New Normal Payment Method among Elderly in COVID-19 Pandemic

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Abstract

The study under the topic the of new standard payment method among the elderly in the COVID-19 pandemic aimed to investigate: 1) elderly payment behavior, 2) factors affecting payment platform selection, and 3) acceptance and adaptation toward digital payment among the elderly. The sample group was 400 elderlies in Nakhon Si Thammarat Province, Songkhla Province, and Phatthalung Province. The research collecting tool was the questionnaires, and the statistics used in analyzing data were frequency, percentage, mean, standard deviation, multiple regression, and Principal Component Analysis. Research findings showed as the followings. The first aspect, the financial behavior among elderlies, was mainly still in cash; however, the elderly chose to pay via digital platforms during the COVID-19 pandemic to access the finance state welfare or get financial aid from the government. Secondly, factors affecting the payment platform selection were payment security, convenience, age, educational levels, and familiarity with the payment platform. Thirdly, the elderly acceptance and adaptation toward digital payment were because of security and mistake concerns. Lastly, the result of hypothesis testing revealed that the electronic device owned, the frequency of cash payment, the frequency of cashless payment, and the digital payment experience during the pandemic situation all positively influenced the acceptance and adaptation among elderlies toward the digital payment with statistical significance of 0.05 ($R=0.642$), In contrast, the cofactors toward the payment platform selection among elderlies were categorized into 9 factors with a variable variation of 62.46 percent.

Keywords: Payment method, Elderly, New normal, COVID-19, Pandemic

Introduction

All people have been impacted when the world faces a pandemic called Coronavirus Disease (COVID-19). This world's crisis has also affected movement and the supply chain, resulting in economic recession and people's life in every dimension. In Thailand, the COVID-19 pandemic has been happening and expanding since 2020. Therefore, it has affected people's way of life and occupations. According to Thai society, in the fourth quarter and throughout 2021, the unemployment rate was at 1.93% due to the COVID-19 pandemic in this quarter. This pandemic has also impacted more homeless people, and COVID-19 infections have still been monitored for young, elderly, and vulnerable people (Office of the National Economic and Social Development Council, 2022).

Significantly, Thailand has been facing an aging society since 2005, and we will be in a wholly aged society in 2021. It is expected that in 2031, Thailand will become a super aged society. Older adults will be over 28% of all Thai people (Department of Older Persons, 2019). In terms of COVID-19 disease, it has negatively impacted the elderly in various dimensions, such as the economy and physical and mental health. The elderly have been considered a vulnerable and risk group of the COVID-19 pandemic.

In addition to the changing behavior of people worldwide because of the COVID-19 pandemic, more people have been living online to do many activities, including digital payment, for convenience, quickness, and safety. The effects of the COVID-19 pandemic have stimulated people's digital payment, and it is expected that ways of payment could be changed in the long run. However, it needs to be accepted that people in Thailand have been paying in cash for a long time. Changing this payment to cashless payment requires time, awareness, and understanding of cashless utilization. If the COVID-19 pandemic still expands in the future, people will need to learn and adjust their payment behavior to suit this changed social context.

It could be seen that the COVID-19 pandemic has badly and inevitably influenced people's way of life. The elderly also need to modify their behavior of consumption and payment to be accustomed to living in a New Normal way of life. Importantly, they have to accept and access necessary payment methods and adapt themselves to overcome this crisis.

Literature review

This study was based on several relevant principles, such as Thailand's aging society, the COVID-19 pandemic, Thai people's transaction trends of payment, and concepts of adaptation and acceptance of innovation and technology. Each principle is explained as follows:

The situation of an aging society

In Thailand in 2020, it was found that there were 12 million elderly people, counted as 18% of all Thai people. In the next 20 years, the number of elderly over 60 will increase at an average of 4% per year, and the number of elderly over 80 will increase at an average of 7% per year (The Foundation of Thai Gerontology Research and Development Institute, 2021). In 2021, there were nine million elderly people, counted as 12.8%. When this number was

compared to other ASEAN countries, the proportion of aged people in Thailand was the second highest after Singapore (Kasikorn Research Center, 2021). Indeed, an aging society can affect the country's development and economic growth in the long term in these three aspects: (1) the state budget which needs to be a lot spent on the elderly, (2) economic acceleration due to a decreasing number of labors in production, and (3) problems of laws, rules, and regulations on older people's operations which do not support the elderly and their database (Department of Older Persons, 2019).

