



What Influences Thai Community–Dwelling Older Adults to Undertake Health Protective Behaviors in the Time of COVID–19 Pandemic?

A Structural Equation Modeling Analysis

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Abstract

The changes and issues associated with aging in addition to the government's response to the Covid-19 crisis pose a significant challenge for older people's compliance with and adherence to the recommended preventive measures. This study examines a proposed extended Theory of Planned Behavior (TPB) model with factors affecting community-dwelling Thai older adults' intent to undertake health protective behaviors. Ajzen's (1985) Theory of Planned Behavior (TPB) was applied and extended to account for government trust, as a proposed additional factor. Using a structural equation modeling analysis, the research data were collected from a sample of 360 Thai older adults aged 60 years old and over living in the community in Thailand. Partial Least Square (SmartPLS) software was used to analyze Structural Equation Model (SEM). The results of this study indicate that subjective norms was the highest influencing factors (TE=0.263), followed by attitude (TE=0.257) and perceived behavioral control (TE=0.239), towards the intention that led to the health protective behaviors of the Thai older adults living in the community amid the outbreak of COVID-19. However, contrary to expectation, the government trust (TE=0.060) was not significantly related to intention to perform health protective behaviors. The findings from this study provide timely evidence needed for policy makers, healthcare professionals, and community to develop preventive measures and strategies to better target complex interventions that are responsive to the needs of local circumstances amid and beyond the crisis. This may include community-based programs or interventions that target both family members and older adults, ensuring equal opportunities and respecting older people's rights.

Keywords: Community, Covid-19 pandemic, health protective behaviors, health promoting behaviors, older adults, theory of planned behavior

Introduction

Given the very recent emergence and ongoing impacts of coronavirus disease 19 (COVID-19), it is becoming more apparent that older adults and individuals with underlying health conditions are at higher risk for severe illness following infection from COVID-19, with a disproportionately large number of deaths occurring in these groups (Centers for Disease Control and Prevention, 2020; Applegate & Ouslander, 2020; Chen et al., 2020). This situation poses significant challenges for healthcare and policies in many parts of the world, including Thailand. In response to the COVID-19 outbreak, the Thai government has ordered a nationwide mitigation measures being implemented to prevent the further community spread of the virus. Despite the growing interest and the need for further research, the study on factors that determine the success and failure of older adults' responses to COVID-19 and accompanying mitigation efforts is limited. This paper examines a proposed



extended Theory of Planned Behavior (TPB) model with factors affecting community-dwelling Thai older adults' intent to undertake health protective behaviors during the COVID-19 pandemic.

Aging is taking place in most countries across the globe and Thailand is no exception. Thailand is experiencing a rapid increase in the proportion of its older population, with numbers now reaching 11 million or approximately 17% of the total population. The number of people aged 60 and older has doubled in the last 20 years and is predicted to double again in the next 30 years (Foundation of Thai Gerontology Research and Development Institute, 2018). As the baby boomer generation ages, it is estimated that Thailand will become a complete-aged society by the year 2021 and will achieve a super-aged society in the next 20 years (National Statistics Office, 2019). However, aging comes with unique challenges and the prevalence of comorbidities and number of comorbid conditions increase with age. Evidence suggests that older adults have experienced various aspects of changes associated with aging and generally have multiple medical conditions. The combination of age-related changes, increased comorbid conditions, and decreased immune function can make older people more susceptible to the infections (Parekh & Barton, 2010; Davis, Chung, & Juarez, 2011; Karlamangla et al., 2007).

It is clear that older people are among those most at risk of serious complications and death from COVID-19. First publicly identified in late December 2019, a novel coronavirus (later named as COVID-19) has affected many provinces in China and expanded to many countries worldwide. In Thailand, the Ministry of Public Health reported the first confirmed case of COVID-19 on January 13, 2020 and announced the COVID-19 a dangerous communicable disease on March 1, 2020. The World Health Organization declared the COVID-19 outbreak a pandemic on March 11, 2020 given the alarming levels of spread and severity. Globally, over 79.2 million confirmed cases of COVID-19 caused by the 2019 novel coronavirus (SARS-CoV-2) have been reported, including over 1.7 million deaths across countries and regions since the start of the pandemic (as of December 27, 2020) (World Health Organization, 2020). Studies confirm that older people are particularly susceptible to infection and more likely to suffer severely from COVID-19 disease and death (Centers for Disease Control and Prevention, 2020; Cawthon et al., 2020). For example, the Chinese Center for Disease Control and Prevention (2020) has indicated that approximately 80% of deaths occurred among adults aged 60 years and older. These findings are similar to the CDC's report (2020), which 80% of deaths associated with COVID-19 in the United States were among adults aged 65 years and over with the highest percentage of severe outcomes among persons aged 85 years or more. In Thailand, a total of 6,884 COVID-19 cases (as of December 31, 2020) had been reported with case-fatality percentages increased with age (Department of Disease Control, 2020).

