

7-1-2023

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Recommended Citation

Ahadzadeh, A., Ong, F., & Wu, S. (2023). Health-related Cognitive Factors and Intention to Adopt mHealth: The Mediating Influence of Attitude. *Makara Human Behavior Studies in Asia*, 27(1), 8-18. <https://doi.org/10.7454/hubs.asia.1280422>

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Health-related Cognitive Factors and Intention to Adopt mHealth: The Mediating Influence of Attitude

Faktor Kognitif terkait Kesehatan dan Intensi untuk menggunakan mHealth: Pengaruh Mediasi dari Sikap

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ABSTRACT

Mobile health (mHealth) is an important service that has remarkable effects on the development of the health care system. Health-related cognitive factors, such as perceived susceptibility (PSU), perceived severity (PSE), and health consciousness (HC), are associated with health-related technology adoption behavior. However, the underlying mechanisms of these associations have not been studied sufficiently. Attitude toward technology is a key construct in health psychology because it has a central role in motivating and changing behavior. Individuals' attitude toward a particular behavior is expected to have a strong association with the behavior. This study aimed to examine how attitude toward mHealth plays a mediating role in the relationship between health-related cognitive factors (i.e., PSU, PSE, HC) and behavioral intention (BI) to adopt mHealth. A convenient sample of 374 Malaysian adults composed of 229 females and 149 males was recruited. These respondents completed a survey that measured PSU, PSE, HC, attitude toward mHealth, and BI to adopt mHealth. PSU and HC were significantly associated with BI to use mHealth, whereas PSE had no significant relationship with BI to use mHealth. Attitude toward mHealth mediated the relationship between two health-related cognitive factors (i.e., PSU and HC) and BI to adopt mHealth. The mediation results suggest that although BI to use mHealth is driven by health-related factors, it is facilitated by positive feelings toward health technology. Implications and recommendations for future research are presented.

ABSTRAK

Mobil Health (mHealth) adalah salah satu layanan yang paling menonjol dengan dampak luar biasa terhadap perkembangan sistem perawatan kesehatan. Faktor kognitif terkait kesehatan seperti persepsi kerentanan (PSU), persepsi keparahan (PSE) dan kesadaran kesehatan (HC) ditemukan berhubungan dengan perilaku penggunaan teknologi terkait kesehatan. Namun, mekanisme dasar hubungan ini tidak banyak dikaji. Sikap terhadap teknologi adalah konstruk kunci dalam psikologi kesehatan karena peran utamanya dalam memotivasi dan mengubah perilaku. Sikap individu terhadap perilaku tertentu diharapkan menunjukkan hubungan yang kuat dengan perilaku tersebut. Oleh karena itu, studi ini bertujuan untuk mengkaji peran mediasi sikap terhadap mHealth dalam hubungan antara faktor kognitif terkait kesehatan (yaitu PSU, PSE, HC) dan niat tingkah laku (BI) untuk menggunakan mHealth. Sampel sebanyak 374 orang dewasa Malaysia terdiri dari 229 perempuan dan 149 lelaki telah dikumpulkan melalui teknik *convenient sampling*. Responden melengkapi survei yang mengukur PSU, PSE, HC, sikap terhadap mHealth, dan BI penggunaan mHealth. PSU dan HC berhubungan secara signifikan dengan BI penggunaan mHealth sedangkan PSE tidak berhubungan signifikan. Sikap terhadap mHealth memediasi hubungan antara dua faktor kognitif terkait kesehatan (yaitu PSU dan HC) dengan BI penggunaan mHealth. Hasil efek mediasi menunjukkan bahwa meskipun niat perilaku untuk menggunakan mHealth adalah proses yang didorong oleh faktor-faktor terkait kesehatan, hubungan ini juga didukung oleh perasaan positif terhadap teknologi kesehatan. Artikel ini diakhiri dengan implikasi dan rekomendasi untuk penelitian masa depan.

