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Article

Gender differences in herbal platform adoption and user behavior: A multi-group comparison based on structural equation model

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Abstract: This study aims to examine how marketing mix and trust theories influence users' intentions to adopt herbal platform services in Thailand and examine the impact of these intentions on actual service usage, placing a special focus on the integration of technologies in the context. The significant potential for growth in Thailand's herbal business and the currently underutilized online platforms, it is crucial for stakeholders to understand the determinants of investment intentions. Merging marketing mix and trust theories, this research offers a comprehensive analysis of factors influencing the use of herbal platform, highlighting the relevance of herbal in enhancing service adoption. This study utilized a quantitative approach, gathering data through online surveys from 416 users of online herbal platforms in Thailand using SEM to examine the impact of gender on consumers' decisions to use these platforms. This study provides insights into effective business strategies for herbal companies and contributes novel perspectives to the literature on herbal services. It specifically examines cognitive and emotional trust impacts and explores gender dynamics within the context of Health development. The study clarifies the roles of these factors and assesses the impact of gender on platform adoption, highlighting the importance of m-Health services in facilitating this process. Enhancing user engagement with herbal platform services requires prioritizing influential determinants, streamlining the investment experience, and underscoring the sector's contribution to economic revitalization. Authorities should prioritize simplifying the investment landscape and initiating advocacy campaigns, while platform developers are advised to improve the user experience, bolster educational efforts, and heighten awareness of the investment advantages within the herbal industry. This research provides stakeholders with insights into the factors that enhance Thais' engagement with herbal market platforms, especially via online channels. Identifying these key drivers is anticipated to boost participation in the herbal market, thereby contributing positively to Thailand's economy.

Keywords: behavioral intention to use; actual usage; marketing mix's; trust; herbal platform services

1. Introduction

The COVID-19 outbreak has catalyzed the development of mobile health (m-Health) services, which have been extensively adopted to alleviate pandemic-related challenges, facilitating real-time information dissemination, remote medical consultations, medical cost reduction, and minimizing exposure to cross-infection (Wright and Caudill, 2020). Furthermore, these services have improved user health management through self-assessment, telemedicine-based consultation, and contact tracing. m-Health services enhance medication engagement and healthcare knowledge from both patient and professional perspectives (Alam, 2020). Defined as

"healthcare to anyone, anytime, and anywhere," m-Health services remove geographical and temporal barriers, thereby enhancing healthcare quality and coverage. Utilizing mobile computing technologies, such as smartphones, m-Health represents a burgeoning field in healthcare (Yuan and Deng, 2022).

In Asian countries, including Malaysia, Singapore, Indonesia, India, and Thailand, there has been a concerted effort to enact legislations promoting the use of technology to address medical and healthcare challenges (Bavishi, 2015). Thailand, in particular, has seen ongoing restructuring and investment from the Ministry of Public Health to maintain a cutting-edge health information system (ICT, 2023). This initiative aims to establish a robust information network that extends to the village level and community health center (CHC), leveraging innovative healthcare technology such as m-Health (ICT, 2023). While m-Health presents a valuable tool in healthcare delivery, offering a range of benefits and aiding in the treatment of medical issues via smartphones (ICT, 2023), its adoption remains limited in the context of Thailand's unique herbal medicine market.

Although the current literature primarily addresses usability, adoption, and policy support for m-Health services, empirical evidence supporting the sustainable development of these services, especially from individual user perspectives in the COVID-19 context, remains limited (Wright and Caudill, 2020). While existing studies predominantly examine users' adoption intentions and their influencing factors, research on users' post-adoption behavioral intentions, particularly concerning continuance intention and positive word-of-mouth (WOM) post-use, is limited (Verkijika and Wet, 2019). Continuance intention is vital for sustained m-Health use, and positive WOM not only reflects users' attitudes but also significantly influences potential users. Despite their criticality for sustainable m-Health development, research focusing on continuance intention and positive WOM (Verkijika and Wet, 2019), particularly during the pandemic, is insufficient. Bridging the gap from the broader m-Health context to the specific focus of this study, we delve into the herbal market platforms, an emerging segment within the m-Health spectrum. This transition underscores the study's intent to explore how m-Health advancements, particularly during the COVID-19 pandemic, have facilitated the adoption and growth of herbal platform services, aligning with consumer health management and engagement needs. In the competitive global market, the marketing mix (product, price, place, promotion) plays a crucial role in influencing consumer behavior and creating customer value and satisfaction. While its importance is acknowledged, its application in the fast-moving consumer goods (FMCG) sector, including the herbal market, has not been extensively studied in recent decades. This gap signifies the need for a deeper exploration of how these marketing strategies can be tailored to enhance the herbal platform services (Ki et al., 2020; Luo, 2000; Mogaji et al., 2021).

The primary objective of this research is to investigate the roles of the marketing mix and trust in shaping consumer behavioral intentions towards the use of herbal platform services in Thailand. Specifically, the study aims to: (1) examine how the marketing mix influences consumers' behavioral intentions to use herbal platforms; (2) analyze the impact of trust on the continuance intention and positive word-of-mouth among users of these platforms; and (3) explore the moderating role

of gender in the relationship between the marketing mix, trust, and behavioral intentions. To achieve these objectives, this study employed a quantitative research approach, utilizing online surveys to collect data from 416 users of herbal platforms in Thailand. The data were then analyzed using Structural Equation Modeling (SEM) to explore the influence of the marketing mix, trust, and gender on users' behavioral intentions and actual usage patterns.

This insight helps businesses in the herbal industry optimize their marketing strategies to attract and retain customers, underscoring the importance of establishing and maintaining trust to foster long-term engagement and customer advocacy. The findings offer actionable insights for herbal platform providers in Thailand, guiding them on how to design and implement targeted marketing strategies that resonate with their audience, thereby enhancing user acquisition and retention.

2. Theoretical background and hypotheses development

2.1. Literature review

Consumer behavior analysis involves the study of buying patterns and usage at both individual and group levels. Understanding consumer behavior is crucial for comprehending market demand dynamics, product selection, purchase processes, and overall consumer satisfaction. Insights into consumer behavior guide marketing strategies, enabling businesses to provide optimal customer service (Wongleedee, 2015).

