

Self Efficacy Application for Traffic Accident Prevention among Senior People Drivers in Municipality, Khon Kaen, Thailand

Chulaporn Sota¹, Pannee Banchornhathakit²,
Kannitha Klongthamachat³, Pornpimon Chupanit⁴,
Nawaporn Three –ost⁵, Pornputhachat Sota⁶,
Chamroon Tangpaisalkit⁷, Chumnong Sorapipatana⁸,
Tuenjai FuKuda⁹

Abstract

Descriptive research, Mixed method study both quantitative and qualitative data, aimed to study self efficacy theory application for traffic accident prevention among senior people drivers in municipality, Khon kaen, Thailand.

The participants were senior people both female and male > 60 yrs 400 persons. Data were collected both qualitative and quantitative method. Data analysis by using SPSS program for quantitative data as well as content analysis for qualitative data. The results showed that perceived self efficacy and expect outcome of car driving, in additional car driving behavior among elderly people were in high level.

The characteristic variables correlation with safety behavior of car driver elderly were sex, education, duration of car driving, main occupation, Income/month, and car driving license. The variable correlation of traffic safety behavior were self-efficacy and expect outcome of car driving of elderly.

Keywords: Self Efficacy, Traffic accident prevention, Senior people drivers, Thailand

Introduction

The Global status report on road safety 2015, reflecting information from 180 countries, indicates that worldwide the total number of road traffic deaths has plateaued at 1.25 million per year, with the highest road traffic fatality rates (90%)are in medium to low income countries .The world's top five countries, Libya is highest country, Thailand, Malawi, Liberia and the Congo at a rate equal to the death, 35, of 73.40 36.20 33.20 33.70 and, per hundred thousand population, respectively, the World Health Organization¹. Southeast Asia would be predicted most serious of traffic accident problems in the year 2020.

Accident situation in South East Asia and Southeast Asia, 10 countries found that countries with the death rate from road accidents highest is Thailand 36.20 per one hundred thousand population, followed by Vietnam with 24.50, Malaysia 24 ,Myanmar 20.30 and Cambodia 17.40². Traffic accidents are a serious problems in Thailand in every province. This leads to public health, economic and social problems.

Thailand had already facing to be ageing society since the year 2007. Due to has a population of approximately 7 million old age people, the elderly accounted for 10.7 percent of the entire population of Thailand. The change in the age structure

¹College of ASIAN Scholars

²⁻⁶Khon Kaen University, Thailand

⁷ATRANS Chief,

⁸ATRANS board committee,

⁹Nihon University, Japan



of the population to access the older population is quite a short period of time when compared to many developed countries, the ratio of the population of seniors Thailand will increase from 9.3 percent in 2000 to 19.2 percent in the year 2025, which took about 22 years to increase the proportion of the elderly population to double. While most developed countries have to take about 70 years to 100 years^{3,7}. It's challenge problem have to urgently concern for preparing and problem solving in many aspects especially transportation.

Although the number of traffic accident still high number, this major cause of death, injuries in Thailand including ageing people is high risk group due to changing of physiology. Ageing people faced traffic accident less than youth group because of slowly driving, more experience, more seat belt fasten, no drunk drive, But if ageing people high speed driving , they got accident more than youth group. Most of ageing who are 70 years old, and 80 years old much more accident than youth group 9 times. The cause of accident among ageing people were more than 85 years old, cause of seeing problem and dementia. Including lack of muscle strength, slowly response of any urgently situation, decreasing co ordination of organs, decreasing of concentration and some people have disease such as cataract, glaucoma, Parkinson, cerebrovascular disease, osteoporosis ,heart disease diabetic mellitus and hypertension, in addition aging people were effect from medicines also, some feel sleepy, dizzy, vomiting, confuse, low concentrate and bad decision making. San Chaiyodsin said that ageing people not necessary to stop driving, because it keep ageing people far from dementia, depressive. 16 researches from The Gerontological Society of America (GSA) found that ageing people who stop driving much more and unhealthy 2 times when compare with same age and same sex who still driving.

