บทความวิจัย .

ปัจจัยที่มีอิทธิพลต่อพฤติกรรมการป้องกันโรค COVID-19 ของผู้สูงอายุในภาคตะวันออก
Factors Influencing COVID-19 Preventive Behavior among Older Adults in Eastern Thailand

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การติดเชื้อไวรัสโควิด 19 ส่งผลกระทบในวงกว้างไปทั่วโลก โดยเฉพาะอย่างยิ่งในกลุ่มผู้สูงอายุซึ่งมีข้อจำกัดทางด้านความแข็งแรงของร่างกายร่วมและการเจ็บป่วยด้วยโรคเรื้อรัง โดยพบว่าความรอบรู้ด้านสุขภาพมีความสำคัญต่อพฤติกรรมสร้างเสริมสุขภาพ 19 การศึกษาครั้งนี้เป็นการศึกษาภาคตัดขวางมีวัตถุประสงค์เพื่อศึกษาพฤติกรรมป้องกันโรคโควิด 19 ระดับความรอบรู้ด้านสุขภาพของผู้สูงอายุในภาคตะวันออก และปัจจัยที่มีอิทธิพลต่อพฤติกรรมการป้องกันโรค COVID-19 เก็บข้อมูลด้วยวิธีการสุ่มอย่างง่ายแบบหลายขั้นตอนในผู้สูงอายุที่มีอายุตั้งแต่ 60 ปีขึ้นไป และอาศัยอยู่ในภาคตะวันออก จำนวน 208 คน แบบสอบถามพัฒนาขึ้นโดยใช้แนวคิดความรอบรู้ด้านสุขภาพมีค่าความตรงเชิงเนื้อหา (CVI) เท่ากับ 0.83 ค่าความเชื่อมั่น (Reliability) ของแบบสอบถามในส่วนที่ 2 และ 3 เท่ากับ 0.89 และ 0.86 ตามลำดับ เก็บข้อมูลในช่วงเดือนมิถุนายน ถึง ตุลาคม 2564 วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา สัมประสิทธิ์สหพันธ์ และสถิติถดถอยพหุคูณแบบขั้นตอน

ผลการศึกษาพบว่า ทักษะการจัดการตนเองด้านสุขภาพเกี่ยวกับโรค COVID-19 การมีโรคประจำตัว การตัดสินใจที่เกี่ยวข้องกับข้อมูลข่าวสารโรค COVID-19 และการเข้าถึงข้อมูลเกี่ยวกับโรค COVID-19 สามารถร่วมกันทำนายระดับ พฤติกรรมการป้องกันโรค COVID-19 ของผู้สูงอายุในภาคตะวันออกได้ ร้อยละ 53.1 (R^2 = .531, F = 4.736,

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p = .031) อย่างมีนัยสำคัญทางสถิติที่ระดับ .05 การศึกษานี้เน้นให้เห็นปัจจัยที่สำคัญในการทำนายพฤติกรรมการป้องกันโรค COVID-19 ในผู้สูงอายุ ทีมสหสาขาวิชาชีพมีส่วนสำคัญในการกำหนดกลยุทธ์นำสู่การปฏิบัติอย่างมีประสิทธิภาพ และพยาบาลควรเป็นผู้นำในการส่งเสริมสุขภาพและสุขภาวะของผู้สูงอายุในช่วงการระบาดของโรค COVID-19 การศึกษาในครั้งต่อไปจำเป็นต้องมีการศึกษาเพิ่มเติมในประเด็นผลกระทบของโรคประจำตัวและการปฏิบัติหน้าที่ของครอบครัวต่อพฤติกรรมการป้องกันโรค COVID-19

คำสำคัญ: ปัจจัยที่มีอิทธิพล พฤติกรรมการป้องกันโรค ผู้สูงอายุโรค COVID-19

Abstract

The COVID-19 pandemic has had a severe impact globally, particularly on the elderly due to reduced body functions and chronic illnesses. Health literacy is crucial in promoting preventive behavior. This study aims to identify COVID-19 preventive behaviors and health literacy levels among the elderly in eastern region of Thailand, as well as factors influencing COVID-19 preventive behavior. A cross-sectional study utilized multi-stage random sampling to survey 208 elderly participants aged 60 years and over in seven provinces of eastern Thailand. A questionnaire based on health literacy concepts was developed. The Content Validity Index (CVI) for this questionnaire was determined to be 0.83. Furthermore, the second and third parts of the questionnaire demonstrated reliability coefficients of 0.89 and 0.86, respectively. Data were collected from June to October 2021 and analyzed using descriptive statistics, correlations, and stepwise multiple regression.