Behavioral intentions, serving as indicators of an individual's inclination to perform certain actions and their persistence in these endeavors, are pivotal in shaping future purchasing decisions. This underscores the importance of discerning the factors driving consumer intentions (Ajzen, 1991; Omar et al., 2012). Consumer decision-making is influenced by various external factors such as social influences and unforeseen events, which can alter initial intentions. It is essential to recognize that consumers' preferences may not always translate into their actions (Kotler and Armstrong, 2018). A thorough understanding of consumer behavior is vital for crafting targeted marketing strategies and products (Hong and Kim, 2012). Future research could benefit from exploring the relationship between purchase intention and actual purchasing behavior, as suggested by Jamil and Mat (2011). Investigating the interplay between cognition and action is key to comprehending human behavior (Limayem et al., 2000). A research conducted by Bashir (2019) revealed that a consumer's purchase intention significantly impacts their actual purchasing behavior, as higher intention levels correlate with a greater likelihood of product purchase.

2.2. Marketing mix

The concept of the marketing mix traditionally refers to McCarthy's 4Ps model, delineating marketing strategy across product, price, place, and promotion. This model facilitates targeted consumer engagement by balancing product attributes, pricing strategies, distribution efforts, and promotional activities to satisfy specific market segments (Grewal and Levy, 2020; Kotler and Armstrong, 2021). While the 4Ps framework remains robust, evolving theories have extended these variables to

encompass the intricacies of digital marketing, underscoring the mix's adaptability in engaging the modern consumer (Czinkota et al., 2021).

2.2.1. Product

Products include all items that pique interest, are owned, used, or consumed, and can be marketed to fulfill needs and desires. They range from tangible goods to intangible services and include the creative vision of the manufacturer (Kotler et al., 2000). The product is the primary criterion for consumers to assess whether their needs are met, necessitating marketers to closely align products with consumer needs (Czinkota et al., 2021). The consumer market is replete with products encompassing both tangible goods and services (Thabit and Raewf, 2018). Enhanced decision-making in consumers is fostered by their knowledge of the product, encompassing an array of meanings and beliefs retained in their memory (Song et al., 2022; Yang et al., 2022). Awareness of the production processes, ingredients, and industry -specific terminology, particularly in the domain of beauty and personal care products, for informed purchasing decisions. Additionally, exposure to advertising and personal experiences can contribute to product knowledge (Kamaruddin et al., 2023). Therefore, the dissemination of precise information about product features and availability by marketers is paramount in aiding consumers to make educated purchasing decisions (Indrawati et al., 2022; Kang et al., 2020), as consumers typically engage in extensive information gathering prior to purchase (Said et al., 2023).

In consumer research, 'objective knowledge' refers to the consumer's familiarity with a product, including comprehension of product names, features, applications, categories, and classifications (Yuan and Deng, 2022). Each product characteristic should be universal, reflecting features common to all products (Miracle, 1965), since consumer perceptions and perspectives, significantly influence purchasing decisions, potentially evoking product-related memories. Consumers possessing deeper product knowledge tend to make more judicious purchasing decisions (Chen et al., 2019; Keng et al., 2014). According to Shalehah et al. (2019), product characteristics, including brand name, quality, design, promotion, and loyalty, substantially impact purchasing intentions. In summary, the characteristics of a product are predictive of consumer purchasing intentions.

2.2.2. Prices

Price, a fundamental element in business operations, is directly proportional to other key metrics such as sales and profits. It serves not only as a signal to the buyer of a product's value but also as a critical factor in consumer decision-making. The concept of 'price' is multifaceted, encompassing both the monetary cost that consumers are expected to pay and the implied worth of the product. In business terms, prices, whether stated in real or monetary values, articulate the perceived value of goods and services. Furthermore, the pricing strategies implemented by companies function as a self-regulatory mechanism, underpinning the commercial sustainability of their offerings (Muhammad et al., 2022).

In its essence, price represents the amount of money or the costs that consumers perceive a product to be worth and the level of expenditure they are prepared to commit (Thabit and Raewf, 2018). The optimal pricing strategy ensures that the

price aligns with consumer affordability and persuades them to prefer the product over competing alternatives (Czinkota et al., 2021). Although historically price has been a primary influencer of consumer choices, its role extends beyond mere cost consideration. Within a company's overall value proposition, price is instrumental in creating consumer value and establishing long-term consumer relationships (Kotler and Armstrong, 2018). Levrini and Jeffman Dos Santos (2021) highlight that price is one of the key factors in consumers' product selection process. Typically, consumers engage in price comparisons among various products to select the most economically viable option that meets their needs (Zeithaml, 1988). The calculation of price involves several considerations, including fair price, competitive price, discount price, retailer price, and price suitability. It is crucial to assess the suitability of a product's price, as reasonable and accessible pricing can influence consumer purchasing decision (Putra et al., 2023; Zhao et al., 2021).

2.2.3. Place

In the context of business strategy, 'place' or 'distribution' refers to the network of entities collaborating to deliver a product to customers, as delineated by Armstrong et al. (2006). This concept underscores the importance of product availability, positing that consumers should be able to locate and purchase products with minimal difficulty. The measurement of this variable is often based on the convenience and accessibility of goods across various retail outlets.

The notion of easy access to products is intricately linked to the locations where consumers procure products, either from physical shops or e-commerce platforms (Thabit and Raewf, 2018). The strategic determination of a business's location for conducting operations and distributing products is crucial in enhancing proximity to consumers, thereby significantly influencing their purchasing decisions (Suhardi et al., 2021). This aspect of 'place' also includes the efficiency of the delivery system, requiring that producers ensure timely accessibility of products to consumers (Czinkota et al., 2021). In the modern era, the Internet has emerged as a pivotal distribution channel, facilitating the exchange of information, entertainment, and online transactions. Online shopping offers multiple advantages, such as convenience, time savings, and the ability to compare various products, thereby reshaping consumer behaviors (Davis et al., 2021). Convenience greatly impacts significantly influences consumer purchasing behavior and therefore must be a primary consideration for businesses (Alfanur and Kadono, 2022). Additionally, Farid et al. (2023) highlight that easy access to products, a crucial component of the marketing mix, directly affects consumer purchase intentions.

2.2.4. Promotions

Promotion incorporates various methods utilized to disseminate information about a product or service (Nuseir and Madanat, 2015). It includes a comprehensive marketing communication mix, or 'promotion mix', which consists of advertising, personal selling, sales promotion, public relations, and direct marketing strategies. These strategies are deployed by businesses to achieve their promotional objectives (Kotler and Pfoertsch, 2007).

