacy, attitude, and social influence emerged as influential factors directly affecting the intention to utilize telemedicine apps. Intriguingly, e-health literacy exhibited substantial and favorable impacts on both the perceived usefulness and perceived ease of use of telemedicine apps, extending beyond its influence on the mere intention to use these apps. Additionally, the findings underscored the notable role of social influence as a predictive factor for the intention to use telemedicine apps. It was revealed that social influence held a significantly positive sway over attitudes towards telemedicine apps and the intention to use them.

It's noteworthy that the TAM framework traditionally overlooked social influence, yet our findings highlighted its significance in shaping user behavior within the context of telemedicine apps. This aligns with other established theories, such as the Theory of Reasoned Action (TRA), the Theory of Planned Behavior [35], and the Innovation Diffusion Theory [36], which effectively incorporate social elements to elucidate user behavior patterns.

5.2. Implications for Academic Researchers

This study provides valuable contributions to the realm of academic research by enhancing the theoretical comprehension of the factors propelling the adoption of healthcare-oriented IT applications, particularly telemedicine apps. Notably, medical-related apps distinguish themselves from conventional apps due to their distinct utilization purposes. Unlike common apps that cater to a wide array of functions such as entertainment, social networking, productivity, and gaming, telemedicine apps are purposefully designed to offer medical services. Their core objective revolves around facilitating patient consultations and diagnoses through non-face-to-face interactions with healthcare professionals. These apps facilitate crucial interactions between patients and medical practitioners, with features like video calls enabling remote medical consultations. Additionally, they might encompass functionalities for storing and exchanging patient health records and diagnostic outcomes. Within this specific context of telemedicine apps, the Technology Acceptance Model (TAM) underscores the pivotal role of perceived usefulness and perceived ease of use as critical determinants of user acceptance.

Moreover, this study uncovers a nuanced perspective on telemedicine apps. It emphasizes that beyond perceived usefulness and perceived ease of use, additional variables are imperative to comprehensively grasp individual intentions in the realm of telemedicine apps. Notably, e-health literacy and social influence emerge as significant factors that shape the inclination of patients to embrace telemedicine apps. The study's explanatory prowess is robust, and these identified variables substantially elucidate the variance observed in the adoption of medical-related IT applications from the patient's standpoint. Through these findings, the study enriches our understanding of the intricate dynamics inherent in the adoption of telemedicine apps within the healthcare landscape.

5.3. Implications for Practitioners

For practitioners operating within the telemedicine app domain, the study's outcomes offer significant insights that can inform strategic decisions and operational approaches. First, developers are advised to meticulously consider the significance of e-health literacy levels among users. This underscores the necessity to design user interfaces that enhance the perception of ease of use. By doing so, the aim is to cultivate a positive attitude towards telemedicine apps across all user segments, irrespective of their e-health literacy proficiency.

Furthermore, the implications extend to app designers who are tasked with crafting user interfaces that are intuitive, user-friendly, and tailored to elevate the perception of ease of use. By focusing on this aspect, designers can foster a more positive and accommodating user experience for a diverse range of users.

Additionally, telemedicine app managers are urged to recognize and acknowledge the pivotal role of social influence. The landscape of telehealth app adoption has notably evolved, particularly after the onset of the COVID-19 pandemic. Prior to this, apprehensions around the sensitivity of health-related data often deterred individuals from utilizing telehealth apps. However, the pandemic brought about a transformation in user behavior. Factors such as geographical distances to healthcare facilities, prolonged wait times at clinics, and concerns about COVID-19 exposure spurred the adoption of telehealth apps.

The pandemic era has also seen an upsurge in positive user experiences with telehealth apps, significantly influencing their usage despite the ongoing pandemic. Hence, managers should be attuned to the fact that current users wield a potent impact on potential users through the mechanism of social influence. Ensuring that existing users have consistently positive experiences with telemedicine apps becomes crucial. This, in turn, encourages them to share their positive encounters with potential users, thereby fostering a positive perception and encouraging wider adoption. It is within this dynamic context that telemedicine app managers should focus their efforts to ensure sustainable growth and acceptance within the user community.

