

## **Examination of the Extended UTAUT Model in Mobile Wallet Continuous Usage Intention during the COVID-19 Outbreak**

Dyah Annisa Saraswati <sup>a\*</sup>, Praditta Syifa Desvi <sup>b</sup>, Nita Suhandha Putra <sup>c</sup>, Evelyn Hendriana <sup>d</sup>

<sup>a\*,b,c</sup> Management Department, BINUS Business School Master Program, Bina Nusantara University, Jakarta, Indonesia

**\*Corresponding author:** praditta.desvi@binus.ac.id

### **Abstract**

The COVID-19 pandemic has prompted the government to encourage cashless payments, including mobile wallets, to reduce potential exposure to the virus. There has not been much research that links the perceptions of health risks and government support to consumer behaviour to use mobile wallets. Therefore, this study aims to determine the intention of using mobile wallets by integrating the Unified Theory of Acceptance and Use of Technology (UTAUT) with the relevant construction of health risk perception and government support during the COVID-19 pandemic. This study involved 308 active mobile wallet users as the respondents, who were selected using the convenience sampling technique. Data analysis was performed using the PLS-SEM method. This study found that performance expectations, health risk perceptions, government support, and social influences had a significant effect on the intention to use mobile wallets. Meanwhile, business expectations did not have any influence on the intention to use mobile wallets.

**Keywords:** COVID-19, Government Support, Mobile Wallet, Perceived Health Risks, UTAUT

### **1. Introduction**

In the last 20 years, many new technological innovations have changed business practices in financial information systems and technology (Pooi et al., 2018). The advancement of financial information technology includes the use of various digital payment methods as alternative instruments. The complexity of consumer needs, the increasing costs to serve customers through traditional media, and the need for innovative customer-centred business solutions have triggered the emergence of an alternative business solution based on mobile technology (Kuganathan & Wikramanayake, 2014).

Mobile payment (hereafter, m-payment) is a technology-based business innovation that formed a new perspective on financial services in the late 2000s (Pooi et al., 2018). The rapid penetration of mobile phones, particularly in developing countries, has created tremendous opportunities and formidable challenges for conventional payment systems dominated by traditional banking and financial institutions (Yadav, 2016). Several companies are competing with each other to offer m-payment solutions in different markets. Mobile wallet (hereafter, m-wallet) technology is an innovative virtual wallet, which provides a facility to make instant payments and transactions via mobile devices (Srivastava & Sinha, 2016). M-wallet is a technology on a mobile phone that allows customers to keep money and make online transactions directly, one of which uses a QR code integrated with a debit or credit card (Singh & Srivastava, 2017; Yadav, 2016). Currently, m-wallet is used because of its advantages to facilitate transactions without requiring physical cash so that consumers can do transactions any time, and anywhere.

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M-wallet changes people's behaviour in conducting financial transactions, especially during the COVID-19 pandemic. The World Health Organisation (WHO) declared COVID-19 a pandemic due to the rapid spread of this highly contagious novel corona virus worldwide. The COVID-19 pandemic has significantly changed consumer behaviour, including how people conduct financial transactions (Alon et al., 2020; Meng et al., 2020). Since cash can be a medium of the COVID-19 virus transmission (Aji, Berakon & Husin, 2020), an m-wallet can give consumers a sense of security in making transactions by reducing physical contact. As a response to this, governments of several countries, including Indonesia, encouraged developing a cashless society to reduce the spread of COVID-19 (Bappenas, 2020). There were 5.22 billion electronic money and digital wallets transactions worth \$10 billion in Indonesia in 2019 (Portal Informasi Indonesia, 2020). Data shows the use of e-money or mobile wallets increased by 24.42 percent. Meanwhile, the use of debit cards decreased by 18.9 percent (Iskandar, 2021). Chairunnisa, Alfina and Yasmin (2020) found that figure could be achieved if the community and business actors frequently collaborated to introduce digital community payments, especially in non-urban areas.

Consumer behaviour regarding the adoption of new technology can be explained by several theories, such as the Unified Theory of Acceptance and Use of Technology (UTAUT). Srivastava and Sinha (2016) explained that the UTAUT variables can explain consumer perceptions of the benefits of using the technology since m-wallets improve the overall consumer experience, leading to satisfaction. Apart from the elements of UTAUT, other variables may influence consumers' intention to use m-wallet during the pandemic as most people are risk averse (Aji et al., 2020; Verkijika, 2018). Research on risk perception in the context of financial technology primarily discusses financial and security risks. While in the pandemic, perceived health risk increases consumers' tendency to use m-wallets. However, there are not many studies associating the perceived health risks with intentions to use m-wallets, except Aji et al. (2020). Furthermore, previous research does not pay attention to the risk dimensions of cognitive and affective aspects (Bae & Chang, 2020).

