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Empowering Patients Through Mobile Health: Understanding Continuance Intention and Shared Decision-Making

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Abstract: ***Mobile health (mHealth) applications are increasingly used to support patient engagement and self-management; however, ensuring users remain actively engaged over the long term remains a challenge. This study investigates the factors influencing continuance intention and shared decision-making in the mHealth context. Drawing on patient-centered healthcare perspectives, the research examines the roles of digital patient agency, perceived personalization, and app usability in shaping patient empowerment and e-patient satisfaction. Data was collected through a survey of mHealth users and analyzed using structural equation modeling. The results indicate that digital patient agency, perceived personalization, and app usability significantly enhance patient empowerment and e-patient satisfaction. In turn, patient empowerment strongly predicts continuance intention and shared decision-making, while e-patient satisfaction positively influences shared decision-making. The findings highlight the central role of patient empowerment in sustaining mHealth engagement and fostering collaborative healthcare interactions, offering insights for researchers, healthcare providers, and digital health developers seeking to design more patient-centered mHealth solutions.***

Keywords: ***mHealth applications; Patient empowerment; Shared decision-making; Continuance intention; Digital patient agency***

I. INTRODUCTION

Healthcare is undergoing a significant digital transformation, shifting from reactive, provider-centered care toward proactive and patient-centered models (Bardhan et al., 2025; Weissenfels et al., 2025; Wu et al., 2026). Mobile health (mHealth) technologiesdefined as the integration of mobile computing, sensors, and communication tools to deliver health services, have become central to this transformation (Ameyaw et al., 2024; Ghose et al., 2022). Mobile health applications include smartphone applications, wearable devices, and remote monitoring systems that support disease management and health-related activities (Weissenfels et al., 2025).

The adoption of mHealth technologies has grown rapidly worldwide. The global mHealth market, for example, was projected to exceed USD 111 billion by 2025 (Wu et al., 2022). Events likethe COVID-19 pandemic have knowingly driven the increased use of digital wellbeing services. (Baudier et al., 2023). Because mobile devices are widely accessible, patients can easily record health data, receive feedback, and communicate with healthcare providers regardless of time or location (Weissenfels et al., 2025; Wu et al., 2022). As a result, mHealth applications hold considerable potential for improving healthcare delivery and health outcomes (Ghose et al., 2022; Weissenfels et al., 2025).

Existing research suggests that mHealth interventions can enhance health behaviors and support the self-management of chronic diseases. By enabling users to monitor health indicators and access personalized information, mHealth technologies can overcome geographic and temporal barriers to care (Hunsaker &Hargittai, 2018). Empirical evidence supports these benefits. For instance, Ghose et al. (2022) found that the use of a diabetes mHealth application increased physical activity and improved dietary behaviors, leading to lower blood glucose levels and fewer hospital visits. Similarly, Yan et al. (2023) reported that individuals using health and fitness applications experienced a 5–18% reduction in hospital visits over subsequent months. These findings illustrate the potential of sustained mHealth usage to improve health outcomes and reduce healthcare system burdens.

Despite these benefits, sustaining long-term engagement with mHealth applications remains a major challenge. While adoption rates of health apps are relatively high, many users discontinue their use shortly after initial adoption (Kidman et al., 2024). One review found that approximately 70% of users stop using health applications within the first three months (Kidman et al., 2024).

Users often abandon these applications due to unclear benefits, lack of perceived value, or concerns regarding reliability and data credibility (Aranha et al., 2021; Wong et al., 2024). Because the effectiveness of mHealth initiatives depends largely on continued engagement, understanding the drivers of sustained use has become a critical research issue. However, existing research has focused primarily on initial adoption, while post-adoption behavior remains relatively underexplored (Nie et al., 2023).

Studies examining continuance behavior in mHealth suggest that technological and psychological factors both play important roles. Drawing on models such as the Technology Acceptance Model and expectation–confirmation theory, prior research has identified perceived usefulness, ease of use, and confirmation of expectations as key determinants of continuance intention (Tian & Wu, 2022). In addition, factors such as technological self-efficacy and outcome expectations can encourage sustained use of digital health tools (Fang et al., 2024). Satisfaction with digital services has also been found to strongly influence continued use, since users who are satisfied are more inclined to continue engaging with health applications (Nie et al., 2023). Furthermore, habitual usage patterns can strengthen the relationship between satisfaction and continuance intention (Wang & Lin, 2021). Although these studies provide valuable insights, they largely focus on technological and psychological determinants, while giving less attention to broader patient-centered outcomes.

Prior research has paid limited attention to how mHealth technologies contribute to patient empowerment and shared decision-making. Contemporary healthcare increasingly emphasizes empowering patients and encouraging their active participation in treatment decisions (Wu et al., 2026). Shared decision-making (SDM) refers to a collaborative decision-making approach in which medical practitioners and care recipients in cooperation evaluate and select treatment alternatives based on the best available clinical evidence alongside patients' preferences and values. (Strategy 6I, 2023). mHealth technologies can facilitate this process by providing access to health information, enabling self-monitoring, and strengthening communication between patients and healthcare providers (Mesko et al., 2025).