The study found that health self-management skills related to COVID-19, underlying diseases, decision-making on COVID-19 information, and access to COVID-19 information predicted the level of COVID-19 preventive behavior among the elderly in the eastern region by 53.1% (R^2 = .531, F = 4.736, p = .031) with statistical significance at the level of .05. This study highlights the critical factors that predict COVID-19 preventive behavior among older adults in Thailand. Multidisciplinary care teams are vital for effective strategy implementation strategies. Nursing professionals should lead efforts to promote the health and well-being of older adults during the pandemic. Further research is needed to understand the impact of underlying diseases and family functioning on COVID-19 preventive behavior.

Keywords: Influencing factors, preventive behavior, older adults, COVID-19

Introduction

The recent surge of the COVID-19 pandemic has exerted a profound global impact (Lim & Pranata, 2021), resulting in a rapid escalation of infections. Older adults are particularly vulnerable to contracting the virus due to the body's reduced function and weakened immune system (Emami, Javanmardi, Pirbonyeh, & Akbari, 2020). Moreover, most of them suffer from chronic illnesses that make them more susceptible to severe symptoms and death (Alharbi et al., 2020; Sun, Chen, & Viboud, 2020). In Thailand, the situation is similar to that in other countries (The Centre for the Administration of the Situation due to the Outbreak of the Communicable Disease Coronavirus (COVID-19), 2021), with the older adult group being the highest-risk group for severe symptoms and death (Gardner, States, & Bagley, 2020; Yodmai, Pechrapa, Kittipichai, Charupoonpol, & Suksatan, 2021). The eastern region of Thailand, characterized by its diverse population and significant port cities that attract tourism, is particularly susceptible to the transmission and spread of COVID-19 (The Office of the National Economic and Social Development Board (NESDB), 2015). These factors emphasize the importance of prioritizing the protection and awareness of older adults in preventing the spread of the virus.

As per the Department of Disease Control under the Ministry of Health, it has been observed that the elderly population bears the highest mortality burden associated with COVID-19, with rates of 24 and 29 individuals per million for age group 60-69 and 70 and above, respectively (Department of disease control, 2021). Despite the development of multiple vaccines, it is imperative to acknowledge that these interventions do not offer absolute protection, and global vaccination campaigns have exhibited varying degree of effectiveness (Boon-itt, Rompho, Jiarnkamolchurn, & Skunkan, 2021; Callaghan et al., 2021; Nomura et al., 2021). Consequently, critical challenges pertaining to epidemic control and mortality have arisen (Swan et al., 2021; The Johns Hopkins Coronavirus Resource Center, 2022). In light of these circumstances, the dissemination of comprehensive information to the high-risk population, particularly older adults, regarding the risks associated with COVID-19

and the corresponding prevention guidelines assumes paramount significance. This measure is indispensable for promoting appropriate health behaviors and exerting effective control over the pandemic situation within Thailand.

Acquiring proper disease prevention behavior is the most important factor in preventing people from contracting COVID-19 (Lin & Chen, 2021), especially the older adults who are the group most at risk of severe symptoms. Disease prevention behaviors encompass a range of actions that contribute to the maintenance and promotion of health, preservation of self-esteem, and mitigation of accidents and illnesses. Notably, these behavior play a pivotal role in reducing the likelihood of contracting various diseases, including COVID-19 (Lin & Chen, 2021). The acquisition of disease prevention behaviors is contingent upon multiple factors, as under recorded by recent research (Karimy et al., 2021; Yodmai et al., 2021). The existing literature, drawing upon investigations conducted in Thailand and other nations, identifies a myriad of determinants that influence COVID-19 preventive behaviors. There determinants encompass gender, age, education, income, domicile, marital status, educational attainment, and occupation (Emami et al., 2020; Karimy et al., 2021; Pornpat, Varnish, Payaowadee, & Barameht, 2020; Yodmai et al., 2021).

