

Knowledge-Behavior Gap on COVID-19 among Older People in Rural Thailand

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Abstract

This study analyzed the difference between rural and urban older adults in Thailand regarding the relationship between the knowledge and behavior toward the prevention of contracting COVID-19. Path analysis was used to observe if the performance of protective behaviors was affected by the level of knowledge that older people have about the disease. This study used the Impact of COVID-19 on Older Persons in Thailand survey collected across the five regions of the country.

Rural residents benefited from community network of village health volunteers who provided information during the pandemic but, they had disadvantages on accessing newer media sources, mainly the internet, for the latest developments on COVID-19. Rural older adults had a higher level of knowledge about COVID-19 than those in urban areas; no difference was observed regarding their behavior to prevent themselves from being infected. The knowledge-behavior gap was viewed as a mechanism of cognitive avoidance because of overwhelming unprecedented information.

Keywords

COVID-19, older population, health literacy, health behavior change

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Introduction

Literacy on health matters is impacted by the vulnerabilities experienced by different populations particularly those in their older ages. Health literacy is described as the capacity to obtain, evaluate, and utilize information to develop individual health status (Chinn, 2011; He et al., 2016). Knowledge and behavior on health are different aspects of health literacy that are important for the older population because it allows them to be more aware of their own health conditions (Sørensen et al., 2012). Social vulnerabilities had been found to be associated with lower health literacy (Serper et al., 2014; Wang et al., 2015). These vulnerabilities include having an aging population structure, lower education attainment, and living in rural areas among others. This predicament with health literacy can be especially prominent in developing countries (Aljassim & Ostini, 2020).

Rural disparities in health had been observed to be present during the Coronavirus Disease 2019 (COVID-19) pandemic. An example is the United States in May 2020 when the concentration of COVID-19 incidence rates were observed to be mostly in metropolitan areas. Mortality and incidence rates in a few non-metropolitan areas were highly similar to hotspots like New York

City. Apart from health outcomes, health literacy also has disparities in this pandemic context. Ranscombe (2020) described that rural areas were at risk of COVID-19 whether in societies with developed, or developing, economies. These factors were: (1) the movement of people from urban to peri-urban and rural areas, (2) the education level of a population whereby their understanding of information provided may be lacking, and (3) the availability of healthcare facilities particularly for communities with an aging population. Disparities in the information level on COVID-19 was also observed between East and West Germany (Okan et al., 2020). This gradient was attributed to the possible perception of people in East Germany feeling they are less susceptible because of the lower prevalence in their region. The people also became less informed of developments because those in East Germany utilized the internet less than their Western counterpart.

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Although both are facets of health literacy, having the knowledge about health matters does not necessarily become part of a person's behavior. This is particularly important especially during the COVID-19 pandemic when a sudden change in behavior is necessary including mask-wearing, constant hand washing, and spatial distancing (van den Broucke, 2020). Vulnerable population like older people need to be given focus and the information provided should account for their needs in order for them to comprehend the message and adopt the recommended behaviors (Smith & Judd, 2020). Rural populations were also been found to be disadvantaged due to the amount of relevant information that reaches them because the news tends to report on urban developments (Kim et al., 2020).

This study focuses on the disparity between urban and rural older residents regarding their protective behavior during the COVID-19 pandemic and how this is impacted by their access to reliable information. Such rural-urban difference on health literacy during a health emergency has yet to be explored in the context of Thailand, particularly with its aging population. This is important in order to provide insights on how the older population gains information and how they subsequently utilize that knowledge in order to prevent themselves from being infected in a time of a public health emergency.

Method

Data

The Impact of COVID-19 on Older Persons in Thailand survey, conducted in July 2020 by the College of Population Studies, Chulalongkorn University was used for the current study. The aim of the survey was to collect information on the experience of people aged at least 60 years during the COVID-19 pandemic. Information on the socioeconomic status, health changes, and behavior among other matters were gathered. Upon the consultation of national and international experts on the conduct of the survey, it was evaluated and approved by responsible administrative bodies. Based on the approved ethics guidelines, written consent was collected from the respondents.