Sustained use of mHealth applications may therefore enhance patients' knowledge, self-efficacy, and autonomy in managing their health. Previous studies show that digital health technologies can improve self-care behaviors, increase patient awareness, and reduce unnecessary healthcare utilization (Wong et al., 2024). As patients become more informed and confident, they are better positioned to participate actively in healthcare decisions. This aligns with the principles of shared decision-making, which has been associated with improved patient satisfaction, stronger patient–provider relationships, and better adherence to treatment plans (Raleigh et al., 2022). Moreover, SDM can help reduce healthcare inequalities by ensuring that treatment decisions consider individual patient needs and preferences (Dennison et al., 2023). Despite these promising developments, limited empirical evidence exists on how sustained mHealth engagement contributes to patient empowerment and shared decision-making.

Therefore, this research seeks to address this gap by examining the determinants of continued use of mHealth applications and exploring how continued engagement contributes to patient empowerment and shared decision-making. Specifically, the study proposes and tests a conceptual model in which technological features and user capabilities influence empowerment and satisfaction, which subsequently shape continuance intention and collaborative healthcare decisions. The model is empirically tested using survey data from mHealth users and analyzed through structural equation modeling (SEM).

The body of this research is structured as follows. Section two reviews the extant literature and formulates the research hypotheses. It then presents the research methodology and reports the conclusions. The research culminates with an assessment of the study's contributions to theory and implications for practice, as well as its constraints and recommendations for subsequent research.

II. LITERATURE REVIEW

1) Digital Patient Agency (PA)

Digital agency refers to "the individual's ability to control and adapt to a digital world" (Passey et al., 2018, p. 426).Furthermore, Patient agency denotes patients' capacity to act, participate, shape outcomes, and make decisions regarding their own care (Bok et al., 2022, p.27).It is shaped by both patients' readiness to engage and the limitations set by healthcare providers, services, and systems. Thus, digital patient agency refers to individuals who use new technologies to enable them to take a proactive role in managing their own health. The development of patient empowerment is influenced by a range of factors, notably the evolution of knowledge dissemination, the recognition of patient agency, and advances in technology (Mesko et al., 2025). In addition, Patient empowerment has been accelerated by technological innovations characterizing the digital health age (Mesko et al., 2019). Patient empowerment depends on access to information, which is now increasingly supported by the internet and digital health technologies. Therefore, the study proposes the following:

H1: Digital Patient Agency is positively associated with patient empowerment

2) Perceived Personalization (PERS)

Personalization is fundamentally concerned with tailoring information to align with recipients' unique preferences (Li, 2016). Personalization generally refers to service providers designing and implementing customized strategies for each individual customer (Wittkowski et al., 2020). Furthermore, Perceived personalization is conceptualized as the degree to which individuals perceive that content (e.g., advertising) is customized to their personal characteristics (De Groot, 2022). The effectiveness of personalization is based on perceived benefits and costs (Tran et al. 2020). Additionally, prior research indicates that personalization directly shapes users' behavioral intentions toward adopting smart healthcare services (Liu et al., 2023).In health chatbot applications, a limited but growing body of research highlights personalization as a critical design element that significantly enhances user satisfaction, fosters sustained engagement, and improves the overall quality of conversational interactions. (Zhu et al., 2022). Moreover, mHealth applications enable the delivery of healthcare services at scale by offering cost-effective, high-quality, and continuous access to care (Zhou et al., 2019). In addition, mHealth apps allow users to access personalized information, track their progress, and participate in their care, thereby improving health knowledge and self-management (Emerson et al., 2022).Thus, these applications are well suited to providing personalized services, which support individuals' active engagement in managing their health status (Zhao et al., 2018; Klossner et al., 2023). Therefore, the followinghypothesis is proposed:

H2: Perceived Personalization is positively associated with patient empowerment

H3: Perceived Personalization is positively associated with e-satisfaction

3) App Usability (AU)

Usability is described by ISO 9241-11 as the capability of a product to support specified users in achieving specified goals efficiently, effectively, and satisfactorily within a defined context of use. According to Bahar et al, (2024), mobile app usability is defined as the ease and effectiveness with which users can navigate and engage with a mobile application. Mobile app usability has increasingly drawn academic and practical attention because thoughtfully designed applications not only enhance user experience but also help build stronger ties between businesses and users (Huang, & Benyoucef, 2023).Like other digital applications, the success of mHealth apps in terms of development and adoption largely depends on their usability (Maramba et al., 2019; Islam et al., 2020). Digital health solutions enhance individuals' ability to access health-related information and services, thereby enabling patients to more effectively manage their conditions and make well-informed decisions regarding their care (Ouyang et al., 2025).User satisfaction in digital services is strongly influenced by the usability of mobile applications (Bahar et al, 2024). In addition, Stampe et al. (2021) indicated that mHealth improves access to health information, allowing patients to gain deeper insight into their health conditions (Stampe et al., 2021), thereby improving service satisfaction and strengthening collaboration between doctors and patients. Therefore, the study proposes the following:

H4: App Usability is positively associated with patient empowerment

H5: App Usability is positively associated with e-satisfaction

4) Patient Empowerment (PE)

Patient empowerment identified as the extent to which individuals possess the autonomy and capability to take control of health decisions and actively participate in their healthcare, enabling them to manage their care and advocate for themselves as healthcare service users (Minheere et al., 2023).Patient empowerment is most cultivated acrossinsightfuldeep self-insight encompassing individual identity, lived illness experience, and coping capabilities (Caston et al., 2024).It reflects the process through which patients build the expertise, skills, and self-efficacy necessary to actively engage in managing their health condition (Rodolico et al., 2025). Patient empowerment has received growing attention in disease management, as it promotes patient independence by enhancing health-related knowledge and enabling active participation in healthcare decision-making (Erturkmen et al., 2024). In collaborative healthcare settings where physicians and patients work jointly toward common goals (Mesko et al., 2025), the literature emphasizes the close relationship between patient empowerment and shared decision-making (Liu et al., 2023). Furthermore, considering the potential benefits of health-related technologies, An increasing body of research has turned its focus toward examining the influence of health empowerment on usage behavior (Zhang et al., 2025). Liu et al. (2025) indicated that health empowerment is a critical determinant of the continued use of health-related technologies.When people feel empowered, they continue to sustain healthy behaviors(Alluhaidan et al., 2023). Studies suggest that as individuals feel more empowered, their willingness to keep using digital technology increases (Zhou, & Ma, 2025).

H6: Patient Empowerment is positively associated with shared decision-making

H7: Patient Empowerment is positively associated with continuance intention

5) E- Patient Satisfaction (ESAT)

Satisfaction is defined as "an affective state resulting from a transaction's affective and cognitive assessment process" (Jameel et al., 2021, p. 2). In the healthcare setting, patient satisfaction denotes an individual's judgment of healthcare services against their expectations, shaped by their experiences during medical care (Qian et al., 2015).Patient satisfaction is a complex construct affected by a combination of sociodemographic features, confidence in healthcare providers, patient self-efficacy, and contribution in the process of DM(Wang et al., 2025). In the era of digital technologies, "e-satisfaction refers to a customer's positive or negative emotional response to their experience with an e-service or e-commerce platform" (Risnia, &Solekah, 2023, p. 178).Thus, this study defined the e-patient satisfaction as the patient's overall evaluation of their experience with digital healthcare services compared with their expectations. Users who experience satisfaction tend to deepen their relationship with a service provider, while those who are dissatisfied are more inclined to reconsider the relationship and seek alternative options (Cao et al., 2018).Evidence from mobile payments and food delivery applications indicates that e-satisfaction enhances continuance intention by fostering positive attitudes toward the provider (Al Amin et al., 2023; Franque et al., 2021).

H8: E- Patient Satisfaction is positively associated with continuance intention

6) Shared Decision-Making (SDM)

Shared decision-making denotes a patient-centered healthcare model that emphasizes collaborative decision-making between physicians and patients. According to Elwyn et al., the SDM model involves three sequential steps: introducing available choices, outlining options using patient decision aids, and assisting patients in exploring their preferences to determine a suitable care plan (Resnicow et al., 2022). SDM aims to promote productive communication and collaborative relationships between physicians and patients (Driever et al., 2020). Healthcare services have increasingly adopted a patient-centered approach, emphasizing patient agency, namely, patients' capacity and readiness to participate in healthcare decision-making processes (Hung et al., 2023). By systematically incorporating patients' perspectives, expectations, and values into clinical decision processes, SDM promotes a more equitable and patient-centered approach to decision-making and is therefore regarded as a middle ground between individual choice and medical professionalism (Muscat et al., 2021). Prior research indicates that SDM can strengthen patient adherence and trust, in addition to contributing to the mitigation of broader systemic challenges, including unequal healthcare resource allocation, access constraints, and suboptimal standard of care (Bok et al., 2022; Li et al., 2023).Consequently, health management and disease treatment increasingly depend on collaborative interactions between physicians and patients rather than on independent physician decision-making (Wu et al., 2026). Thus, this collaborative approach complements mHealth applications by raising patient awareness of available health choices via mobile platforms, integrating digital tools to explain conditions and treatment options, and offering personalized information that helps patients define priorities and express their needs to providers (Davidson et al., 2022).

7) Continuance Intention (CI)

The sustainability of mHealth services is contingent upon users' continued engagement and usage (Ma et al., 2025).Yoon and Rolland (2015)indicated that continuous use is characterized by behavioral patterns indicating that individuals persist in using technology over the long term after adopting it.Sustained engagement with mHealth applications contributes both to the financial sustainability of mHealth businesses and to improved health management among patients (Ma et al., 2025).A expanding stream of recent studies emphasizes the significance of exploring the factors and dynamics underlying continuous use in mHealth settings (Shen et al., 2020; Ma et al., 2025; Mirabootalebi et al., 2025).Bhattacherjee's expectation–confirmation model (ECM) (Bhattacherjee, 2001) is widely applied in technology acceptance and continuance studies (Wu et al., 2020), examining how confirmation and user satisfaction influence continuance intention. Furthermore, Research on chronic disease management apps by Yongmei et al. (2020) demonstrated that health empowerment plays a central role in shaping patients' continuance intention, suggesting that enhancing users' empowerment is critical to the longevity of such applications.