The situation of the COVID-19 pandemic

The first COVID-19 infected person in Thailand was found in January 2020, and many more people and medical personnel have been infected (Department of Disease Control, 2022). This pandemic has terribly and widely affected businesses and households. According to a research report, 'How Will Thai Economy Be If People Need to Live with COVID-19?' The tourism and services industries were the most badly impacted (Leingchan, 2021). In Thailand, the COVID-19 pandemic negatively influenced people and society in various dimensions as economy, health, education, environmental changes, and Thai social contexts (Institute for Population and Social Research of Mahidol University, 2021).

Thai people's payment for transaction trends in 2021

Referring to the Bank of Thailand (2021a), it was found that (1) Thai people made more digital payments in the New Normal Way of life in 2021. It showed more of these payments than in previous years, with 41.6% and 18.7%, respectively. Most transactions were done via mobile banking/internet banking, counted as 70%. (2) More Thai people paid online, resulting in more money and transactions, with 64.8% and 20.8%, respectively. (3) A smaller number of Thai people paid in cash, according to the decreasing withdrawn money at 17.7% compared to the previous year. (4) Finally, offline payment was dropped due to Thai people's behavior.

Concepts of adaptation and acceptance of innovation and technology

Cruijsen and Horst (2016) investigated payment behavior with socio-psychological factors. The variables made to test relationships of people's payment behavior (1) payment behavior consists of payment intention, actual control, and habits, (2) payment intention consisted of attitudes, injunctive norms, descriptive norms, roles, personal norms, emotions, and perceived control, and (3) control variables such as genders, ages, incomes, etc., and other variables expected to have effects or relationships with payment.

Roy and Andrews (1999), who created 'Roy's Adaption Model' employed Holistic Adaptive System and an open system containing inputs, a coping process, an adaptive mode, outputs, and a feedback process. Each part was related to one another in a system with a control mechanism and cognition subsystem to affect four dimensions of people's behavior adaptation: physical health, self-concept mode, roles and duties, and interdependence. The two outcomes of adaptation were adaptability and ineffective adaptability.

Foster (1973) explained that the self-learning of people and communities caused elements of innovation acceptance. Rates of this acceptance, even the same innovation, varied according to social situations.

Rogers and Shoemaker (1971) stated that decisions on fully utilizing innovation were better and more valuable. Innovation acceptance was the beginning process for people and communities to sense innovation and be persuaded. The process included five steps: awareness, interest, evaluation, trial, and adoption. Then decisions on innovation were adjusted.

Davis (1989) mentioned 'the Technology acceptance model (TAM)', showing external variables' main factors perceived usefulness, perceived ease of use, attitudes toward using, and behavioral intention to use. The actual system use would occur.

Data and methodology

The purpose of this survey research was to investigate older people's payment methods, factors affecting payment platform selection, and acceptance and adaptation to digital payment among the elderly.

Population and samples

The population was 605,886 elderly in Nakhon Si Thammarat Province, Songkhla Province, and Phatthalung Province, Thailand, in 2020 (Department of Older Persons, 2021). According to the statistics of older people in Thailand in 2020, it was found that in the elderly in 14 southern provinces the first and second highest number of older people was in Nakhon Si Thammarat and Songkhla, respectively. In Phatthalung, the elderly were counted as 19.13% compared to the most significant population. In this research, the elderly were people 60 and older living in the mentioned provinces.

Population size was determined by probability since it was finite. Yamane's (1973) formula was applied, and the confidence level was 95%. 400 samples of the elderly operating payment were selected by area and convenience random sampling.

$$n = \frac{N}{1+N(e^2)}$$
$$n = \frac{605,886}{1 + 605,886 \,(0.05)^2}$$
$$n = 400$$

Where n = sample size

      N = population size = 605,886

      e = error (0.05) reliability level 95% or level of precision always set the value of 0.05

Then the sample size of three provinces was calculated by the proportional to size formula (Wanichbancha, 2018) as shown in Table 1.