Original Article

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Received: 21 December 2021

Revised: 27 April 2022

Accepted: 28 April 2022

Keyword: Perceived susceptibility, perceived severity, health consciousness, attitude, mHealth

Cite this article: Ahadzadeh, A. A., Ong, F. S., & Wu, S. L. (2022). Health-related cognitive factors and intention to adopt mhealth: The mediating influence of attitude. *Makara Human Behavior Studies in Asia*, 27(1), 8-18.
<https://doi.org/10.7454/hubs.asia.1280422>

1. Introduction

The term “mobile health” or mHealth refers to “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants, and other wireless devices” (World Health Organization, 2016, p. 6). Research on the benefits of mHealth is widespread. Previous research found that mHealth offers great potential in the acquisition of health information, care, and services, improvement of communication, treatment adherence, health/disease management, reduction of costs, and easier access to health/disease interventions (Ahadzadeh et al., 2021; Darmayanti et al., 2020; Hamine et al., 2015; Leichman et al., 2020; Marcolino et al., 2018; Omboni et al., 2016).

In view of the positive impact of mHealth on the health care system, researchers have been interested in understanding the factors that influence mHealth behavior. Guided by theories such as health belief model (HBM) (Rosenstock, 1974), protection motivation theory (Rogers, 1975), and social learning theory (Rotter, 1966), some studies postulated that readiness to perform health-related technology use behavior is a function of health-related orientations, such as perceived susceptibility (PSU), perceived severity (PSE), and health consciousness (HC) (Ahadzadeh et al., 2015; Ahadzadeh et al., 2018; Zhu et al., 2018). These health-related cognitive determinants are the positive predictors of health technology use. However, the underlying mechanism of these positive associations has not been studied extensively.

Attitude is a key construct in health psychology because it has a central role in motivating and changing behavior (Lowe & Norman, 2013). Our attitude toward a particular behavior is expected to be strongly associated with that behavior because the measure of attitude is linked to the measure of behavior in terms of the action involved and the aim of the action (Ajzen & Timko, 1986). Previous research merely used attitude as a mediating factor to examine the relationship between health factors and intention to use health technology, specifically in mHealth. Therefore, the goal of this study is to advance the literature by investigating the relationship between health-related cognitive factors (PSU, PSE, HC) and behavioral intention (BI) to adopt mHealth, as well as studying attitude toward mHealth as a mediator in these associations.

mHealth programs have become increasingly popular around the world. This phenomenon was found by the Statista report in 2021, which stated that the estimated number of health and fitness apps downloads worldwide exponentially increased from 446 million in 2019 to 656 million in 2020 (Ceci, 2021). A global survey by the World Health Organization showed that 114 countries

have established mHealth initiatives (World Health Organization, 2011). India and Southeast Asian countries such as Malaysia, Singapore, Indonesia, and Thailand are restructuring their health care policies and encouraging more start-ups to use disruptive technology to solve key medical challenges (Hussein et al., 2017).

The context of the present study was Malaysia, where 87.61% of the population was using smartphones in 2020, thus making the country a mobile-oriented society (Müller, 2021). This situation could be a golden opportunity to capitalize on the use of mHealth for healthy living. The Ministry of Health Malaysia validated that information and multimedia communication technologies have a strong potential to contribute to health care, thus implementing the Telemedicine blueprint. According to the ministry, “Through the seamless and ubiquitous availability of information and other services, Telemedicine can dramatically reshape the delivery of healthcare. Information and other services have become more virtual, more distributed, and more integrated, resulting in better, more timely, and more efficient health care delivery” (Malaysia Ministry of Health, 1997). One of the key aims of the Telemedicine blueprint is to change people’s attitudes toward health management, from simply seeking post-diagnostic treatment to active prevention (Malaysia Ministry of Health, 1997). In this regard, mHealth can facilitate a preventive and proactive approach to health.

Perceived susceptibility and perceived severity

PSU and perceived severity PSE are two factors of HBM (Rosenstock, 1974). PSU is defined as the subjective perception of the risk of contracting a health problem/disease, while PSE refers to feelings about the seriousness of contracting a health problem/disease (Rosenstock, 1974). Extant literature has provided evidence of the influence of PSU and PSE on health behaviors, such as the intention to use bicycle helmets (Zavareh et al., 2018), skin cancer prevention behaviors among farmers (Jeihooni & Rakhshani, 2019), social distancing as a health behavior during the COVID-19 pandemic (Bourassa et al., 2020), breast cancer screening (Juárez-García et al., 2021; VanDyke & Shell, 2017), smoking preventive behaviors (Khazaei-Pool et al., 2017), and oral cancer prevention in men who smoke (Jeihooni et al., 2019). The relevance of PSU and PSE has also been examined in the context of health technology adoption. Studies have shown that PSU and PSE are predictors of health-related Internet use for health information seeking and communication purposes (Ahadzadeh et al., 2018) and the adoption of mobile chronic disease management systems (Zhu et al., 2018).