Promotion serves as a strategic communication tool for firms, facilitating product differentiation and enhancing consumer recognition (Alhedhaif et al., 2016;

Gillani et al., 2013). The objective of promotional strategy is twofold: it seeks to encourage repeat purchases among infrequent brand users and assumes that consumers with established brand loyalty will continue their patronage without additional incentives (Huang et al., 2014). Sales promotions, integral to marketing campaigns, aim to motivate and expedite consumer responses, typically resulting in increased purchases of a specific product or service in terms of both quantity and frequency. Sales promotions are executed through These promotions are often implemented via consumer coupons, in-store displays, and price reductions, strategies commonly utilized in retail stores worldwide. Mullin and Cummins describe price promotions as manifesting in various forms, including buy-one-get-one-free offers, bonus packaging, and discount coupons (Hanaysha, 2018). Kim and Lee (2020) assert that when price promotions are implemented in a cohesive and integrated manner, there is a significant likelihood of an increase in consumers' intention to purchase the products offered by a company.

2.3. Trust

Following the exploration of the 4Ps, it is crucial to introduce the concept of trust, illustrating its integral role in enhancing the effectiveness of the marketing mix within online herbal platforms. Trust in a brand or platform is not solely the product of direct consumer interactions but is intricately woven through the perceptions formed by the marketing mix. For instance, product reliability and quality, fair pricing strategies, accessible and convenient distribution, and honest promotional activities collectively contribute to building consumer trust. This trust is paramount in contexts such as online herbal product platforms in Thailand, where consumer skepticism and the need for assurance are heightened due to the intangible nature of online transactions and the sensitivity surrounding health-related products.

Several studies have explored the factors influencing trust in technology adoption. From a business and technology perspective, issues related to trust in technology adoption have been addressed. For instance, Bailey et al. (2017) highlighted the lack of transparency in cloud services like Amazon, making it difficult for users to track data provenance and access history. Similarly, Pearson's recent study revealed that security concerns are the primary reason deterring Chief Information Officers from adopting cloud services, followed by data protection and privacy anxieties (David et al., 2021). More specifically, studies have shown that the lack of user control, inadequate training, concerns about unauthorized data use, and overall uncertainty can significantly affect trust in technology adoption (Bailey et al., 2017).

Trust is recognized as a mediator in studying the technology adoption ecosystem, facilitating trust transitivity and propagation. Scholars emphasize trust's pivotal role in fostering effective business relationships within technology adoption contexts, particularly in light of security and privacy concerns (Slade et al., 2015). Moreover, Garrison et al. leverage the theory of planned behavior (TPB) to understand user motivations despite privacy and security concerns (David et al., 2021). They incorporate trust as a moderator between various factors like attitude, subjective norm, perceived behavioral control, and ultimately, the user's intention to

adopt a technology. Similarly, another study investigated the mediating effect of trust on the intention to adopt a technological application, exploring key determinants that can enhance user trust and adoption rates (David et al., 2021). However, it is important to note that these studies primarily focus on individual user behavior and the trust relationship between users and technology. They often lack a comprehensive examination of the broader context, neglecting technological, organizational, and environmental factors that can also influence trust in technology adoption. Consequently, the generalizability of the proposed models in these studies may be limited.

2.4. Moderator: Gender

Various moderators have been employed in technology adoption studies (Sun and Zhang, 2006). Sun and Zhang (2006) effectively categorized these moderators into three groups: organizational variables, technological elements, and personal factors such as age, gender, and income. Other studies suggest that gender might play a significant role in the behavioral intention of technology adoption (Chiu et al., 2007). Gender schema theory, which incorporates gender into consumer behavior models (Riquelme and Rios, 2010), indicates a substantial impact of gender on decision-making. Previous research has demonstrated that males and females differ in their decision-making processes (Riquelme and Rios, 2010). Moreover, Humbani (2018) observed that technological readiness, age, and gender are influential factors in the adoption of technology for cashless payment systems. Importantly, this study identifies gender as a moderating variable. Marketing, as defined by Kotler and Keller (2016), is an organizational function encompassing a series of processes focused on creating, communicating, delivering, and providing added value to customers, partners, and other stakeholders. The marketing mix comprises controllable variables that firms can use to influence buyers' responses (Kotler and Keller, 2016; Sriram et al., 2019).

Digital technologies have fundamentally reshaped the concept of products. Kannan and Li (2017) outline three key changes: the blending of physical products with digital services, the ability to network products to unlock greater value, and the complete transformation of products into purely digital offerings. Price, defined as the monetary value exchanged for services or products, or the perceived value obtained, has witnessed increased popularity in dynamic pricing strategies such as price discrimination (Hussein and Attia, 2019; Ighomereho and Iriobe, 2019; McCarthy, 1960). The concept of place in marketing has evolved, with online shopping enabling transactions to occur independent of physical location, accessible 24/7 (Heikkinen, 2018). Promotion strategies now emphasize the effectiveness of new media over traditional channels in brand building and influencing consumer behavior, extending to various online platforms including social media, search engines, and e-mail (Kannan and Li, 2017). Marketplaces serves as the solution to the evolving demands of e-commerce. Defined as virtual spaces where buyers and sellers converge to conduct transactions, electronic marketplaces cater to the exchange of goods or services (Corrot and Nus- senbaum, 2014). The intention behind technology adoption transactions encompasses various activities such as

information sharing, maintaining business relationships, and conducting transactions through shopping sites (Dachyar and Banjarnahor, 2017). However, the development of technological infrastructure surrounding online frameworks has revealed a shortage of resources, including a lack of service technology adoption (Capri, 2018).

