

Predicting Young Users' Adoption of mHealth Services: Evidence from a Developing Country

Afruz Haque¹, Rasheda Akter Rupa², Farjana Nasrin³, Most. Sadia Akter², Shafiqur Rahman⁴ , Md. Mazharul Alam¹

ABSTRACT

Mobile health (mHealth) services are revolutionizing healthcare in developing nations, yet adoption among young users remains low despite increasing digital access. This study integrates the Unified Theory of Acceptance and Use of Technology 2 (UTAUT-2) and the Information Systems Success (ISS) Model to explore adoption drivers in Bangladesh, replacing 'price value' with 'intrinsic value' to better assess user motivation. Surveying university students and analyzing data via PLS-SEM, findings show performance expectancy, intrinsic value and ISS factors (information, system and service quality) significantly boost satisfaction. Surprisingly, effort expectancy had little impact, likely due to high digital literacy. User satisfaction strongly predicted continued mHealth use intention. The study offers both theoretical contributions to technology adoption literature and practical guidance for developers and policymakers to improve mHealth engagement among young users.

Keywords

mHealth; UTAUT-2; ISS model; Intrinsic Value; Developing Country.

INTRODUCTION

With the advantages of technology and digitalization, mHealth services are becoming a transformative force in global healthcare¹. The term mHealth refers to the use of mobile technologies such as mobile phones, tablets, personal digital assistants (PDA), wearable devices, smart watches, and other wireless networks to support health care services and information such as online medical consulting services, doctors' appointment, online payment, report collection, medicine purchase, fitness tracking, and health education^{2,3}. These services offer convenient, accessible, and real-time healthcare benefits to a wide range of people, particularly young users. Since young individuals are more tech-savvy and possess greater digital literacy, they are more inclined to adopt mHealth solutions for health tracking, remote consultation, and personalized services⁴. Young people are now more aware and health-conscious, which further encourages mHealth adoption among themselves. Although the perception of mHealth adoption significantly increased among young individuals in developing countries due to their prompt acceptance of technology⁵, the actual adoption rate in mHealth applications among the broader population in these countries remains limited, which creates a research gap to

1. Dhaka University of Engineering & Technology, Gazipur, Bangladesh.
2. University of Dhaka, Dhaka, Bangladesh.
3. Islamic University of Technology, Gazipur, Dhaka.
4. PhD, Professor, International Open University, The Gambia [remotely from Australia]

Correspondence

Dr. Shafiqur Rahman, PhD, Professor, International Open University, The Gambia [remotely from Australia]
Email: Shafiq.Australia@gmail.com

understand young users' perception towards mHealth services in the context of developing countries.

However, higher-income countries have more access to healthcare services compared to lower- or middle-income countries⁶. Although the use of mobile phones in health care facilities is increasing in developing countries, their adoption rate is relatively lower⁷. Developing countries often face challenges in delivering proper health care services due to a lack of human and non-human resources, poor infrastructure⁸. Consequently, healthcare access in these regions remains limited. Moreover, developing countries struggle with technological adoption across all levels of healthcare and experience insufficient measurable outcomes in the health sector⁹.

Wealthy nations prioritize universal healthcare, while Bangladesh struggles with fragmented information, creating barriers to effective patient care¹⁰. Bangladesh is strengthening health systems, adopting digital solutions, and enhancing information management to combat the health crisis¹¹. The government cannot address healthcare needs for all citizens due to budget constraints¹². However, there are some initiatives, including banking CSR, to overcome these crises^{13, 14, 15}. In this country, the doctor-patient ratio is very low. According to the WHO, the doctor-to-patient ratio should be 1 doctor for every 1,000 people, while in Bangladesh, it is approximately 5.26 doctors for every 10,000 people⁸. Shortage of doctors, overcrowded hospitals, long waiting times, and, more specifically, limited access to real-time treatment and healthcare awareness¹⁶ are the most challenging issues in the healthcare sector in Bangladesh. Subsequently, mHealth applications can cost-effectively mitigate these challenges and encourage personal health care and health awareness among people. Thus, mHealth applications can bridge the gaps between overpopulation and doctor shortage.

Over the past few decades, a considerable amount of research has been conducted due to the increased importance of the digital health care delivery system. Although several studies have been conducted to understand the influencing factors of mHealth adoption in Bangladesh, the specific segment of young people remains unrevealed. No previous studies have shown the integration of different contexts and models in understanding users' adoption of mHealth service⁴. In previous studies, different theories and models have

been used to understand the usage patterns and actual utilization of digital or eHealth services. To address this gap, our study conceptualizes a unique model by integrating Delone & McLean's IS Success Model¹⁷ with the widely acknowledged UTAUT-2 model¹¹ to get a more comprehensive understanding of young users' adoption of mHealth services. The primary aim of this study is to understand the young users' perceptions and uptake of mHealth services through the lens of UTAUT-2 and the IS Success model. The findings of this research will provide some insightful practical implications for society.

Literature review

Theoretical foundations and model conceptualization

Several prior research efforts have focused on different technology adoption models, often incorporating additional contextual and environmental attributes as predictors to better explain the attributes impacting the intention to adopt and the actual utilization of innovative technologies across various fields¹². Hence, to provide a more holistic explanation of young users' uptake of mHealth services, this study integrates the Delone & McLean IS Success Model¹⁷ with the widely acknowledged UTAUT-2 model¹⁸.