On the basis of the above literature, the following hypotheses are proposed:

H1: PSU has a significant positive relationship with BI to adopt mHealth.

H2: PSE has a significant positive relationship with BI to adopt mHealth.

Health consciousness

HC is the intrinsic motivation to maintain good health, and it reflects accountability for one's health (Dutta-Bergman, 2004a). Individuals who have a high HC tend to participate in health communities (Basu & Dutta, 2008) and are more able to remember health content and incorporate it in their future behavior (Dutta-Bergman, 2006). Their preferred primary sources of health information are newspapers, magazines, the Internet, and interpersonal networks (e.g., family, friends) and not television and radio, which less health-conscious individuals tend to consult more (Dutta-Bergman, 2004b). Moreover, according to previous studies, HC positively influences the pursuit of online health information (Dutta-Bergman, 2004a; Xiao et al., 2014), the use of health apps (Cho, Quinlan et al., 2014; Cho et al., 2014a), the use of dietary and fitness apps (Chen & Lin, 2018), and mHealth services to enhance and/or sustain their health status (Meng et al., 2019). HC also positively affects the perceived usefulness of health and disease information seeking on the Internet (Ahadzadeh et al., 2015; Yun & Park, 2010) and the use of health apps (Cho et al., 2014b).

On the basis of the above literature, the following hypothesis is proposed:

H3: HC has a significant positive relationship with BI to adopt mHealth.

Mediation effect of attitude

Attitude, in which the positive or negative evaluation of performing a behavior is emphasized, might be more commonly found in health psychology literature. Attitude guides an individual's behaviors by shaping his/her perception of the world (Ajzen & Fishbein, 1980). A large number of empirical studies provided evidence that attitude functions as a predictor in influencing health behaviors such as medication adherence among patients with psychoses (Richardson et al., 2013), positive dental health behaviors (Freeman et al., 1993), healthy behaviors (i.e., regular exercise and maintaining desired weight) in individuals with cardiovascular disease (Robinson et al., 2009), and breast cancer screening attendance (Lostao et al., 2001). Positive attitude also facilitates individuals' intention to use mHealth services (Guo et al., 2015) and intention to use a mobile electronic health records system among health care professionals (Kim et al., 2015). Studies on intention to use this technology to seek disease information supported the idea that attitude functions as a predictor (Kim & Park, 2012; Yun & Park, 2010).

According to studies on the association between health-

related cognitive factors (i.e. PSU, PSE, and HC) and attitude toward various health behaviors (Chen, 2009; Lostao et al., 2001; White et al., 2011), including attitude toward health technology, when people perceive a greater threat of diseases (such attitude includes both PSU and PSE) and have greater health concerns, they are more likely to have positive attitudes toward the use of a disease care mobile service system and the Internet for health information (Ahadzadeh et al., 2015; Lin, 2011). These studies paved the direction for further research on the mediating role of attitude toward mHealth adoption intention.

Empirical results related to the relationships between health-related cognitive factors, attitude, and health technology use behavior prompt the assertion that attitude toward behavior may function as a link between cognitive factors related to health (i.e., PSU, PSE, and HC) and BI to adopt mHealth. Attitude was found to have a mediating influence in the context of health technology use behavior, such as in the relationship between personalization and privacy concern on mHealth adoption (Zhang et al., 2014). A similar influence was found in the relationship between cognitive factors related to technology (such as perceived ease of use and perceived usefulness) and Internet use for health information (Ahadzadeh & Pahlevan Sharif, 2017) as well as in the relationship between perceived usefulness and purchase intention on health-related products (Zhao & Wang, 2020). The mediating role of attitude was also found in other studies, such as in the relationship between other factors and various health behaviors. For instance, studies have found that attitude toward food plays a mediating role between factors (such as HC, subjective norms, and food safety concern) and intention to purchase organic foods (Cabuk et al., 2014; Chu, 2018).