Various theoretical perspectives have been proposed to explain user acceptance of technology adoption. Notable theories include the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975), Theory of Planned Behavior (TPB) (Ajzen, 1991), technology acceptance model (TAM) (Davis, 1989), and the decomposed TPB (Taylor and Todd, 1995). Taylor and Todd's research indicates that the Decomposed TPB model offers better explanatory power for behavioral intention, attitude, and subjective norm compared to TRA and pure TPB models, making it an excellent predictor of IT usage behavior (Lai, 2017; Momani and Jamous, 2017). Marketing mix activities have been found to influence trust, as evidenced by Mosavi's (2012) research on online health shopping. As stated earlier, the e-marketplace platform serves as a medium for online transactions between buyers and sellers, similar to a medium for credit application among online sellers (merchants). Based on these observations, the proposed hypotheses are as follows (in **Figure 1**):

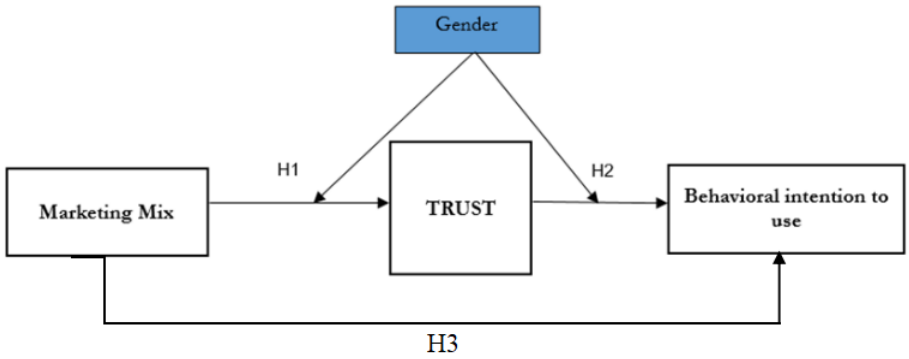

Figure 1. Research model.

Previous research has laid a strong groundwork in understanding consumer behavior, emphasizing the significance of behavioral intentions in shaping future purchasing decisions and acknowledging the influence of external factors on decision-making (Ajzen, 1991; Kotler and Armstrong, 2018; Omar et al., 2012). However, notable gaps exist within the literature. First, while previous research confirms the impact of purchase intentions on actual behavior (Bashir, 2019), it often falls short in explaining the discrepancies that can arise between these intentions and real-world actions. Second, the existing body of work predominantly focuses on traditional marketplaces, neglecting the unique dynamics of digital platforms, particularly in the rapidly growing herbal product sector. Third, the potential moderating effects of demographic factors like gender remain underexplored. Finally, while valuable, many studies rely on simpler analytical methods, limiting the depth of insights into the complex relationships at play.

Thus, this study addresses these gaps by focusing on the specific context of digital herbal platforms, investigating the moderating role of gender, and utilizing structural equation modeling (SEM) to provide deeper insights into consumer behavior. These hypotheses are central to examining the interplay between the

marketing mix, trust, and consumer behavior in the digital marketplace, with trust acting as a crucial mediator in this relationship. The study seeks to empirically test these relationships, utilizing the collected data and structural equation modeling to analyze the mediating effect of trust.

H1: The marketing mix can positively influence consumer trust in herbal product platforms in Thailand.

H2: Trust can positively influence the intention to use the herbal platform in Thailand.

H3: The marketing mix can positively influence the trust associated with the use of herbal platform in Thailand, mediated by trust.

3. Research methodology

This study utilized a statistical survey technique to monitor latent structures effectively. The use of various scales facilitated the validation of findings from prior research on herbal platforms (Rana et al., 2013; Slade et al., 2015). The survey was bifurcated into two distinct sections: the first assessed consumers' familiarity with herbal platform methods, and the second collected demographic information.

3.1. Population sampling and data collection

The sample size for this study was determined using Cochran's (1953) method, resulting in a minimum sample size of 385 participants. A combined sampling approach was employed, utilizing both snowball sampling and convenience sampling techniques. Snowball sampling involved identifying initial respondents through personal networks (friends and acquaintances), who then referred other potential participants (Couto et al., 2013). This was supplemented by convenience sampling, where respondents were solicited through social network platforms (Saunders et al., 2007). Data was collected through online surveys targeting users of herbal platforms in Thailand. Prior to survey dissemination, the researcher explained the study's objectives to potential participants to ensure an appropriate sample. To be eligible for final selection, respondents were required to have either substantial experience with the internet and applications or a minimum three-month training period in these areas (Mclean et al., 2018).

3.2. Variable measurement

Data collection was conducted using a structured questionnaire. The questionnaire was developed with the following instruments:

- The marketing mix's scale, comprising 16 questions and 4 factors, was derived from the work of Kotler and Armstrong, (2021).
- The trust scale, consisting of 9 questions and 3 factors, was based on research conducted by Namahoot and Jantasri (2023).
- Items measuring behavioral intention to use included three components, adapted from the studies of Nasri and Charfeddine (2012), and Namahoot and Jantasri (2023).

Each item in the questionnaire was measured using a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Respondents were instructed to indicate their level of agreement with each statement.

3.3. Validation of measures

The validation of the questionnaire involved a comprehensive two-fold approach. Firstly, a panel of experts conducted a professional evaluation and a pilot test to identify potential issues prior to the main data collection phase. This step also included specifying the optimal length of the survey. As recommended by Saunders et al. (2007), a panel of professionals was convened to critically evaluate a preliminary version of the questionnaire, ensuring its relevance and clarity. Concurrently, a pilot test was executed to assess the questionnaire's practicality in a real-world setting.

Following this, the questionnaire underwent rigorous scrutiny by a team of researchers. This phase involved a detailed cross-examination by an expert representative, as suggested by Hair et al. (2010), to validate the accuracy and appropriateness of the questions. The instrument was further tested with a select group of IT professionals and distinguished academics specializing in platform technology, adding an additional layer of credibility to the validation process. The pre-test stage included a sample of 30 users of Thai herbal platform services. These participants provided valuable feedback on various aspects of the instrument, including linguistic clarity, structure, format, length, and terminology used in the scaling system (Bhattacherjee, 2012). This feedback was instrumental in refining the instrument. To assess the reliability of the questionnaire, Cronbach's alpha was calculated for its 22 items, yielding a value of 0.875%. This score significantly exceeds the commonly accepted minimum threshold of 0.7%, indicating that the instrument possesses excellent reliability (Hair et al., 2010). Consequently, the questionnaire was deemed robust and suitable for use in the subsequent stages of the study.

4. Data analysis and results

This study employed rigorous methodologies to test its hypotheses, utilizing confirmatory factor analysis (CFA) to examine the goodness-of-fit of the measurement model. The adequacy of the measurement model was evaluated based on its ability to reproduce the observed covariance matrix among the indicator items. Model fit was assessed using a comprehensive set of indices, categorized according to the guidelines outlined by Hair et al. (2010).