Chatchai promlert said that ageing people most unhealthy were risk of accident so they should be advice for effective driving as follow 1) consult Dr. for driving capacity evaluation 2) avoid driving bad atmosphere such as night, raining, smoke, 3) Avoid driving in rush hour on long distance 4) Ageing people who sickness with heart disease, dementia, Parkinson, severe diabetes mellitus and myoasthenia or muscle weakness. These are high risk of accident should stop driving⁵. It necessary to make them increase self efficacy.

Self-efficacy is defined as a personal judgment of "how well one can execute courses of action required to deal with prospective situations" Expectations of self-efficacy determine whether an individual will be able to exhibit coping behavior and how long effort will be sustained in the face of obstacles. Individuals who have high self-efficacy will exert sufficient effort that, if well executed, leads to successful outcomes, whereas those with low self-efficacy are likely to cease effort early and fail.

Therefore researchers would like to study self efficacy for traffic accident prevention among senior people in Municipality , Khon Kaen Thailand for improving safety transportation of senior people further.

Research Objectives

1. Study self efficacy for traffic accident prevention behavior among senior people.
2. Study expect outcome for traffic accident prevention behavior among senior people.
3. Study traffic accident prevention behavior among senior people.
4. Study correlation between personal characteristic , self efficacy and safety behavior.

Limitation

This research study in only 1 Provinces is Khon Kaen province in the Northeast of Thailand.

Material and Method

This is descriptive research, research design was mix method both qualitative and quantitative data.

Population and samples. There are 400 general senior people in 1 province, in the Northeastern of Thailand study in municipality Khon Kaen, Thailand.

1. Research Design : This is descriptive research, mix method design study both qualitative and quantitative data.

There are 7 steps of study:

1. Select 1 province in the Northeastern of Thailand, and then purposive sampling is Municipality Muang, Khon Kaen, Thailand.

2. Approach to senior Center in Municipality, Khon kaen namely.

1. Srichan temple senior center which most senior people is retirement senior people from official government.

2. Nongwang Temple. which cooperation among Nongwang temple, municipality, and Khon Kaen hospital work together call Happiness increasing Center.

3. Senior Club in Regional Health Promotion Center 7 Khon Kaen 7, this place there are established for senior people around hospital come to join exercise and physical check examination.

4. Khon Kaen Social welfare Development Center for Older Persons.

3. Approach to senior people in community and senior center both female and male by accidental technique who still driving.

4. Research tools conduction for data collection both for qualitative and quantitative data for drivers.

5. Data collection both qualitative and quantitative data by interviewing.

6. Data analysis by using computer program SPSS.

7. Summarize and full paper complete including publication.

2. Population and samples Old age people who were more than 65 year old.

Limitation: Study 1 province namely Khon Kaen Provinces, in the Northeast of Thailand. Total of general old age people person 400 person. Both male and female who still driving.

Sample size calculation for unknown population (Taro Yamane, 1967)

$$n = \frac{(P)(1-P) Z^2}{e^2}$$

n = Sample size,

p = proportion of population = 0.5

Z = standard score 95% = 1.96

e = error 50% = 0.05

n = 385. : (adjust = 400)

3. Research Tools

The research tools were two questionnaires for quantitative data and guideline interview for In-depth interview Including camera for taking photo in real situation.

3.1 Questionnaires for data collection, There are 7 parts composed of Self Efficacy Application for Traffic Accident Prevention among Senior People Drivers in Municipality, Khon Kaen, Thailand.

Part 1 Characteristic questionnaire

Part 2 Questionnaire for Self efficacy for car driving among elderly people 15 items.

Part 3 Questionnaire for expect outcome for car driving among elderly people 15 items.

Part 4 Questionnaire for practice of car driving among elderly people 10 items.