Health literacy refers to a person's ability to access, comprehend and utilize vital health information and services, which aids in making sound health decisions. It is related to health promotion and cost-effective health prevention behaviors. Health literacy is determined by cognitive and social abilities that influence a person's motivation and decision-making skills regarding self-care, health promotion, and disease prevention. Research has consistently demonstrated a significant association between health literacy and health behaviors among older adults with chronic illnesses. Notably, studies have elucidated that individuals with low health literacy levels are more likely to exhibit suboptimal self-care behaviors, consequently exacerbating their physical deterioration (Uemura, Yamada, & Okamoto, 2018; Vichitpong & Lapatrada, 2020). It has also been established that high health literacy is linked to positive attitudes and COVID-19 preventive behaviors (McCaffery et al., 2020; Silva & Santos, 2021). Health care professionals must consider health literacy when developing interventions to encourage preventive behaviors among older adults (Smith et al., 2015).

Thailand's remarkable success in preventing the first wave of COVID-19 is widely recognized. However, there is a notable dearth of research exploring health literacy and preventive behaviors among older adults, especially within the elderly population residing in Eastern Thailand. This knowledge gap represents a significant limitation in the existing scholarly literature. Notably, the eastern region accounted for 15% of the total reported infections in the country from August to October 2021 (Department of Disease Control of Thailand, 2021). Addressing this research gap and comprehensively investigating the various factors influencing preventive behaviors among the elderly population in Eastern Thailand during the COVID-19 pandemic is of utmost importance. The present study aims to identify and describe COVID-19 preventive behaviors and health literacy levels among older adults in the Eastern Region of Thailand. Additionally, the study seeks to examine the factors that influence their preventive behaviors. The findings of this study provide crucial insights for designing a care standard that promotes health literacy and fosters correct preventive behaviors related to COVID-19 among older adults.

Conceptual framework

The conceptual framework for this study is based on Nutbeam's health literacy concept (Nutbeam, 2008), which includes six components: access to information, knowledge and understanding, communication skills, decision-making skills, self-management skills, and media literacy. Health literacy is a combination of cognitive and social abilities that determine an individual's motivation and abilities to evaluate self-management and the use of health information to make appropriate health decisions. The study also considers personal factors such as age, gender, religion, occupation, income, underlying diseases, family characteristics, and society membership as factors that affect disease prevention behaviors. This conceptual framework is presented in Figure 1.

