

# TRANSPORTATION BARRIERS ON HEALTHCARE UTILIZATION AMONG ELDERLY POPULATION LIVING IN MAHASARAKHAM PROVINCE, THAILAND

Apisit Kullanit, Nutta Taneepanichskul\*

College of Public Health Sciences, Chulalongkorn University, Bangkok, 10330, Thailand

## ABSTRACT:

**Background:** Health Insurance System Research Office (HISRO) of Thailand found that the utilization of healthcare services of outpatient care was decreasing from 2009 to 2010 among elderly. Transportation could be a predominant factor influencing outpatient care utilization especially in rural area where patients must travel long distances to access health care services. This study aimed to assess the association between healthcare utilization and transportation barriers and perception among elderly in Mahasarakham province Thailand.

**Method:** A cross-sectional study design was applied in Muang district and Wapi Pathum district in Mahasarakham province. Face-to-face interview by health volunteers was utilized to obtain information from 359 elderlies using structured questionnaire, which was divided into 3 parts; demographic characteristic, transportation barriers and perception of transportation to healthcare services. Bivariate analysis using Chi-square and independent t-test was performed to investigate the association.

**Results:** Majority of respondents was female (59.3%) and had average age ( $\pm$ SD) of 70( $\pm$ 7.1) years old. Sixty-six percent of them reported insufficient monthly income. More than half of them had underlying disease (53.5%) and moderate health status (56.5%). During the past two months, sixty-eight percent of overall elderly reported non-utilize the healthcare service even though they preferred to receive care. We found that traveling duration and distance from home to healthcare services were significantly influenced on healthcare utilization of elderly in health promoting hospital and provincial hospital care ( $p$ -value $<$ 0.05). Elderly out-of-pocket of transportation expenses was significantly associated with utilization of provincial hospital ( $p$ -value = 0.02). Their perception on ability to pay for transportation expenses was significant different between elderly who had visited and who had not visited healthcare services ( $p$ -value = 0.05).

**Conclusion:** Travel duration and distance from elderly home to healthcare services was associated with healthcare utilization in health promoting hospital and provincial hospital. Elderly satisfaction and perception on ability to pay for transportation expense was related to their healthcare utilization. Further basic insurance strategy may consider to partially support transportation expenses for elderly to lessen their ability to pay perception.

**Keywords:** Transportation barriers; Health care utilization; Elderly; Thailand

DOI: 10.14456/jhr.2017.89

Received: July 2017; Accepted: February 2018

## INTRODUCTION

The Thailand Health Insurance System Research Office (HISRO) in 2009 and 2010 showed

that utilization of health care services of out-patient care was decreasing among who were over 75 years old. However, in-patient service was increasing along with the increased in age of Thai people [1]. Transportation barriers are a barrier to healthcare access for low income elderly. These barriers lead to

\* Correspondence to: Nutta Taneepanichskul  
E-mail: nutta.t@chula.ac.th

**Cite this article as:** Kullanit A, Taneepanichskul N. Transportation barriers on healthcare utilization among elderly population living in Mahasarakham province, Thailand. *J Health Res.* 2017; 31(Suppl.2): S233-8. DOI: 10.14456/jhr.2017.89

rescheduled or missed appointments, delayed care, and missed or delayed medication use. Elderly with transportation barriers reflect the relationship between poverty and transportation availability [2]. Therefore, decreasing in rate of healthcare service utilization among elderly is an ability to pay for transportation cost [3]. Focusing on the distance of healthcare service and elderly resident, a previous study found that the longer distance to reach services leads to the higher cost to pay for transportation [4].

Moving forwards to an aging society, Thailand faces an increasing proportion of elderly. Thai elderly population has increased seven-fold from approximately 1.5 million to 10.7 million by 2015 or 16% of the total population [5]. Elderly population in Mahasarakham province had increased from 92,227 to 137,387 from 2006 to 2016.

Healthcare system in provincial level is normally composed of primary and secondary care. Health promoting hospital provides primary healthcare for Thai population. Provincial hospital is responsible for primary and secondary care. Generally, there is a health promoting hospital in each sub-district (Tum-bon). Since the rate of out-patient visit was decreased among elderly, there would be in doubt because universal healthcare coverage had been provided. Therefore, the objective of this study was to examine an association between healthcare utilization and transportation barriers and perception among elderly in Mahasarakham province, Thailand.