The survey was collected in July 2020 after the majority of lockdown measures implemented from March-June 2020 were lifted. An online mode of data collection was utilized because safety measures remained to be the priority according to government guidelines. A multistage sampling method was utilized and randomly selected community respondents were to complete the survey. Two provinces were selected for each of the five regions of the country including Bangkok. As the survey was online, a higher response rate was ensured by selecting one province from three

provinces that have the highest proportion of older people within the regions. Ultimately, urban and rural areas in nine provinces of the country were the sites to conduct the survey. The resulting sample size was 1,230 individuals. An intermediary, who is a local resident in the communities, visited the respondents when they were illiterate, dependent, had a lack of access to the internet, or had difficulty navigating the survey itself using their devices. More than 97% of the respondents opted to have the assistance from an intermediary regarding the navigation of the survey platform. The responses between those who answered independently and with intermediaries were not statistically different based on selected characteristics including age, gender, and education and income levels.

Measures

Residence information, categorized into urban and rural areas, was present in the survey. Other sociodemographic data were utilized for the analysis including age and sex. Education attainment was categorized into three groups: lower than primary education (0–3 years of education), primary level (4–6 years), and higher than primary level. Income level was based on the average income received by the respondent in the past 12 months before March 2020 which was the date when public health measures such as sheltering in place were implemented.

Protective behavior was based on the question in the survey: "During the COVID-19 outbreak, how did you protect yourself from COVID-19?" Five categories were asked: avoided leaving the house, distanced from others, washed hands regularly, wore a facemask in public, and avoided sharing meals with others. The responses for these were "never," "sometimes," and "always." To create the measure, the number of "Always" as the response was counted to represent regularity of the behavior while the remaining responses were categorized as the reference category. A maximum value of five (5) represents performing all the protective behaviors.

For knowledge on COVID-19, respondents were asked if the following statements were correct or otherwise: (1) Older persons with chronic conditions are at higher risk of infection with COVID-19; (2) COVID-19 can spread through a sneeze, cough, or talking; (3) because the incubation period is 3 to 7 days, those who are exposed to COVID-19 positive cases should be quarantined for 7 days; and (4) wearing a facemask and washing hands frequently can prevent the COVID-19 infection. The answers to items (1), (2), and (4) are correct while it is "incorrect" for (3). The precise responses were added to determine the level of knowledge on COVID-19 and the total score was four.

An enquiry was done about the respondents' sources of information about COVID-19 during the pandemic