Convergent validity was evaluated through the calculation of the average variance extracted (AVE), which measures the proportion of variation explained by the latent variable relative to random measurement error. Discriminant validity was assessed by comparing the square root of AVE with the correlations between the variables and all other variables, following the approach proposed by Fornell and Larcker (1981). Additionally, structural equation modeling (SEM) was applied to further analyze the relationships among variables. Frequency and descriptive

analyses were conducted to explore averages, percentages, and variances, in accordance with the methodology outlined by Anderson and Gerbing (1988).

4.1. Descriptive statistics

The research obtained a total of 505 usable responses from an online survey. Preliminary analysis led to the exclusion of 84 responses with *z*-scores exceeding the (−3, 3) range, ensuring the elimination of outliers. This resulted in a final sample size of 416 for detailed analysis.

Frequency analysis was performed to investigate the demographic characteristics of the 416 respondents. The sample predominantly consisted of female participants (61%), with the largest age group being 31–35 years (55.30%). Most respondents held a bachelor's degree (30.50%), worked in government sectors (49.7%), and earned over 30,000 Baht monthly (49.7%). Notably, about 40.60% had experience using cashless payment methods for one to three years. Regarding the marketing mix elements, the least concern was expressed for product (4.430), price (4.430), place (4.430), and promotion (4.430) in the context of the herbal platform service. WOM regarding the service scored 4.284. Additionally, in terms of behavioral intention to use, participants reported a perception of modernity when using the herbal platform service, scoring 3.911.

4.2. Assessment of univariate normality

A three-step measurement model was employed for analysis. The first step confirmed that all model components adhered to the normality assumption, with skewness and kurtosis values remaining below 2 (+2.0) and 7 (+7.0), respectively (Curran et al., 1996). The reliability and internal consistency of the scales were evaluated using Cronbach's alpha. The standard cutoff level for Cronbach's alpha is typically 0.70. Following these assessments, the 22 items of the questionnaire yielded Cronbach's alphas of 0.806 (PD), 0.791 (PRM), 0.754 (PLC), 0.800 (PME), 0.800 (Trust), and 0.701 (BI). These results affirmed the suitability of the data for factor analysis, with detailed outcomes presented in **Table 1**.

Table 1. Outcomes of reliability testing and exploratory factor analysis (EFA).

Observed variables	**Cronbach's alpha (*α*)**
Marketing mix	0.787
Product (PD1, PD2, PD3, PD4)	0.806
Price (PRM1, PRM2, PRM3, PRM4)	0.791
Place (PLC1, PLC2, PLC3, PLC4)	0.754
Promotion (PME1, PME2, PME3, PME4)	0.800
Trust	0.701
Competence (CP1, CP2, CP3)	0.701
Benevolence (BL1, BL2, BL3, BL4, BL5, BL6, BL7, BL8)	0.702
Integrity (IT1, IT2, IT3)	0.701
Behavioral intentions to use (DS3, DS4, DS5, DS6, DS7)	0.701

Reliability, EFA, and CFA were used to assess the adequacy of the study's measures. **Table 1** illustrates the exploratory component analysis using varimax rotation alongside varied Cronbach's alpha values. Hair et al. (2010) suggest a minimum Cronbach's alpha value of 0.70, echoed by Nunnally and Bernstein (1994). Values exceeding 0.70 meet this criterion. Additionally, Hair et al. (2010) recommend factor loadings above 0.5 for each item. Following these initial analyses, CFA was utilized to assess model fitness, convergent validity, and discriminant validity, leading to the subsequent application of SEM for evaluating causality among variables.

4.3. Convergent validity

The convergent validity of the questionnaire was tested using factor loadings, composite reliability (CR), and average variance extracted (AVE) (Fornell and Larcker, 1981).

Table 2 presents the findings of the analysis from this investigation.

Table 2. Summary of standardized loadings and validity metrics.

Construct and items	Standardized loadings	CR	AVE	Discriminant validity				
				1	2	3	4	5
Marketing mix's								
Product	0.949	0.849	0.652	0.808				
PD1	0.767							
PD2	0.727							
PD3	0.796							
PD4	0.681							
Price	0.911	0.814	0.533	0.652	0.730			
PRM1	0.734							
PRM2	0.703							
PRM3	0.665							
PRM4	0.771							
Place	0.974	0.824	0.613	0.407	0.647	0.783		
PLC1	0.752							
PLC2	0.680							
PLC3	0.734							
PLC4	0.800							
Promotion	0.882	0.808	0.585	0.691	0.600	0.428	0.765	
PME1	0.725							
PME2	0.747							
PME3	0.680							
PME4	0.765							

Table 2. (*Continued*).

Construct and items	Standardized loadings	CR	AVE	Discriminant validity				
				1	2	3	4	5
Trust								
Competence	0.975	0.808	0.585	0.691	0.600	0.428	0.765	
CP1	0.792							
CP2	0.786							
CP3	0.712							
Benevolence	0.828	0.824	0.613	0.407	0.647	0.783		
BL1	0.703							
BL2	0.805							
BL3	0.804							
BL4	0.699							
BL5	0.833							
BL6	0.740							
BL7	0.607							
BL8	0.706							
Integrity	0.965	0.808	0.585	0.691	0.600	0.428	0.765	
TI1	0.733							
TI2	0.824							
TI3	0.844							
Behavioral Intentions to use		0.716	0.500	0.702	0.679	0.520	0.806	0.688
DS1	0.756							
DS2	0.782							
DS3	0.774							

1) Standardized factor loadings indicated that each item on the scale was significantly related to its respective latent variable. The factor loading for each item should exceed 0.6, as corroborated by Suh and Han (2003).
2) CR evaluated the consistency of the items in avoiding random error and producing replicable results. Hair et al. (2010) stipulate that CR values should be greater than 0.7.
3) AVE measured the extent to which the latent variable accounted for the variance in the observed items, relative to the amount of variance due to measurement error. Fornell and Larcker (1981) recommend that AVE should be greater than 0 for it to be considered satisfactory.

The findings pertaining to standardized loadings and validity metrics (in **Table 2**) revealed that all values (factor loading, CR, and AVE) met the stipulated criteria, affirming the robustness of the convergent validity.

4.4. Discriminant validity

According to Fornell and Larcker (1981), discriminant validity can be established by comparing the square root of AVE with the correlations between each

construct and all other constructs. This comparison indicates whether constructs are distinct from one another.