In response to the COVID-19 pandemic, the Thai Government has implemented a nationwide infection control measures to slowing down transmission and reducing mortality associated with COVID-19. Public health and social measures to prevent the spread of COVID-19 including personal protective, physical distancing, environmental, and travel-related measures were publicized daily in the media as a way to reduce the risks of exposure to and becoming infected with COVID-19. For example, in Thailand, the government has placed serious restrictions on freedom of movement based on age, pushing older people to remain confined in their home amid the spread of COVID-19. Although these measures and efforts are highly commendable and necessary, it is important not to lose sight of the fact that older people are feeling the effects of the pandemic the most (Schrack, Wanigatunga, & Juraschek, 2020; Usher, Bhullar, & Jackson, 2020; Volpato, Landi, & Incalzi, 2020). This is in part due to the presence of physical and functional impairments that come with aging,



as well as potential underlying health problems. In addition, older people are often dependent on the support from family caregivers and communities in maintaining health and well-being. The physical challenges and psychological changes associated with aging might affect older adults' compliance with and adherence to the recommended preventive measures during an outbreak.

The limited but available studies found that government trust (e.g., leadership, intergovernmental relationship, quality of information sharing, and communication) influences individuals' responses particularly in time of crisis (Thévenaz & Resodihardjo, 2010; Lee & Jung, 2019; Quinn et al., 2013). Quinn and colleagues (2013), for example, examined the relationship between trust in government and perceptions of the quality of communication, and the adoption of preventive behaviors amidst the 2009 H1N1 pandemic. In this same study, the findings revealed that perceived quality of communication was associated with higher trust in government, which contributed to greater response and compliance with infection control measures (Quinn et al., 2013). Understanding factors affecting community-dwelling older adults' intent to undertake preventive measures during the COVID-19 pandemic is a vital first step in the effort to prevent the further community spread and death toll from the virus, reduce the burden on the healthcare system, and subsequently unnecessary healthcare costs.

Methodology

Research hypotheses

- H1: Attitude directly influences Intention
- H2: Subjective Norms directly influences Intention
- H3: Perceived Behavioral Control directly influences Intention
- H4: Government Trust directly influences Intention
- H5: Intention directly influences Health Protective Behavior

Research design

The research applied the literature review, an analysis on the concepts, theory and principles. The Theory of Planned Behavior (TPB) (Ajzen, 1985) was employed to examine factors that influence older adults' intention to undertaking health protective behaviors amid Covid-19 pandemic. The TPB model consist of three key components including attitudes, subjective norms, and perceived behavioral control, which Ajzen (1985) suggests predict and control human behaviour. The TPB has been found to be a promising theory to predict older adults' intentions and behaviors, particularly in the context of health (Gretebeck et al., 2007; Stolte, Hopman-Rock, Aartsen, van Tilburg, & Chorus, 2017; Tate et al., 2017). Based on the review of relevant literature, trust in the government has been identified as one of the most important factors, influencing people' attitudes and responses to public health policies during crisis. The TPB model was then extended to include the government trust as a proposed additional factor (Figure 1).