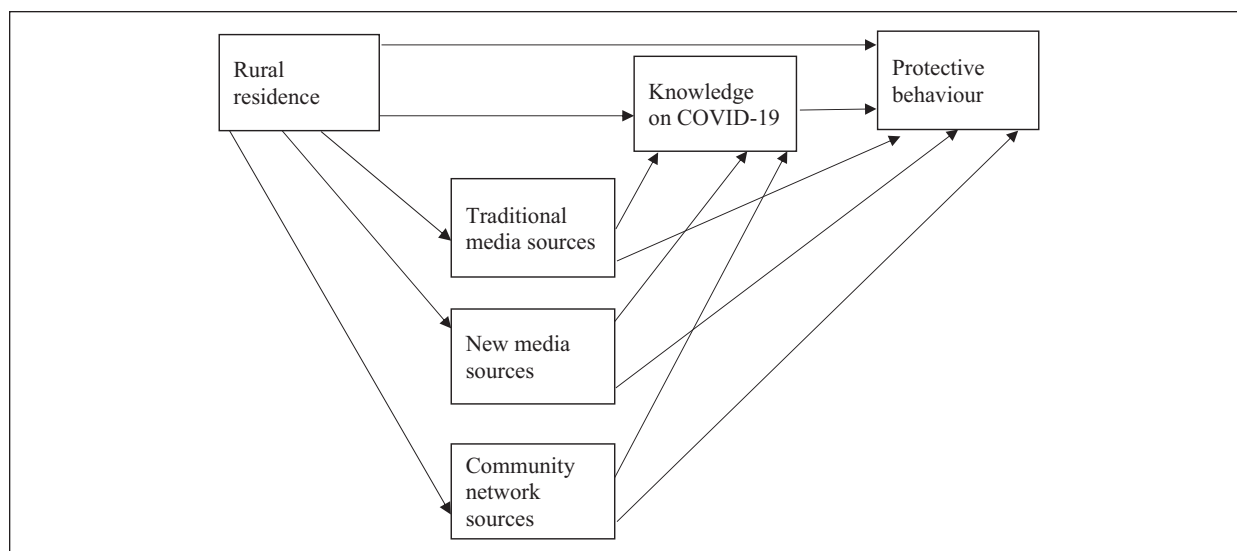


Figure 1. Path model for protective behaviors.

quarantine period. The sources mentioned in the survey were divided into three measures for the analysis. The first measure was “Tri-media sources” which includes TV/radio and the newspaper. The next measure was “New media sources” which represents the internet and short message service (SMS). The last measure was “community network sources” which included receiving information from a community leader and village volunteers.

Analysis

The association of residence, information sources, and knowledge level on COVID-19 with protective behavior was observed using multiple linear regression. The sociodemographic factors were controlled in the modeling.

For the path analysis, the mediation of knowledge level toward performing protective behaviors among older people in the rural areas was tested (Figure 1). The sole exogenous variable in the model was rural residence. Its direct effects were tested with the three sources of information, knowledge level, and protective behavior. Indirect and total effects were observed in reference with traditional media, new media, and community network sources toward knowledge and with protective behavior.

Model fit indices were evaluated using the following indices with their corresponding acceptability threshold: the root mean square error of approximation (RMSEA < 0.05), comparative fit index (CFI \geq 0.95), Tucker-Lewis index (TLI \geq 0.95), and standardized root mean squared residual (SRMR < 0.05). These limits were based on the threshold utilized in the literature (Garre-Olmo et al., 2016). The χ^2 index was not used here because it is highly influenced by sample size (Byrne, 2011).

Table 1. Characteristic Distribution of Sample in Rural Areas.

	Total sample	Rural (%)
Age groups		
60–69	707	52.9
70–79	376	65.4
80+	147	62.6
Female	682	57.5
Education attainment		
Lower than primary level	91	70.3
Primary level [4–6 years]	845	58.2
Higher than primary level	294	53.1
Average annual income level		
Lower income (\leq 29,999 Baht)	700	64.0
Higher income (\geq 30,000 Baht)	530	49.8
Total	1,230	57.9

Source. Impact of COVID-19 on Older Persons in Thailand Survey.

Results

The differences in selected characteristics of the sample are presented in Table 1. The proportion of older individuals was higher in rural areas particularly those aged at least 70 years old. About 70% in the sample who have lower than primary level of education were in the rural areas but more than half with at least primary education level were also in those areas. Rural older people with lower income levels were higher in proportion (64%).

The difference between information sources and knowledge and behavior regarding COVID-19 are in Table 2. It was observed there was no difference in the average protective behaviors among urban and rural older residents. Higher level of knowledge about the disease was found among those in the rural areas. In the urban areas, access to new media sources, including the internet, was more prevalent while community

Table 2. Information Sources, Knowledge, and Protective Behaviors for COVID-19 by Residence.