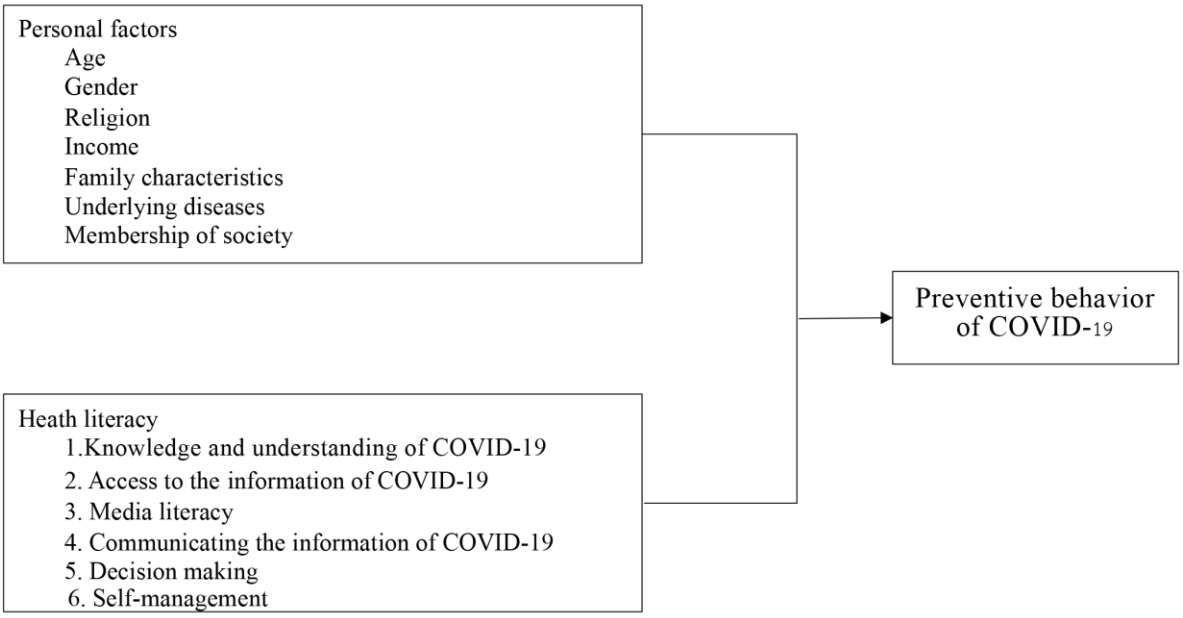

Figure 1 Research conceptual framework

Methods

Participants: A representative sample of Thai people age 60 and over was selected from a population of 719,044 persons who had been living in the provinces in the eastern region of Thailand for over one year (Department of Elder Persons, 2019). The minimal calculated sample size of 175 was determined according to effect size formula: medium = 0.30, α = 0.05 power = 0.95 (Polit & Beck, 2017). The sample size was increased by 20% to prevent discrepancy, thus requiring 210 participants. Multistage random sampling was utilized to select the sample from 7 provinces in the eastern region. One district from each of the seven provinces was randomly sampled in the first stage. Besides, one sub-district was randomly chosen from each selected section, and then 30 individuals were randomly selected from each sub- district. A total of 210 individuals responded to the questionnaire. After preliminary data screening and verifying the completeness and accuracy of the data, a total of 208 questionnaires were included for further data analysis in the final stage. The inclusion criteria for the study were as follows: being a resident in the area for at least one year, having the ability to take care of oneself, being able to communicate, and passing the Thai version of the Mini- Mental State Examination (MMSE) as a primary cognitive screening test (Folstein, Folstein, & McHugh, 1975; Institute of Geriatric Medicine, 2002; Tanglakmankhong, Hampstead, Ploutz-Snyder, & Potempa, 2022). The research data were collected using a questionnaire via telephone interviews. Data were collected from June to October 2021.

Ethical considerations: Permission to conduct the study was obtained from the Ethics Committee, No. HS035/2564, May 3, 2021. Before conducting the telephone interviews, the researcher explained the objective and details of the study to all participants. Verbal consent was obtained from each participant, ensuring their voluntary participation in the research. To protect the confidentiality and privacy of the participants, they were explicitly instructed not to reveal their identities during the interviews.

Instrument: The data collection tool employed in this study was a questionnaire designed to investigate the factors influencing COVID- 19 preventive behaviors among older adults residing in the eastern region of Thailand. The development of the research questionnaire was informed by a comprehensive literature review that focused on older adults' comprehension competency. Consequently, the questionnaire was structured into three parts, each serving a specific purpose.

The first part of the questionnaire was the participant' s characteristics. Regarding participant demographics, individuals provided information encompassing key variables such as age, gender, religion, occupation, education, income, family characteristics, underlying diseases, and any affiliations with community organizations.

The second part of the questionnaire focused on assessing health literacy concerning COVID- 19 preventive behaviors, which incorporated six distinct components, namely:

1. Knowledge and understanding of COVID- 19 and its preventive behaviors measures containing ten true-false items.

2. Access to information about COVID-19: Questions rated on a 3-point scale (low, moderate, high) with a score range of 1-3 points for 11 items.

3. Media literacy when receiving information about COVID-19: Questions rated on a 3-point scale (low, moderate, high) with a score range of 1-3 points for four items.

4. Communication skills regarding COVID-19: Questions rated on a 3-point scale (low, moderate, high) with a score range of 1-3 points for four items.

5. Decision-making skills: Questions rated on a 3-point scale (low, moderate, high) with a score range of 1-3 points for four items.

6. Self-management skills: Questions rated on a 3-point scale (low, moderate, high) with a score range of 1-3 points for four items.

The first component has a minimum score of 1 and a maximum score of 10. The knowledge and understanding of COVID-19 and its preventive behaviors are scored into three levels: low scores ranging from 1 to 3, moderate scores ranging from 4 to 7, and high scores ranging from 8 to 10. Additionally, the second through sixth COVID-19 health literacy score components were separated into three levels (Rojanat, Chonticha, & Kamonporn, 2021). The low level is designated as scores between 1.00 and 1.66, the moderate level falls between 1.67 and 2.33, and the high level is between 2.34 and 3.00.

The third part was Preventive behavior of COVID-19 among older adults, including 11 items that assessed Preventive Behaviors of COVID-19. Participants rated their level of COVID-19 prevention behaviors, such as wearing a cotton face mask or a hygienic mask when leaving the house, with scores ranging from 1-3 points (never, sometimes, always).