On the basis of the above literature, the following hypotheses are proposed:

H4: Attitude toward mHealth mediates the positive relationship between PSU and BI to adopt mHealth.

H5: Attitude toward mHealth mediates the positive relationship between PSE and BI to adopt mHealth.

H6: Attitude toward mHealth mediates the positive relationship between HC and BI to adopt mHealth.

2. Methods

Participants

This study used a sample composed of 145 males and 229 females whose ages ranged from 18 to 68 years old ($M = 28.01$, $SD = 11.10$), with a mean age of 28. Almost 45% of the participants were Chinese, while Malays made up 40.7% of the participants. With regard to health status, 47.4% of the participants perceived that they have a good health status, 27.5% perceived that their health was fair, and 18.2% considered themselves

in very good health. The participants were asked if they had an ongoing or a serious health problem such as heart disease and arthritis, or if they had a mental health condition that requires frequent medical care, such as regular visits to doctors or daily medications. According to the majority (84.3%), they did not have any ongoing or serious health problem, 12% reported that they were not aware if they had any serious health problems, and a small percentage (3.7%) had an ongoing disease or serious health problem. With regard to mobile phone usage experience, 40.4% of the participants have been using mobile phones for 8–10 years, 39% have been using mobile phones for 4–7 years, 15% have been using mobile phones for more than 10 years, and the smallest proportion of 5.6% have been using mobile phones for 1–3 years. Table 1 shows the demographic profile.

Table 1. Demographic profile of respondents (N = 374)

Background variable	n (%)
Gender	
Male	145 (38.8)
Female	229 (61.2)
Ethnicity	
Malay	152 (40.7)
Chinese	166 (44.4)
Indian	47 (12.5)
Others	9 (2.4)
Perceived health status	
Don't know	3 (0.8)
Poor	9 (2.4)
Fair	103 (27.5)
Good	177 (47.4)
Very good	68 (18.2)
Excellent	14 (3.7)
Disease	
Yes	14 (3.7)
No	315 (84.3)
Do not know	45 (12.0)
Mobile phone usage experience	
1–3 years	21 (5.6)
4–7 years	146 (39.0)
8–10 years	151 (40.4)
More than 10 years	56 (15.0)

Study design

The data that were required for this study were collected through a cross-sectional self-administered questionnaire. Four hundred questionnaires were distributed among

Malaysian adults residing in Kuala Lumpur, Malaysia. Convenience and snowball sampling methods were used for data collection, and a research assistant was recruited for the process. The participants were furnished a copy of the survey instructions and the study objectives. Before the questionnaire was administered, the respondents' willingness to participate in the study was verified. Participation was voluntary and the participants were given the absolute right of withdrawal any time they wished to do so. Confidentiality was ensured throughout the process. A screening question was included to identify mHealth users to ensure that the respondents were mHealth users. The participants were asked if they have ever used their smartphones for any health-related purposes, such as looking for health- and disease-related information online, sending or receiving text messages for health-related purposes (such as reminders/alerts for appointments, taking medications, and consultations), and downloading and using health-related apps (such as fitness apps and health and medication tracking apps). Participants who reported having used their smartphones for at least one of these purposes were included in the analysis. Incomplete questionnaires were excluded, and a total of 374 responses were included in the analysis.

Measurement

Perceived severity

Participants' subjective perception of the seriousness of the health problems they could potentially contract were measured by using the following three items developed by Johnston and Warkentin (2010): "If I suffered health problems, it would be severe," "If I suffered health problems, it would be serious," and "If I suffered health problems, it would be significant." All the items of these constructs were rated on a five-point Likert-type scale (1 = strongly disagree to 5 = strongly agree).

Perceived susceptibility

The following three items developed by Johnston and Warkentin (2010) were used to measure participants' subjective perception of the risk of having a health problem: "I am at risk for suffering health problems," "It is likely that I will suffer health problems," and "It is possible for me to suffer health problems." All items of these constructs were rated on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree).

HC

Oude Ophuis (1989) developed the HC Scale, which consists of an 11-item measure to assess the degree of readiness to promote better health. Such items include "I have the impression that I sacrifice a lot for my health," "I consider myself very health-conscious," and "I am prepared to give up a lot to eat as healthy as possible." All items of these constructs were rated on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree).