Revathy and Balaji (2020) mention that mobile phone users worldwide are the primary mobile wallet users, particularly during the pandemic. This tendency may be higher if the government facilitates the business. As reported by Christian et al. (2020) and Lajuni et al. (2017), government support may leverage consumers' intention to adopt financial technology. Hence, government support may facilitate the penetration of m-wallets by encouraging mobile phone users to use m-wallets (Chawla & Jossi, 2020). Even though government support is vital for the success of financial technology products, this variable has not been much discussed in the context of m-wallets.

A more comprehensive understanding of consumers' intention to adopt m-wallet technology can be obtained by looking at the dimensionality of perceived risk and government support. This study aims to fill the gap by (1) examining the direct effect of UTAUT variables, perceived health risk, and government support on the intention to re-use a mobile wallet, (2) examining the effect of perceived health risk on government support, and (3) testing the influence of performance expectancy in mediating the relationship between perceived health risks, government support, and intention to re-use a mobile wallet. This article is divided into several parts. After formulating the research background and problems, the following section discusses a review of related literature and hypotheses. It follows the research methodology used and the presentation of findings and discussion. The final section describes the conclusions, implications of the study, and suggestions for future research.

## 2 Literature Review and Hypothesis Development

### 2.1 UTAUT

Several theories can be used to test users' intentions towards information technology and information systems. Some of them are Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), Theory of Planned Behaviour (TPB) (Ajzen, 1991), Technology Acceptance Model (TAM) (Davis, 1989), the Diffusion of Innovation (DOI), and Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). These theories use psychological principles to describe the intention to adopt information technology or information systems. Research on TRA, TPB, and TAM contributed to explaining consumers' behaviour in adopting information technology. These theories use the same concept in describing adoption of technology with different terminology, and there is no single theory that could explain all factors for technology adoption (Min et al., 2008). Hence, Venkatesh et al. (2003) integrates these theories and summarises them into a model, namely the Unified Theory of Acceptance and Use of Technology (UTAUT).

Shin (2009) explains that TAM does not consider the social influence of adopting new technology a barrier for users to use a particular system and assumes only one technology is available to users. This contradicts mobile-based applications which are strongly influenced by other factors, such as social influences adopted in the UTAUT model (Venkatesh, 2003). The other constructs in the UTAUT model are performance expectancy and effort expectancy, which are similar to the perceived usefulness and the perceived ease of use in TAM

(Dwivedi et al., 2011). As reported by Venkatesh et al. (2003), UTAUT has greater explanatory power than other theories explaining the variance of an individual's intention to use information technology.

This study adopts the UTAUT theory with three primary constructs: performance expectancy, effort expectancy, and social influence as determinants of consumers' intention to continue using m-wallets. This study excludes facilitating conditions from the UTAUT model because this construct only directly affects the actual behaviour of technology users (Venkatesh, 2003). The usage intention refers to the individual's tendency to perform certain behaviours (Ajzen & Fishbein, 1980). According to Tsai (2012), behavioural intention concerning the use of technology is an individual's willingness to adopt new technologies that measures the technology acceptance level (Raza et al., 2018).

The UTAUT theory is extended by adding health risk perception and governmental support as the primary constructs to determine the adoption of m-wallets during the COVID-19 pandemic. The use of information technology supports the preventative efforts during the pandemic. Public awareness of health risks forced people to minimise physical contact by utilising technology, such as making financial transactions using m-wallets (Aji et al., 2020). In addition, Chawla and Joshi (2020) stated that the government played an important role in supporting cashless transactions.

## 2.2 Perceived Health Risk, Government Support, and Intention to Use

Perceived risk refers to an individual's subjective beliefs or judgments about uncertain situations from certain risks (Bauer, 1960). Dowling (1986) defines risks as a situation in which an individual has prior knowledge of the consequences of alternatives and their occurrence likelihood. In the technological context, risk perception is associated with product performance, financial considerations, time, convenience, and psychological situation (Forsythe & Shi, 2003). Maser and Weiermair (1998) added disease risk that is more relevant to this research context to predict health behaviour (Rosenstock, 1960). The perceived health risk is a subjective assessment of a person's likelihood of experiencing health problems during a specific period (Menon et al., 2008). In this study, the perceived health risk is defined as a situation where the individual knows about the danger of coronavirus and feels anxious about coronavirus aerosol droplets on cash (Bae & Chang, 2020; Oh et al., 2015).