$$n_i = n \ \ x \ \ \frac{N_i}{N}$$

Where n = sample size = 400

n$_i$ = samples size required in each province

N = population size = 605,886

N$_i$ = elderly people in each province

Table 1 The population and sample size were selected based on area sampling

Province	Elderly (N$_i$)	Sample (n$_i$)
Nakhon Si Thammara	276,331	182
Songkhla	229,513	152
Phatthalung	100,042	66
Total	605,886 (N)	400

Research instruments

In this research, the data were collected through a questionnaire responded to by the samples of the study. The steps to create this instrument are as follows:

1. The contents covering all the research variables were analyzed.

2. The literature of all the variables was reviewed.

3. A questionnaire was created based on quantitative research and classified as the primary data. Therefore, this questionnaire was used as the instrument to collect the data both offline and online. The secondary data were gathered from academic documents, research reports, articles, textbooks, related theses, electronic data, and other data from other related resources.

4. The questionnaire was tested for reliability. The reliability of the questionnaire was examined using Cronbach's Alpha coefficient, which yielded a value of 0.892 out of 10 percent of the pre-test samples (Hair et al., 2010), and the index of item objective congruence (IOC) equaled 0.867 (Rovinelli & Hambleton, 1997). After the inspections mentioned, the questionnaire was employed to collect the data.

5. This research was operated for human research ethics approval from Human Research Ethics Office at Walailak University. The committee approved this research and issued the certificate under the code of WU-EC-EX-33-015-65 with approval no. WUEC-22-032-01 on 2nd February 2022.

6. The data were gathered through the questionnaire, selection, and classification based on the research scope variables to have correct and complete data. The data were collected between 15th February and 15th May 2022.

7. In this research, a survey was used for data collection, along with close-ended and open-ended questions and five rating scales. The Likert scales by Rensis Likert and dummy variables with scores ranged from 1 to 5 (1 = "Not important at all", 2 = "Not very important",

3 = "Moderate", 4 = "Important" and 5 = "Very important"). In this survey, a questionnaire was applied as a research tool to find out the samples'general information, payment methods, and payment behavior, factors affecting payment platform selection, acceptance and adaptation toward digital payment among the elderly, and recommendations.

In terms of data analysis, the primary data were processed; the correlation among variables was considered; the variables were compared; and the hypothesis was tested according to the research scope. The details of the questionnaire are described below.

Part 1: 8 items asking about the personal information of the samples

Part 2: 10 items asking about the payment behavior of the samples

Part 3: 30 items asking about the factors affecting payment selection of the samples

Part 4: 20 items asking about acceptance and adaptation to digital payment of the samples

Part 5: An open-ended question asking for additional suggestions

For parts 3 and 4, the statistics used to analyze these Likert Scale data were mean. The data were rated on five scales (Pongwichai, 2008).

Scale 5 (4.21-5.00) means the most agreement or importance.

Scale 4 (3.41-4.20) means much agreement or importance.

Scale 3 (2.61-3.40) means moderate agreement or importance.

Scale 2 (1.81-2.60) means little agreement or importance.

Scale 1 (1.00-1.80) means the least agreement or importance.

The data analysis was carried out using statistical software to analyze descriptive statistics (frequencies, percentage, mean, and standard deviation) and inferential statistics (multiple regression analysis and exploratory factor analysis by the Principal Component Analysis (PCA)).

8. Conclusions and discussions

Research results and hypothesis development

The results from this study were summarized as follows:

1.The analysis of 400 older people's personal information displayed 59.25% of women and 40.75% of men. Their average age was 65.82 years old, counted from the age range of 61-77. Most of them graduated from a primary school level, counted as 49.50%, followed by Bachelor's degree (26.75%), secondary school (14.75%), and higher education (9%) respectively. Before retirement at 60, they worked as government or state enterprise officials (23%) and farmers (22%). It was also found that 50.50% of them were unemployed during the research, but 49.5% worked in their own/businesses/trades, agriculture, general service work, fishery, etc. In terms of incomes, 30.25% of them received money from their children/grandchildren/other family members, followed by other jobs after retirements (28%), pensions (18.50%), and other incomes from Social Security Fund, provident funds, saving life insurance, spouses, interests/dividends/investment returns, etc., respectively. In addition, 55.25% of them had their own electronic devices for digital payment; however, 68.25% had no online shopping experiences. Regarding the purchase, 23.75% of the samples sometimes

bought goods and services online, and 8% of them usually preferred to buy goods and services online.