Part 5 Suggestion for car driving among elderly people 10 items.

Part 6 general suggestion (open end)

Part 7 Guideline questionnaire for in depth interview and Focus group discussion 9 items.



4. Data analysis

Quantitative data

Bring information to the correctness, put them into code and analyze with computer by using the statistical package SPSS program for descriptive statistic by using frequency distribution, percentage, mean standard deviation.

Qualitative data

Qualitative data using content analysis for categorizing and theme.

5. Results

The research results showed in detail as following.

Part 1. Demography of characteristics of participants

The results found that the respondents were the most in the range of 60-69 years old, 66.3 percent were male, 38.8 percent were female, 61.3 percent were female. Study at the upper secondary level / vocational 29.5 percent, followed by undergraduate degrees, 22.8 percent, most of whom do not have congenital diseases, 69.5 percent, most respondents drive for more than 26 years, 46 percent, followed by 21-25 years, 17.5 percent. Most of the occupations were retired, 34.5 percent, such as government officials, public health ministries, followed by non-work, 25.8 percent, the average monthly income was mostly in the range of 0-5000 baht, 20.5 percent,

followed by more than 50,000 baht. 17 percent, most respondents have a driver's license, 82.5 percent used to have an accident, 71.3 percent. Driving in the future, most respondents will drive indefinitely. 66.5%, followed by driving again within 5 years to quit, 13.3%, most of whom had never practiced safe driving, 68.8% and no need for safety driving, 73.8%, only 26.3% at Want driving for safety. Respondents had comments about the need for help. For safe driving, for example, should be able to clearly draw traffic lines. Providing knowledge about traffic rules, make traffic signs clear and every point where there are accidents, often training for all types of motorists. Offer people to respect traffic rules and there are penalties, etc. as well as there are suggestions for road safety, for example, it should consider how much different lights are appropriate and should add a signal light at the turn of the car to make it more visible than before. They should use light reflecting light to see clearly. Various signs should be improved, Respondents did not want to driving trained 86.8 percent and wanted 13.3 percent.

2. Self efficacy of car driving among elderly people

Most senior people perceived self efficacy of car driving among elderly people in high level 57.75 %, Moderate 42.25% as table 1.

Table 1 Self efficacy of car driving among elderly people each item.

Self efficacy of car driving among elderly people	Number	Percent
Low (<1.66)	2	88.00
Moderate (1.66-3.32 score)	169	42.25
High (> 3.33 score)	229	57.75

3. Self efficacy of car driving among elderly people each items.

Most senior people perceived self efficacy of car driving among elderly people most in high level such as Preparing before driving such as sleeping., respect to traffic l Most senior people

perceived self efficacy of car driving among elderly people most in high level such as Preparing before driving such as sleeping., respect to traffic law, when driving, car driving regularly, no Alcohol drink before driving as table 5.

Table 5 Self efficacy of car driving among elderly people each items.

No	Item	average	S.D	level
1	Car driving regularly.	3.62	.58	High
2	Car checking before driving.	3.38	.77	High
3	Preparing before driving such as sleeping.	3.65	0.56	High
4	Long experience for car driving.	3.44	0.78	High
5	Driving speed less than 80 km/hour.	3.33	0.74	High
6	No Alcohol drink before driving.	3.50	0.70	High
7	Driving speed more than 80 km/hour.	2.96	0.77	High
8	Respect to traffic law, when driving.	3.59	0.65	High
9	They cannot see when any car come in opposite way.	3.75	0.51	High
10	They cannot see when any car come in opposite way.	3.33	0.83	High
11	They cannot hear when any car come follow or in opposite way.	3.37	0.86	High
12	Confident to safety driving.	3.46	0.75	High
13	Senior people could drive car normally.	3.22	0.86	High
14	Senior people could learn about traffic law.	3.48	0.71	High
15	Senior people not necessary to learn safety driving anymore.	2.59	1.19	Medium
	Average	3.38	0.34	High

4. Expect outcome of car driving among elderly people.

Expect outcome of car driving among elderly people most was high level 71.50% follow by moderate level 27.75% as table 2.