The analysis revealed that the square root of the AVE values was consistently higher than the correlation values between constructs, demonstrating strong discriminant validity. This finding aligns with the results obtained from the standardized loadings and validity assessments, as supported by the discriminant validity of the constructs. As shown in **Table 2**, the constructs displayed commendable internal consistency. Consequently, it can be confidently asserted that the sample dataset exhibits robust convergent validity.

4.5. Assessment of the measurement model

In the second phase of analysis, CFA was conducted using a set of 35 items. The model's goodness-of-fit was assessed based on how well the SEM corresponded with the observed covariance matrix among the indicator items. To appraise the model fit, various indicators were scrutinized and categorized into four groups, as described in **Table 3** (Hair et al., 2010). The results, as presented in the table, indicate a satisfactory fit to the measurement model, evidenced by the following metrics: chi-square (CMIN) = 3.332, *p*-value > 0.000; comparative fit index (CFI) = 0.951; incremental fit index (IFI) = 0.952; tucker-lewis index (TLI) = 0.947; adjusted goodness-of-fit index (AGFI) = 0.811; parsimony normed fit index (PNFI) = 0.786; root mean square error of approximation (RMSEA) = 0.029; and root mean square residual (RMR) = 0.041.

Table 3. Comparative analysis of path coefficients based on gender.

Path	Male (*N* = 175)		Female (*N* = 225)		*T*-value
	B	SE	B	SE	(Male-Female)
MIXs → TR	0.596(n.s.)	0.120	0.703***	0.131	4.101***
TR → DS	0.149***	0.122	0.156 ***	0.106	7.205***
MIXs → TR → DS	0.517***	0.122	0.104 ***	0.092	7.208***

*** $p < 0.001$, n.s. = not significant.

4.6. Structural model analysis based on gender

This study divided the data into male and female cohorts and employed a modified version of the grouping variable technique within the Amos framework to evaluate the mediating influence of gender (Riquelme and Rios, 2010). While the ratio of male to female respondents varied in our dataset, comparisons remain viable as long as the discrepancies across genders are consistent (Humbani, 2018). Given that both datasets originated from the same population, it is reasonable to assert that there was no significant disparity in variance between them. Furthermore, Singh and Masuku (2014) have highlighted the feasibility of comparing groups with differing sample sizes. The results of the path coefficients are shown in **Table 3**. Among women, all variables except marketing mix were significant, whereas for men, trust was a pivotal factor. While no gender differences were observed regarding the product, notable disparities existed in price, place, and promotion factors. The *R*-squared values for men and women were 0.34 and 0.57, respectively.

4.7. Path analysis

The concluding phases of the study are presented in **Figures 2** and **3**, and **Table 4**, highlight the estimated path for the construct marked as numeral 2. The findings underscore that effort expectancy, social influence, and facilitating conditions substantiate the validity of hypotheses 1, 2, and 3. Notably, Hypothesis 1 for males was rejected due to the insignificance of trust (H_1 (male) = 0.596, p = 0.129). The results demonstrate significant impacts for Hypotheses (H1 (male, female) = 0.703, p = 0.000), (H2 (male, female) = 0.149, 0.156, p = 0.019), and (H3 (male, female) = 0.517, 0.104, p = 0.050) the usage of the herbal platform service. These findings suggest that providers are cognizant of the challenges inherent in implementing herbal platform service methods. Even though using the service can be challenging, consumers can still get assistance from others. Additionally, they could access the necessary technological tools to use the Herbal platform service services on the internet platform, which promotes the use of the system and can convert that use Despite potential difficulties in usage, consumers can receive assistance and access necessary technological tools for using herbal platform services via the internet. This access not only facilitates system use but also potentially translates into behavioral intentions.

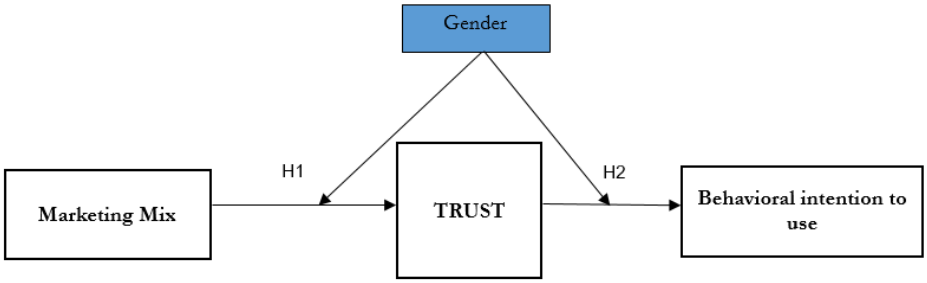

Figure 2. Final analysis of structural model.