III. METHODOLOGY

A. Research Model

This research utilized a cross-sectional quantitative approach to examining the factors that impact the sustained utilization ofmHealth technologieswithin Saudi Arabia. The use of a quantitative methodology is suitable because it enables the statistical analysis of relationships between the hypotheses and offers findings that can be generalized to the broader user population (Creswell & Creswell, 2018). The target population was individual who lives in Saudi Arabia and used mobile health applications. The research model (Figure 1) was conceptual framework is developed drawing on technology acceptance and patient engagement theories, and empirically evaluate it using a survey of mHealth app users.The research constructs were established in previous research(Almunawar et al. 2015; Bhattacherjee, 2001; Guo et al., 2016; Kim et al., 2024; Kriston et al., 2010; Liu, K., & Tao, D.,

2022; Johnson et al., 2012; Mamakou et al., 2024; Scherrenberg et al., 2023; Zhang, & Li, 2022; Zhou et al., 2019; Wittkowski et al., 2020; Wu et al., 2022).

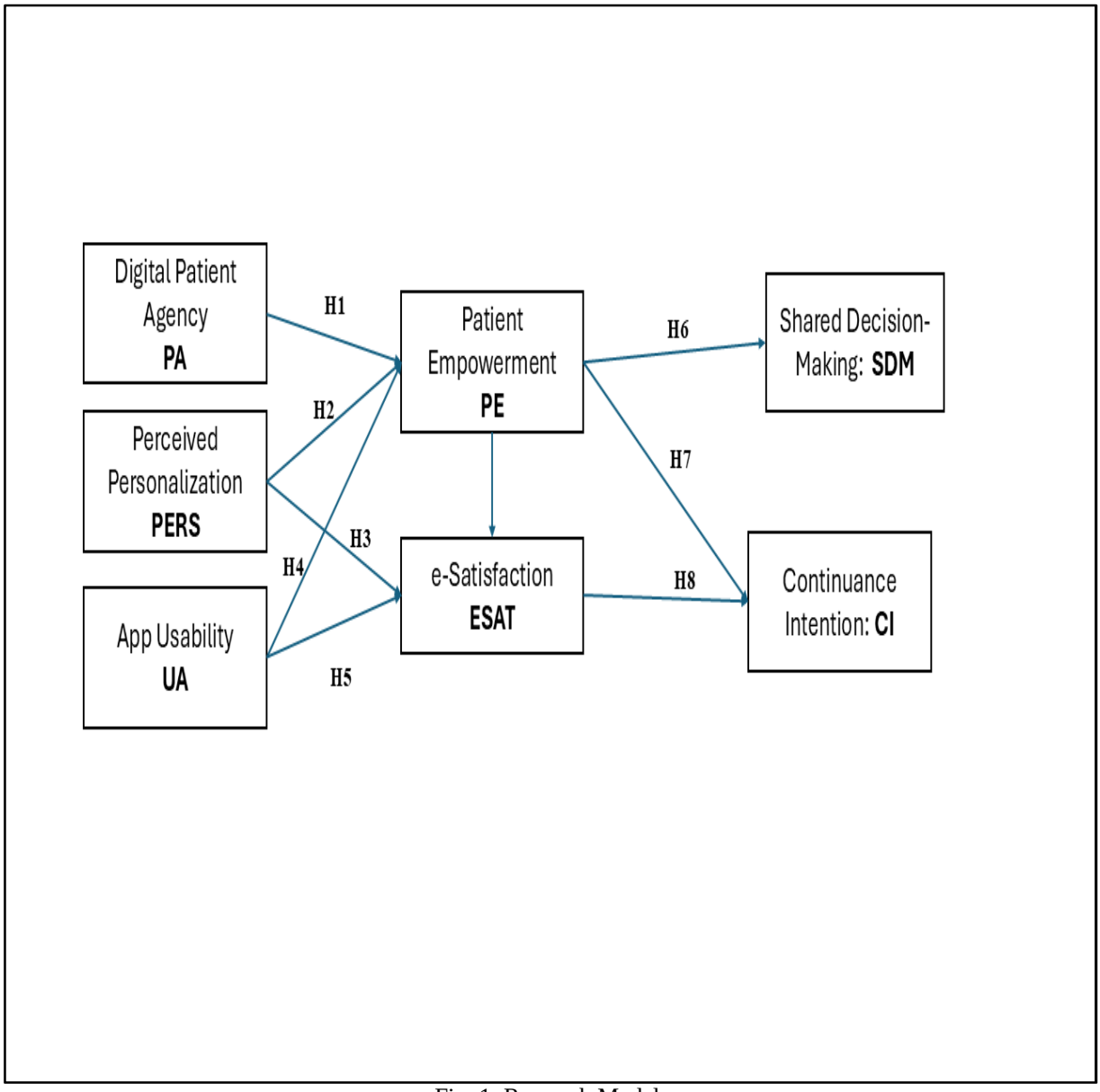

Fig. 1: Research Model

B. Population and Sampling

Data were collected through an online survey administered to individuals residing in Saudi Arabia. A non-probability convenience sampling technique was employed to recruit prospective users of mobile health applications through social media platforms and email distribution. Participants were informed that their responses would remain anonymous and that the survey was conducted solely for academic purposes, which was intended to enhance participation and reduce the likelihood of duplicate submissions. The questionnaire was created and disseminated using Google Forms, resulting in 350 complete responses. To ensure data quality, several screening procedures were applied to detect missing values, response bias, and outliers (see Table 1).