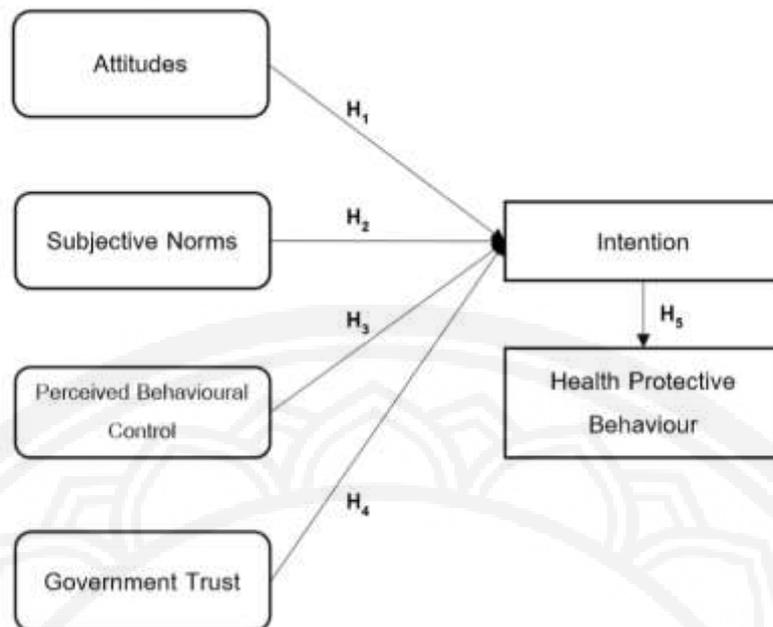


Figure 1 Conceptual Framework

Participants, sample size, and data collection

The population or the analysis unit of this research was the older adults living in the community in Thailand. The size of the sample was 20 samples per one variable; 18 variables \times 20 = 360 samples (Schumacker & Lomax, 2010). To analyze the structural equation model (SEM), the size of the sample should be larger than that for the analysis with other approaches in order to have an accurate estimation that was representative of the population with the normal curve distribution (Hair, 2006). Demographic data such as age, marital status, religion, education level, monthly income, occupation, and comorbidity were collected from each participant at the beginning of the survey. The questionnaires contained written informed consent were distributed to over 500 participants by local volunteers. In total, 360 participants completed and returned the questionnaires.

Instrument

The questionnaire was adapted from the Cawthon et al. (2020)'s Questionnaire for Assessing the Impact of the COVID-19 Pandemic on Older Adults (QAICPOA) and based on the review of the relevant literature. The developed questionnaire was translated into Thai using the back-translation method to ensure the quality of translated research instruments. The instrument content validity was checked by five experts in the fields of geriatric care and/or infection control to verify the index of item objective congruence (IOC). When each of the results of $\sum x/n$ is more than 0.5, they are accepted as valid. A pilot test was performed with 36 samples to assess the instrument reliability with a Cronbach α -coefficient. It was found that Cronbach's Alpha was 0.936, which was higher than 0.70. Thus, the reliability was at a high level (Hair, 2006).

Statistical analyses

The analysis was divided into 2 parts, descriptive statistics and the development of the Structural Equation Model (SEM). Descriptive statistics of study participants were explored using SPSS 24.0 software. The SEM was used to test the extended TPB model and to assess unobservable latent constructs with partial least square method via SmartPLS 2.0 software. The SEM analysis was the technique used to analyze the multivariate variables involving the factor analysis and multiple analysis, which verified the relationship between the variables



at one time and the results of the goodness of fit measures used an acceptable standard criterion (Henseler, Ringle, & Sinkovics, 2009). The Composite Reliability (CR), the AVE values should be greater than 0.50. (Hooper, Coughlan, & Mullen, 2008) while the multiple R^2 values should be over 0.25, representing the reliability of the measurement (Henseler et al., 2009).

Ethical considerations

This survey research was granted ethics approval from the Provincial Health Research Ethics Board, in which the study was conducted (approval number# PPHO-REC 2563/032). Informed written consent was obtained prior to completing a questionnaire. Confidentiality and anonymity of participants were maintained at all times.

Results

Descriptive characteristics

The majority of participants were female, accounting for 61.9%. The age of participants was mostly between 60–69, followed by 70–79, accounting for 57.2% and 31.4%, respectively. As of the marital status, the majority of study participants were married (51.7%) while 26.4% were separated/widowed/divorced. The majority religion of the participants was Buddhism, accounting for 89.7%. Participants' level of education ranged from a primary level (88.3%) to not attending school (2.2%). Farmer was found to be a primary occupation among study participants (45.3%). The majority of participants received a monthly income of 2,500–5,000 Baht. In addition, 51.86% of the study participants reported not having comorbidity, while 28.65% reported of having at least one co-occurrence underlying medical condition or disease and 19.48% reported having two or more diseases or conditions that coexist with another disease or condition. The descriptive analysis of the 360 samples of Thai community-dwelling older adults in the time of COVID-19 is shown below (Table 1).