      2. In terms of payment behavior, it was analyzed that 47.90% of the elderly paid for goods and services in cash, followed by mobile & Internet banking (18.08%), e-Money (12.57%) which the majority of the elderly paid by e-Social Welfare the most, e-Wallet (11.38%) via Paotang Application which has been widely used according to the campaign of buying goods and services during the COVID-19 pandemic, debit and credit cards (10.06%), respectively. The most popular place for shopping and payment was fresh markets (27.77%), where the elderly bought foods and drinks as the most kind of goods (25.37%), followed by personal things (22.37%), health care and medical payment (14.65%), payment for children and grandchildren (9.12%), and other expenses such as communication and entertainment services, traveling, older people's activities, making merit/donation, etc., respectively. The average daily cash holdings were 684.12 Baht (100-5,000 Baht). 39.50% of them chose to pay in cash because of their familiarity, followed by ease of use, convenience, and uncomplexity (28.25%), knowing their saving balance and controlling expenses (12.25%), inability to access other payment methods (8.75%), and places of cash-accepted-only purchase and payment (5.25%), respectively. The average frequency of cash payment was 1.98 times per day, with an average amount of 188.87 Baht per time. Regarding other payment types, the average frequency of payment was 0.67 times per day, with an average of 107.15 Baht per time. However, 69.75% of them chose digital payment during the COVID-19 pandemic mainly because they received money for government welfare or COVID-19 pandemic compensation (15.25%), followed by a reduction of the COVID-19 spread by touching cash (12.75%), time reduction for financial transaction at banks (12.25%), and reduction of being close and touching each other (9.50%), respectively. After the COVID-19 pandemic, 55.75% of the elderly thought they would pay digitally, but 46.25% of the elderly thought that they would not be sure how to live without cash (46.25%).

      3. According to the factors affecting payment platform selection, most of the samples focused the most on the safety of payment (Mean=4.39), followed by convenience/ease of use/payment at anywhere and any time (Mean=4.28), ages of payers (Mean =4.15), educational levels of payers (Mean =4.13), Familiarity with payment methods (F17) (Mean =4.07), income level of payers (Mean =4.02), and occupation of payers (Mean =4.01). Additionally, it was found that the last three factors affecting payment selection, which the elderly emphasized the least was behavior after using each kind of payment (Mean=3.35, frequency of payment (Mean =3.25), and discounts, gifts, and other benefits from the payment of goods and services (Mean =3.09), respectively, as shown in Table 2.

      Older people preferred the convenience and no complexity of payment. Some payment methods were so complicated that they needed help to use them efficiently. It was also indicated that personal factors could classify groups of people who accessed and used each payment method. The elderly still used the traditional payment of cash due to their familiarity. However, when they experienced other payment methods, they could feel the difference and outcomes of other methods. Notably, the payment measurements by the government have now

been focused on payment access and selection; therefore, the elderly have had to access and use it to receive any benefit from the government. In other words, it was considered a compulsory mechanism for the elderly to accept and adjust to new payment behavior.

　　　4. According to the factors of acceptance and adaptation toward digital payment, concerns of safety and system connection of payment devices were at a high level (Mean =3.75), followed by anxiety and fear of errors in digital payment (Mean =3.74), assistance or welfare from the government resulting in digital payment (Mean =3.30), reliance and trust in modern digital payment (Mean =3.23), and readiness of suitable electronic devices for digital payment (Mean =3.19), positive attitude toward innovation and technology (Mean=3.10), access to cashless society (Mean =3.06), respectively. However, acquiring knowledge and learning about digital payment (Mean =2.39) and knowledge and understanding of payment innovation and technology (Mean =2.38) were rated as the second last variables, as shown in Table 3.

　　　To summarize, the elderly's acceptance and adaptation toward digital payment was moderate, resulting in little accessibility and usage. There were several reasons, namely low acknowledgment of digital payment, concerns of safety and possible errors due to their accessibility, and no reliance and trust in the system's safety and efficiency, possibly due to no understanding of digital payment. Consequently, older people should be supported and promoted for accessibility and use of innovation and technology. It could be seen that the samples in the research still felt concerned about several factors of digital payment, leading to no confidence and obstacles to access to electronic devices which were needed for digital payment and affecting adaptation to personal payment behavior and overall cashless society in the future.