Three experts then quantified the content validity index (CVI) and independently rated the relevance of each item to the conceptual framework using a 4-point Likert scale (1 to 4; not relevant to very relevant) to ensure the content validity of the questionnaire. Subsequently, the item-level content validity index (I-CVI) and scale-level content validity index (S-CVI) were calculated based on the experts' evaluations, where each item was appraised as either not relevant or very relevant (Polit & Beck, 2017). The resulting CVI for this study was determined to be 0.83.

The questionnaire was piloted with 30 older adults who were not part of the research sample. Therefore, the reliability of the second and third parts of the questionnaire was evaluated using Cronbach's alpha coefficient, resulting in reliability coefficients of 0.89 and 0.86, respectively.

Statistical analysis: The Statistical Package for Social Sciences (SPSS) was used for analysis. P-values less than 0.05 were considered as statistical significance. Descriptive statistics were used to explore the individual characteristics, health literacy regarding COVID-19 prevention, and COVID-19 preventive behaviors. In addition, relationships between demographic factors and COVID-19 preventive behaviors were analyzed using point biserial correlation coefficients. The relationships between health literacy and COVID-19 preventive behavior were analyzed utilizing Pearson product-moment correlation coefficients. The factors influencing the COVID-19 preventive behaviors were analyzed employing stepwise multiple regression.

Results

Characteristics of the sample: The sample consisted of 208 people aged 60 and over living in the eastern region of Thailand. Over half were female (59.1%), and the participants' average age was 67.96 years (S.D. = 7.7; range 60 to 69 years). About half had completed primary education (51.0%), and nearly all were Buddhists (96.2%). In addition, 37.5% used to work as hired workers, followed by 23.1% working in trade or personal business. About two-thirds had income less than or equal to 10,000 baht/month (67.3%), and the average income was 12,379.87 baht/month (S.D. = 13,798.09). Over haft of the respondents surveyed (58.2%) reported living with children or relatives, whereas less than a third (30.8%) indicated living with their spouses. Regarding health status, the majority of respondent participants (58.7%) reported having at least one underlying disease. Additionally, over half of the respondents (51.4%) reported engaging in social activities.

COVID-19 preventive behaviors

COVID-19 preventive behaviors are presented in Table 1. Overall, COVID-19 preventive behavior among the older adults in the eastern region of Thailand was at a high level ($\bar{X}$ = 2.58, *S.D.* = 0.41). The most common COVID-19 preventive behavior was wearing a cloth or hygienic mask when leaving the house ($\bar{X}$ = 2.78, *S.D.* = 0.46), followed by measuring body temperature when in public places ($\bar{X}$ = 2.72, *S.D.* = 0.53), eating freshly cooked food and using a serving spoon ($\bar{X}$ = 2.65, *S.D.* = 0.51), and washing hands with soap or alcohol gel ($\bar{X}$ = 2.64, *S.D.* = 0.54).

COVID-19 health literacy: Participants' COVID-19 health literacy is present in Table 2. Regarding knowledge and understanding of COVID-19 (germs, disease transmission, symptoms, severity, and disease prevention), the results showed that over half (53.8%) of the older adults had a moderate level of knowledge (4-7 points; min = 1, max = 10, $\bar{X}$ = 7.14, *S.D.* = 1.57 points). The item that most of the participants responded with correct responses was that older adults have a chance of getting severe illnesses when infected with COVID-19 (95.7%), followed by COVID-19 being transmissible through droplets, touching, snot, saliva from a cough or

sneeze (95.2%). Regarding the question that being in close contact with others is possible if they do not have a fever, almost one-third of the participants answered correctly (31.7%).

The results showed that older adults could access COVID-19 information (the disease's situation, outbreak, severity, and disease prevention) from print media, television, the internet, family members, relatives, and village health volunteers. The overall score for access to information on COVID-19 was at a high level ($\bar{X}$ = 2.43, *S.D.* = 0.39).

Regarding media literacy about COVID-19 information, many older adults could search for information about the disease and distinguish between reliable and less reliable sources; as well, they might ask for information from health care personnel to confirm the veracity of information. Overall, older adults' media literacy was at a moderate level ($\bar{X}$ = 2.32, *S.D.* = 0.43).

In terms of the judgment of COVID-19 information, it was found that the mean score of the information received about COVID-19, which can help older adults reduce their anxiety about contracting the virus, was at a high level ($\bar{X}$ = 2.46, *S.D.* = 0.45).