Brug et al. (2004) argued that perceived health risk is multidimensional and consists of cognitive and affective risks. The cognitive risk perception includes the vulnerability and severity of risk that each individual feels. In contrast, the affective risk perception refers to a person's anxiety or concern about their exposure to the risks (Bae & Chang, 2020). Li and Hu (2018) found that perceived health risk significantly affected the intention to reduce air pollution in another research context. A study in South Korea also showed that both cognitive and affective perceived health risk significantly affected an individual's travel intentions during the COVID-19 pandemic (Bae & Chang, 2020). In the context of financial technology adoption, Aji et al. (2020) explained that perceived health risk significantly affected consumers' intentions to use e-wallets. A perceived health risk may reduce an individual's willingness to use cash and that directs them to use an m-wallet (Oh et al., 2015; Maser & Weiermair, 1998). Based on the explanation above, we formulate the following hypothesis:

**H1:** Perceived (a) cognitive and (b) affective health risks have a positive influence on the intention to use m-wallet continuously.

According to Wang et al. (2019), government support refers to the government's facilitating role in corporate strategic initiatives and business operations by providing political, economic, and social resources. As a response to the harm of the coronavirus on public health, the government as a regulator must prevent negative consequences from the spread of the virus to their people (Aji et al., 2020). According to Sheikh et al. (2020), the government have a de jure role, which means that they are responsible for public health. In this study, government support is triggered by people's significant potential to get exposed to the COVID-19 virus while transacting using cash. Hence, we formulate the following hypothesis:

**H2:** The perceived (a) cognitive and (b) affective health risks have a positive influence on government support.

Teo et al. (2015) believe that government support can intervene and play a significant role in the spread of technological innovation. A study in developing countries shows that formal organisations such as legislative bodies, governments, and trade unions play a significant role in creating and shaping normative rules in society, influencing individuals and organisations' behaviour and decision (Madan & Yadav, 2016). Nasri and Charfeddine (2012) argue that government support has a positive impact on the intention to adopt mobile banking. This finding is supported by Raza and Hanis (2013), who found that government support could increase the intention to use online banking services (Raza & Hanif, 2013). We formulate the following hypothesis based on the above arguments:

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**H3:** Government support has a positive influence on the intention to use m-wallet continuously.

### 2.3 Perceived Health Risk, Government Support, and Performance Expectancy

Perceived risk has been widely used to measure information technology acceptance (Koenig-Lewis et al., 2010; Lee & Park, 2016). It has a significant effect on perceived usefulness (Hampshire, 2017; Lee, 2009). When individuals consider the risk of financial technology is low, they tend to think that the technology is useful (Chan & Lu, 2004). Martins et al. (2014) reported that individuals who perceived the use of financial technology required low effort tended to think that technology was less risky. Riquelme and Rios (2010) stated that an individual will adopt m-payments only if they benefit from the technology.

The WHO recommends using digital payments due to the potential transmission of COVID-19 through cash (Ather et al., 2020; Brown, 2020). The response by consumers who felt anxious when transacting using cash, was for them to use e-wallets (Aji et al., 2020). Based on the explanation above, we formulate the following hypothesis:

**H4:** Perceived (a) cognitive and (b) affective health risks have a positive effect on performance expectancy.

Perceptions of technology usefulness can be influenced by external factors, such as government support (Al-Haderi, 2014; Hai & Kazmi, 2015). Aji et al. (2020) found that government support significantly enhanced individual's perceptions of the benefits of using e-wallets. In this study context, government support is presented through the policies and effort to encourage the public to make cashless transactions during the COVID-19 pandemic. The greater the support, the more likely an individual perceives that an m-wallet is beneficial during the pandemic. The following hypothesis presents the relationship:

**H5:** Government support has a positive influence on performance expectancy.

### 2.4 Performance Expectancy, Effort Expectancy, Social Influence, and Intention to Use

Performance expectancy is the extent to which an individual believed that using a system helped improve job performance (Venkatesh et al., 2003). Performance expectations are often related to the complexity of using and operating technology (Chawla & Joshi, 2017; Kristina & Harris, 2020). If the users do not understand the technology, they may find it difficult to process information (Sinha, Majra, Hutchins, & Saxena, 2019; Kristina & Harris, 2020). A study by Madan & Yadav (2016) explains that performance expectancy can accelerate performance when making daily sales and purchase transactions. Performance expectancy is one of the most influential drivers of adopting and using information technology (Soodan & Rana, 2020). It is in line with Kim et al. (2010), who found that users would adopt m-payment services when they found benefits in making financial transactions.