Table 2. Mean, standard deviation, and internal consistency of variables

Variable	No. of items	Mean for total score	SD	Cronbach's alpha
1. Perceived susceptibility (PSU)	3	7.47	2.76	0.853
2. Perceived severity (PSE)	3	9.7	2.84	0.904
3. HC	11	42.36	6.51	0.877
4. Attitude	4	13.19	3.37	0.943
5. BI	3	8.99	2.84	0.947

Table 3. Correlations between the study variables (N = 374)

Variable	1	2	3	4	5
1. Perceived susceptibility (PSU)	1				
2. Perceived severity (PSE)	0.36***	1			
3. HC	-0.14**	0.08	1		
4. Attitude	0.13*	0.11*	0.27***	1	
5. BI	0.13*	0.10	0.26***	0.74***	1

Note: *p < 0.05, **p < 0.01, ***p < 0.001

Table 4. Mediation analysis

Hypotheses	Path a	Path b	Path c	Path c'	Indirect effect	95% CI (LLCI, ULCI)
H5: PSU → Attitude → BI	0.15*	0.62***	0.13*	0.03	0.09	0.12, 0.17
H6: PSE → Attitude → BI	0.13*	0.62***	0.10	0.01	0.08	-0.006, 0.17
H7: HC → Attitude → BI	0.14***	0.61***	0.11***	0.03	0.08	0.05, 0.12

Note: Path a = Effect from the predictor variable to the mediator; Path b = Effect from the mediator to the outcome variable; Path c = Total effect of the predictor on the outcome variable; Path c' = Direct effect from the predictor variable to the outcome variable

Attitude toward mHealth

Participants' attitude toward mHealth was measured by using the following four items developed by Guo et al. (2015): "Using mobile health services is a good idea," "Using mobile health services is a wise idea," "I like the idea of using mobile health services," and "Using mobile health services is pleasant." These items were rated on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree).

Behavioral intention to use mHealth

The following three items were adopted from Guo et al.'s (2015) study and used to measure BI to use mHealth: "I intend to use mHealth service in the future," "I will always try to use mHealth service in my daily life," and "I plan to use mHealth service frequently." All items of these constructs were rated on a 5-point Likert-type scale (1 = strongly disagree to 5 = strongly agree).

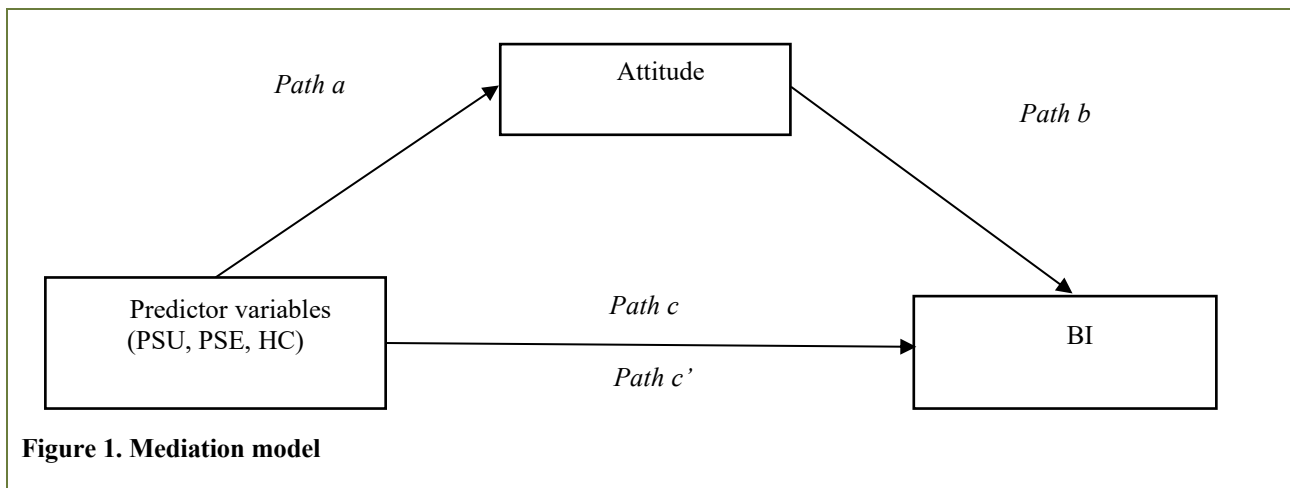
The internal consistency reliability of the variables was verified. Findings show that all variables had acceptable reliability, as shown in Table 2.