Table 2 Mean and standard deviation value of factors affecting payment platform selection

Factors affecting payment platform selection	Mean	S.D.	Level
Payment safety (F_1)	4.39	0.591	Very Important
Convenience/ease of use/payment anywhere and any time (F_2)	4.28	0.548	Very Important
Ages of payers (F_{10})	4.15	0.681	Important
Educational levels of payers (F_{12})	4.13	0.679	Important
Familiarity with payment methods (F_{17})	4.07	0.968	Important
Income levels (F_{13})	4.02	0.870	Important
Occupations of payers (F_{11})	4.01	0.744	Important
Reliance and trust in payment (F_{22})	3.99	0.807	Important
Obstacles of digital payment (F_9)	3.90	0.834	Important
Types of accommodation (F_7)	3.89	0.753	Important
Government's payment policies and measurements (F_{30})	3.87	0.872	Important
Payroll/income channels (F_{14})	3.85	0.826	Important

Factors affecting payment platform selection	Mean	S.D.	Level
Sellers and shops' payment receiving (F_5)	3.83	0.757	Important
Prices of goods and services for each time of payment (F_{19})	3.77	0.913	Important
Problems of cash payment due to the COVID-19 pandemic (F_8)	3.75	0.987	Important
Readiness of technology to access payment (F_{23})	3.75	0.815	Important
Places of payment (F_6)	3.70	0.989	Important
Duration of each payment (F_3)	3.68	0.860	Important
Access to payment information (F_{28})	3.63	0.787	Important
Previous experiences of payment (F_{20})	3.54	0.903	Important
Verification of evidence/statements (F_{24})	3.53	0.875	Important
Chances of errors for each payment (F_{27})	3.53	0.828	Important
Expense planning and control of payers (F_{25})	3.45	0.959	Important
The main purpose of each payment (F_{18})	3.38	0.810	Moderate
Behavior of close or aquatint people (F_{16})	3.36	0.788	Moderate
Present lifestyles (F_{15})	3.35	0.644	Moderate
Various methods of payment as desired (F_{26})	3.35	0.787	Moderate
Behavior after each payment (F_{29})	3.35	0.685	Moderate
Frequency of payment (F_4)	3.25	0.795	Moderate
Discounts/gifts/other benefits from payment of goods and services (F_{21})	3.09	0.772	Moderate

Table 3 Mean and standard deviation values of factors of acceptance and adaptation toward digital payment

Acceptance and adaptation toward digital payment	Mean	S.D.	Level
You are concerned about the safety and connection of devices for payment.	3.75	0.893	Important
You are anxious and afraid of errors in digital payment.	3.74	0.846	Important
You choose digital payment because of the government's assistance or welfare.	3.30	0.795	Moderate
You have confidence and trust in modern digital payment.	3.23	0.924	Moderate
You are ready to use your electronic devices for digital payment.	3.19	0.895	Moderate
You have positive attitudes and focus on innovation and technology influencing your daily life.	3.10	1.046	Moderate
A cashless society affects your behavior of more digital payment.	3.06	0.930	Moderate
Your real experiences make you accept and access digital payment.	3.03	1.157	Moderate

Acceptance and adaptation toward digital payment	Mean	S.D.	Level
You are delighted to adapt your behavior and choose more digital payment without discomfort.	3.02	0.913	Moderate
Communication via the internet and online social networks impacts your digital payment.	3.00	1.161	Moderate
You have tried various types of digital payment.	2.98	1.040	Moderate
You tend to choose more digital payment than cash payment after the COVID-19 pandemic.	2.95	1.138	Moderate
Behavior of online shopping and services makes you understand and access more digital payments.	2.88	1.176	Moderate
You have found problems during digital payment but have yet to receive assistance from service providers in time.	2.80	1.004	Moderate
You are interested in and curious about digital payment, and are always ready to try it.	2.79	1.106	Moderate
You can access to services of digital payment by yourselves.	2.74	0.996	Moderate
You acknowledge the ease of use and benefits of digital payment.	2.74	0.996	Moderate
Your close people influence you to choose more digital payment.	2.66	1.161	Moderate
You look up some information and more knowledge about digital payment.	2.39	0.899	Not very important
You understand and know the innovation and technology of digital payment.	2.38	0.918	Not very important