## METHODS

### Study area and study population

A cross-sectional study was applied among 359 male and female respondents, aged above 60 years old in April to May, 2017. Two districts in Mahasarakham province; namely Umphur Muang and Wapi Pathum, were purposively selected to be the study areas. A sub-district in each district was purposively selected to recruit participants. Respondents were systemic random by every 10th of name list in health promoting hospital in each district which included all eligible elderly in the service area of the districts hospital. The inclusion criteria were resident living in study areas more than one year, be able to come to health facility, and be a member of any type of insurance. Elderly exclusion criteria were the elderly who had hearing and vision loss and bed ridden.

### Data collection and questionnaire

Questionnaire composed of 3 parts are demographic characteristic, transportation barrier, and accessibility of healthcare facilities on transportation developed from the concept of Panchanskie and Thomas [6]. In this study, accessibility of healthcare facilities on transportation was focused in three areas; Ability to access health center, ease to access services and ability to pay services. A main dependent variables was out-patient visit during last 2 months if the elderly needed. A need of healthcare utilization in this study was accessed by elderly self-perception. The transportation barriers and accessibility were stratified into health promoting hospital, district hospital and provincial hospital. The respondents were interviewed according to each type of healthcare facility in each set of question. For example, an estimated actual transportation cost which had to spend was reported as the barrier of healthcare access using question of "What is your total expenses that you have to pay by yourself for travelling to each healthcare facility type?". The perception and satisfaction of transportation facilities; transit time from home, importance of transportation cost, convenience of vehicles for traveling and satisfaction of expense, was asked elderly through a five likert scale (5 is "the most satisfy and 1 is the least satisfy). The reliability test by using Cronbach's was 0.73.

Collecting data process was "Face-to-Face" interview among elderly who had been recruited into the study. Village health volunteers Muang district and Wapi Pathum district were research assistants in collecting data process. All were trained, realized the purpose of this study.

### Statistical analysis

Data analysis was used Statistical package with Windows (SPSS) version 17 licensed of Chulalongkorn University. Descriptive analysis, frequency, mean, percentage, and standard deviation was utilized to describe elderly general information, healthcare utilization and transportation barriers. Normality of continuous data was tested by Kolmogorov-Smirnov test. In Bivariate analysis, independent t-test was analyzed a difference of continuous data between elderly who sought and received care (Yes) and who seek but not received care (No) during the last 2 months. If data is skewed, Mann Whitney u test was used. For categorical data, Chi-Square (or fisher exact test) was analyzed to test an association between categorical data and

**Table 1** Socio-demographic characteristics of participated elderly in Maharashtra province

	Total N = (359)	
	n	Percent
<b>Age (years)</b>		
60 - 69	196	54.6
70 - 79	123	34.3
≥ 80	40	11.1
<b>Gender</b>		
Male	146	40.7
Female	213	59.3
<b>Education</b>		
Primary school and lower	319	88.9
Secondary	16	4.5
High school and above	24	6.6
<b>Marital status</b>		
Single /Divorce	20	5.6
Married	230	64.1
Widow	109	30.4
<b>Exercise</b>		
Everyday	50	13.9
< 3 days per week	36	10
3-4 days per week	68	18.9
Have physical activity but not exercise	205	57.1
<b>Income sufficiency</b>		
Sufficient	120	33.4
insufficient	236	65.7
Retained	3	0.8

**Table 2** Health care utilization of participated elderly in Maharashtra provinces

	Total (N = 359)	
	n	Percent
<b>Out-patient visit during last 2 months (if needed)</b>		
Yes	115	32
No	244	68
<b>Type of insurance</b>		
Universal healthcare coverage	303	84.4
Civil servant medical benefits scheme (CSMBS)	21	5.8
Social security scheme (SSS)	7	1.9
Self-payment	25	7
Other	3	0.8

healthcare utilization (yes/no). Statistical significant was considered at *p*-value less than 0.5.

#### Ethical consideration

The study will be conducted after getting permission from the sub-district health promoting hospital. Consent from the elderly would be taken before interview. Ethical approval will be taken from Ethics Review Committee for Research involving Human Research Subjects, Maharashtra Hospital Research Center (MSKH\_REC no.60-02-023).

## RESULTS

### Socio-demographics

The data was collected from 359 elderly in this study whose mean of age was 70 years. The majority group of elderly population located in range of 60 to 69 years or about 54.6%. Almost elderly was graduated from primary school and below as 88.9%. More than 60% of elderly had couple status, 30% had widow status and only 5 % had single status. More than half of all participant had physical activity but not exercise. The income sufficiency of the elderly showed that 65.7% of all participant had insufficient income per month (Table 1).