A study by Cao and Niu (2019) shows the use of Alipay in China is influenced by performance expectancy. Other studies conducted in Brazil (Sena et al., 2016) and Indonesia (Rosnidah et al., 2018) also reported a similar result. In their research, Oliveira et al. (2016) found that performance expectancy could measure an individual's adoption rate of m-payments due to the ease of making financial transactions. Based on the explanation above, we formulated the following hypothesis.

**H6:** Performance expectancy has a positive influence on the intention to use m-wallet continuously.

Effort expectancy is similar to the perceived ease of use in TAM. Venkatesh et al. (2003) describe effort expectation as the convenience level associated with system usage. This variable presents the extent to which consumers expect the use of m-wallet to be easy gives a positive impression and leads to their behaviour to use the service in everyday life (Kristina & Harris, 2020; Madan & Yadav, 2016). The easier it is for individuals to use a particular technology, the greater the intention is to adopt that technology.

Phutela and Altekar's (2019) study showed that effort expectation positively affected m-wallet adoption in India. However, a person may find that the system is challenging to use even though they believe that it is useful (Pooi et al., 2018). Oliveira et al. (2016) said that m-payments required low effort to enable individuals to obtain more benefits in making payment transactions. Gupta and Arora (2019) explained that effort expectancy could predict behavioural intention to accept m-payment systems. The relationship is presented through the following hypothesis.

**H7:** Effort expectancy has a positive influence on the intention to use m-wallet continuously.

Venkatesh et al. (2003) define social influence as the degree to which an individual feels the importance of other people that leads him to use the technology. The higher the influence exerted from the social environment on potential users to adopt new information technology, the higher the intention is to use it (Venkatesh & Davis,

2000). An individual's behaviour is affected by the group culture, in which they want to get acceptance by adopting the group's advice and using the same products (Kristina & Harris, 2020).

Previous research on m-payment adoption found that social influence affected the intention to use m-payment (Hussain et al., 2018; Cao & Niu, 2019). Another study conducted in Portugal reported that public figures' opinions and recommendations could drive technology adoption for mobile platforms (Oliveira et al., 2016). Thus, we formulate the following hypothesis:

**H8:** Social influence has a positive effect on the intention to use m-wallet continuously.

### 3 Research Methodology

This study is performed in Indonesia, the fourth most populous country in the world. Unlike in developed countries, the adoption of cashless culture is still relatively new in emerging countries like Indonesia. This study's target population is m-wallet users in Greater Jakarta, the region with the strongest concentration of coronavirus. A samples of 307 respondents were selected using a convenience sampling technique. Data were collected by distributing online questionnaires using Google Form. The survey link was spread via social media such as WhatsApp, Facebook, Instagram, and Twitter to involve active m-wallet users.

All measurement items were adopted from the literature. Four items measuring performance expectancy and five items of effort expectancy were adopted from Venkatesh et al. (2003). Five items of social influence variable were taken from Venkatesh et al. (2003) and Gupta and Aurora (2019). This study considered the perceived health risk as multidimensional. Four items measuring cognitive perceived health risk were adapted from Bae and Chang (2020) and four items measuring the affective perceived health risk were taken from Aji et al. (2020) and Bae and Chang (2020). Four items of governmental support and four items of intention to continue using m-wallets were adopted from Aji et al. (2020). The items were translated to Indonesian to ease respondents' understanding of the contents of the questionnaire. They were retranslated to ensure that the meaning of each statement was the same as the original. All items were measured using a 5-point Likert scale.

The data were analysed using the partial least square structural equation modelling (PLS-SEM) that enabled examining complex relationships simultaneously and highlighted the key constructs of intention to continue using m-wallets.

