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## ***International Conference on Sports and Exercise Science 2019***

### ***Book of Abstracts and Proceedings***



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**The Results of the Health Belief Theory Applied to Exercise Behavior in  
the Elderly: The Case Study of the Elderly Club, Public Health Service  
Center 22, Pak Bo Temple, Bangkok**

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**Abstract- Purpose:** This research was to study the effects of the application of the Health Belief Theory on exercise behavior in the Elderly. **Methods:** The samples were 22 people aged between 60-80 years, equally divided into Experimental Group, EG, participating the program, and Control Group, CG without participation. Every Tuesday and Friday, EG got training on the Health Belief Theory for 30 minutes, and exercised for the elderly for 30 minutes, a total of one hour session per day, a total of 7 sessions over 4 weeks. The questionnaires with content validity of 0.72, and Cronbach's alpha coefficient of 0.73 were used before and after the experiment. Descriptive statistical analyses were used together with paired t-test and independent t-test. **Results and Discussion:** It was found that the EG had higher average perception score of the exercises benefits and the hindrance perception to exercise as well as better exercise behavior after the experiment at 0.05 level of significance compared to those of CG.

**Conclusions:** The success of applying the Health Belief Theory to exercise behavior in the elderly resulted from integrating sports science and recreation principle to bring easy yet effective exercise to promote health and make fun for creating understanding, knowledge, entertainment and better health behavior changes for the elderly.

**Keywords—** Health Belief Theory, Physical Activity, Elderly.

## I. INTRODUCTION

Advances in science, technology, medical and healthcare have made people live longer and more elderly population. Thailand will enter complete aged society in 2021 with more than 20% of population older than 60 years [1]. Deterioration of bones, muscles and joints in conjunction with loss of neuromuscular coordination and balance cause probable injuries from



falling, leading to capacity and functionality loss, and reducing quality of life upon getting older. Therefore exercise in the elderly is necessary as per recommendation from WHO, but exercise habits in Thai elderly are declining in percentage [2]. Health Belief Theory can be applied to improve health behavior by perceiving that one is at risk to be sick, and may severe to be life-threatening, then one needs to take action to mitigate those adversaries by perceiving the benefits of so doing and obstacles that may hinder one from achieving desired behaviors. [3]

Therefore it is interesting to apply Health Belief Theory to exercise behavior in the elderly by integrating sports science and recreation principle to bring easy yet effective exercise to promote health and enhance behavior changes for the elderly.

## II. METHODS

This study is quasi-experimental research with Experimental Group, EG, and Control Group, CG, pre-posttest design on applying Health Belief Theory to exercise behavior of the elderly. EG will received Health Belief Activity Program every Tuesday and Friday for 30-minute lecture and 30-minute entertaining exercise for the elderly, a total of one hour per sessions, and a total of seven sessions in four weeks, while CG continued their normal usual life.

### Population and samples:

Population are aging people from 60 to 80 years from Public Health Service Centre 22, and sample size was calculated by G Power software Version 3.1.9.2 with desired power of 0.95, significant level of 0.05, and effect size of 1.49 to be 18 people and rounded up and drop-outs to be 22 people divided equally into the Experimental Group, EG, participating the program and Control Group, CG.

### Research tools:

#### 1. Intervention

1<sup>st</sup> week: Tuesday-7.5.2019

“Understanding Fitness in the elderly” Program: lecture and fitness test of EG according to SATST norms by assessing body weight, height, blood pressure, body fat, grip strength, sit-and-reach, 30-second chair stand and Osness balance test

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1<sup>st</sup> week: Friday-10.5.2019

“No mind change aging” Program: lecture on aging physiological and mental change, and preliminary stretching exercise with circle rubber chain for 30 minutes.

2<sup>nd</sup> week: Tuesday-14.5.2019

“Falling Prevention Medicine” Program: lecture on all possible causes of fall in the elderly and practice falling prevention exercise for 30 minutes.

2<sup>nd</sup> week: Friday-17.5.2019

“Flexible stretching” Program: lecture on breathing exercise, relaxation practice and Yoga for the elderly and practice for 30 minutes.

3<sup>rd</sup> week: Tuesday-21.5.2019

“Aging strength with resistance” Program: lecture on strength training and practice with circle rubber chain for 30 minutes.

3<sup>rd</sup> week: Friday-24.5.2019

“Aerobic age forgetting” Program: lecture on introducing aerobic exercise and practice low-impact aerobic exercise in combination with circle rubber chain for 30 minutes.

4<sup>th</sup> week: Tuesday-28.5.2019

“Health rhythm” Program: lecture on exercise in combination with folk play – Lao Kra Tob Mai – and practice for 30 minutes.