Table 1: Demographics Statistics (N = 350)

Element	Occurrence	Rate of Occurrence (%)
Gender		
Male	166	47
Female	184	53
Age		
Below 20	162	46
20 – 30	121	35
31 – 40	25	7
41 – 50	25	7
above 50	17	5
Education		
High School	59	17
Diploma	5	2
Bachelor	279	79
Master	3	1
Doctorate	4	1
Experience		
Less than three months	85	24
Three months to one year	67	19
over one year	198	57
Internet availability and quality		
Low	16	5
Moderate	175	50
High	159	45

C. Research Framework and Measures

The survey tool comprised organized questions, systematically arranged into sections corresponding to each construct within the research framework. All constructs were measured with multiple items adapted from previously validated scales in mobile health literature, then tailored to this research context. The data will be collected using a structured online survey consisting exclusively of closed-ended items. The questions included in the questionnaire will be based on well-established measurement scales from earlier research to ensure that the data collected are both reliable and valid, as illustrated in Table 2.

Table2: Summary of Research Constructin mHealth

Construct	Key Source(s)
Digital Patient Agency (PA)	Kim et al., 2024; Scherrenberg et al., 2023
Patient Empowerment (PE)	Johnson et al., 2012; Almunawar et al. 2015
Shared Decision-Making (SDM)	Kriston et al., 2010; Zhang, & Li, 2022
App Usability (AU)	Zhou et al., 2019
Perceived Personalization (PERS)	Guo et al., 2016; Liu, K., & Tao, D., 2022; Wittkowski et al., 2020
e-Satisfaction (ESAT)	Bhattacherjee, 2001; Mamakou et al., 2024

Construct	Key Source(s)
Continuance Intention (CI)	Bhattacherjee, 2001; Wu et al., 2022

D. Data Analysis

The records were assessed through PLS-SEM using SmartPLS 4. The adopted approachselected for its strong suitability in analytical modeling contexts and its robustness with small to medium sample sizes (Hair et al., 2021). A two-step procedure was followed. First, The evaluation of the measurement model was conducted through confirmatory factor analysis (CFA) to assess the robustness of the measurement model by evaluating reliability and validity, encompassing internal consistency (Cronbach's alpha CA and composite reliability CR) and convergent validity (average variance extracted and indicator loadings), and discriminant validity. After establishing satisfactory measurement properties, the structural model was analyzed to examine the hypothesized relationships among the constructs and to assess the proposed hypotheses.

IV. RESULTS

A. Measurement Model Results

Before examining the structural relationships between the constructs, the adequacy of the measurement model was first established by assessing the reliability and validity of the latent variables. The outcomes of CFA are summarized in Table 3.First, internal consistency reliability was examined using CA and CR. As presented in Table 3, All constructs exhibited robust levels of reliability. CA's values spanned from 0.857 to 0.941, surpassing the established threshold of 0.70, demonstrating adequateinternal consistency among the measurement items. Similarly, the CR values spanned from 0.861 to 0.941, which also surpassed the acceptable benchmark of 0.70, further confirming the reliability of the measurement scales.

Table 3: A CFA Results for Latent Constructs (N = 350)

	Cronbach's Alpha	Composite Reliability	R2	Average variance extracted (AVE)
CI	0.919	0.920	0.54	0.803
ESAT	0.941	0.941		0.849
PA	0.857	0.864		0.702
PE	0.861	0.861		0.706
PERS	0.914	0.922		0.795
SDM	0.908	0.908	0.68	0.784
UA	0.925	0.927		0.818

Second, Convergent validity is assessed by examining the average variance extracted (AVE), with all constructs yielding AVE values between 0.702 and 0.849, exceeding the recommended value of 0.50. This demonstrates that each construct accounts for over half of the variance in its corresponding indicators, providing strong evidence of convergent validity.Additionally, the coefficient of determination (R^2) values denotes the explanatory power of the model for endogenous constructs. The results show that continuance intention (CI) had an R^2 value of 0.54, while shared decision-making (SDM) recorded an R^2 value of 0.68, suggesting that the model accounts for a considerable proportion of variance within the examined constructs.Discriminant validity is established through the Fornell–Larcker criterion (Fornell and Larcker, 1981), confirming the adequacy of construct distinctiveness. (Table4).

Overall, The findings provide robust evidence that the measurement model achieves acceptable standards of reliability, convergent validity, and discriminant validity, indicating that the measurement scales are appropriate for evaluating the structural relationships among the constructs.