UTAUT is emerging as a foundational framework for evaluating recipient intentions and actual usage of information systems²⁰⁻²². The model comprises four key independent components that influence final-users' behavioral intention to use, as well as their actual use of information systems: performance expectancy, effort expectancy, social influence, and facilitating conditions²⁴. Subsequently, the model was extended to form UTAUT-2 by integrating additional independent factors such as hedonic motivation, price value, and habit, enhancing its applicability in consumer domains^{19, 21}. One of the prime reasons the authors selected the UTAUT-2 model for this study is its superior explanatory power, greater applicability, and relevance in consumer contexts¹⁹.

It has been argued that understanding the factors influencing the widespread adoption of mHealth services in Bangladesh requires examining the DeLone and McLean Information Systems Success Model, as it provides more nuanced and comprehensive insights into IS success issues¹⁸. IS Success Model was founded in 1992²⁷ to assess IS success in organizational settings, consisting of six constructs: information quality, system

quality, use, user satisfaction, individual impact, and organizational impact, which was updated in 2003 by incorporating two new constructs: service quality and net benefits¹⁹. This framework has frequently served as a tool to evaluate various innovations across different research domains²⁸.

To measure the mHealth use intention, this study extracted three variables from UTAUT-2: Performance Expectancy (PE), Effort Expectancy (EE), and replaced Price Value (PV) with Intrinsic Value (IV). In the health domain, especially in mHealth services, users are often more motivated by personal interest, enjoyment, or perceived importance of managing their health rather than cost concerns; thus, intrinsic value is considered more relevant than price value from the original UTAUT-2 model. The predictors derived from the D&M IS Success Model include Information Quality (IQ), System Quality (SQ), Service Quality (SEQ), and User Satisfaction (SAT). By combining these two models,

this study presents a conceptual framework to explore individual behavioral determinants alongside system-related success factors. As young users often base their decisions on a combination of social, technological, and psychological factors, this integration enables researchers to examine both technology acceptability and system performance outcomes^{5,20}.

Development of Hypotheses

Performance Expectancy (PE)

PE refers to “the degree to which an individual believes that using the Information System (IS) will help him/her to attain gains in job performance”²⁴. From the perspective of mHealth usage, PE reflects users’ expectations of technology in addressing healthcare challenges⁵. Research in the mHealth context has also highlighted the favorable outcome of performance expectancy on user satisfaction and behavioral intention^{5,29}. When users perceive technology as beneficial in

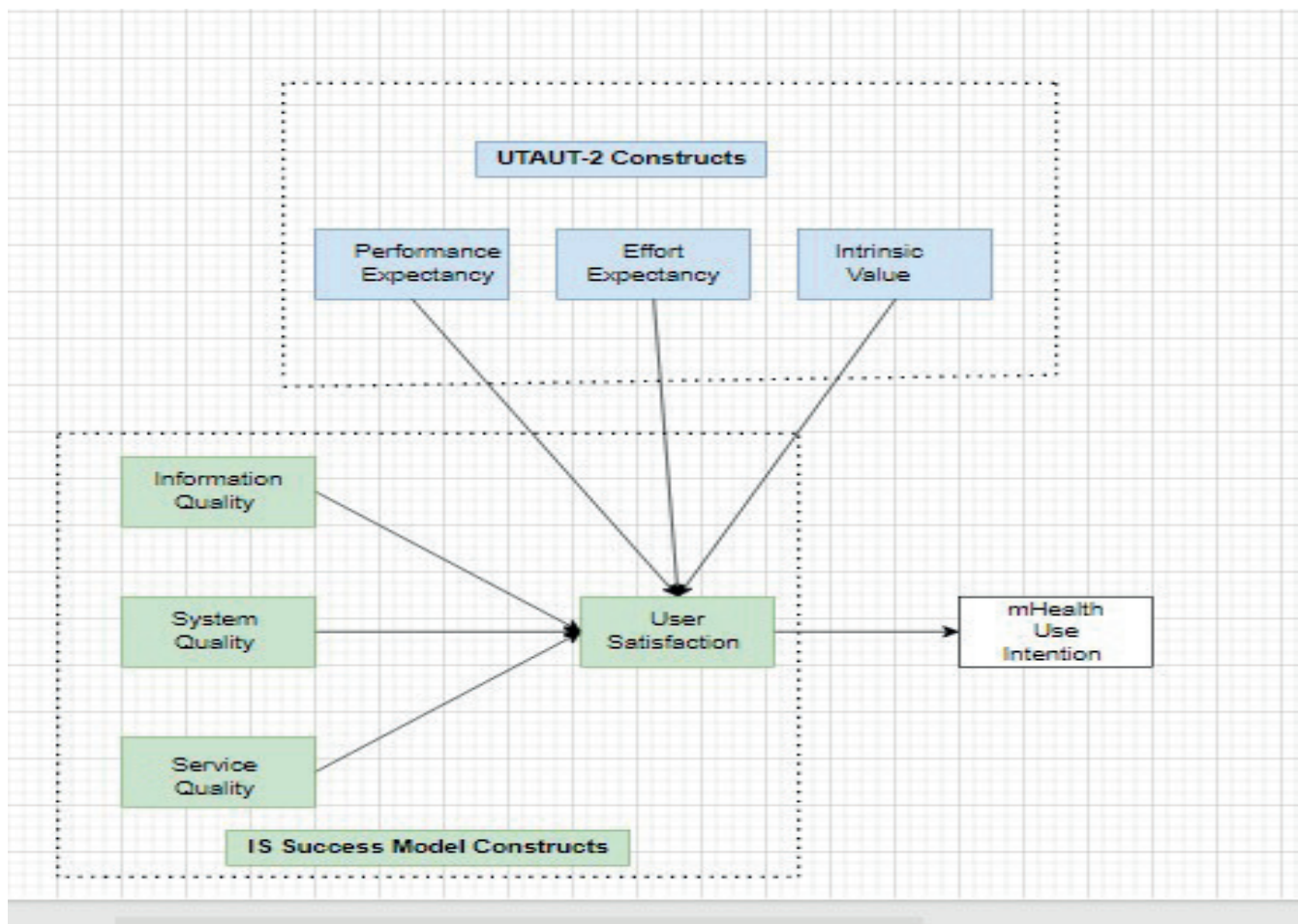


Figure 1: Proposed Research Model

solving healthcare-related problems, their satisfaction with the system is likely to increase, which ultimately increases the mHealth service adoption. Based on this, the following hypothesis was formulated.