2. Three-part questionnaire – 6 demographic data, 4 areas of perception and 10 health behaviors – with IOC of 0.72 from 3 experts and reliability tryout with Cronbach's Alpha Coefficient of 0.73 were used for pre and posttest and further analyzed with paired t- test and independent t- test.

### III. RESULTS

Demographic data: Experimental Group was 81.8% female with 36.4% in the age range from 60 to 64 years and 45.5% with maximum education level of primary school, whereas Control Group was 72.7% female with 36.4% in the age range from 70 to 74 years and 36.4% with maximum education level of diploma.

Experiment data: Comparisons of averages of various perception and exercise behavior within and between Experimental Group and Control Group before and after the experiment will be compiled and discussed in the following tables.

**Table 1** Comparisons of averages of various perception and exercise behavior within Control Group and Experimental Group before and after the experiment.

Variables	Control Group (n = 11)			Experimental Group (n = 11)		
	$\bar{X} \pm S.D.$	t	p-value	$\bar{X} \pm S.D.$	t	p-value
1. Risk perception						
Before	2.48±0.41			1.95±0.49		
After	2.35±0.37	2.76	0.02*	2.11±0.39	-0.83	0.42
2. Severity perception						
Before	2.35±0.35			1.94±0.81		
After	2.12±0.28	2.17	0.06	2.26±0.35	-1.59	0.14
3. Benefit perception						
Before	2.25±0.39			2.14±0.49		
After	2.05±0.33	2.01	0.07	2.47±0.30	-3.59	0.00*
4. Obstacle perception						
Before	1.69±0.81			1.44±0.59		
After	1.98±0.34	-1.64	0.13	2.35±0.31	-4.85	0.00*
5. Exercise behavior						
Before	1.81±0.61			1.74±0.56		
After	1.58±0.59	1.34	0.21	2.08±0.39	-2.34	0.04*

\* at 0.05 level of significance.

From Table 1, by comparing the results of the Perception and Exercise Behavior Program at The Elderly Club, Public Health Service Center 22, Pak Bo Temple, Bangkok between Control Group, CG and Experimental Group, EG, in four areas of perception, namely, risk, severity, benefit and obstacle in addition to exercise behavior, it was found that after experiment, EG has statistically increased in benefit and obstacle perception as well as exercise behavior than before experiment at 0.05 level of significance, while CG has reduced in risk perception.

**Table 2** Comparisons of averages of various perception and exercise behavior between Control Group and Experimental Group before and after experiments.

Variables	Before Experiment (n = 11)			After Experiment (n = 11)		
	$\bar{X} \pm S.D.$	t	p-value	$\bar{X} \pm S.D.$	t	p-value
1. Risk perception						
Control Group	2.48±0.41			2.35±0.37		
Experimental Group	1.95±0.49	-2.73	0.01*	2.11±0.39	-1.50	0.15
2. Severity perception						
Control Group	2.35±0.35			2.12±0.28		
Experimental Group	1.94±0.81	-1.57	0.13	2.26±0.35	1.06	0.30
3. Benefit perception						
Control Group	2.25±0.39			2.05±0.33		
Experimental Group	2.14±0.49	-0.55	0.59	2.47±0.30	3.10	0.01*
4. Obstacle perception						
Control Group	1.69±0.81			1.98±0.34		
Experimental Group	1.44±0.59	-0.84	0.41	2.35±0.31	2.62	0.02*
5. Exercise behavior						
Control Group	1.81±0.61			1.58±0.59		
Experimental Group	1.74±0.56	-0.29	0.77	2.08±0.39	2.33	0.03*

\* at 0.05 level of significance.

From Table 2, by comparing four areas of perception, namely, risk, severity, benefit and obstacle in addition to exercise behavior, it was found that before experiment, CG had statistically more risk perception than EG at 0.05 level of significance, however after experiment, EG had more benefit perception and obstacle perception as well as better health behavior than CG.

**Table 3** Comparisons of averages of various perception and exercise behavior before and after experiments between Control Group and Experimental Group.