3. Results

Pearson's correlation was used to verify the validity of hypotheses H1 to H3. Table 3 shows that H1 and H3 were supported, with PSU (r = 0.13, p < 0.05) and HC (r = 0.26, p < 0.001) being significantly and positively correlated with BI to adopt mHealth. However, H2 was not supported, as indicated by PSE (r = 0.10, p = 0.07) being unable to correlate significantly with BI to adopt mHealth.

SPSS PROCESS was used for mediation analysis, which was conducted to test the mediation effect of attitude toward mHealth on the relationship between health-related factors (i.e., PSU, PSE, and HC) and BI to adopt mHealth (Figure 1 and Table 4).

Findings show that attitude mediates the relationship between PSU and BI to adopt mHealth, with an indirect effect of 0.09, 95% CI (0.12, 0.17). Thus, H4 was supported. However, hypothesis H5 was not supported where attitude did not mediate the relationship between PSE and BI (indirect effect = 0.08, 95% CI [0.006, 0.17]). Hypotheses six was



supported where attitude significantly mediated the positive relationship between HC and BI (indirect effect = 0.08, 95% CI [0.05, 0.12]). In sum, attitude is a significant mediating factor between health-related factors (i.e., PSU and HC) and BI to adopt mHealth.

4. Discussion

This study aimed to examine the relationship between health-related cognitive factors and BI to use mHealth and the mediating influence of attitude toward mHealth use. The results showed that PSU and HC had a significant positive relationship with BI to use mHealth (H1 and H3). These associations are consistent with previous studies that showed that PSU had a positive influence on the adoption of health technologies, such as Internet use for health purposes (Ahadzadeh et al., 2018), and that HC influenced health and disease information seeking behavior on the Internet (Ahadzadeh et al., 2015; Dutta-Bergman, 2004a; Yun & Park, 2010). Similarly, the results suggest that individuals may be opting to use mHealth services because they are taking responsibility for their health and believe that they have control over it. This study failed to find a significant relationship between PSE and BI of mHealth usage (H₂) because of the lack of commonality (common ground) between PSE and BI (Ajzen & Timko, 1986). PSE measures the respondents' belief about the seriousness of contracting health problems, while BI captures the degree to which the respondents consciously plan to adopt mHealth, which is a mobile application.

This study also aimed to examine the possible mediating role of attitude toward mHealth use (H4, H5, H6). This aspect presents the primary contribution of this study. Understanding the role of the third variable that drives the BI to use mHealth is important. Examining the mediating role of attitude enables us to derive a more comprehensive understanding of the mechanism through

which health-related cognitive factors (PSU and HC) are associated with intention to adopt mHealth. These results demonstrate the importance of attitude toward intention to use mHealth. Attitude involves an individual's judgment as to whether performing a behavior is good or bad. It is derived from cognitive beliefs and guides an individual's behaviors by shaping their perception of the world (Ajzen & Fishbein, 1980). In the present study, attitude toward mHealth is formed by PSU and HC, thereby lending credibility to previous research (Chen, 2009; Lostao et al., 2001; White et al., 2011). For example, Ahadzadeh et al. (2015) found that females with higher levels of PSU, PSE, and HC are more likely to report positive attitudes toward the use of the Internet for finding health information. Lin (2011) demonstrated that a positive relationship exists between health-related factors and the use of disease care mobile service systems. All these findings confirm that health factors play a determining role in shaping a positive attitude toward technology usage for health-related purposes. The present study also corroborated Ajzen and Fishbein's (1980) notion that attitude contributes to BI. A positive attitude toward mHealth can predispose individuals to be receptive to mHealth; this finding is supported in the present study and is well documented in emerging literature (Kim et al., 2015; Kim & Park, 2012; Richardson et al., 2013; Yun & Park, 2010). The current study has advanced previous research, which did not examine the indirect relationships between PSU, HC, attitude, and intention to use mHealth (Guo et al., 2015). The results of the current study provide support for the role of attitude in BI to use digital technology. Attitude can enhance the association between health-related cognitive factors and BI because the measurements of attitude and BI have a high correspondence in certain properties. This study lends support to previous research, which found that attitude plays a mediating role between different technology cognitive factors (such as perceived usefulness and perceived ease of use) and Internet use for health information (Ahadzadeh & Pahlevan Sharif,

2017). The mediation results of the current study also validate the findings of Zhao and Wang (2020), which indicate a positive association between perceived usefulness and purchase intention for health-related products through a positive attitude toward such products.