Table 1 Descriptive Statistics

		Frequency (n=360)	Percent
Sex	Male	133	36.9
	Female	223	61.9
Age	60–69	206	57.2
	70–79	113	31.4
	80–89	39	10.8
	90 and Over	2	0.6
Marital Status	Single	78	21.7
	Married	186	51.7
	Separate/Widow/Divorce	95	26.4
Religion	Buddhism	323	89.7
	Christianity	3	0.8
	Islamic	34	9.4
Education	No Study	8	2.2
	Primary School	318	88.3
	Secondary School	15	4.2
	Vocational	5	1.4
	Bachelor Degree and Over	6	1.7



Table 1 (Cont.)

		Frequency (n=360)	Percent
Occupation	Civil Servant	8	2.2
	Private Employee	3	0.8
	Own Business	24	6.7
	Self-Employed	38	10.6
	Farmer	163	45.3
	Merchant	36	10.0
	Unemployed	79	21.9
Monthly Income (Thai Baht)	Below 2,500	96	26.7
	2,500-5,000	126	35
	5,001-10,000	103	28.6
	10,001-15,000	13	3.6
	15,001-20,000	6	1.7
	More Than 20,001	6	1.7
Comorbidity	No	181	51.86
	One	100	28.65
	Two or more	68	19.48

The extended TPB model

This research set the error (α) at .05 in the statistics test or the error acceptance at 5%. The data analysis using the descriptive statistics and the standard regression weights had the statistical significance or critical ratio (CR) or t-test at > 1.96 (Hair, 2006). According to the analysis result of scale validity and reliability, scale investigation has been conducted using internal consistency measurement coefficient Cronbach’s alpha to calculate the average value of the correlation coefficient. It was found that alpha coefficients ranged from 0.711 to 0.833 and the total is 0.771. The corrected item to total correlation (CITC) was used in the data collected to purify items. The researcher suggested the items with a CITC score of higher than 0.5 are acceptable. Individual item reliability was examined by looking at the loadings, or correlations, of each indicator on its respective construct. For reflective indicators, it is generally accepted that items must have a factorial load (λ) of 0.707 or above (Table 2) (Hair, 2006).

Table 2 Convergent validity of the latent variables

Construct/Item	CITC	Cronbach’s Alpha	Loading	t-stat
Health Protective Behavior (HPB)		0.711		
HPB1	0.484		0.811	8.740
HPB2	0.629		0.872	19.716
HPB3	0.486		0.694	5.245
Intention (INT)		0.766		
INT1	0.535		0.738	5.974
INT2	0.656		0.874	23.824
INT3	0.614		0.859	20.999
Attitude (ATT)		0.761		
ATT1	0.466		0.751	9.492



Table 2 (Cont.)

Construct/Item	CITC	Cronbach's Alpha	Loading	t-stat
ATT2	0.666		0.841	13.895
ATT3	0.658		0.869	16.700
Subjective Norms (SUN)		0.833		
SUN1	0.844		0.929	32.544
SUN2	0.678		0.827	15.427
SUN3	0.597		0.845	18.313
Perceived Behavioral Control (PBC)		0.749		
PBC1	0.635		0.860	22.923
PBC2	0.541		0.729	6.997
PBC3	0.573		0.858	20.368
Government Trust (GOT)		0.796		
GOT1	0.484		0.731	2.279
GOT2	0.737		0.929	4.328
GOT3	0.721		0.961	4.448
Total		0.771		

Table 3 and Figure 2 show factor analysis results affecting Thai community-dwelling older adults in the time of COVID-19 with the Composite Reliability (CR) greater than 0.50 with the AVE values also greater than 0.50. Hooper et al. (2008) indicated that items with low multiple R² values (≤ 0.20) should be removed from an analysis as this is an indication of very high levels of error. Hair (2006) used higher criteria and suggested that the R² values should be greater than 0.25, representing the reliability of the measurement (Henseler et al, 2009) Reliable measurements can be found in the column of interest which is higher than the cross-construct correlation values in the same column.