Table 2 Expect outcome of car driving among elderly people.

Expect outcome of car driving among elderly people	Number	Percent
Low	3	0.75
Moderate	111	27.75
High	286	71.50

5. Expect outcome of car driving among senior people each item.

Expect outcome of car driving among senior people most were high level and subsequently medium. Especially they expected that senior

people who could drive, make a convenient life, help their family, make a self reliance meanwhile the low score in medium level were senior people who could drive, make a risk of accident, and make a burden of policeman as table 3.

Table 3 Expect outcome of car driving among senior people each item.

No.	Items	Average	S.D	level
1.	Senior people who could drive, make a convenient life.	4.09	1.10	High
2.	Senior people who could drive, make a proud.	3.87	1.24	High



No.	Items	Average	S.D	level
3.	Senior people who could drive, help their family.	4.06	1.05	High
4.	Senior people who could drive, make a freedom in life.	3.94	1.11	High
5.	Senior people who could drive, make a job and income.	3.64	1.23	High
6.	Senior people who could drive, release stress.	3.73	1.28	High
7.	Senior people who could drive, make a traffic accident.	3.63	1.24	High
8.	Senior people who could drive, make a family increase worry.	3.92	1.24	High
9.	Senior people who could drive, make a self reliance.	4.06	1.12	High
10.	Senior people who could drive, make a healthy guy.	3.85	1.20	High
11.	Senior people who could drive, decrease dementia.	3.88	1.14	High
12.	Senior people who could drive, make a risk of accident.	2.23	1.23	Medium
13.	Senior people who could drive, make a burden of policeman.	2.57	1.23	Medium
14.	Senior people who could drive, make a happy life.	3.96	1.17	High
15.	Senior people who could drive, make a proud of life.	3.99	1.25	High
	Average	3.69	0.78	High

6. Car driving behavior among senior people

Car driving among elderly people in overall most was high level 95.75 % subsequently was moderate level 4.25 % as table 4.

Table 4 Car driving behavior among senior people

Car driving among elderly people	Number	Percent
Moderate	17	4.25
High	383	95.75

7. Car driving behavior among elderly people by items.

Most senior people have a high level in all items. Most were respect traffic law, use the break suitable, always focusing when driving for accident prevention, learning about safety driving and Never confuse for using between break and accelerator, .but low score of driving behavior was car checking before driving as table 5.

Table 5 Car driving behavior among elderly people.

No	Item	Average	S.D	Level
1.	Driving everyday in daily life.	4.12	1.14	High
2.	Respect traffic law.	4.55	0.70	High
3.	No respect traffic law.	4.22	1.12	High
4.	Car checking before driving.	3.80	1.15	High
5.	Control yourselves driving less than 80 km/hour.	4.09	1.02	High
6.	Always Focusing when driving for accident prevention.	4.54	0.70	High

No	Item	Average	S.D	Level
7.	Use the break suitable.	4.57	0.66	High
8.	Never confuse for using between break and accelerator.	4.51	0.79	High
9.	Try to continue driving until can not.	4.43	0.83	High
10.	Learning about safety driving.	4.52	0.71	High
	Average	4.33	0.55	High

8. Correlation between characteristic variables and safety behavior of car driver elderly. The characteristic variables correlation with **safety behavior** of car driver elderly are sex, education, duration of car driving, main occupation, Income/month, and car driving license. As table 6.