Table 4: Discriminant Validity Outcomes (N = 350)

	CI	ESAT	PA	PE	PERS	SDM
CI						
ESAT	0.904					
PA	0.708	0.667				

PE	0.737	0.763	0.869			
PERS	0.822	0.836	0.714	0.801		
SDM	0.628	0.636	0.672	0.830	0.731	
UA	0.815	0.861	0.614	0.742	0.794	0.618

B. Structural Model and Hypothesis Testing

The structural model evaluation is conducted to empirically test the proposed relationships. The outcomes of the path analysis, containing path coefficients (β), standard deviations, and p-values, are presented in Table 5. The empirical results demonstrate that the majority of the hypothesized relationshipsare proven at significant levels.

Table 5: The Hypothesis Results (N = 350)

Path	path coefficient (β)	Standard deviation (STDEV)	P values	Significance
ESAT -> SDM	0.159	0.065	0.015	*
PA -> PE	0.461	0.048	0.000	***
PE -> CI	0.657	0.037	0.000	***
PE -> SDM	0.625	0.063	0.000	***
PERS -> ESAT	0.408	0.062	0.000	***
PERS -> PE	0.265	0.061	0.000	***
UA -> ESAT	0.504	0.058	0.000	***
UA -> PE	0.214	0.052	0.000	***

First, digital patient agency (PA) revealed a pronouncedand significant impact on patient empowerment (PE) ($\beta = 0.461$, $p < 0.001$). This result supports H1 and indicates that patients who possess greater degree of digital agency demonstrate a higher propensity tofeel empowered in managing their health through mobile health technologies.

Second, perceived personalization (PERS) was found to significantly influence both patient empowerment (PE) and e-patient satisfaction (ESAT). Specifically, perceived personalization had a positive association with patient empowerment ($\beta = 0.265$, $p < 0.001$) and a stronger validity on e-patient satisfaction ($\beta = 0.408$, $p < 0.001$). These findings support H2 and H3, suggesting that when patients recognizemobile health applications as being customized to align with their individual expectations and preferences, they experience higher levels of empowerment and satisfaction.

Third, app usability (UA) also exhibited significant positive effects on both patient empowerment and e-patient satisfaction. The relationship between app usability and e-satisfaction was particularly strong ($\beta = 0.504$, $p < 0.001$), while its influence on patient empowerment was also significant ($\beta = 0.214$, $p < 0.001$). The results empirically validateforH4 and H5, indicating that applications that are easier to use and navigate significantly enhance users' satisfaction and their perceived ability to manage their health.

Fourth, patient empowerment (PE) was found to be a key determinant of both continuance intention (CI) and shared decision-making (SDM). Patient empowerment strongly influenced continuance intention ($\beta = 0.657$, $p < 0.001$), implying that empowered patients demonstrate a higher propensity to continue using mobile health applications. In addition, patient empowerment exerted a substantial positive associationwith shared decision-making ($\beta = 0.625$, $p < 0.001$), suggesting that empowered users are more actively involved in collaborative healthcare decisions with providers. These findings support H6 and H7.

Furthermore, e-patient satisfaction (ESAT) demonstrated positive and supported at significant levels of effect on shared decision-making ($\beta = 0.159$, $p = 0.015$). Although the effect magnitude is smaller compared with other relationships in the model, the result still supports H8, indicating that satisfied users are more likely to engage in collaborative decision-making processes with healthcare providers.

Overall, the structural model results demonstrate that digital patient agency, perceived personalization, and app usability play important roles in enhancing patient empowerment and satisfaction, which in turn significantly influence continuance intention and shared decision-making. Among all relationships tested, patient empowerment emerged as the strongest predictor of continuance

intention, highlighting its critical role in sustaining long-term engagement with mobile health applications.

V. DISCUSSION

This study examined how digital patient agencies, perceived personalization, and app usability influence patient empowerment and e-patient satisfaction, and how these factors subsequently shape continuance intention and shared decision-making in the context of mHealth applications. Overall, the findings reinforce the view that digital health technologies can enhance patient engagement and support the shift toward more collaborative healthcare models.

The results show that digital patient agencies significantly increase patient empowerment, indicating that individuals who possess stronger digital capabilities are more likely to actively engage in the management of their health. This finding aligns with previous research suggesting that patient agency reflects individuals' capacity to influence healthcare decisions and participate actively in managing their health (Passey et al., 2018; Bok et al., 2022). In the mHealth context, digital tools provide patients by enabling the availability of health-related information, self-tracking functionalities, and interactive communication with healthcare professionals, which collectively strengthen patients' autonomy and ability to manage their health conditions (Mesko et al., 2025; Wu et al., 2026).

The findings also reveal that perceived personalization positively affects both patient empowerment and e-patient satisfaction. Personalized services enable mHealth applications to provide tailored information and recommendations that match individual health needs and preferences. Prior studies highlight that personalization enhances engagement and improves users' satisfaction with digital services (Tran et al., 2020; Zhu et al., 2022). In healthcare contexts, personalized digital interventions can improve users' health knowledge and support self-management behaviors, thereby strengthening empowerment outcomes (Zhou et al., 2019; Emerson et al., 2022).