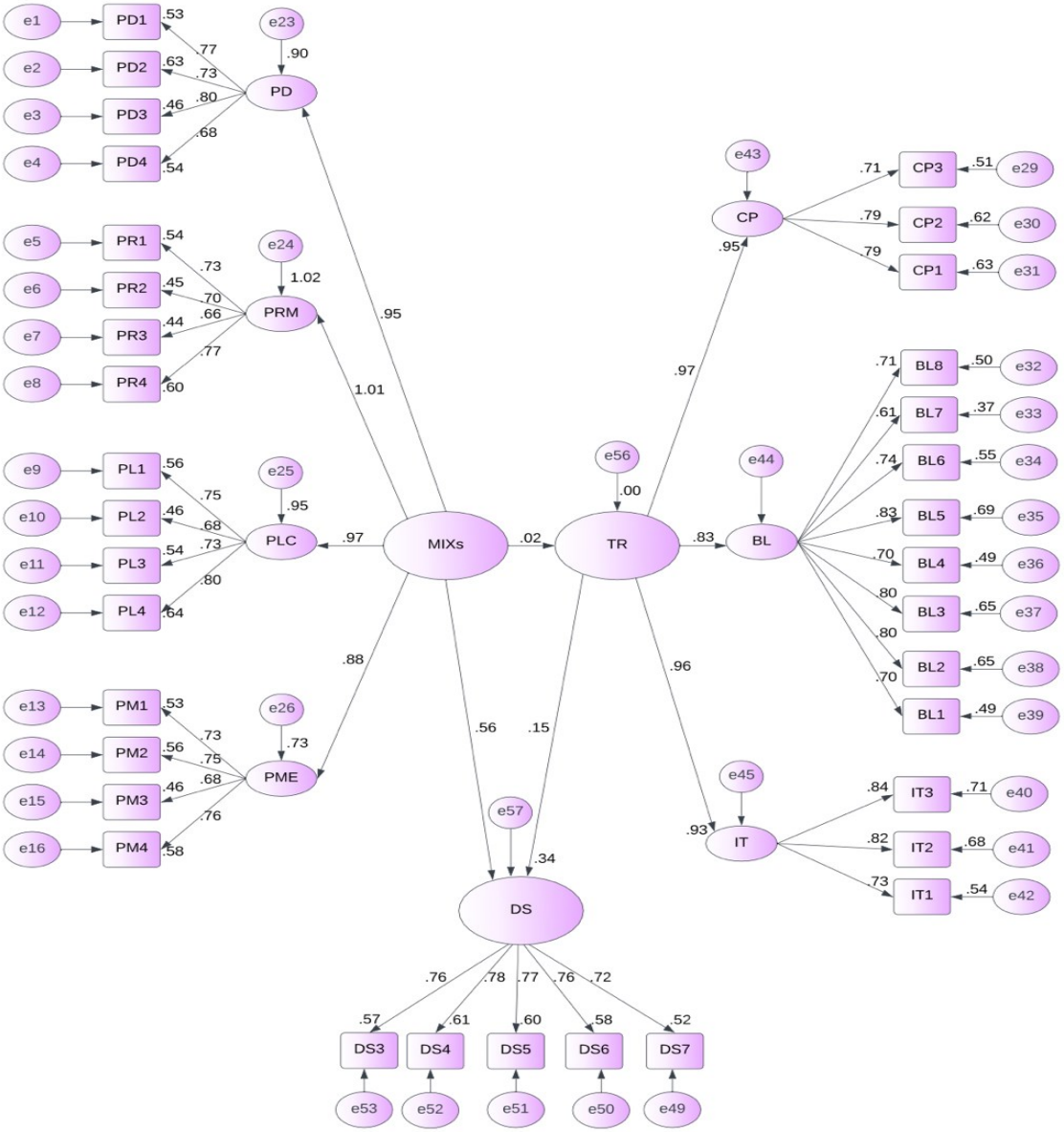

Figure 3. Comprehensive outcomes from the structural model analysis.

Table 4. Consolidated overview of hypotheses testing and effect analysis.

Hypothesis	Result	Standardized estimate
H1: The marketing mix can positively influence consumer trust in herbal product platforms in Thailand.	Supported	0.137***
H2: Trust can positively influence the intention to use the herbal platform in Thailand.	Supported	0.435***
H3: The marketing mix can positively influence the trust associated with the use of herbal platform in Thailand, mediated by trust.	Supported	0.291***

5. Conclusion and discussion

The results of the structural equation model reveal that both subjective factors (e.g., marketing mix, trust and intention to use) and objective factors (e.g. gender) significantly affect the intention to use herbal platform services. Among these factors, gender emerged as the strongest predictor, with female users demonstrating a

particularly heightened intention to use the platform. Trust also significantly affects intention to use across both genders.

The analysis further indicates a correlation between subjective and objective factors. Notably, female users exhibit a more positive perception of marketing mix elements, which in turn fosters greater trust and stronger behavioral intentions to engage with the herbal platform. Specifically, female users are more drawn to platforms that prioritize transparent product information, ethical branding, and personalized marketing strategies. This enhanced trust leads translates into a greater likelihood of utilizing the herbal platform services.

The primary objective of this study was to ascertain the factors within the marketing mix that hinder customer adoption of herbal platforms in Thailand. Route estimation analyses indicated that while marketing mix and trust significantly and positively influence the adoption of herbal platforms in Thailand, the marketing mix had no discernible effect on male respondents. Trust values were notably different, paralleling findings from Statista (2021), which also identified a substantial social media user base in Indonesia.

In the context of developing countries, the transactional impacts often remain obscured (Slade et al., 2015). For instance, when customers are not adequately assisted, they may question the efficiency of the transaction process. These doubts can amplify concerns about the quality of products and trust in both quality and pricing. Therefore, it is suggested that assigning greater value to these elements could mitigate such barriers. Effective strategies could include offering each customer a tailored tutorial on using the herbal platform in Thailand, coupled with convenient and trustworthy online transaction options. Customer service representatives should inform walk-in customers about the availability and benefits of herbal platforms in Thailand. Confidence in these platforms is essential for their acceptance. Previous research indicates that herbal platforms in Thailand can enhance efficiency and save time (Wulandari, 2017). One strategy to achieve this is through price promotions, which can psychologically motivate buyers, making products appear more affordable temporarily and influencing purchasing decisions.

5.1. Comparative analysis of path coefficients based on gender

The study found that with a factor loading of 0.703 for females, the marketing mix's dimension is most influential in the adoption of the herbal platform in Thailand. trust follows closely in significance (as is shown in **Figure 2**). Bailey et al. (2017) highlighted that trust is a critical dimension for both males and females, with significant factor loadings of 0.149 and 0.156, respectively. Therefore, to enhance the ubiquity of herbal platforms in Thailand as mobile applications, increasing the number of cooperating stores and partners is vital, as is making the platform easy and comfortable to use. However, customer effort in learning the utilization techniques and procedures remains a challenge and cannot be diminished merely by ubiquity. Providing a reliable, accessible, and user-friendly interface can foster a positive perception. The ability to compare and balance services enhances user comfort with the platform. Alaeddin et al. (2018) argue that a simple and user-friendly structure can diminish barriers and create a sense of convenience. Moreover,

the online availability of herbal platforms offers greater freedom and flexibility compared to traditional methods, allowing customers to optimize their money usage effectively. To align with customer expectations, these platforms must not only expand their partner network but also ensure the consistency of their partners' credibility and quality.