In terms of COVID-19 communication skills, the older adult participants were able to disseminate information about COVID-19 or recommend health care to others to prevent infection at a high level ($\bar{X}$ = 2.43, *S.D.*= 0.49).

For COVID-19 health self-management skills, the older adults could use COVID-19 information to take care of their health and be concerned about health care in various fields. They were confident that they could prevent themselves from contracting the disease at a high level ($\bar{X}$ =2.46, *S.D.* = 0.45).

Table 1 Mean ($\bar{X}$), standard deviation (*S.D.*), and interpretation of the level of preventive behavior of COVID-19 among the elderly (n = 208)

Preventive behavior of COVID-19	$\bar{X}$	*S.D.*	Level
1. Wear a cloth mask or a hygienic mask when leaving the house.	2.78	0.46	High
2. Measure the body temperature when going in public places.	2.72	0.53	High
3. Eat freshly cooked food and using a serving spoon.	2.65	0.51	High
4. Wash hands with soap or alcohol gel.	2.64	0.54	High
5. Avoid sharing items with others.	2.63	0.57	High
6. Avoid being in crowded places such as flea markets, convenience stores.	2.62	0.55	High
7. Wash hands after leaving the bathroom.	2.58	0.56	High
8. Keep a distance of at least 1-2 meters from others	2.53	0.60	High
9. Wash hands before eating.	2.52	0.61	High
10. Avoid touching face, eyes, nose, mouth when going out in public places.	2.48	0.59	High
11. Exercise 3 days a week, 30 minutes each time.	2.21	0.72	Moderate
Overall preventive behavior of COVID-19	2.58	0.41	High

Table 2 Mean ($\bar{X}$) and standard deviation (*S.D.*) of health literacy in COVID-19 of the elderly in the eastern region of Thailand (n=208)

Health literacy in COVID-19	$\bar{X}$	*S.D.*	Level
1 Knowledge and understanding about the COVID-19	7.14	1.57	Moderate
2 Access to the information of COVID-19	2.43	0.39	High
3 Media literacy when receiving the information of COVID-19	2.32	0.43	Moderate
4 Decision making on the information of COVID	2.46	0.45	High
5 Communication skills about COVID-19	2.43	0.49	High
6 Health self-management skills related to COVID-19	2.46	0.45	High

The relationships between personal factors, health literacy, and COVID-19 preventive behavior: Regarding the relationships between personal factors and COVID-19 preventive behavior, there was a low but statistically significant negative correlation between age and preventive behavior (r = -.209, *p* = .002). Underlying disease and preventive behavior were positively and significantly correlated (r = .184, *p* = .008). There were no significant correlations between gender, religion, education, income, family characteristics, and COVID-19 preventive behavior.

Concerning the relationships between health literacy and COVID-19 preventive behavior, the results showed that knowledge and understanding of COVID-19 were positively and significantly correlated with COVID-19 preventive behavior (r = .206, *p* = .003). There was a significant, moderate positive correlation between

access to COVID-19 information (r = .625, $p < .001$), media literacy regarding COVID-19 information (r = .451, $p < .001$), decision making based on COVID-19 information (r = .578, $p < .001$), communication skills about COVID-19 (r =. 580, $p < .001$), and health self-management skills related to COVID-19 preventive behavior (r =. 689, $p < .001$). The relationships between personal factors and COVID-19 preventive behavior and the relationships between health literacy and COVID-19 preventive behavior for the older adults in the eastern region of Thailand are presented in Table 3.

Table 3 Results of the correlation coefficient analysis of health literacy and preventive behavior of COVID-19 of the elderly (n=208)

Variables	Preventive behavior of COVID-19	
	r	*p*
Personal factors		
Age	-.209[(p)**]	.002
Gender	.093[(b)]	.182
Religion	-.095[(b)]	.170
Education	.025[(b)]	.715
Income	.001[(p)]	.994
Family characteristics	.053[(b)]	.449
Underlying disease	.184[(p)**]	.008
Health literacy		
Knowledge and understanding about the COVID- 19	.206[(p)**]	.003
Access to the information of COVID-19	.625[(p)***]	<.001
Media literacy when receiving the information of COVID-19	.451[(p)***]	<.001
Decision making on the information of COVID-19	.578[(p)***]	<.001
Communication skills about COVID-19	.580[(p)***]	<.001
Health self-management skills related to COVID-19	.689[(p)***]	<.001