H1: PE has a positive impact on user satisfaction with mHealth services.

Effort Expectancy (EE)

EE refers to “the degree of ease associated with the use of the system”²⁴. In the context of mHealth services, EE refers to the degree to which users perceive the app as straightforward and easy to learn. A user-friendly interface and intuitive functionality reduce cognitive load, enhance usability, and promote a more positive interaction with the system. This improved user experience contributes directly to user gratification, which is a critical determinant of continued usage and acceptance of mHealth services^{5, 30}. Accordingly, the following hypothesis is proposed.

H2: EE has a positive impact on user satisfaction with mHealth services.

Intrinsic Value (IV)

Intrinsic value, closely related to intrinsic motivation, is explained as the degree to which a technology use activity is perceived to be inherently enjoyable or personally meaningful³¹. This variable has been incorporated into extended versions of UTAUT-2 to explore user behaviour in domains, especially health and education, where enjoyment and personal relevance are important³². When users perceive that using the mHealth services is inherently valuable and meaningful, it enhances their overall satisfaction with the service, thereby fostering sustained engagement and acceptance^{29,33}. Hence, the following hypothesis is offered:

H3: IV has a positive impact on user satisfaction with mHealth services.

Information Quality (IQ)

IQ is defined as a “measure” that “measures semantic success, which is the success of the information in conveying the intended meaning”⁸. IQ is characterized by facets such as timeliness, precision, correctness, accessibility, reliability, scope, completeness, and pertinence³⁴. In the domain of mHealth services, Information Quality (IQ) is vital for ensuring user satisfaction as well as adoption, as inaccurate or poor-quality medical information can lead to long-term adverse effects^{5, 26, 29}. Therefore, this study considers the

following hypothesis.

H4: IQ has a positive impact on user satisfaction with mHealth services.

System Quality (SQ)

SQ can be defined as a “measure of the success of a service from a technical point of view”¹⁸. It has been argued that users are more inclined to adopt systems that offer the highest level of accuracy and technical efficiency³⁵. Greater SQ contributes to a smoother user experience, reduced frustration, and increased trust in the service, leading to higher levels of user satisfaction in the mHealth domain³⁷. A positive association between service quality and user satisfaction in e-learning systems has been identified³⁶. Hence, we postulate the following hypothesis.

H5: SQ has a positive impact on user satisfaction with mHealth services.

Service Quality (SEQ)

SEQ refers to “the overall support delivered by the service provider in a way that reveals assurance, empathy, and responsiveness”¹⁸. It is critical to consider the issue of ensuring the SEQ when laying the foundation of any services. Several studies^{28,37} found a strong relationship between SEQ and SAT in using innovative technologies and systems. In the field of mHealth, an elevated degree of SEQ yields increased user satisfaction^{5,29}. Therefore, the following hypothesis is offered.

H6: SEQ has a positive impact on user satisfaction with mHealth services.

User Satisfaction (SAT)

SAT is regarded as one of the prominent success indicators of IS success²⁸. Within the realm of mHealth, satisfaction becomes even more crucial due to the sensitivity and importance of healthcare services²⁹. When users perceive that the mHealth platform is reliable, accurate, and easy to use and meets their health care needs, they are more likely to view it as a valuable tool, thereby increasing their intention to use it regularly^{30,38}. SAT, derived from IQ, SQ, and SEQ, is likely to enhance both the intention to use and the actual utilization of the system^{28, 39}. Hence, the following hypothesis is proposed.

H7: SAT has a positive impact on mHealth adoption intention.

Research Methodology

Research Design, Population, and Sampling Technique

The researcher takes an exploratory research design for its positive research paradigm⁴⁰ so that a causal relationship can be found between the outcome and predictor variables. The target population of this study is young users who are postgraduate and undergraduate University students. A purposive sampling technique was employed to select the respondents for this study. The respondents for this study were university students aged under 35.

Questionnaire Design and Measurement Items

A well-organised survey was created to get information from the intended people. The first half of the survey asked basic demographic questions, whereas the second half consisted of latent construct items for testing hypotheses. The researcher uses a 5-point Likert scale that ranges from strongly disagree to strongly agree. There were 29 items covering every possible construct. The researcher used the items from the preceding research for the latent constructs. Items of UTAU-2 constructs (performance expectancy, effort expectancy) were sourced from^{19, 30}, items assessing intrinsic value were adapted from²⁵, while items evaluating information quality, system quality and service quality were taken from^{18, 28}. Items of user satisfaction sourced from²⁸ and items of mHealth use intention derived from^{24, 35}.

Pilot Testing, Data Collection, and Sample Size

The questionnaire was reviewed by three academic experts, leading to revisions for clarity and ease of understanding. A pre-test with 12 target participants was conducted in January 2024 to assess simplicity, relevance, and comprehensibility. Final data collection took place from February to April 2025 via both online (social media, Google Forms) and offline (printed copies) methods.