Table 6 Correlation between characteristic variables and **Safety behavior** of car driver elderly

Variables	X ²	P value
Age	1.35	.850
Sex	13.88	<.001
Marital status	13.37	.038
Education	35.87	<.001
Disease	2.18	.337
Duration of car driving	61.49	<.001
Main occupation	34.00	<.001
Income/month	59.25	<.001
Car Driving License	12.57	.002

9. Correlation between variables and traffic safety behavior.

The result show that the variable correlation of traffic safety behavior were self-efficacy of driving elderly, and expect outcome of car driving of elderly, including car driving behavior of elderly as table 7.

Table 7 Correlation between variables and traffic safety behavior.

No	Variables	X ²	P value
1	Knowledge of car safety driving elderly.	0.93	0.063
2	Self-efficacy of driving elderly.	8.71	0.003
3	Expect outcome of car driving of elderly.	17.81	<.001
4	Suggestion of car driving elderly.	3.77	.152
5	Car driving behavior of elderly.	13.88	<.001

10. Qualitative data. By in depth interview as following.

1. Most of senior people need to continue car driving, because of feel freedom and high confident but more careless and more slowly driving. Female elderly 67 years old, food selling,

“I drive a car when necessary, because daughter and son prohibit in this year.”

Female 72 years old “I still drive a car for working and going from Khon Kaen to Udornthani 240 km by myself”.



Female 80 years old “I still drive a car for working and going from in Khon Kaen to districts in Khon Kaen 140 km by myself, I happy to do ordinary, I still working and still drive a car continuing”.

2. Some senior people still car driving regularly in their daily life : 70 Years old male “I still drive a car ordinary, just bought a new car last month”.

3. Some elderly quite drive a car but in urgently situation, they have to drive often by themselves because no helping from other to traveling. Female 69 year old “I drive a car when no body help.

4. Most of senior people who have car accident experiences, stop driving but some only drive inside city near by home. Female 69 Years old “I have experience of car accident but I still drive a car in daily life because I still working in Univ.

5. Some senior people who had car accident experiences make feel terrible from situation, can't drive car anymore. Male 63 years old. “I felt so scar when car accident, so I can't drive a car anymore. I stop for driving since 7 years ago”.

Discussion

Thailand now is ageing society, the number of ageing people was increased since the year 2005. Because of the effectiveness of medicine and public health. Therefore the number of senior people involve in traffic accident has grown over than the past also. However senior people have to concern about self reliance. The performance of driving is important thing made them feel freedom, strong and useful for other people in their family, working and daily life. This research found that most of senior people perceived efficacy in high level, it mean that they still confident for driving, because of they have long experience of driving and more careful than youth. On the other hand driving give more benefit for them such as

easy to go anywhere by themselves, feel freedom, going for working, temple, market, garden, anywhere depend on their need, and feel happy, Therefore the government should concern about safety driving among senior people, special focus to improve car and street design for more safety same as Brand, S. et al study⁷. Although senior people have confident for driving but Thailand should concern about senior people drive because major traffic accident situation in senior people were motorcyclist accident, cause of high speed, drunk drive, hit animals, and bad environment, senior people in rural area believe that traffic accident unpreventable because of sin. Senior people who had experience of traffic accident found that factors related traffic accident was careless bad behavior, most of traffic accident not severity, admit hospital < 5 days. In order to road safety control senior people should be improve of safety road, suitable vehicle, safety environment and continuing campaign throughout the year, local authority must increase concern for safety legislation also⁸. San Chaiyodsin said that ageing people not necessary to stop driving, because it keep ageing people far from dementia, depressive. 16 researches from The Gerontological Society of America (GSA) found that ageing people who stop driving much more and unhealthy 2 times when compare with same age and same sex, but Chatchai promlert said that ageing people most unhealthy were risk of accident so they should be advice for effective driving as follow 1).consult Dr. for driving capacity evaluation 2).avoid driving at bad atmosphere such as night, raining, smoke, 3). Avoid driving in rush hour on long distance 4). Ageing people who sickness with heart disease, dementia, parkinson, severe diabetes mellitus and myoasthenia or muscle weakness. These are high risk of accident should stop driving⁵. It necessary to make them increase self efficacy. Therefore increasing effectiveness driving should be important for senior people as well.