	Urban (n=518)		Rural (n=712)		p-Value*
	Mean	SD	Mean	SD	
Protective behavior	3.6	1.4	3.6	1.5	.521
Knowledge on COVID-19	3.2	0.6	3.5	0.6	<.001
Traditional media sources	1.7	1.1	1.7	1.1	.485
New media sources	0.4	0.7	0.3	0.6	.037
Community network sources	1.3	0.9	1.6	0.7	<.001

Source. Impact of COVID-19 on Older Persons in Thailand Survey.

Note. SD = standard deviation.

*T-test was used to compare urban-rural difference.

Table 3. Regression Model with Protective Behavior.

	Protective behavior
Rural	0.021
Age	-0.001
Female	-0.006
Primary education [4–6 years] ⁺	0.301*
Higher than primary level	0.480**
Higher income level [$\geq 30,000$ Baht] [†]	-0.366*

⁺Lower education level as reference category.

[†]Lower income level as reference category.

* $p < .01$. ** $p < .05$. *** $p < .001$.

network source access was more apparent among rural older people.

Selected sociodemographic characteristics were also observed for association with protective behaviors for COVID-19 (Table 3). Socioeconomic factors were observed to be associated but education and income levels have differing directions. Increase in protective behavior was observed with increasing education attainment levels. Older people with higher income on the other hand, was associated with decreasing performance of behavior to protect oneself from the disease.

Path analysis results are presented in Table 4. The model fit the data where the indices were within the acceptable limits (RMSEA=0.00; CFI=0.99; TLI=0.99; SRMR=0.04). Based on direct effects, knowledge of the disease and obtaining information from new media sources increased protective behavior performance. Older people in the sample who gathered information from traditional media performed less of such behaviors. With regard to knowledge of COVID-19, an increase was observed when people from rural areas and for those who access new media and community network sources.

Access to new media sources, when mediated with knowledge on COVID-19, a positive significant effect on protective behaviors when indirect effects was observed. This result is maintained with total effect results. A positive effect on knowledge of the disease was found with rural residence and access to new media and community network sources. Traditional media information sources had a negative total effect on knowledge level.

Discussion

This study explored the mediation of information sources and level of knowledge toward having protective behavior to avoid contracting COVID-19 among older people residing in rural areas in Thailand. Urban-rural gradients are often observed whereby those in the rural areas have lower levels of health literacy which can be detrimental to health status (Quashie & Pothisiri, 2019; Zhang et al., 2017). It was observed in the current analysis that during the COVID-19 pandemic, rural older people were not different from those residing in the urban areas in terms of protective behavior but the former have a higher level of knowledge about the disease. The mediation path was the various sources of information among respondents where the outcome was the performance of preventive behavior.

In reference to the regression model analysis of the socioeconomic factors, higher education attainment was observed to have advantages in health-related matters in Thailand (Loichinger & Pothisiri, 2018; Pothisiri & Vicerra, 2021). Education matters in accessing and understanding health information and adopting proper behavior toward gaining improved well-being. Income level was observed to have a negative association with preventive behavior which is counter to previous studies on health (Vicerra & Pothisiri, 2020). Similarly, people with higher income in Western China were found to be less mindful of health risks due to their action and behavior (Yuan et al., 2015). People with upper socioeconomic capacity have greater access to medical facilities and personnel and therefore have less motivation to perform preventive actions.

Established community health networks in localities were found in the present study to be significant in educating older individuals about the pandemic. Thailand instituted the Village Health Volunteers (VHV) scheme in the late 1970s and this became central to the country's community-based public health (World Health Organization [WHO], 2007). The volunteers have multiple duties but mainly, they are responsible for disseminating information and monitoring health status at a highly local level. This system has shown successes in urban and rural communities over the years in positively

Table 4. Path Analysis Result.