### 4 Results

As presented in Table 1, the respondents' proportion based on gender was almost equal, with slightly more female respondents than males. The majority of respondents were young, between 15 and 25 years old. Most respondents had monthly expenditures between IDR2,000,000 and 4,999,999 (equivalent to USD 138-345). They had used m-wallet for more than one year with average usage of m-wallet of more than three times per month.

**Table 1** Respondents' Profile

Sample Characteristics	Frequency (n=307)	Percentage
Gender:		
Female	162	52.77%
Male	145	47.23%
Age:		
15 – 25 years old	142	46.25%
26 – 32 years old	55	17.92%
33 – 42 years old	31	10.1%
43 – 56 years old	63	20.52%
More than 56 years old	16	5.21%

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Education Level:		
High school	37	12.05%
Undergraduate degree	239	77.85%
Postgraduate degree	31	10.1%
Occupation:		
Public servant	10	3.26%
Private sector Employee	155	50.49%
Entrepreneur	47	15.31%
Housewife	14	4.56%
Student	48	15.64%
Others	33	10.75%
Monthly expenditures*:		
Less than IDR 2,000,000	53	17.26%
IDR 2,000,000 – 4,999,999	122	39.74%
IDR 5,000,000 – 9,999,999	66	21.5%
IDR 10,000,000 – 14,999,999	23	7.49%
IDR 15,000,000 and above	43	14.01%
Duration of using m-wallet:		
3 - 6 months	9	2.93%
7 - 11 months	15	4.89%
1 - 2 years	120	39.09%
More than 2 years	163	53.09%
Frequency of using m-wallet per month:		
Less than 3 times	45	14.66%
3 - 6 times	99	32.25%
7 - 10 times	57	18.57%
11 - 14 times	13	4.23%
15 times and more	93	30.29%

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\*Note: 1 million Indonesian Rupiah (IDR) equals USD 69

One indicator of perceived cognitive health risk was excluded from the study due to validity issue. As presented in Table 2, all remaining indicators had outer loading greater than 0.5 and AVE above 0.5 that suggested each item reflected its respective variable. The discriminant validity were achieved as presented in Tables 3 and 4. The composite reliability was greater than 0.7 that indicated the reliability of all constructs.

**Table 2** Descriptive Statistics, Convergent Validity, and Reliability

Construct	Mean	Standard Deviation	Convergent Validity		Composite Reliability
			Loadings	AVE	
Cognitive Health Risk				0.751	0.797
CHR2	3.02	1.13	0.659		
CHR3	2.93	1.11	0.755		
CHR4	2.43	1.25	0.698		
Affective Health Risk				0.877	0.966
AHR1	3.8	1.08	0.934		
AHR2	3.7	1.1	0.924		
AHR3	3.77	1.07	0.96		
AHR4	3.81	1.06	0.927		
Government Support				0.761	0.927
GS1	3.74	1.03	0.846		
GS2	3.56	1.1	0.904		
GS3	3.67	1.06	0.907		
GS4	3.46	1.06	0.828		
Performance Expectancy				0.752	0.924
PE1	4.5	0.71	0.871		
PE2	4.59	0.65	0.89		
PE3	4.44	0.8	0.873		
PE4	4.6	0.63	0.832		
Effort Expectancy				0.763	0.941
EE1	4.53	0.62	0.827		
EE2	4.42	0.65	0.847		
EE3	4.44	0.64	0.917		
EE4	4.58	0.61	0.884		
EE5	4.51	0.65	0.89		
Social Influence				0.589	0.877
SI1	3.36	1.13	0.784		
SI2	3.82	1.05	0.766		
SI3	2.94	1.22	0.8		

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SI4	2.79	1.15	0.763		
SI5	3.1	1.29	0.72		
Intention to Use				0.759	0.926
ITU1	3.93	0.99	0.86		
ITU2	3.97	1.01	0.905		
ITU3	4.01	1.0	0.866		
ITU4	4.19	0.87	0.853		

**Table 3** Discriminant Validity Analysis (Fornell-Larcker)

	EE	GS	ITU	PE	PHRA	PHRC	SI
EE	0.874						
GS	0.286	0.872					
ITU	0.453	0.495	0.871				
PE	0.648	0.323	0.632	0.867			
PHRA	0.241	0.370	0.386	0.334	0.936		
PHRC	0.319	0.531	0.513	0.422	0.503	0.705	
SI	0.874	0.872	0.871	0.867	0.466	0.354	0.767