Variables	Before Experiment (n = 11)		After Experiment (n = 11)	
	$\bar{X} \pm S.D.$	Level	$\bar{X} \pm S.D.$	Level
1. Risk perception				
Control Group	2.48±0.41	Very Good	2.35±0.37	Very Good
Experimental Group	1.95±0.49	Good	2.11±0.39	Good
2. Severity perception				
Control Group	2.35±0.35	Very Good	2.12±0.28	Good
Experimental Group	1.94±0.81	Good	2.26±0.35	Very Good
3. Benefit perception				
Control Group	2.25±0.39	Good	2.05±0.33	Good
Experimental Group	2.14±0.49	Good	2.47±0.30	Very Good
4. Obstacle perception				
Control Group	1.69±0.81	Good	1.98±0.34	Good
Experimental Group	1.44±0.59	Fair	2.35±0.31	Very Good
5. Exercise behavior				
Control Group	1.81±0.61	Good	1.58±0.59	Good
Experimental Group	1.74±0.56	Good	2.08±0.39	Good

From Table 3, by comparing four areas of perception, and exercise behavior between CG and EG before and after experiment, it was found that

1. CG's risk perception was very good both before and after the experiment, while that of EG was both good.
2. CG's severity perception was very good before and good after the experiment, but that of EG was good before and very good after the experiment.
3. CG's benefit perception was good both before and after the experiment, while that of EG was good before and very good after the experiment.
4. CG's obstacle perception was good both before and after the experiment, while that of EG was fair before but very good after the experiment.
5. Exercise behavior of both CG and EG were good before and after the experiment.

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#### IV. DISCUSSION

It was found that after the experiment the elderly from Public Health Service Centre 22, Pak Bo Temple, Bangkok, the Experimental Group had statistically higher average scores in four areas of perception, namely, risk perception of no exercise, severity perception of the consequences of no exercise, benefit perception of exercise and obstacle perception of exercise hindrance at 0.05 level of significance in accordance with the hypotheses of this study based on the application of The Health Belief Theory compared to insignificant changes in the Control Group.

Findings in this study complied with the Health Belief Theory in that perception of a person determines his behavior as one will do what one is satisfied to do and thinks that it will create good things to oneself and stay away from things one does not want [4]. As health belief has positive impact towards health behavior, activity setup in providing knowledge and exercise have been arranged as per key components in health belief of the elderly, namely, risk perception of no exercise, severity perception of the adverse consequences of no exercise, benefit perception of exercise, and hindrance perception of exercise. The Experimental Group participated in program activities for seven sessions of sixty minutes each for four weeks on each Tuesday and Friday. Each session was 30-minute lecture on health belief topics and 30-minute exercise and recreational activities comprising 5-minute warmup, 20-minute elastic band exercise, and 5-minute muscle relaxation. Exercise instruction manuals with content and pictures with easy explanation and complete activity program were made available for all participants to accompany and review their exercise and activities. The Experimental Group was also assigned to lead exercise to other group member on one extra day per week in addition to Tuesday and Friday to make three-day program per week. Aforementioned activities have made the Experimental Group perceive the benefit and hindrance of exercise in accordance with Atipong Pimdee [5] in his study of the effectiveness of Health Education Program by applying Health Belief Model and Social Support with Paslop Dancing Exercise for Falling Prevention in Pre-aging Thai Female Roi-et Province and found that after the experiment the Experimental Group had significantly better perception of benefit and hindrance of exercise than before the experiment and more than the Control Group at 0.01 level of significance.

Furthermore the Experimental Group has increased their exercise behavior due to wide varieties of exercise causing fun and continuing participation in accordance with the Pornchai Jullamet [6] in his study of the effects of the application of Health Belief Model in exercise with Health Circle Rubber Chain and Nine-Square Table on health-related physical fitness and well-being of chronically ill community-dwelling older persons that the Experimental Group had significantly better well-being scores than before the experiment and more than the Control Group at 0.01 level of significance. This was also in accordance with activity theory of Kossuth and Bengtson [20] in sociological theories of aging in that performing activities cause satisfaction in life, motivation in building interpersonal relationship and by maintaining continuous activities, and ability to do daily routine by oneself make one perceives of well-being. Healthy body promotes life-satisfaction in the elderly and achieves positive self-concept. Therefore success in this program resulted from integrating sports science and recreation principle to bring easy yet effective exercise to promote health and make fun for creating understanding, knowledge, entertainment and better health behavior changes for the elderly.

## V. CONCLUSION

Suggestions from research results:

Application of Health Belief Theory has significantly enhanced exercise benefit perception and obstacle to exercise perception as well as improved exercise behavior in the elderly. Therefore researchers should increase collaboration among participants and researchers in designing and trying new activities to increase positive perception and exercise effectiveness suitable for the elderly physically and mentally.

Suggestions for future researches:

1. Increase program duration for long term benefit, better adherence and sustainable effective exercise for the elderly.
2. Increase collaboration among researchers and participants in activity design and try-outs for more creative, innovative, entertaining and effective program.
3. Create activity network for expanding to other areas.

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