	Independent variables	β	SE	p-Value
Direct effect				
Protective behavior	Rural residence	0.054	0.262	.533
	Knowledge on COVID-19	0.150	0.071	.035
	Traditional media sources	-0.126	0.073	.084
	New media sources	0.302	0.123	.014
	Community network sources	-0.049	0.042	.243
Knowledge on COVID-19	Rural residence	0.238	0.034	<.001
	Traditional media sources	-0.065	0.029	.024
	New media sources	0.149	0.049	.002
	Community network sources	0.036	0.017	.032
Traditional media sources	Rural residence	-0.045	0.065	.484
New media sources	Rural residence	-0.079	0.038	.037
Community network sources	Rural residence	0.389	0.057	<.001
Indirect effect				
Protective behavior	Rural residence	-0.0004	0.029	.989
	Traditional media sources	-0.010	0.006	.123
	New media sources	0.022	0.013	.083
	Community network sources	0.005	0.004	.132
Knowledge on COVID-19	Rural residence	0.005	0.010	.613
Total effect				
Protective behavior	Rural residence	0.053	0.084	.526
	Knowledge on COVID-19	0.150	0.710	.035
	Traditional media sources	-0.136	0.073	.062
	New media sources	0.325	0.123	.008
	Community network sources	-0.043	0.042	.299
Knowledge on COVID-19	Rural residence	0.243	0.034	<.001
	Traditional media sources	-0.065	0.029	.024
	New media sources	0.129	0.049	.002
	Community network sources	0.036	0.017	.032
Traditional media sources	Rural residence	-0.045	0.065	.484
New media sources	Rural residence	-0.079	0.038	.037
Community network sources	Rural residence	0.389	0.057	<.001

Note. β = coefficient; SE = standard error.

contributing to chronic diseases (Visanuyothin et al., 2018) and providing surveillance of the Avian influenza (WHO, 2007).

In the COVID-19 pandemic, the VHV scheme has also been deemed important in disseminating information (World Health Organization & Ministry of Public Health, 2020). Having lower access to new media resources as the internet, the older rural people benefited from obtaining information from their community network. For individuals in the sample who do have access to new media, they performed more protective behavior as observed here. This signals that the VHV has to be maintained and that access to new media in the rural districts has to be strengthened in order to have better health literacy among older people in the time of a pandemic.

The health promotion campaign provided through the VHV scheme was effective inasmuch as there were individuals who adhere to the messaging. Among the strengths of the VHV scheme that several studies (Kaewpitoon et al., 2016; Lyttleton, 1996; WHO, 2007)

assessed was the capability of health volunteers to formulate their messages to reflect the local community's lifestyle. Whether the aim was for infectious or non-communicable diseases, the health volunteers were able to provide clear communication. Despite the aforementioned strength, local belief systems of a community and the personal temperament and judgment of individuals remain a challenge to health promotion (Lyttleton, 1996). Contradictory information from various sources, such as those from different media references as well as the village leader's interpretation of the situation, can cause confusion and ultimately muddle the adoption of preventive behavior.

As with the immediately preceding point, one aspect that shows negative association with protective behaviors and knowledge of COVID-19 was accessing media sources such as the television, radio, and the newspaper. In the case of selected rural areas in the US (Kim et al., 2020) and China (Chen & Chen, 2020), the information coverage on news media often focuses on urban areas and the situation of rural populations can be absent

resulting in the people's disengagement with messaging through the media. This is not substantiated in the case of Thailand based on the current findings. There is no information in the survey utilized for the present analysis on information appraisal among other measures but, van den Broucke (2020) cautioned that the breadth and scope of media coverage during the pandemic can raise concern and create anxiety among the people. This can eventually result in cognitive avoidance whether the information is correct and the behavioral guidance is beneficial (Croyle et al., 2013)

Conclusion

This study observed the prevalence of COVID-19 knowledge and the protective behavior against the disease among older people in rural areas. Although no causation was established, it was important to gain insight on the knowledge-behavior consistency among the older population. The study sample indicated there was a difference in the medium from which rural residents obtained their proper COVID-19 information. Upon obtaining the information, older people may also not necessarily adopt the corresponding behavior due to other factors.

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Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethics Statement

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