**Table 4** Discriminant Validity Analysis (Heterotrait-Monotrait Ratio)

	EE	GS	ITU	PE	PHRA	PHRC	SI
EE							
GS	0.309						
ITU	0.486	0.549					
PE	0.705	0.356	0.705				
PHRA	0.222	0.454	0.630	0.353			



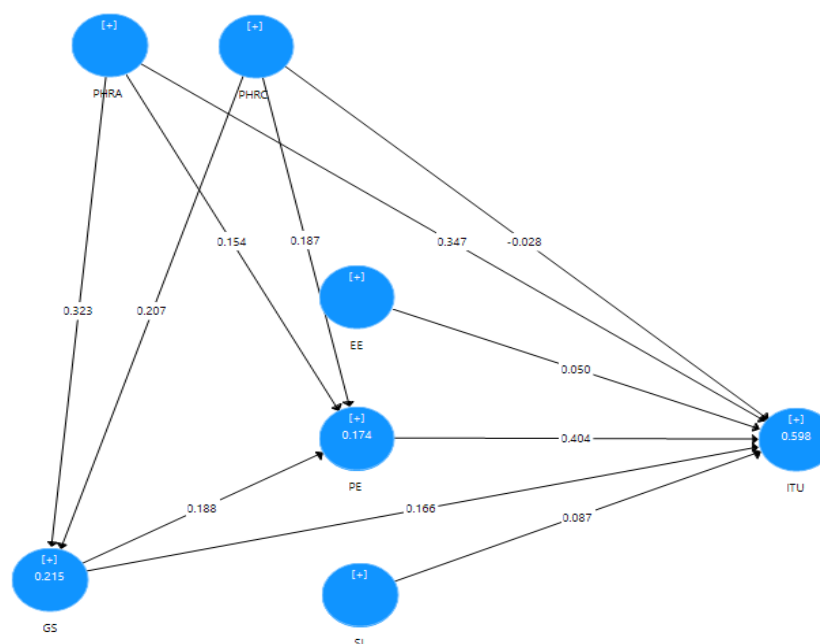
PHRC	0.216	0.440	0.385	0.291	0.549	
SI	0.351	0.614	0.582	0.466	0.524	0.433

Table 5 and Figure 1 show that almost all hypotheses were supported, except for H1a and H7. Perceived health risk, government support, performance expectancy, effort expectancy, and social influence could explain the variability of the intention to continue using m-wallets by 59.8%. It appears that performance expectancy ( $\beta = 7.314$ ;  $p < 0.000$ ) had the strongest influence on the formation of intentions to continue using m-wallets, followed by perceived affective health risk ( $\beta = 5.471$ ,  $p < 0.000$ ), government support ( $\beta = 3.036$ ;  $p < 0.002$ ), and social influence ( $\beta = 1.667$ ;  $p < 0.033$ ). In contrast to our expectations, this study found that the effect of perceived cognitive health risk ( $\beta = 0.581$ ,  $p\text{-value} = 0.280$ ) and effort expectancy ( $\beta = 0.942$ ,  $p\text{-value} = 0.173$ ) on intention to continue using m-wallet was not significant, so H1a and H7 were rejected. As the variable that had the greatest effect on intention to continue using m-wallets, performance expectancy was proven to be formed by government support ( $\beta = 3.298$ ;  $p < 0.000$ ), perceived affective health risk ( $\beta = 2.274$ ;  $p < 0.011$ ), and perceived cognitive health risk ( $\beta = 2.199$ ;  $p < 0.014$ ). These three variables could explain the performance expectancy by 17.4%. Meanwhile, perceived health risk might explain government support by 21.5 per cent. The result showed that the affective health risk dimension ( $\beta = 0.4549$ ;  $p < 0.000$ ) had a greater influence than the cognitive dimension ( $\beta = 2.871$ ;  $p < 0.002$ ) in determining government support.