A total of 598 questionnaires were recorded out of a total of 700 that were distributed, which results in a response rate of roughly 85.43%. After removing responses that were deemed to be inadequate or wrong, there were a total of 587 responses that were considered appropriate for further evaluation. The sample size of 587 is sufficient for this study, as it meets several criteria established by prominent scholars.³³ suggested the 10

times rule, representing that the minimum sample size should be at least 10 times each item of each construct. Similarly, it has been stated that while a sample size of 200 is acceptable for general studies, a sample size of 300 is considered reliable for conducting statistical analysis using structural equation modelling (SEM)³⁴. Therefore, the sample size for this study is justified.

Data Analysis Technique

After collecting data, the data are initially analyzed through SPSS software version 28. This helps to find the missing value of the collected data. The demographic information is analyzed by using the SPSS software. In the next phase, to prove hypotheses, the Partial Least Squares Structural Equation Modelling (PLS-SEM) technique was used using Smart-PLS 4.0 software. Before bootstrapping, a measurement model was employed to validate the reliability and validity of the items. The assessment of common method bias was conducted through variance inflation factors (VIFs), necessitating that all VIF values remain below 3.

Ethical Clearance

The research was conducted in the context of Bangladesh, where formal ethics clearance is not required for studies of this nature, as performed by the authors.

RESULTS

Demographic Analysis

The demographic factors of respondents are given in Table 1. As young generations are the target population of this study, data have been collected from respondents who are between 16 and 35 years old. The majority of the respondents (90.5%) belong to the age group of 21-25. 77.2% of respondents are male, and 22.80% are female. Inquiry regarding mHealth use frequency revealed that 32.20% of young people most often use mHealth, while 27.90% frequently use mHealth.

Common Method Variance (CMV)

The dataset of the survey instrument was examined for common method variance (CMV) to mitigate any possible bias. The single-factor test for this study, conducted by Harman (1976) revealed that one component explained 38.67% of the overall variance. The value, being under the suggested threshold value of 50%, indicates that no overarching factor predominates

Table 1. Demographic profile of the respondents

Variables	Option	Frequency	Percentage (%)
Gender	Male	453	77.20%
	Female	134	22.80%
Age	16-20	11	1.90%
	21-25	531	90.50%
	26-30	37	6.30%
	31-35	8	1.40%
	Rarely	118	20.10%
mHealth Use Frequency	Often	189	32.20%
	Frequently	164	27.90%
	Always	116	19.80%

the dataset. Consequently, for this study, CMV is not a substantial matter⁴³.

Measurement Model Analysis

The factor loadings (FL), composite reliability (CR), Cronbach’s alpha (CA), and average variance extracted (AVE) as presented in Table 2 measure the convergent validity of the measurement model. For this study, the factor loadings, being within the range of 0.709 to 0.949, surpass the threshold of 0.70⁴¹. Therefore, indicator reliability has been established. The Cronbach’s alpha values surpassed the suggested lowest value of 0.70, signifying internal consistency across all constructs⁴¹.

The CR values range from 0.761 to 0.926, indicating strong internal consistency, as all values exceed the threshold of 0.70. The AVE values for all multi-item constructs ranged from 0.611 (PE) to 0.870 (SAT), exceeding the 0.50 threshold established by³⁶. Each construct thus adequately captures variance from its items. The results demonstrate strong convergent validity within the measurement model.