### Health care utilization of elderly in Maharashtra

The number of outpatient visit during last 2 months

**Table 3** Association between transportation barriers and healthcare utilization (if needed) among elderly in Maharashtra province (N= 359).

Barriers of transportation	Health promoting hospital				p-value	District hospital				p-value	Provincial hospital				p-value
	Yes (n=115)		No (n=244)			Yes (n=115)		No (n=244)			Yes (n=115)		No (n=244)		
	n	Percent	n	Percent		n	Percent	n	Percent		n	Percent	n	Percent	
<b>Transportation expense by elderly</b>					0.63					0.68					0.02
Not pay	88	76.50%	181	74.20%		77	67.00%	158	64.80%		69	60.00%	113	46.30%	
Pay	27	23.50%	63	25.80%		38	33.00%	86	35.20%		46	40.00%	131	53.70%	
<b>Travel duration (Min; Mean±SD)</b>	15.5 ± 5.5		12.8 ± 5.9		<0.001	33.9 ± 12.6		30 ± 8.5		0.004	51.1 ± 23.6		43 ± 18.3		<0.001
<b>Distance from home (Km; Mean±SD)</b>	2.3 ± 1.4		1.3 ± 1.3		<0.001	7.6 ± 3.6		6.7 ± 1.3		0.01	27.3 ± 18.5		20.4 ± 19.2		0.04
<b>Accompany people</b>					0.07					0.65					0.53
Self	32	27.80%	96	39.30%		24	20.90%	58	23.80%		22	19.10%	59	24.20%	
Children	58	50.40%	111	45.50%		67	58.30%	144	59.00%		69	60.00%	141	57.80%	
Couple / Relative	25	21.70%	37	15.20%		24	20.90%	42	17.20%		24	20.90%	44	18.00%	

**Table 4** An association between perception and satisfaction of transportation facilities on healthcare and healthcare utilization among elderly in Maharashtra province

	Health promoting hospital			p-value	District hospital			p-value	Provincial hospital			p-value
	Yes (n=115)	No (n=244)	p-value		Yes (n=115)	No (n=244)	p-value		Yes (n=115)	No (n=244)	p-value	
	mean±SD	mean±SD			mean±SD	mean±SD			mean±SD	mean±SD		
Transit time from home	4.22 ± 0.7	4.25 ± 0.7	0.72	3.71 ± 0.8	3.86 ± 0.8	0.10	3.57 ± 1.0	3.67 ± 0.8	0.35			
Convenience of traveling	3.96 ± 0.7	3.95 ± 0.8	0.95	3.57 ± 0.7	3.58 ± 0.8	0.88	3.56 ± 1.0	3.6 ± 0.9	0.66			
Importance of transportation cost	2.86 ± 1.2	2.87 ± 1.2	0.95	2.57 ± 1.1	2.62 ± 1.2	0.66	2.52 ± 1.1	2.5 ± 1.2	0.87			
Convenience of vehicles for traveling	3.94 ± 0.9	3.89 ± 0.8	0.64	3.65 ± 0.9	3.77 ± 0.8	0.23	3.35 ± 1.1	3.5 ± 1.0	0.21			
Satisfaction of expense	3.57 ± 1.1	3.46 ± 1.2	0.44	3.47 ± 1.1	3.26 ± 1.1	0.10	3.36 ± 1.2	3.14 ± 1.2	0.12			

if the elderly needed showed that only 32% of elderly had visited. Around 80% of overall elderly used a universal healthcare coverage, followed by 7% self-payment, 5.8% civil servant medical benefits scheme, and 1.9% social security scheme (Table 2).

#### **An association between transportation barriers, perception and healthcare utilization**

Table 3 reveals an association between healthcare utilization and transportation barriers among elderly in current study. A significant difference of travel duration between elderly who visit health care and who were not ( $p < 0.01$ ). Elderly who utilize healthcare reported a longer duration of travelling than another. The trends were showed in the similar direction among Health promoting hospital, District hospital, and Provincial hospital. Similarly, travel distance was showed the significant difference among elderly who utilize and non-utilize health care. However, only provincial hospital visit was associated with elderly out-of-pocket expenditure. An accompany people for healthcare visit was associated with healthcare utilization only in the first level of hospital care. The finding of this study found that travel duration and distance to healthcare facility of the one who used healthcare facility if they needed was higher than those who did not utilize.