App usability was also found to significantly influence both empowerment and satisfaction. This finding underscores the importance of designing user-friendly mobile health applications. Usability is conceptualized as the extent to which a system enables usersto accomplish their objectives accurately and with minimal effort. (ISO 9241-11). Previous studies emphasize that intuitive system design improves user satisfaction and encourages engagement with digital services (Maramba et al., 2019; Bahar et al., 2024). In healthcare settings, user-friendly interfaces allow patients to access health information more easily and participate more actively in their healthcare decisions (Ouyang et al., 2025).

The results further indicate that patient empowerment strongly predicts continuance intention, suggesting that empowered individuals are more likely to continue using mHealth applications over time. This finding supports prior research indicating that empowered users tend to remain engaged with digital health platforms because these technologies enhance their self-efficacy and ability to manage their health (Lee et al., 2020; Wu et al., 2026). Similarly, continuance research suggests that satisfaction and perceived usefulness play key roles in sustained technology use (Tian & Wu, 2022; Nie et al., 2023).

The findings also demonstrate that patient empowerment significantly influences shared decision-making. This result supports the growing emphasis on patient-centered care, where patients collaborate with physicians in making treatment decisions. Shared decision-making enables patients to combine their preferences with medical expertise in determining appropriate care strategies (Strategy 6I, 2023). Prior studies indicate that empowered patients are more likely to communicate their preferences and participate actively in healthcare decisions (Dennison et al., 2023; Raleigh et al., 2022).

Finally, the results show that e-patient satisfaction positively affects shared decision-making. When patients report positive digital health experiences, they demonstrate a greater propensity to engage with healthcare providers and participate in collaborative decision processes. Previous research suggests that positive digital service experiences enhance patient trust and communication with healthcare professionals, which in turn encourages more active participation in treatment decisions (Nie et al., 2023; Wang et al., 2024).

VI. ACADEMIC AND PRACTICAL CONTRIBUTIONS

A. Academic Contributions

This study provides several important theoretical insights to the field of digital health. First, it extends mHealth research by focusing on post-adoption behavior, specifically continuance intention and shared decision-making. While existing research hasmainly examined the uptake offactors such as perceived usefulness and ease of use, relatively little emphasis has been placed on the underlying mechanismsthat sustain long-term engagement with mHealth technologies (Tian & Wu, 2022; Nie et al., 2023). Second, the study highlights the central role of patient empowerment in digital health usage. The findings show that empowerment functions

as a key mechanism linking digital capabilities and technology features to sustained engagement with mHealth applications (Wu et al., 2026; Mesko et al., 2025). Finally, this research contributes to the literature on shared decision-making in digital healthcare, demonstrating that both patient empowerment and e-patient satisfaction facilitate collaborative decision-making between patients and healthcare providers (Dennison et al., 2023; Strategy 6I, 2023).

B. Practical Contributions

The findings provide several practical implications. First, healthcare organizations should design mHealth systems that enhance patient empowerment by supporting self-management, providing accessible health information, and enabling patients to actively engage in the management of their health (Mesko et al., 2025; Wong et al., 2024). Second, developers should prioritize personalization and usability, as user-friendly and tailored applications can improve satisfaction and encourage sustained engagement with digital health services (Tran et al., 2020; Bahar et al., 2024). Finally, healthcare providers can leverage mHealth applications to support shared decision-making by enabling patients to access health data and communicate more effectively with clinicians, thereby promoting more collaborative and patient-centered care (Baudier et al., 2023; Raleigh et al., 2022).

VII. LIMITATIONS AND DIRECTIONS FOR FUTURE STUDIES

Despite its contributions, This study is constrained by several limitations that meritconsideration. First, it adopts a cross-sectional survey approach, thereby limiting the extent to which causal relationships among the constructs can be established. Subsequent studies may employ longitudinal approaches to investigate how patient empowerment, satisfaction, and continuance intention develop evolve over time as users gain more experience with mHealth applications. Second, The study draws on survey-based responses, thereby potentiallysusceptible to method-related bias and subjective interpretation of responses. Although survey-based approaches are widely used in information systems and digital health research, future studies may complement survey data with objective behavioral data, such as app usage logs or clinical outcomes. Third, the sample was collected using a convenience sampling approach, potentially constraining the broader applicability of the results. Subsequent research may utilize expanded and more heterogeneous samples across different healthcare contexts, demographic groups, or countries to enhance the external validity of the results. Finally, while this study examined several key determinants of mHealth continuance, other potentially important factors were not included in the model. Future research may explore additional variables such as trust in digital health platforms, perceived privacy risk, social influence, or health literacy, which may further explain users' engagement with mHealth technologies (Tian & Wu, 2022; Nie et al., 2023).

VIII. CONCLUSIONS

This study examined the factors that influence sustained engagement with mHealth applications and their implications for patient empowerment and shared decision-making. By integrating technological factors (perceived personalization and app usability) with patient-related capabilities (digital patient agency), the study developed and tested a model explaining how these elements shape patient empowerment, e-patient satisfaction, continuance intention, and collaborative healthcare decisions.