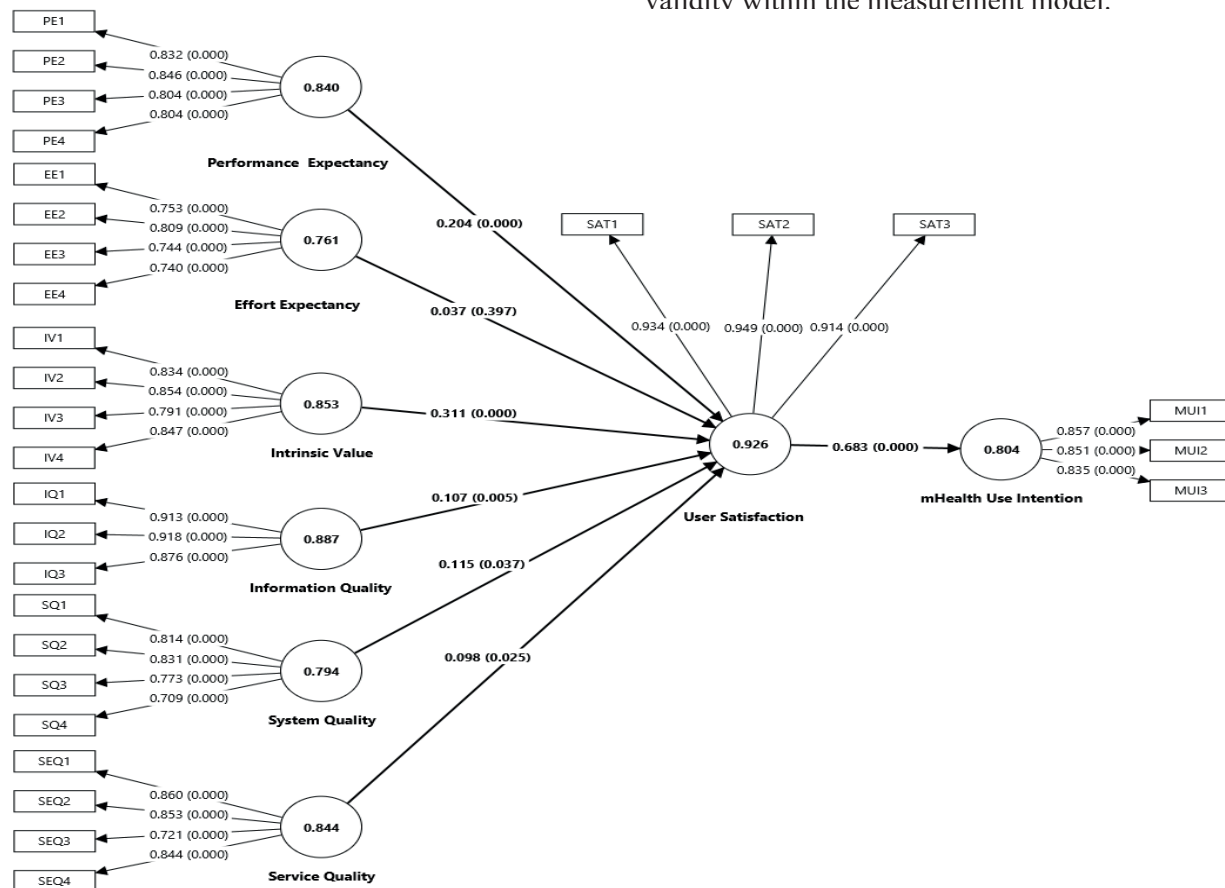


Figure 2: Measurement model

Table 2: Measurement Model

Constructs	Items	Loadings	CA	CR	AVE
PE	PE1	0.832	0.759	0.761	0.611
	PE2	0.846			
	PE3	0.804			
	PE4	0.804			
EE	EE1	0.753	0.839	0.840	0.675
	EE2	0.809			
	EE3	0.744			
	EE4	0.740			
IV	IV1	0.834	0.851	0.853	0.692
	IV2	0.854			
	IV3	0.791			
	IV4	0.847			
IQ	IQ1	0.913	0.886	0.887	0.814
	IQ2	0.918			
	IQ4	0.876			
SQ	SQ1	0.814	0.788	0.794	0.613
	SQ2	0.831			
	SQ3	0.773			
	SQ4	0.709			
SEQ	SEQ1	0.860	0.837	0.844	0.675
	SEQ2	0.853			
	SEQ3	0.721			
	SEQ4	0.844			
SAT	SAT1	0.934	0.925	0.926	0.870
	SAT2	0.949			
	SAT3	0.914			
mUI	mUI1	0.857	0.804	0.804	0.719
	mUI2	0.851			
	mUI3	0.835			

Note: PE = Performance Expectancy, EE = Effort Expectancy, IV = Intrinsic Value, IQ = Information Quality, SQ= System Quality, SEQ= Service Quality, SAT= User Satisfaction, mUI = mHealth Use Intention.

Structural Model

The suggested path's ability to describe the connections between the latent constructs is measured and explained by the structural model. Table 3 denotes the statistics for R^2 and Q^2 . The model shows 64% and 61% variance in user satisfaction and mHealth use satisfaction, respectively, assuring that the model fits well. Moreover, the model also has adequate predictive accuracy as the values for Q^2 for both dependent variables are greater than the threshold value of zero⁴⁵.

Table 3. Measurement of determination coefficient (R^2) and predictive accuracy (Q^2)

Constructs	R-square	R-square adjusted	Q^2 predict
User satisfaction	0.640	0.525	0.415
MHealth use satisfaction	0.616	0.565	0.433

The structural model was assessed for evaluating the hypotheses using the bootstrapping technique. Figure 2, and Table 4 present the findings. All hypotheses except H2 are accepted. It is shown that PE ($t = 3.549$, $p = 0.000$), IV ($t = 4.899$, $p = 0.000$), IQ ($t = 2.804$, $p = 0.005$), SQ ($t = 2.086$, $p = 0.037$), and SEQ ($t = 2.248$, $p = 0.025$) significantly affect user satisfaction, supporting Hypotheses H1, H3, H4, H5 and H6. EE ($t = 0.846$, $p = 0.397$) has insignificant impact on satisfaction, rejecting hypothesis H2. Interestingly, SAT ($t = 4.487$, $p = 0.000$) also has a substantial impact on mHealth use intention.

Since all of the Variance Inflation Factor (VIF) values from path analysis are less than 5, multicollinearity is absent from the current study model. Table 4 also shows that SQ and SEQ have medium impacts, with effect sizes of 0.217 and 0.312, respectively. PE, IV, IQ and SAT have large effects as all f^2 values are greater than 0.35.

DISCUSSION

This research aims to explore the drivers influencing mHealth user satisfaction and how user satisfaction influences their mHealth use intention in a developing country context. The results from PLS-SEM depict that all factors except EE positively stimulate user satisfaction, supporting H1, H3, H4, H5, H6, and H7. Only EE has an insignificant impact on users' satisfaction. Therefore, H2 has not been accepted.

Table 4: Structural model assessment for direct connections

H	Relations	Std Error	T values	P values*	f ²	VIF	Decision
1	PE -> SAT	0.058	3.549	0.000	0.635	2.298	Supported
2	EE-> SAT	0.044	0.846	0.397	0.001	2.973	Not Supported
3	IV-> SAT	0.063	4.899	0.000	0.673	2.798	Supported
4	IQ-> SAT	0.038	2.804	0.005	0.415	1.590	Supported
5	SQ-> SAT	0.055	2.086	0.037	0.217	2.280	Supported
6	SEQ-> SAT	0.044	2.248	0.025	0.312	1.730	Supported
7	SAT-> mUI	0.028	4.487	0.000	0.774	1.000	Supported

* at the significance level of < 0.05.

Note: PE = Performance Expectancy, EE = Effort Expectancy, IV = Intrinsic Value, IQ = Information Quality, SQ = System Quality, SEQ = Service Quality, SAT = User Satisfaction, mUI = mHealth Use Intention.

Moreover, user satisfaction positively impacts users' mHealth use intentions.