5.4. Implications for Government Agencies

For government entities, the research findings underscore the paramount significance of e-health literacy within the context of telemedicine app adoption. The prevailing landscape has cast a spotlight on telemedicine apps as a potential solution for addressing the concentration of medical resources within specific geographic regions, aiming to alleviate the burden of healthcare access disparities [37]. Nevertheless, the practical ability of individuals to effectively engage with telehealth apps is profoundly diverse, influenced by individual capabilities and the varying state of digital infrastructure [5,6,38].

This prevailing digital divide raises substantial concerns, particularly since patients devoid of access to telemedicine apps may encounter barriers to obtaining essential healthcare services, thereby exacerbating existing health inequalities [38]. While telemedicine presents an innovative solution, it is imperative for government bodies to proactively address the digital disparity to ensure equitable access for all patients. A critical avenue lies in the expansion of digital infrastructure, seeking to bridge the accessibility gap and facilitate seamless utilization of telemedicine apps by all segments of the population.

Furthermore, the role of the government extends to fostering enhanced e-health literacy among the citizenries. This can be achieved through a multifaceted approach that includes organizing and disseminating educational initiatives, workshops, and informational brochures. By bolstering people's e-health literacy, the government empowers individuals to utilize telemedicine apps confidently and effectively. This proactive approach contributes not only to enhanced healthcare accessibility but also to a more technologically empowered and health-conscious society.

6. Conclusions

The primary objective of this study was to expand the Technology Acceptance Model (TAM) in order to comprehensively investigate the determinants of intention to use telemedicine apps. Through empirical analysis, this study successfully validated the significant impact of both e-health literacy and social influence on the behavioral intention of individuals toward utilizing telemedicine apps.

In summary, this study contributed to the field in three significant ways. First, it demonstrated the substantial influence of e-health literacy on individuals' intentions to use telemedicine apps. Specifically, the research findings underscored that e-health literacy significantly impacts perceived ease of use, perceived usefulness, and the intention to use telemedicine apps. Second, this study provided insights into the interconnectedness of the components within the TAM framework within the telemedicine context. The results remained consistent with prior research, indicating that ease of use directly influences perceived usefulness and attitude and that ease of use further affects attitudes and intentions, with attitudes directly impacting intentions. Last, the study findings highlighted the direct effect of social influences on attitudes and the intention to use telemedicine apps. This outcome reflects the growing inclination for individuals to embrace telemedicine positively when it is socially endorsed or actively promoted, particularly in the aftermath of the COVID-19 pandemic, as noted in the existing literature [1,11,24].

It is important to acknowledge the limitations of this study, which warrant a cautious interpretation of the results for several reasons. First, the investigation primarily centered on the intention of patients regarding telemedicine apps, omitting the viewpoint of medical service providers or professional medical staff. Given the incorporation of e-health literacy and social influence as supplementary determinants of telemedicine app usage intention, the generalizability of the findings to other categories of telemedicine app users, such as medical service providers, remains uncertain. Second, the survey was exclusively conducted in South Korea after the COVID-19 pandemic. To enhance the breadth of understanding, future research endeavors could encompass surveys targeting telehealth app users in diverse countries, allowing for cross-national comparisons to enrich insights. Furthermore, this study encourages scholars to account for the potential impact of external elements, like system interface, national telemedicine policies, and cultural factors, on

individuals' perceptions, including e-health literacy, social influence, perceived usefulness, and ease of use. Incorporating these factors into the analysis can lead to a more comprehensive comprehension of the patterns of telemedicine app utilization. Finally, considering the context of telemedicine apps amid the COVID-19 pandemic and in alignment with previous literature studies [39–41], our model systematically investigates social influence and e-health literacy as independent factors. However, acknowledging the potential impact of social influence on e-health literacy or on perceived usefulness, this study opens avenues for future research exploring this interplay.

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Informed Consent Statement: The study involves a non-coercive survey of adult participants who autonomously decide on their involvement. The rights of participants are minimally impacted, and the survey data collected are devoid of personally identifiable information, with all responses anonymized and de-identified. Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data are available from the corresponding author upon reasonable request.

Conflicts of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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