**Table 5** Results of Hypotheses Testing

Hypothesis	Path coefficient	Standard error	t-value	p-value	Remarks
H1a: PHRC $\rightarrow$ ITU	-0.028	0.048	0.581	0.280	Not supported
H1b: PHRA $\rightarrow$ ITU	0.347	0.063	5.471	0.000	Supported
H2a: PHRC $\rightarrow$ GS	0.207	0.072	2.871	0.002	Supported
H2b: PHRA $\rightarrow$ GS	0.323	0.071	4.549	0.000	Supported
H3: GS $\rightarrow$ ITU	0.166	0.055	3.036	0.001	Supported
H4a: PHRC $\rightarrow$ PE	0.187	0.087	2.199	0.014	Supported
H4b: PHRA $\rightarrow$ PE	0.154	0.068	2.274	0.011	Supported
H5: GS $\rightarrow$ PE	0.188	0.057	3.298	0.000	Supported
H6: PE $\rightarrow$ ITU	0.404	0.055	7.314	0.000	Supported
H7: EE $\rightarrow$ ITU	0.050	0.053	0.942	0.173	Not supported
H8: SI $\rightarrow$ ITU	0.087	0.053	1.667	0.048	Supported

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**Figure 1** Path Diagram

### 5. Discussion

During the COVID-19 pandemic, it is evident that greater health risk perception, especially consumer fear of the virus, stimulated the government to allocate more funding to support the development of financial technology and encourage the emergence of a cashless society by promoting the use of m-wallets. Later, perceived health risk and government support influenced consumers' perception of m-wallet benefits, which is in line with Aji et al. (2020). It appears that the consumers' emotions played a more dominant role in shaping their perceptions toward the danger of COVID-19. When making cash transactions, they worried about the possibility of getting infected by the virus. The government tried to prevent the massive spread of the virus by urging the public to perform non-cash transactions more regularly and created an ecosystem that fostered financial technology innovations. The presence of m-wallets to facilitate non-cash transactions may reduce consumers' anxiety about the virus transmission risk, which is considered more useful during the pandemic.

Among the three antecedents of UTAUT, this study found that performance expectation had the greatest positive impact on consumers' decision to continue using m-wallets. It supports the UTAUT principle that performance standards positively influence an individual's willingness to use technology (Venkatesh et al., 2003). This result is in line with previous research indicating that performance expectations may better predict an individual's plans to use m-wallets (Aji et al., 2020; Lajuni et al., 2017; Madan & Yadav, 2016; Oliveira, 2016). The m-wallets provide convenience for consumers to do various financial transactions anytime, anywhere without much effort. This convenience feature leads m-wallet users to continue using the service during the COVID-19 pandemic that restricts business operations and social interactions even after the pandemic ends.

The perceived affective health risk is the second-largest significant variable influencing individuals' intention to continue using m-wallets, which is consistent with Aji et al. (2020) in the context of m-wallets and Bae and Chang (2020) in different contexts. Consumers are more dependent on m-wallet services during the pandemic because of fears of being exposed to the coronavirus. M-wallet transactions can minimise the health risk, thereby shaping consumers' intention to continue using the product. Government support also has a significant effect on consumers' intention to continue using m-wallets. This result is consistent with Aji et al.'s (2020) and Haderi's (2014) studies that reported the effectiveness of government support in increasing society's comprehension regarding financial activities. This study demonstrates that the government supports m-wallet transactions to reduce the spread of the coronavirus through regulations. The government support through financial technology infrastructure strengthens consumers' intention to continue using m-wallets.

In line with Verkijika (2018) and Madan and Yadav (2016), the social environment also affects individuals' intention to continue using m-wallets. It indicates that individuals tend to listen to influencers, friends, and family's opinions before deciding to keep using m-wallet services. Among these groups, friends appear to be more influential in influencing consumers' intention to use m-wallets. Most respondents in this study are young,

between 15 and 25 years of age, who spend more time with their peers and seek social approval from their peer group. Therefore, they are keener to follow the opinions and behaviours of their peers than other social groups.

This study does not support the hypothesis about the impact of effort expectation on the decision to continue using mobile wallet services, which contradicts the UTAUT theory. It is consistent with the study by Madan and Yadav (2016), Slade et al. (2015), and Verkijika (2018), who found an insignificant effect of effort expectations on intention to adopt new technology. The technology for m-wallets is relatively simple, so it is easy to use and learn. However, respondents seem to be more concerned with the product benefits and its ability to reduce the risk of contracting disease during the pandemic. The ease of use becomes less significant in affecting their decision to continue using this product. Moreover, this study found that perceived cognitive health risks did not directly influence the decision to continue using m-wallets but should be through government support and performance expectancy. It implies that consumers' knowledge of the danger of COVID-19 will stimulate them to consider how m-wallets may reduce the probability of getting infected by the virus, which leads them to continue using m-wallets during the pandemic.