Lastly, to boost the sales of Something products, it is crucial to implement compelling marketing strategies and promotional offers that attract consumer purchases (Prasetio, et al., 2017). Previous research has consistently highlighted the significance of digital marketing and the social marketing mix as determinants of behavioral intention in various contexts. For instance, Dahiya and Gayatri (2017) underscored the importance of digital marketing, while Dolatabadi et al. (2013) emphasized the role of the social marketing mix. These findings align with studies conducted by Aziz and Afaq (2018) on the intentions of adopting Islamic banking/finance in Pakistan and Bizri et al. (2017) in Lebanon. Similarly, the conclusions drawn from these studies are corroborated by research conducted by Kajenthiran et al. (2016) on youth's intention to apply for microcredit in Sri Lanka's northern region. However, Tolba et al. (2016) presented contradictory results, demonstrating how factors influencing behavioral intention may vary among different populations, such as Egyptian platform owners' intentions in taking online shopping. In today's consumer landscape, personalized products and tailored credit facilities are increasingly in demand. Online merchants, in particular, require credit facilities that align with their business models, whether as producers or resellers. The e-marketplace feature further facilitates this by enabling online merchants to compare various credit packages offered by financial institutions, thereby enhancing promotion strategies. Moreover, micro merchants actively compare digital services against other available options. This study's findings support previous research by Aqrobaee et al. (2014) and Pour et al. (2013), which demonstrated the significant positive impact of micro-merchant variables on intention, particularly in attracting customers.

5.2. Implications for theory

The findings of the current study offer valuable insights into the factors influencing the intention to use the herbal platform in Thailand, particularly in the context of a developing country like Bangladesh. In the realm of m-Health literature, this study makes several theoretical contributions.

Firstly, unlike previous studies that primarily focused on the relationship between health consciousness and perceived usefulness or behavioral intention, our study delves into the predictive power of health consciousness in explaining the actual usage of m-Health services. This novel approach sheds light on the crucial role of health consciousness in driving real-world adoption behavior.

Secondly, our study confirms the causal effect of self-quarantine, a pertinent construct during pandemic situations, on actual m-Health usage. This contribution enhances our understanding of m-Health adoption behavior, particularly in crisis scenarios, providing valuable insights for policymakers and practitioners.

Thirdly, we identify marketing mix and trust constructs as significant determinants of m-Health usage intention, with behavioral intention emerging as a meaningful predictor of actual m-Health services usage. This underscores the explanatory power of these constructs within the Thai context, offering fresh insights into the dynamics of m-Health adoption.

Lastly, unlike previous studies that mainly focused on ascertaining the m-Health usage intention or actual usage behaviour, our study went a step further by examining the consequences of m-Health services adoption or use. Specifically, we validated the positive impact of m-Health services usage on users' mental well-being, particularly in today's stressful environment where mental well-being is a paramount concern.

In summary, this study contributes to advancing theoretical understanding in the field of m-Health by exploring novel predictors and consequences of m-Health adoption behavior, thereby enriching the existing literature and guiding future research endeavors.

5.3. Implications for practice

This study provides three pragmatic implications for service promotion. Firstly, it reveals that personal characteristics, particularly the propensity to trust, are instrumental in fostering trust towards herbal platforms in Thailand. Thus, managers of such platforms may strategically target individuals with a higher inclination to trust, aiming to expand the user base and cultivate a loyal customer segment.

Secondly, our findings underscore the critical importance of providers' abilities and benevolence in establishing trust in the herbal platform in Thailand. The study recommends that practitioners initially focus on demonstrating providers' capabilities to build cognitive trust. However, the cultivation of emotional trust, primarily through providers' benevolence, such as concern for customers and goodwill, is crucial during interactions. To maintain the momentum of the herbal platform in Thailand, providers might consider recruiting personnel with a benevolent disposition and providing benevolence-focused training to encourage empathetic behaviors during online consultations.

Lastly, this study reveals that perceived privacy and physical risks associated with the herbal platform in Thailand can diminish both emotional and cognitive trust. Addressing these concerns involves developing protocols for physical safety and enhancing privacy protection through the publication and enforcement of privacy policies.

5.4. Implications for practice

Firstly, policies should be developed to support marketing strategies aimed at identifying and engaging individuals with a higher propensity to trust. This could include guidelines for personalized marketing approaches and user engagement initiatives to build a loyal customer base.

Secondly, establish standards and training requirements for providers on herbal platforms to ensure they demonstrate cognitive trust through capabilities and expertise, and emotional trust through benevolence and empathetic interactions.

Policies could mandate recruitment criteria that emphasize benevolent dispositions and continuous training programs focused on customer care and empathy.

Lastly, formulate and enforce stringent privacy protection and physical safety protocols for herbal platforms. This includes developing comprehensive privacy policies that are transparently communicated to users and strictly adhered to, as well as safety guidelines to minimize physical risks associated with herbal product use, thereby enhancing overall trust in the platform.

5.5. Research limitations and future research

This study acknowledges several limitations that warrant consideration in future research endeavors. Firstly, it primarily focuses on post-behavioral intentions of users of the herbal platform in Thailand, without delving into their actual reuse behaviors. Understanding users' subsequent actions following their stated intentions is crucial for assessing the efficacy of the platform's offerings.

Furthermore, human behavior during stress and after stress situations may differ significantly. Therefore, employing longitudinal study designs would be more suitable to capture nuanced insights regarding m-Health adoption, particularly in dynamic contexts Additionally, future research should strive to overcome the limitations associated with convenience and referral-based sampling methods by employing more robust sampling frames representative of the entire population of m-Health users.

Future studies could also delve deeper into exploring the potential positive consequences of m-Health usage, such as improvements in quality of life and users' psychological well-being. Investigating the interplay between m-Health adoption and variables like lifestyle and perceived security would provide a more comprehensive understanding of user motivations and experiences. Moreover, it would be valuable for future research to concurrently investigate both positive and negative factors influencing users' mental well-being. This holistic approach would facilitate a deeper understanding of the complex dynamics surrounding m-Health adoption. Additionally, exploring the perceptions of generational cohorts, particularly Generation Y or Z, could offer valuable insights into technology adoption trends and preferences.

Future studies might also consider employing dynamic tracking methods to capture actual user behaviors, provided data privacy concerns can be adequately addressed. Secondly, this research exclusively focused on cognitive and emotional trust as internal linkage mechanisms. Exploring other potential mediators, such as user satisfaction and motivation, would enrich our understanding of the trust-behavior relationship.

Lastly, given that this study adopts a cross-sectional design, it is limited in its ability to establish causal relationships within the model. Employing experimental or longitudinal methodologies would enable researchers to validate and extend the findings of this study, thereby contributing to a more robust understanding of m-Health adoption dynamics.

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