　　　　5. According to the hypothesis, older people's personal information and payment behavior of had positive relationships with acceptance and adaptation toward digital payment during the COVID-19 pandemic. The personal data and payment behavior as seven independent variables included genders (X_1), education (X_2), electronic devices to support digital payment (X_3), daily cash holdings (X_4), frequency of cash payment (X_5), frequency of cashless payment (X_6), and experiences of digital payment during the COVID-19 pandemic (X_7). The factors (Y: the average value of 20 variables in Table 3) were used to find a correlation with a dependent variable, level of acceptance, and adaptation toward digital payment. Then the hypothesis was tested through Multiple Linear Regression Analysis using the Stepwise method, as shown in Table 4. An equation is displayed below.

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

Table 4 Regression analysis to predict the elderly's data and payments behavior affecting levels of acceptance and adaptation toward digital payment

Predictor data	b	SE	t	Sig.
Constance	1.839	0.093	19.674	0.000*
Electronic devices to support digital payment (X_3)	0.299	0.072	4.165	0.000*
Frequency of cash payment (X_5)	0.244	0.040	6.111	0.000*
Frequency of cashless payment (X_6)	0.266	0.040	6.608	0.000*
Experiences of digital payment during the COVID-19 pandemic (X_7)	0.335	0.072	4.681	0.000*
R= 0.642, R^2= 0.413, Adj.R^2 = 0.407, SE_{est} = ±0.598				
Cook's Distance = (0 - 0.029), Durbin-Watson = 1.565				
F= 69.384, Sig. = 0.000*				

 * p-value < 0.05

Data testing for data analysis included (1) a multicollinearity test showing that tolerance values of the variables were not close to 0 (0.685-0.955), and variance inflation factor values (VIF) of the independent variables were less than 10 (1.048-1.460) (Black, 2006). (2) Moreover, in terms of outlier testing, it was found that Cook's Distance values were between 0-0.029, concluding that the values of the analyzed data were average. (3) Also, the outcomes of the autocorrelation test revealed that a Durbin-Watson value equaled 1.565, which was still in the range of 1.5-2.5 and resulted in no correlation among independent variables. (4) The results of a homoscedasticity test from scatter plots displayed that most error values were spread above 0 and below 0. The spread was in a narrow range no matter which direction the Y variable was changed to, so it was concluded that error variance values were stable. (5) Finally, the results of a Kolmogorov-Smirnov test explained that Sig.= 0.000, which is less than 0.05, but the value was still in a central limit theory indicating that more than 30 samples led to a normal distribution (Bland & Altman, 1996). In this research, there were 400 samples, so it was considered normal distribution. Then these data were analyzed by multiple regression.

According to Table 4, it was found that the independent variables—electronic devices to support digital payment (X_3), frequency of cash payment (X_5), frequency of cashless payment (X_6), and experiences of digital payment during the COVID-19 pandemic (X_7)—positively influenced the levels of acceptance and adaptation toward digital payment, with a statistical significance value at 0.05. However, four variables of personal information and payment behavior had moderate relationships with the levels of acceptance and adaptation toward digital payment, considered by a correlation value (R = 0.642) (Hinkle et al., 1998). It could be forecasted at 40.7% (Adj.R^2 = 0.407); therefore, the independent variables could set up an equation as

$$Y' = 1.839 + 0.299X_3 + 0.244X_5 + 0.266X_6 + 0.335X_7$$

6. The exploratory factor analysis using PCA found that there were 30 variables affecting payment platform selection (Table 2). The results of the analysis using Varimax rotation are revealed as follows.

The first co-variable accounted for 11.081% of the variance in explaining four variables as the modifying factors of the behavior of payment selection: the readiness of technology to access payment (F_{23}), verification of evidence/statements (F_{24}), expense planning and control of payers (F_{25}), and various methods of payment as desired (F_{26}).

The second co-variable accounted for 10.832% of the variance in explaining four variables as the modifying factors of payment intention: duration of each payment (F_3), frequency of payment (F_4), sellers and shops' payment receiving (F_5), and places of payment (F_6).