In addition the variable correlation of traffic safety behavior were self-efficacy and expect outcome of car driving of elderly. As we know that Self-efficacy is defined as a personal judgment of "how well one can execute courses of action required to deal with prospective situations" Expectations of self-efficacy determine whether an individual will be able to exhibit coping behavior and how long effort will be sustained in the face of obstacles. Individuals who have high self-efficacy will exert sufficient effort that, if well executed, leads to successful outcomes, whereas those with low self-efficacy are likely to cease effort early and fail⁶.

Conclusion

Mix method research study both quantitative and qualitative data for traffic accident prevention behavior among senior people by applying self efficacy theory among 400 senior people in Khon Kaen municipality, Northeast of Thailand. The results show that self efficacy and expect outcome score in high level and car driving in moderate level. Meal while The characteristic variables correlation with safety behavior of car driver elderly are sex, education, duration of car driving, main occupation, Income/month, and car driving license. And the variable correlation of traffic safety behavior were self-efficacy of driving elderly, and expect outcome of car driving of elderly, including car driving behavior of elderly.

Recommendation

1. Recommendation for further research

1. Self efficacy of car driving make senior people freedom and confident to transportation.
2. Increase concern for safety driving skill among senior people are very important.
3. People who have experience of car accident need to empowerment and support to continue driving carefully.

4. Closely monitoring by daughter and son are need as well as car check up.

5. Learning more road, map and car including environment regularly before driving.

2. Recommendation for further research

1. Study the effectiveness of safety driving program among elderly people.
2. Create media for safety driving among elderly people .
3. Empowerment for safety driving among elderly people.

Acknowledgements.

We would like to thank ATRANS (Asia Transportation Research Society) for generously the funding that supported this research. Thanks IATSS (International Association of Traffic and Safety Science). Thanks all participants for cooperation the interviewing, Thanks Faculty Khon Kaen University for supporting. Thanks all everyone who kindly help this research successful smoothly.

References

1. WHO. (2015). **World Health Statistic 2015**. <http://apps.who.int/iris/bitstream/10665/170250/1/978924> [Retrieved 19 November 2018].
2. WHO. (2015). **Road safety in The South East Asia Region. 2015**. http://www.who.int/violence_injury_prevention/road_safety_status/2015/Road_Safety_SEAR_3_for_web.pdf [Retrieved 9 December 2018].
3. Knodel J and Chayovan N, (2008). **Population Ageing and the Well-being of Older Persons in Thailand**. <https://www.psc.isr.umich.edu/pubs/pdf/rr08-659.pdf> [Retrieved 9 August 2018].
Chaiyodsins S. (2018) (<http://www.goodlifeupdate.com/20706/healthy-body/older-drive-protect-brain/,2018>) [Retrieved 9 October,2019].



4. Promlert C. (2018) (<http://www.thaihealth.or.th/>,2018) [Retrieved 9 October,2019].
5. Bandura, A (1977). "**Self-efficacy: Toward a Unifying Theory of Behavioral Change**". Psychological Review. 84 (2): 191–215.
6. Stephan Brand, Dietmar Otte, Christian Walter Mueller, Maximilian Petri, Philipp Haas, Timo Stuebig, Christian Krettek, and Carl Haasper **Injury patterns of seniors in traffic accidents: A technical and medical analysis**. World J Orthop. (2012) Sep 18; 3(9): 151–155. Published online 2012 Sep 18.
7. National Statistic Office. (2018) <http://web.nso.go.th> [19 September 2018].
8. Sota C, Phokee W, Duangsadee S, Three-ost S, Sota P, FuKuda T. **Traffic Accident Prevention among Senior People in The Northeast of Thailand**. <https://www.dpublication.com/abstract-of-icarss/icarss-1-160/> [Retrieved 9 October, 2019].