The results show that digital patient agency, perceived personalization, and app usability significantly enhance patient empowerment and e-patient satisfaction. In turn, patient empowerment was found to strongly influence both continuance intention and shared decision-making, highlighting its critical role in sustaining mHealth engagement and enabling more collaborative healthcare interactions. Additionally, e-patient satisfaction was found to positively contribute to shared decision-making, indicating that positive digital health experiences encourage patients to participate more actively in healthcare decisions.These findings reinforce the growing importance of digital health technologies in supporting patient-centered care. mHealth applications can empower patients by providing accessible health information, self-monitoring tools, and communication channels that strengthen collaboration between patients and healthcare providers (Mesko et al., 2025; Wu et al., 2026). As healthcare systems increasingly integrate digital technologies into clinical practice, understanding the factors that promote sustained engagement with mHealth tools becomes essential.

Overall, This study advances digital health research by emphasizing the pivotal role of patient empowerment in linking technology design features with long-term mHealth usage and shared decision-making. The findings provide valuable insights for researchers, healthcare providers, and digital health developers seeking to design more effective, user-centered mHealth solutions that enhance patient participation and improve healthcare outcomes.

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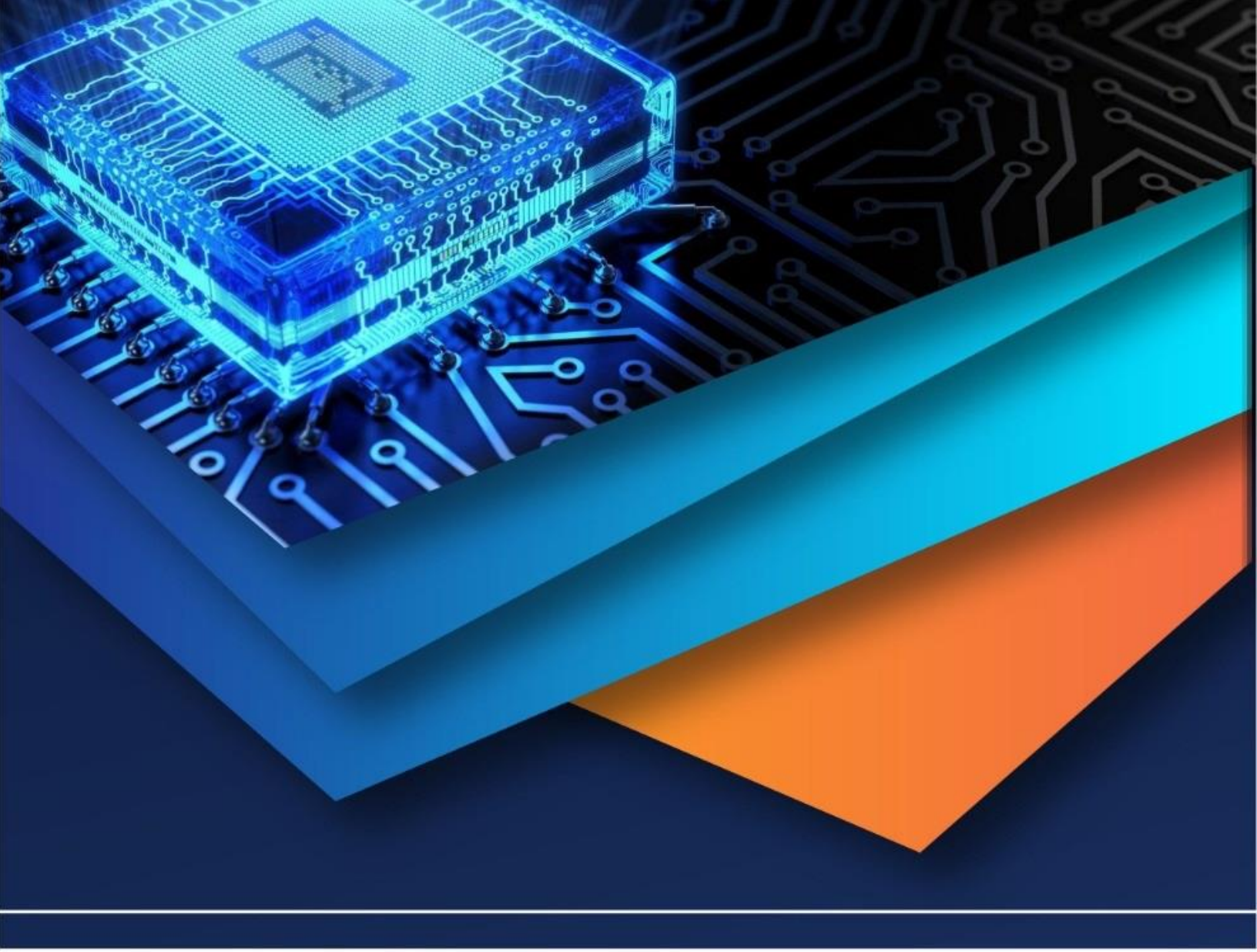

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