Notes. [(b)] Tested by point biserial correlation coefficient
[(p)] Test by Pearson product-moment correlation coefficients
** p <.01, *** p <.001

Factors influencing COVID-19 preventive behavior: The analysis of the influence of the independent variables revealed that health self-management skills, underlying disease, decision-making based on COVID-19 information, and access to COVID-19 information could jointly predict 53.1% of COVID-19 preventive behavior among older adults in the eastern region (R^2 = .531, F = 4.736, p = .031). Health self-management skills related to COVID-19 described the greatest variation (β = .499, p=<.001), followed by access to COVID-19 information (β = .179, p = <.05), decision making based on COVID-19 information (β = .156, p = <.05), and underlying disease (β = .109, p = <.05), respectively. The equation based on the raw scores was as follows: Y = 7.179 + 1.129 (health self-management skills) + .998 (underlying disease) + .390 (decision making based on COVID-19 information) + .188 (access to COVID-19 information). Factors influencing COVID-19 preventive behavior are presented in Table 4.

Table 4 Results of the correlation coefficient analysis of health literacy and preventive behavior of COVID-19 of the elderly (n=208)

Variables	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	b	SE	β		
Constants	7.179	1.446		4.965	<.001
Health self-management skills	1.129	.180	.449	6.265	<.001
Underlying disease	.998	.448	.109	2.227	.027
Decision making on the information of COVID-19	.390	.179	.156	2.176	.031
Access to the information of COVID-19	.188	.082	.179	2.293	.023

Discussion

To the researchers' knowledge, very few studies have examined the factors influencing COVID-19 preventive behavior among older adults in the eastern region of Thailand. The results showed that health self-management skills, underlying disease, decision making based on COVID-19 information, and access to COVID-19 information could together predict 53.1% of the variation in COVID-19 preventive behavior among older adults in the eastern region.

One intriguing finding of this study is the identification of health self-management skills related to COVID-19 as the most influential factor in shaping preventive behavior among older adults. Self-management plays a vital role in preventing the transmission of COVID-19. This finding can be attributed to the fact that self-management encompasses an individual's ability to set goals, create action plans, and effectively implement them, leading to behavioral modifications that mitigate the risk of diseases or illnesses. Practical self-management skills empower individuals to adopt and consistently maintain preventive behaviors, thereby reducing the likelihood of COVID-19 transmission (Barlow, Wright, Sheasby, Turner, & Hainsworth, 2002; Bratzke, Muehrer, Kehl, Lee, Ward, & Kwekkeboom, 2015; Clark, Becker, Janz, Lorig, Rakowski, & Anderson, 1991; Lorig, Ritter, Villa, & Armas, 2009; Mackey, Doody, Werner, & Fullen, 2016). These results are consistent with previous findings by Smith et al. (2020) who demonstrated that individuals with higher self-management skills were more likely to engage in consistent hand hygiene, mask-wearing, and physical distancing. Furthermore, the positive influence of self-management extends beyond COVID-19 prevention and encompasses overall health behavior change. A systematic review conducted by Mackey et al. (2016) and recent study by Lorig et al. (2009) revealed that self-management interventions improve health outcomes and self-efficacy among individuals with various chronic conditions. These findings emphasize the crucial role of self-management in promoting preventive behaviors and suggest its potential in enhancing public health efforts, both during the COVID-19 pandemic and in managing chronic conditions.

Another significant factor influencing COVID-19 preventive behavior among older adults is their access to COVID-19 information. In today's era of advanced information technology, various communication platforms provide health news, making it easily accessible to people of all age groups. This convenient and timely communication allows older adults, particularly vulnerable, to stay informed about the pandemic of COVID-19 through multiple channels, thereby increasing their awareness of the disease and understanding of the risks involved in not practicing preventive measures. Accessing up-to-date, accurate, and reliable health information enables older adults to effectively utilize the received content leading to an enhancement of their media literacy and communication skills. These acquired skills empower them to make healthy decisions and enable older adults effectively manage their well-being (Winai, Natthapan, Paradorn, Panida, Raphatphorn, & Pramote, 2020).

The study's findings align with previous research, highlighting the significance of obtaining COVID-19 information in predicting preventive behavior among older adults. It suggests that diverse knowledge acquisition predicts COVID-19 preventive behavior in adults. This consistent with the study conducted in Khohong City Municipality, Songkhla Province, which found that receiving information predicts preventive behavior among general people population regarding COVID-19 (Pornpat et al., 2020).