The third co-variable was counted as 8.369% of the variance in explaining four variables as the modifying factors of purposes and experiences of payment selection: behavior of close or aquatint people (F_{16}), the main purpose of each payment (F_{18}), prices of goods and services for each time of payment (F_{19}), and previous experiences of payment (F_{20}).

The fourth co-variable accounted for 7.534% of the variance in explaining four variables as the modifying factors of personal data and payment obstacles: problems of cash payment due to the COVID-19 pandemic (F_8), obstacles of digital payment (F_9), ages of payers (F_{10}), and occupations of payers (F_{11}).

The fifth co-variable accounted for 6.812% of the variance in explaining three variables as the modifying factors of perception and access to payment information: access to payment information (F_{28}), behavior after each payment (F_{29}), and government's payment policies and measurements (F_{30}).

The six co-variable accounted for 4.847% of the variance in explaining two variables as the modifying factors of payment safety and convenience: payment safety (F_1) and convenience/ease of use/payment at anywhere and any time (F_2).

The seven co-variable was considered as 4.706% of the variance in explaining three variables as the modifying factors of attitudes toward payment selection: educational levels of payers (F_{12}), payroll/income channels (F_{14}), and current lifestyles (F_{15}).

The eight co-variable was counted as 4.184% of the variance in explaining one variable as the modifying factor of living locations: types of accommodation (F_7).

The nine co-variable was counted as 4.090% of the variance in explaining two variables as the modifying factors of income levels and payment reliability: income levels (F_{13}) and reliance and trust in payment (F_{22}).

The variation of all nine common factors was explained at 62.456%, as shown in Table 5. However, it was noted that F_{17}, F_{21}, and F_{27} could not be classified into the new group of elements due to factor loading < 0.5.

Table 5 The factor loading and the communality of 30 variables after Varimax factor rotation

Factor	Factor Loading after rotation by Varimax									Communality
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	
F_1	0.085	0.072	-0.075	0.001	0.023	0.748*	0.231	-0.164	0.117	0.671
F_2	0.061	0.042	0.132	0.145	0.032	0.802*	-0.127	0.169	-0.015	0.733
F_3	0.145	0.783*	0.185	0.062	0.061	0.053	-0.085	-0.028	-0.015	0.687
F_4	0.232	0.726*	0.199	0.039	0.041	-0.071	-0.019	-0.228	-0.045	0.683
F_5	0.143	0.728*	0.064	0.096	0.103	0.158	-0.025	0.242	0.104	0.670
F_6	0.066	0.754*	0.141	0.050	0.166	0.038	0.172	0.217	0.034	0.702
F_7	-0.015	0.423	-0.020	0.327	0.104	-0.047	0.200	0.558*	0.068	0.656
F_8	0.122	0.472	0.145	0.545*	0.109	-0.089	0.126	0.225	0.003	0.643
F_9	0.023	0.091	0.099	0.754*	-0.004	-0.018	0.131	0.378	-0.001	0.747
F_{10}	0.024	-0.025	0.109	0.742*	-0.036	0.198	0.041	-0.010	0.026	0.606
F_{11}	0.058	0.095	-0.028	0.691*	0.070	0.013	0.016	-0.227	0.221	0.596
F_{12}	0.324	0.065	-0.213	0.249	-0.123	0.046	0.602*	-0.037	-0.003	0.597
F_{13}	-0.047	0.049	0.152	0.116	-0.052	-0.021	0.135	-0.110	0.804*	0.721
F_{14}	0.017	0.044	0.242	0.152	0.200	0.126	0.602*	0.027	0.102	0.513
F_{15}	-0.047	-0.049	0.380	-0.114	0.146	-0.099	0.556*	0.206	-0.093	0.553
F_{16}	-0.044	0.222	0.612*	0.083	0.248	-0.048	0.220	-0.055	0.112	0.561
F_{17}	0.398	0.111	0.391	-0.100	-0.048	0.066	0.035	0.486	0.035	0.578
F_{18}	0.303	0.185	0.629*	0.129	0.237	0.041	-0.027	0.106	0.026	0.608
F_{19}	0.249	0.298	0.619*	0.086	0.058	0.000	0.102	0.071	0.088	0.568
F_{20}	0.395	0.130	0.626*	0.080	0.092	0.132	0.036	0.013	0.028	0.599
F_{21}	0.462	0.402	0.337	-0.117	0.131	-0.031	0.118	-0.185	-0.124	0.584
F_{22}	0.236	-0.017	-0.025	0.104	0.110	0.161	-0.150	0.260	0.606*	0.563
F_{23}	0.708*	0.103	0.050	0.046	0.179	0.012	0.018	0.111	0.037	0.563
F_{24}	0.811*	0.188	0.147	-0.005	0.109	0.060	0.019	0.089	0.027	0.739
F_{25}	0.748*	0.191	0.219	0.062	0.183	0.117	-0.004	0.049	0.052	0.700
F_{26}	0.593*	0.063	0.144	0.105	0.258	0.007	0.172	-0.141	0.089	0.511
F_{27}	0.345	-0.088	0.312	0.141	0.411	0.256	-0.092	-0.017	-0.155	0.510
F_{28}	0.185	0.056	0.241	-0.001	0.753*	0.039	-0.016	-0.067	0.064	0.673
F_{29}	0.295	0.130	0.116	0.044	0.663*	-0.040	0.170	0.017	-0.126	0.606
F_{30}	0.187	0.307	0.045	-0.026	0.641*	0.026	0.108	0.149	0.130	0.594