The positive link between PE and user satisfaction supports prior studies^{29, 30, 46} indicating that users who view mHealth systems as effective in enhancing their health management tend to report higher satisfaction levels^{19, 47}. Therefore, perceived usefulness is a key predictor of satisfaction, particularly when users perceive that mHealth services significantly impact their health outcomes.

Effort expectancy was determined to have no significant impact on satisfaction. This contrasts with existing research^{5, 48, 49}, yet can be understood through the lens of rising digital literacy and greater familiarity with smartphone technology, especially among younger or urban demographics in developing nations.

Intrinsic value significantly influences satisfaction, aligning the results with findings in health information systems that indicate perceived value is crucial for technology acceptance. Similar findings were also reported, where information accuracy was identified as a significant predictor of user satisfaction, emphasizing the importance of reliable and precise content in

healthcare applications²⁹. Accurate health information facilitates improved decision-making and increases users' trust in the digital platform. The finding aligns with the conclusions of telemedicine.

SQ demonstrated significant positive effects on satisfaction, which is consistent with the studies on telemedicine²⁹ and e-learning^{36, 50}. Literature supports the findings of this research on the positive correlation between SEQ and SAT. These findings assert that system consistency, convenience and service responsiveness, and utility are essential in influencing favorable user assessments. In mHealth, users rely on real-time and precise health services, making the quality of the platform and its support crucial for building confidence and contentment⁵¹.

Finally, the positive impact of satisfaction among users on mHealth use intentions underscores the fundamental principle of post-adoption behaviors. Satisfied users are more inclined to persist in using and endorsing mHealth applications, indicating that improving satisfaction is essential for sustained user engagement. This finding aligns with existing literature highlighting the role of satisfaction in influencing use intentions^{28, 29, 39}.

Theoretical and Practical Implications

This study offers both theoretical and practical implications for understanding mHealth services adoption among young users in Bangladesh. Theoretically, it integrates the IS Success Model with UTAUT-2, a novel combination that enhances the predictive power for mHealth use intention. Notably, the study validates the significant role of user satisfaction in mHealth adoption, thereby extending the IS model's applicability. The model demonstrates strong explanatory power, with R^2 values of 0.804 for use behavior and 0.926 for user satisfaction, reinforcing its robustness and potential for future theoretical development.

Practically, the findings benefit healthcare providers, developers, and policymakers. By identifying key predictors from both models, such as service, information, and system quality (IS model) and performance expectancy and intrinsic value (UTAUT-2), the study guides strategies to enhance user satisfaction and mHealth uptake. Healthcare providers should ensure high-quality service and offer strong customer support. Developers can boost satisfaction by protecting user privacy, offering reliable health content, and enabling transparency. The government and NGOs are encouraged to support policy initiatives and awareness programs that promote trust and adoption of digital health services as viable alternatives to traditional care.

Limitations and Prospective Research Paths

While this study offers valuable insights into the factors influencing young users' adoption of mHealth services, it is not without limitations. The use of a cross-sectional design restricts the ability to observe changes in user behavior over time, particularly in a rapidly evolving digital health landscape. Additionally, the sample was limited to a specific emerging country context, which could limit the generalizability of the outcomes. Future research is encouraged to adopt a longitudinal approach to capture temporal shifts in mHealth adoption and expand the sample to include diverse user groups across different regions. Additionally, while the current study employed a quantitative approach to test hypothesized relationships, the inclusion of qualitative research methods in future studies could generate richer, more subtle insights into the stimuli and challenges shaping

mHealth adoption behavior. Such mixed-methods approaches can reveal underlying factors not easily captured through surveys.

CONCLUSION

This study aims to explore the factors influencing the perception of adopting mHealth services among young users in a developing country context. PLS-SEM analysis shows that performance expectancy, intrinsic value, information quality, system quality, and service quality positively influence users' satisfaction, which in turn positively impacts users' intentions to use mHealth services. Only effort expectancy has no significant impact on users' satisfaction. However, it acts as a significant predictor in technology acceptance research, possibly due to the perception of ease of use being now the primary expectation rather than a satisfaction driver among the young users. The result emphasizes that performance expectancy is a key predictor of satisfaction, particularly when users perceive that mHealth services significantly impact their health outcomes. Moreover, system consistency, convenience and service responsiveness, and utility are essential in influencing favorable user assessments. Subsequently, users who perceive mHealth as a practical application for managing health are generally associated with a higher satisfaction level. Finally, these observations highlight the importance of designing mHealth applications that ensure effective and responsive health services. This study enriches mHealth adoption literature by integrating the IS Success Model and UTAUT-2 to highlight young users' perspectives, offering actionable insights for developers, policymakers, and service providers in developing countries.

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Authors' Contributions: Afruza Haque, Rasheda Akter Rupa, and Farjana Nasrin conceptualised and designed the study and collected the data. Most. Sadia Akter and Md. Mazharul Alam verified and analysed the data. Shafiqur Rahman contributed to the overall study design, final manuscript preparation, and submission.