## 6. Conclusions and Managerial Implications

This study expands the UTAUT model by integrating perceived health risks and governmental support to analyse the intention to continue using m-wallets during the COVID-19 pandemic and identify the significant factors that influenced consumers' willingness to continue using the product. The results showed that the intention to continue using m-wallet during the COVID-19 pandemic was influenced by performance expectancy, perceived health risk, government support, and social influence. This study found a significant mediating role of government support and performance expectancy in the relationship between perceived health risk and intention to continue using m-wallets. The other contribution is the significance of affective health risk perception in influencing consumers' intention to continue using m-wallets. This study reported that perceived affective health risk plays a more significant role than cognitive health risk during the pandemic.

M-wallet service providers and government should broadly implement a touchless payment mode, such as QR codes and NFC (near-field communication), to minimise physical contact and prevent COVID-19 transmission. M-wallet providers should also improve their service performance, for example, by having more cooperation agreements with merchants and increasing transaction value limits. In terms of marketing, with the current pandemic situation, companies can focus more on word-of-mouth communication strategies, especially among youth, to increase their intention to continue using m-wallets.

Simultaneously, the government should increase their support in terms of infrastructure, such as facilitating m-wallet providers to expand their business coverage area and creating a good ecosystem that promotes financial technology innovations. The government can also produce regulations that foster m-wallet business development and protects m-payment system security. This support will help the m-wallet businesses sustainability and increase consumers' willingness to keep using m-wallets.

## 7. Limitations and Suggestions for Future Research

This study only portrays the behaviour of consumers in Greater Jakarta using m-wallets during the COVID-19 pandemic. Henceforth, the further research should reach consumers in other areas or countries to confirm the findings. This study only looks at the continuous usage intention of m-wallet users. Future studies may look at the intention of using m-wallets among new consumers. The majority of respondents in this study were young consumers who are more familiar with m-wallet technology. Further research may be carried out with an even distribution of respondents based on their age so that their different behaviour toward financial technology products across age groups can be explored. Future studies are also suggested to include other variables in the UTAUT2 model, such as hedonic motivation and habit and other elements of perceived risk, such as security risk.

## 8. Disclosure Statement

No potential conflict of interest was reported by the authors

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## APPENDIX

Performance Expectancy (PE)	PE1. Mobile wallets are useful in my daily life. PE2. Mobile wallet makes it easier for me to make transactions. PE3. Mobile wallet helps me complete more transactions. PE4. Mobile wallets help me make transactions faster.
Effort Expectancy (EE)	EE1. Easy for me to learn how to use a mobile wallet. EE2. The instructions to use a mobile wallet are clear for me. EE3. The instructions to use a mobile wallet are easy to understand for me. EE4. I found that a mobile wallet is easy to use. EE5. It is easy for me to be skilled in using mobile wallets.
Social Influence (SI)	SI1. My family advised me to use a mobile wallet. SI2. Friends encouraged me to use my mobile wallet. SI3. People whose opinions I appreciate (e.g. influencers, reviewers, celebrities, etc.) encourage me to use mobile wallets. SI4. Mobile wallet users in my neighborhood are considered more prestigious than those who do not use it. SI5. I use a mobile wallet because many people use it.
Affective Perceived Health Risk (AHR)	AHR1. I am worried about being infected with COVID-19 when using cash. AHR2. I feel uncomfortable paying with cash. AHR3. I am afraid of being infected with COVID-19 if I use cash. AHR4. I am afraid there is a droplet of COVID-19 from cash.
Cognitive Perceived Health Risk (CHR)	CHR1. In general, COVID-19 transmission is relatively high. CHR2. My chances of being transmitted with COVID-19 are higher than others. CHR3. My chances of being transmitted with COVID-19 are higher than with other diseases. CHR4. There is a big possibility that I will die because of COVID-19.
Government Support (GS)	GS1. The government encourages payment transactions using mobile wallet during the COVID-19 pandemic. GS2. The government guarantees mobile wallet support infrastructure during COVID-19 pandemic. GS3. The government encourages payment innovation through mobile wallets during the COVID-19 pandemic. GS4. The government oversees mobile wallet transactions during COVID-19 pandemic.
Intention to Use (ITU)	ITU1. I will use my mobile wallet for payment during the COVID-19 pandemic. ITU2. I prefer using my mobile wallet for payment during the COVID-19 pandemic. ITU3. I plan to continue using my mobile wallet as often as possible even though the COVID-19 pandemic has ended.

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ITU4. In the future, I will use my mobile wallet for payment transactions.