Table 3 Statistics showing the discriminant validity

Construct	CR	R ²	AVE	cross construct correlation					
				ATT	GOT	HPB	INT	PBC	SUN
ATT	0.862		0.676	0.822					
GOT	0.840		0.657	0.178	0.811				
HPB	0.838	0.393	0.634	0.405	0.154	0.796			
INT	0.865	0.409	0.682	0.511	0.189	0.627	0.826		
PBC	0.858		0.670	0.508	0.150	0.433	0.531	0.819	
SUN	0.902		0.754	0.465	0.180	0.389	0.532	0.582	0.868

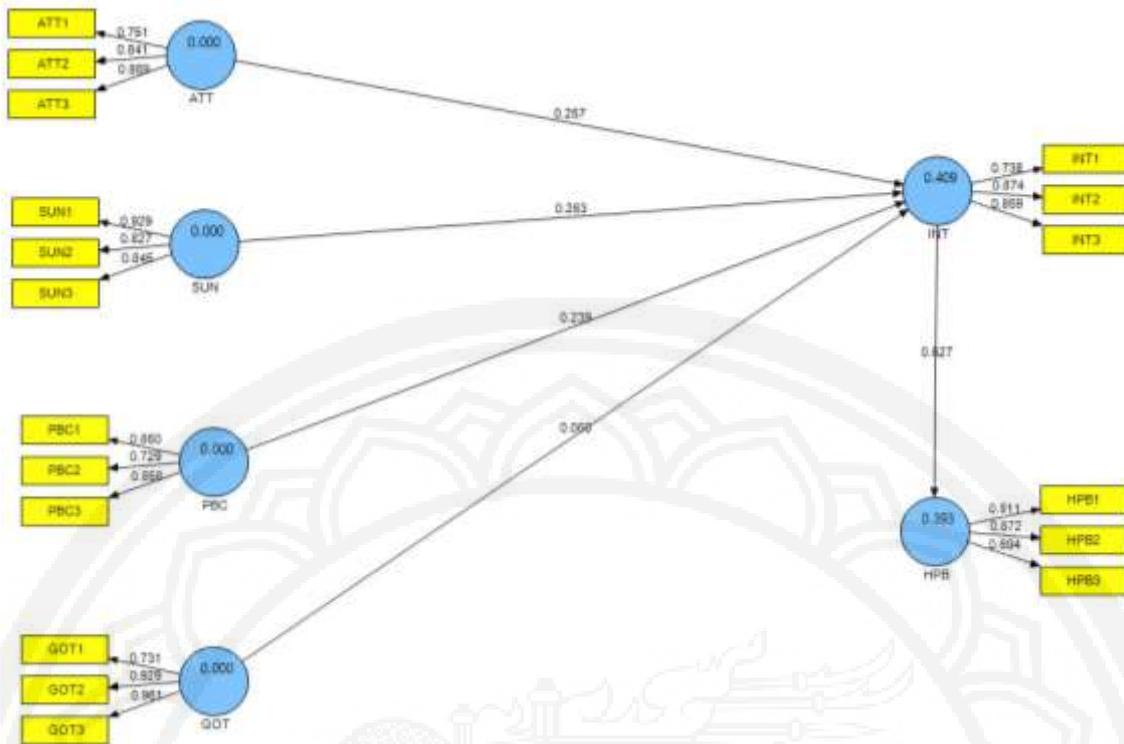


Figure 2 A PLS-SEM of Thai community-dwelling older adults

There are four hypotheses having statistical significances and had high reliability at $|t| \geq 1.96$, means significance at $p \leq 0.05$ (Table 4).

Table 4 Results of hypotheses testing

Hypotheses	coef.	t-stat ¹	Results
H1 :Attitude directly influences Intention	0.257	2.537	Supported
H2 :Subjective Norms directly influences Intention	0.263	2.261	Supported
H3 :Perceived Behavioral Control directly influences Intention	0.239	2.181	Supported
H4 :Government Trust directly influences Intention	0.060	0.743	Unsupported
H5 :Intention directly influences Health Protection Behavior	0.627	8.019	Supported

¹ $|t| \geq 1.96$, means significance at $p \leq 0.05$.

Table 5 shows an influence of each of the variables that affect health protection behavior of Thai community-dwelling older adults in the time of COVID-19. The results revealed that intention had a stronger direct effect on health protective behavior compared to other variables, with subjective norms showing the strongest association with intention, followed by attitudes, and perceived behavioral control.