REFERENCES

- Ernawati K, Nugroho BS, Suryana C, Riyanto A, Fatmawati E. The advantages of digital applications in public health services on automation era. *International journal of health sciences*. 2022 Feb 6;**6**(1):174–86.
- Moorthy P, Weinert L, Schüttler C, Svensson L, Sedlmayr B, Müller J, et al. Attributes, Methods, and Frameworks Used to Evaluate Wearables and Their Companion mHealth Apps: Scoping Review. *JMIR mHealth and uHealth*. 2024 Apr 5;**12**(1):e52179.
- Tohit NF, Haque M. Leveraging technology to transform sexual and reproductive health services. *Bangladesh Journal of Medical Science*. 2024 Oct 2;**23**(4):896-906.
- Subramaniam M, Vaingankar J, Tan B, Abdin E, Chang S, Tan Y, et al. Examining psychological distress among youth in Singapore: Insights from the National Youth Mental Health Study. *Asian Journal of Psychiatry*. 2025 Mar 1;**105**:104405.
- Alam MZ, Alam MMD, Uddin MA, Mohd Noor NA. Do mobile health (mHealth) services ensure the quality of health life? An integrated approach from a developing country context. *Journal of Marketing Communications*. 2022;**28**(2):152–82.
- Hashemi G, Wickenden M, Bright T, Kuper H. Barriers to accessing primary healthcare services for people with disabilities in low and middle-income countries, a Meta-synthesis of qualitative studies. *Disabil Rehabil*. 2022 Apr;**44**(8):1207–20.
- Moudud-Ul-Huq S, Sultana Swarna R, Sultana M. Elderly and middle-aged intention to use m-health services: an empirical evidence from a developing country. *Journal of Enabling Technologies*. 2021;**15**(1):23–39.
- Mwakawanga DL, Chen S, Ogata Y, Suzuki M, Kobayashi Y, Toda M, et al. Barriers and facilitators of fetal heart monitoring with a mobile cardiocograph (iCTG) device in underserved settings: An exploratory qualitative study from Tanzania. *PLoS One*. 2024;**19**(12):e0314812.
- Chib A, van Velthoven MH, Car J. mHealth adoption in low-resource environments: a review of the use of mobile healthcare in developing countries. *J Health Commun*. 2015;**20**(1):4–34.
- Rahman S, Islam A. Success Factors in the Implementation of Healthcare Information Systems (HIS) among Developing Countries. *Bangladesh Journal of Medical Science*. 2024 Oct 2;**23**(4):957-66.
- Rahman S, Islam A. Healthcare information systems (HIS): implementation challenges in developing countries. *Bangladesh Journal of Medical Science*. 2024 Mar 27;**23**(2):314-26.
- Hossain MS, Yahya SB, Rahman MD, Sobhani FA, Rahman R. Corporate social responsibility in healthcare: A case of Islamic banks (IBs) in Bangladesh. *Bangladesh Journal of Medical Science*. 2019;**18**(3)w
- Huda, N., Sobhani, FA, Al-Mahmood, AK, Rahman, S., Ahmad, AUF, Akter, T., Haque, A., Afrin, FS. CSR to tackle the economic effect of COVID-19: The case of Bangladesh. *Bangladesh Journal of Medical Sciences*. 2023; **22**:154-62.
- Sarkar S, Islam S, Rahman S, Moniruzzaman M, Haque A, Rahman F. Contribution of Banking CSR to the Healthcare Sector in Bangladesh. *Bangladesh Journal of Medical Science*. 2025 Jan 7;**24**(1):67-73.
- Rahman S, Jahan S, McDonald N. CSR by Islami Bank in healthcare stakeholders' perception. *Bangladesh Journal of Medical Science*. 2010;**9**(4):208-15.
- Huda N, Suanda J, Ahamed NI. Systematic Literature Review on Digital Marketing in Women's Healthcare Using the PRISMA Model. *Bangladesh Journal of Medical Science*. 2025 May 17;**24**(2):373-84.
- Hossain MS, Syeed MMM, Fatema K, Uddin MF. The Perception of Health Professionals in Bangladesh toward the Digitalization of the Health Sector. *Int J Environ Res Public Health*. 2022 Oct 21;**19**(20):13695.
- Delone W, McLean E. The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *J of Management Information Systems*. 2003 Apr 1;**19**:9–30.
- Venkatesh V, Thong JYL, Xu X. Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*. 2012;**36**(1):157–78.
- Dwivedi YK, Rana NP, Janssen M, Lal B, Williams MD, Clement M. An empirical validation of a unified model of electronic government adoption (UMEGA). 2017 Mar 31 [cited 2025 Jun 17]; Available from: <https://uobrep.openrepository.com/handle/10547/622855>
- Haque A, Sultana N, Kim YS, Amin MA. Integration of the UTAUT Model in Mobile Banking Context: The Mediating Role of Personal Innovativeness and Perceived Value. *Asia Pacific Journal of Information Systems*. 2024 Sep 30;**34**(3):929–56.
- Pan M, Gao W. Determinants of the behavioral intention to use a mobile nursing application by nurses in China. *BMC Health Services Research*. 2021 Mar 12;**21**(1):228.
- Sultana N, Chowdhury RS, Haque A. Gravitating towards Fintech: A study on Undergraduates using extended UTAUT model. *Heliyon*. 2023 Oct;**9**(10):e20731.
- Venkatesh V, Morris MG, Davis GB, Davis FD. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*. 2003;**27**(3):425–78.
- Admassu W, Gorems K. Analyzing health service employees' intention to use e-health systems in southwest Ethiopia: using UTAUT-2 model. *BMC Health Services Research*. 2024 Sep 27;**24**(1):1136.
- Hossain MA. Assessing m-Health success in Bangladesh: An empirical investigation using IS success models. *J Enterp Inf Manag*. 2016;**29**(5):774–96.
- DeLone WH, McLean ER. Information Systems Success: The Quest for the Dependent Variable. *Information Systems Research*. 1992 Mar;**3**(1):60–95.