Remark: Kaiser-Meyer-Olkin =0.849; and Bartlett's Test of Sphericity (p-value = 0.000)
* Factor Loading > 0.5

Conclusions and recommendations

Conclusions

(1) Cash payment was still the elderly's primary payment method. However, changed to use e-payment such as mobile banking/internet banking or e-money for the government's e-social welfare. Some of them could access cashless payments because of their previous experiences and their own electronic devices. Still, cash was considered the primary payment method and needed to hold each day due to the elderly's familiarity, ease of use, and no complexity. The mentioned results are relevant to the Bank of Thailand (2021b) findings that most Thai people still pay in cash for their daily consumption. Interestingly, a study by Sangsawangwatthana et al. (2020) showed that Thai people needed to adjust from their former behavior of various lifestyles under the situations of the COVID-19 pandemic. It was found in

a study by Septech and Socatiyanurak (2021) that electronic payment channels tended to be increased.

(2) The factors affecting payment platform selection were payment safety, convenience, and ease of use. Some older people chose cash payment thanks to their familiarity. These findings are related to a study by Saetim (2019) showing that factors influencing the behavior of payment intention via mobile phone were reliability, habits, and facilities. According to Tangpattamachart and Parncharoen (2020), it was found that personal factors of consumers affected their behavior regarding mobile banking payment, system quality, and data quality.

(3) Most of the elderly in the research expressed concern about the safety and connection of devices used for payment and their anxiety about errors from digital payment, assistance or welfare by the government led most of the elderly to use more digital payment. Their acceptance and adaptation toward digital payment were moderate, resulting in less accessibility and use.

Recommendations

(1) Planning money, working, or extra jobs is necessary to deal with decreased incomes. Saving money should also be educated to people studying at school or working to support aging society in the future.

(2) Elderly people who still pay in cash should be promoted to (1) improve financial skills or technology access for their ages and (2) increase guidelines and support for e-payment use by firstly adjusting their attitudes towards the importance of e-payment.

(3) Government and private sectors should collaboratively promote access and use of various digital payment methods for elderly people to meet purposes of expenses.

Suggestions for further studies

(1) More survey locations should be included to compare their areas in terms of payment accessibility and services. Plus, need for users for digital, especially older people, the number of whom will be more in the near future in Thailand.

(2) To apply the research results efficiently, more variables or factors should be included to suit the time and any situation shortly, such as variables of financial behavior in this digital era, economic status affecting elderly people, advancements of financial technology, financial innovation related to older people, and welfare for older people, etc. It is essential that these mentioned variables can be changed.

(3) To make the research interesting and useful for knowledge transfer, further research about older people's financial literacy should be conducted, such as financial knowledge, saving behavior, preparation for older people's payment accessibility and services, etc. The research results of financial literacy can be used to promote financial skills for the elderly to have a good financial immune system, be ready for any changes in the future, set their financial independence goals, and have secured income insurance when they are older.

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