The findings of this study have several implications. PSU and HC have both direct and indirect influences on mHealth adoption through attitude, which plays a mediating role in influencing BI. Consumer attitude needs to be understood, because technology that is not driven by favorable attitudes may not be well accepted. For the health care and digital technology industry, understanding what drives behavior is a useful task. Therefore, communicating the benefits of a new technology to the target audience should begin with understanding people's attitude toward the technology. Doing so ensures that the benefits of using a new technology are clearly communicated through influencing attitude. Ensuring that a technology is accepted should not be limited to providing knowledge and consumer education.

The results of this study also provide practical implications for Malaysia. According to research, only a small percentage of a 4,504-person sample of Malaysian respondents residing in an urban area were familiar with the term mHealth or had used a health-related application for health management (Lee et al., 2020). However, the same sample reported that they have a positive attitude toward mHealth (Lee et al., 2020). Likewise, Jembai et al.'s (2022) findings have pointed to "a discrepancy between awareness of mHealth apps and positive attitudes toward them and their use" in a sample of medical students at a Malaysian government university (p. 2). According to the Malaysian participants, the main issues with mHealth apps are inaccuracy, inconvenience, and lack of user-friendliness (Bhuvan et al., 2021). The result of the present study substantiated the importance of favorable attitudes toward mHealth. Thus, the Malaysian Ministry of Health should pay special attention to generating affective feelings to encourage Malaysians to effectively utilize mHealth for health-related purposes. Such attention is needed because affective feelings have a greater direct weight on BI to use mHealth as compared with health-related cognitive factors, as indicated by correlation coefficient values. This finding indicates that positive affective feelings about mHealth strongly contribute to the intent to use mHealth for health management. Moreover, the Malaysian participants' attitudes toward mHealth have a direct effect on intention to use mHealth, whereas HC and PSU influence users through the attitude variable. Therefore, the attitude toward mHealth has a more prominent role in influencing mHealth users. Nevertheless, the importance of health-related cognitive factors that drive BI to use mHealth should not be

ignored. Research showed that HC predicts Malaysian health behaviors, including Internet use for health-related purposes (Ahadzadeh et al., 2015; Ahadzadeh et al., 2018; Mamun et al., 2020). This finding suggests that the degree to which Malaysians are concerned about their health can also encourage their mHealth usage.

Inferences with regard to the relationship between health-related cognitive factors, attitude toward mHealth, and BI to use mHealth depend on correlational data that preclude causal inferences. Moreover, this study is a cross-sectional study, which is why any attitude change cannot be captured. A longitudinal study needs to be conducted to derive a better understanding of how attitude change may take place and its central role in motivating adoption behavior. This study examined the relationship between health-related cognitive factors and BI to adopt mHealth. Drawing upon theory of reasoned action (Ajzen, 1991) and theory of planned behavior (Ajzen & Fishbein, 1975), BI influences actual behavior. In view of these theories, future research should focus on the discrepancy between intention and behavior and on examining the moderating role of health-related cognitive factors in the relationship between BI to use mHealth and actual behavior of mHealth use. Future studies should use a more representative sample, which will ensure that the results can be generalized to the population. Health literacy was found to be an effective factor in predicting health behaviors (Park et al., 2017; Wisuantari & Sekarasih, 2020), including the use of mHealth (Abu Seman et al., 2020). Future research should test the mediating effect of attitude on the relationship between health literacy and BI to adopt mHealth.

Funding

This study was funded by Xiamen University Malaysia Research Grant (XMUMRF/2019/C3/IART/0004).

Conflict of Interest

The authors declare no conflict of interest

CRedit Authorship Contribution Statement

Ashraf Sadat Ahadzadeh: Conceptualization, Investigation, Methodology, Writing-original draft, Funding acquisition. Shin Ling Wu: Formal analysis. Fon Sim Ong: Writing - review & editing.

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