28. Alzahrani AI, Mahmud I, Ramayah T, Alfarrarj O, Alalwan N. Modelling digital library success using the DeLone and McLean information system success model. *Journal of Librarianship and Information Science*. 2019 Jun;**51**(2):291–306.
29. Hidayah NA, Utami MC, Rizki IN. Behavioral Intentions of Generation Z and Millennial Users of Telemedicine: A UTAUT 2 Analysis from the Halodoc User Perspective. *Journal of Information Systems and Informatics*. 2024 Sep 10;**6**(3):1373–99.
30. Lee WI, Fu HP, Mendoza N, Liu TY. Determinants Impacting User Behavior towards Emergency Use Intentions of m-Health Services in Taiwan. *Healthcare*. 2021 May;**9**(5):535.
31. Deci EL, Ryan RM. Intrinsic Motivation and Self-Determination in Human Behavior [Internet]. Boston, MA: Springer US; 1985 [cited 2025 Jun 17]. Available from: <http://link.springer.com/10.1007/978-1-4899-2271-7>
32. Koivisto J, Hamari J. The rise of motivational information systems: A review of gamification research. *International Journal of Information Management*. 2019 Apr 1;**45**:191–210.
33. Althinayyan T, Alojail M. Enhancing User Experience and Sustainability in Open Banking Using PLS-SEM. *Sustainability*. 2024 Jan;**16**(22):9656.
34. Urbach N, Mueller B. The Updated DeLone and McLean Model of Information Systems Success. In: Dwivedi YK, Wade M, Schneberger SL, editors. *Information Systems Theory: Explaining and Predicting Our Digital Society*. New York: Springer; 2011. p. 1–18. (Integrated Series in Information Systems; vol. 1).
35. Prasetyani D, Cahyadin M, Indriawati RM, Santosa A. Does technology adoption matter for SMEs? A literature review. *JEPP*. 2025 Jun 17;**14**(2):351–75.
36. Riatur, Lestari ED. Analysis of the Effect of Information Quality, System Quality, and Support Service Quality on User Satisfaction Levels and Its Implications for Blended E-Learning Continuance Intention to Use in the New Normal Era. *Formosa Journal of Sustainable Research*. 2022 Dec 27;**1**(7):1067–82.
37. Shaltoni AM, Khraim H, Abuhamad A, Amer M. Exploring Students' Satisfaction with Universities' Portals in Developing Countries: A Cultural Perspective. *International Journal of Information and Learning Technology*. 2015;**32**(2):82–93.
38. Kalinić Z, Marinković V, Djordjevic A, Liebana-Cabanillas F. What drives customer satisfaction and word of mouth in mobile commerce services? A UTAUT2-based analytical approach. *Journal of Enterprise Information Management*. 2019 Oct 28;**33**(1):71–94.
39. Birkmeyer S, Wirtz BW, Langer PF. Determinants of mHealth success: An empirical investigation of the user perspective. *Int J Inf Manage*. 2021 Aug;**59**:102351.
40. Saunders MNK, Lewis P, Thornhill A. Saunders, Research Methods for Business Students [Internet]. 2019 [cited 2025 May 16]. Available from: <https://www.pearson.com/content/one-dot-com/one-dot-com/se/en/Nordics-Higher-Education/subject-catalogue/business-and-management/Research-methods-for-business-students-8e-saunders.html>
41. Hair JF, Risher JJ, Sarstedt M, Ringle CM. When to use and how to report the results of PLS-SEM. *European Business Review*. 2019 Jan 1;**31**(1):2–24.
42. Kline RB. *Principles and Practice of Structural Equation Modeling*. Guildford Press.; 2015.
43. Podsakoff PM, MacKenzie SB, Lee JY, Podsakoff NP. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*. 2003;**88**(5):879–903.
44. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*. 1981;**18**(1):39–50.
45. Hair JF, Hult GTM, Ringle CM, Sarstedt M, Danks NP, Ray S. An Introduction to Structural Equation Modeling. In: Hair Jr. JF, Hult GTM, Ringle CM, Sarstedt M, Danks NP, Ray S, editors. *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook* [Internet]. Cham: Springer International Publishing; 2021 [cited 2025 Jan 19]. p. 1–29. Available from: https://doi.org/10.1007/978-3-030-80519-7_1
46. Siripipatthanakul S, Limna P, Sriboonruang P, Kaewpuang P. Applying the TPB and the UTAUT Models Predicting Intentions to Use Telemedicine Among Thai People During the COVID-19 Pandemic. *International Journal of Computing Sciences Research*. 2023 Jan 1;**7**:1362–84.
47. Hoque MR. An empirical study of mHealth adoption in a developing country: the moderating effect of gender concern. *BMC Medical Informatics and Decision Making*. 2016 May 3;**16**(1):51.
48. Ooi SK, Yeap JAL, Lam SL, Gim GCW. Consumers' receptivity to mHealth technologies: a hybrid PLS-ANN approach. *Kybernetes* [Internet]. 2024 May 13 [cited 2025 Jun 17];ahead-of-print(ahead-of-print). Available from: <https://www.emerald.com/insight/content/doi/10.1108/k-10-2023-2029/full/html>
49. van de Werken HA, Rohrbach PJ, Bolman CAW. Explaining intention and use of Mhealth with the unified theory of acceptance and use of technology. *Acta Psychol (Amst)*. 2025 Apr;**254**:104819.
50. Puriwat W, Tripopsakul S. The Impact of e-Learning Quality on Student Satisfaction and Continuance Usage Intentions during COVID-19. *IJMET*. 2021;**11**(8):368–74.
51. Deniz-Garcia A, Fabelo H, Rodriguez-Almeida AJ, Zamora-Zamorano G, Castro-Fernandez M, Ruano M del PA, et al. Quality, Usability, and Effectiveness of mHealth Apps and the Role of Artificial Intelligence: Current Scenario and Challenges. *Journal of Medical Internet Research*. 2023 May 4;**25**(1):e44030.