**Table 5** Direct (DE), indirect (IE), and total (TE) effects of the independent variables

Variable	R ²	Effect	Independent Variables				
			ATT	SUN	PBC	GOT	INT
Health Protective Behavior (HPB)	0.393	DE	N/A	N/A	N/A	N/A	0.627
		IE	0.161	0.165	0.150	0.037	N/A
		TE	0.161	0.165	0.150	0.037	0.627
Intention (INT)	0.409	DE	0.257	0.263	0.239	0.060	N/A
		IE	N/A	N/A	N/A	N/A	N/A
		TE	0.257	0.263	0.239	0.060	N/A

Discussion and Conclusions

The findings of this study provide a glimpse into factors that affect community-dwelling older adults' intention to undertake preventive measures during the COVID-19 pandemic. In this study, we extended the TPB model to account for government trust. The quantitative approach based on an advanced statistical technique—SEM revealed that the TPB components (SUN, ATT, PBC) are linked to behavioral intention, with intention significantly influences on the health protective behavior of older adults residing in the community. This indicates that older adults with increased perception of social pressure to engage in health protective behavior, more favorable attitudes towards health protective behavior, and more control with fewer barriers that prevent them from engaging in health protective behavior have greater intention to undertake health protective behavior amid Covid-19 outbreak. These findings provide further support for the predictive validity of the TPB model and are in line with previous research both within and outside Asian contexts, particularly in relation to health behaviors of older people (Gretebeck et al., 2007; Michels & Kugler, 1998; Stolte et al., 2017; Tate et al., 2017).

Government trust, an important factor in the health and disaster domain, has been applied to study the response to crisis in a few studies (Lee & Jung, 2019; Quinn et al., 2013; Vaughan & Tinker, 2009). A study conducted in South Korea, for example, revealed that the legislative factors (e.g., leadership and trust of the government) had both direct and indirect influence on the individuals' responses to infectious diseases (i.e., SARs and MERs) (Lee & Jung, 2019). Vaughan and Tinker (2009) argued that trust influences public awareness and the extent to which people comply with recommendations over the course of pandemic. However, contrary to expectation, government trust was not significantly related to intention to perform health protective behavior in this current study. The reasons for this inconsistency might be a cross-cultural difference, poor communication and information sharing, causing confusion and distrust among the general public, in addition to the leadership and government response capacity to deal with the Covid-19 outbreak (Panyaarvudh, 2020; Rojanaphruk, 2020). This speaks to the importance of boosting public trust and fostering effective communication to secure older persons' support in the context of response to a pandemic. Though adding the concept of government trust to the existing TPB model has not shown to improve the predictability of the model, further investigation is needed for assessing the external validity of the extended TPB model in other contexts or different groups such as adolescents and adults.

The results of this study suggest that particular attention should be paid to the significant influence of the subjective norms and other TPB components. The preventive measures and strategies should be designed to attract older adults and those who interact with them in significant and meaningful ways (e.g., family members,



friends, neighbors). This may result in an increased likelihood of older people undertaking responsibility for their own health and the health of their significant others. As the Covid-19 pandemic continues to spread and older people are forced to remain confined in their homes, community services and resources to support health and social care for this vulnerable population should not be underscored (Brewster, Wilson, Kunkel, Markwood, & Shah, 2020). In addition, consideration should be given to the government and community responses to the pandemic, ensuring equal opportunities and respecting older people's rights. In other words, specific needs and issues pertaining to older adults (e.g., community-based services, social isolation, and abuse) should be addressed while implementing the infection prevention and control measures.

The Covid-19 outbreak has exposed the deep-rooted weaknesses and strengths of different countries. It has also demonstrated the need for effective responses and management to constrain the spread of this and the next communicable disease, as well as to create equal opportunities for all. Although government trust, as a proposed additional factor to the TPB model, did not significantly affect intention to perform health protective behavior, the findings from this study provide timely evidence needed for policy makers, healthcare professionals, and community to better target complex interventions that are responsive to the needs of local circumstances amid crisis. As older people are prioritized over the general public to get a newly arrival of Covid-19 vaccine, concerns about its safety and effective may arise and potentially affect older people's willingness to be vaccinated. Therefore, further research should focus on the factors influencing vaccine acceptance and hesitancy, including how older people make decision about vaccinations. This may lead to the development of strategies, culturally sensitive programs, and evidenced-based policies in relation to vaccine and immunization; thus, mitigating crises.

This study is subject to certain limitations. First, given the recommendations about social distancing the study was conducted using the self-administered questionnaire. As a result, this may have introduced bias and measurement errors. Second, as a large portion of the participants lived independently in their communities, further research on how older people with limited mobility and loss of independence experience and view about undertaking preventive health behaviors is needed.

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