Decision-making skills play a significant role in influencing COVID-19 preventive behavior among older adults. It seems possible that these results are due to the ability of older adults to access accurate, reliable, and up-to-date health information, which increases their understanding of the risks and awareness of the consequences associated with COVID-19 and the importance of taking preventive actions and modifying behavior following disease prevention guidelines. This finding corroborates the health belief model of (Becker, 1974), which states that individuals' motivation and decision-making regarding appropriate behavior result from understanding the advantages of treatment and disease prevention and the belief that what they have accomplished is reasonable for disease prevention.

It was also found that underlying disease significantly correlated with COVID-19 preventive behavior. There are several possible explanations for this. One may be that older adults are more vulnerable to infectious diseases due to poor immunity. Therefore, the older adults with underlying chronic illnesses were also at an increased risk of severity, morbidity, and mortality than others who were healthy (Emami et al., 2020; Gupta, Lakshmi, Kaur, & Rastogi, 2020; Liu, Chen, Lin, & Han, 2020; Onder, Rezza, & Brusaferro, 2020). Consequently, older adults and their caregivers might be concerned about the infection and transmission of COVID-19 and practice preventive behaviors to avoid this infection. The result is in accord with previous studies, which found that older adults, especially from urban areas, were more likely to implement sufficient protective behaviors than were young adults who had less-developed levels of self-awareness. Therefore, older people who recognized that they were at high risk of COVID-19 due to underlying diseases tended to protect themselves and avoid contracting the disease (Clark, Davila, Regis, & Kraus, 2020; Sun, Yang, Zhang, & Cheng, 2020)

This study has several strengths. First, using an interview may have helped the sample of older adults better understand the questions. Second, this study explores the link between personal factors (age, diseases, family) and COVID-19 preventive behavior, as well as the connection between health literacy and preventive behavior among older adults in Eastern Thailand. This offers valuable insights into how various factors may impact COVID-19 preventive behavior. In addition, the study's structure, concepts, and methodology may be replicated in other studies with different samples and settings to discover the generalizability of results. However, this study also has some limitations. The sample was drawn from only the eastern regions of Thailand, reducing the generalizability of the findings even within just one nation. Future studies should be geographically broadened to get a better and more representative understanding of the whole nation. Also, since this is a cross-sectional study, the results are based on relationships at one point in time. Consequently, the correlations between the independent

variables and COVID-19 preventive behavior may not be permanent. These findings should thus be interpreted with caution.

The findings of this study have several implications for prevention programs targeting COVID-19 infection among older adults. Community nurses, other healthcare providers, caregivers, and policymakers should be aware of potentially predictive factors and promote new interventions to reduce the risk of COVID-19 infection among older people. Accessibility to the information about COVID-19 is one of the significant factors in preventing older adults from COVID-19 infection. Consequently, up-to-date, accurate, and trustworthy knowledge of COVID-19 is needed. Therefore, when presenting information to older adults, it is crucial to take into consideration their age-related limitations. For instance, fact sheets should be designed with large icons, font sizes, and visual aids such as infographics to enhance readability and comprehension.

Furthermore, this study highlights the need for further research to understand the impact of underlying diseases and family functioning on COVID-19 preventive behavior among older adults in Thailand. Further research is also needed to understand the effectiveness of interventions aimed at improving health literacy, self-management skills, and access to information on COVID-19 to promote preventive behavior among older adults in the Eastern region of Thailand. Overall, this study highlights the importance of continued efforts to promote the health and well-being of older adults during the COVID-19 pandemic and the need for nurses to take a leading role in these efforts.

Conclusion

In conclusion, this study highlights the importance of understanding the factors influencing COVID-19 preventive behavior among older adults in eastern Thailand. This research found a high level of COVID-19 preventive behavior among older adults in the Eastern region of Thailand. In addition, this study showed that health self-management skills, underlying disease, decision making on the information of COVID-19, and access to the information of COVID-19 are critical predictors of COVID-19 preventive behavior among older adults in the Eastern region. These findings have important implications for nursing care, as they suggest that nursing professionals should work to improve health literacy, self-management skills, and access to information on COVID-19 among older adults to promote preventive behavior.

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Conflict of interest statement

The authors declare no conflict of interest. The funders had no role in designing the study, in the data collection, analysis, or data interpretation, in the writing of the manuscript, or in the determination to publish the study results.

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