Table 4 showed elderly perception and satisfaction toward healthcare utilization amongst three of hospital care. Results presented that there were no association between perception and satisfaction toward healthcare utilization and health care visit of elderly. For health promoting hospital visit, elderly who utilized healthcare showed a higher score of perception and satisfaction convenience of vehicles for travelling (mean score  $3.94 \pm 0.9$ ) and satisfaction of expense (mean score  $3.57 \pm 1.1$ ). Comparing to district hospital, mean score of transit time from home (mean score  $3.71 \pm 0.8$ ) and satisfaction of expense (mean score  $3.47 \pm 1.1$ ) among elderly who utilized care were greater than another. Additionally, only satisfaction of expense (mean score  $3.36 \pm 1.2$ ) among elderly who utilize care was higher than who was not in the provincial hospital visit.

#### **DISCUSSION**

In this study, the rate of healthcare utilization in this study elderly had health care utilization for 32 percent as out-patient during last 2 months from overall elderly reported while more than half of

them had underlying disease (53.5%) and moderate health status (56.5%). Similarly, a study conducted by National statistical office, Ministry of Information and Communication Technology in 2013 found that only 33.5 % of Thai elderly had been utilized the healthcare service when they were seeking for treatment [6]. Another study showed that Thai elderly in Kanchanaburi province used healthcare services an average of 3.7 times per year [7]. But some study argued that there were strong old people, they believed that they need medical care and used of health care services even healthy [8]. However, the rate of health care utilization that quite low could be explained that there were the group of the healthy elderly due to the majority of elderly in this study had physical activity which they are not necessary to receive health care at all. Similarly, from study that the six-minute walking distance can be predicted adequately using a clinically useful model in healthy elderly subjects [9].

Transportation for access to healthcare-related services is a critical component for maintaining high levels of health and well-being among older adults. Our study found that the travel time showed a strong relationship to healthcare utilization since travel duration was statistically significant in relation to healthcare utilization at health promoting hospital, community hospital and general hospital. Elderly who spend longer transportation duration to access healthcare services reported to utilize healthcare service more than the one who spend less. Additionally, we found that distance from elderly home to healthcare services was associated with their healthcare utilization. Elderly whose house located far away from healthcare services was tended to utilize more healthcare. Our study was contradicted with other studies. Theoretically, increased distance between residents and health care providers is commonly thought to decrease the utilization of health care [10]. However, we found that the transportation expense when elderly went to the general hospital had strong relationship to the health care utilization in both rural and urban area at  $p$ -value equal to 0.02.

The result of the study in the satisfaction and perception of transportation facilities on healthcare and healthcare utilization showed five from six satisfaction and perception had statistically insignificant to the healthcare utilization which include of transit time from home to health promoting hospital, community hospital, and general hospital. One of the transportation facilities

on healthcare satisfaction and perception, ability to pay, there are relationships to healthcare utilization since ability to pay for health care expense was statistically significant in relation to overall healthcare utilization (p-value = 0.05). But this argument can be supported by the fact that there are no consistent relationships were observed between increased copayments per dispensing and medical care utilization and expense [11].

There are several limitations in this study. First, findings in this study conducted only two districts and one province which the result cannot be describe to the whole population of the elderly in Thailand. Second, healthcare utilization in this study was based on elderly satisfaction and perception. Third, we investigated utilization of elderly during the past two months which was a period of chronic disease receiving care because we selected participants from health promoting hospital. However, it may lead to a selection bias of study participants. Some may not require to receive care during those two months' period. Lastly, an analysis of association in this study was based on bivariate analysis and did not consider to include any potential confounding factors in the analysis. By that analysis, it may lead to mislead interpretation. Further research should be considered healthcare utilization together with elderly underlying disease to ascertain multivariate analysis.

## CONCLUSION

Travel duration and distance from elderly home to healthcare services was associated with healthcare utilization in health promoting hospital and district hospital. Elderly satisfaction and perception on ability to pay for transportation expense was related to their healthcare utilization. An elderly healthcare utilization promoting strategy should be recognized to enhance elderlies' health. Further basic insurance; universal healthcare coverage, strategy may consider to partially support transportation expenses for elderly to lessen their ability to pay perception.

## ACKNOWLEDGEMENT

This study was supported by Chulalongkorn Academic Advancement into its 2<sup>nd</sup> Century Project (CUAASC).

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