The Development of Rehabilitation and Promotion of Healthy Aging Park

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Abstract

The objective of this research was to develop the rehabilitation and promotion of Healthy Aging Park. There were three consecutive phases in this research: to study the health status and health problems of the elders in the community, to develop and design Rehabilitation and Promotion Healthy Park for elders, and to study the results of the utilization of the Rehabilitation and Promotion Healthy Aging Park. The sample group of the survey of health status and problems were 69 elders while 80 elderlies were for the physical fitness test and 31 elderlies were for testing exercises at Rehabilitation and Promotion Healthy Aging Park for three months. The samples of this research were selected by voluntary technique. Questionnaires and an evaluation form as the instruments were used in this research. Index of Item Objective Congruence (IOC) was employed as a procedure for evaluating the questionnaire's content validity. Moreover, the quantitative data were evaluated by using frequency, mean, standard deviation, percentage, and Paired-Samples T-Test.

It was found that most of the elderlies had underlying disease (54.86%) such as diabetes, hypertension, high cholesterol, and allergy. Males physical fitness test results had very low leg strength, moderate arm strength and shoulder flexibility. Females had very low back flexibility, low leg strength and very low of both shoulder flexibility. The results were applied for the designing of the Rehabilitation and Promotion Healthy Park that fits community demands. This park consisted of three stations: 1) rehabilitating and enhancing shoulder and arm flexibility; 2) rehabilitating and enhancing shoulder and arm strength; and 3) rehabilitating and enhancing legs strength. After 31 elder volunteers' three months of continuous exercises at the Rehabilitation and Promotion Healthy Park, male volunteers increased their physical fitness, only leg strength, at the level of significance ($p < .05$). Female volunteers' physical fitness, back flexibility, leg strength, arm strength and left shoulder flexibility, increased at the level of significance ($p < .05$). The satisfaction of samples and stakeholders on the Rehabilitation and Promoting Healthy Aging Park was very high, at the level of "strongly required". All three stations in the Development Rehabilitation and Promoting Healthy Aging Park could be utilized to reach the goal of success in community promotion of aging health and physical fitness.

Keywords: The Rehabilitation and Promotion Healthy Aging Park, Elderlies

Introduction

According to the citizen surveys in B.E. 2560, it is found that the number and the proportion of elderlies have been rapidly increasing. Compared with B.E. 2550, the proportion of the elderlies has been found to be 9.4 percent of the country's citizens. In B.E. 2560, such proportion has been increased to 16.7 percent. In addition, Thailand has completely stepped into the Aging Society. It is predicted that the number of the elderlies will become 14.9 million in B.E. 2568, which is considered to be two times the number of the elderlies. In B.E. 2552, ageing society was considered as having a higher number of elderlies (those who were older than sixty years old) for more than 10 percent of the whole citizen while children and labors were continuously decreased so that it became the "Complete Aged Society". When the number of the elderlies was more than 20 percent of the whole citizen, it became the "Super Aged Society" in B.E. 2561. It has been also predicted that there would be more than 28 percent in B.E. 2574 (National Statistical Office, Ministry of Digital Economy and Society, 2018; Foundation of Thai Gerontology Research and Development Institute (TGRI), & Institute for Population and Social Research,

Mahidol University, 2016). The circumstance of being the Aging Society causes several effects including physiological, emotional, cognitive, social status, and economic; which effects on living lives. Elderlies ought to adjust themselves because those changes all effect on quality of life. This is considered a challenging issue to take care of this group of people due to the fact that they usually face health problems which are different from other groups of people. This is because being older is going back to getting sick easily. In addition, most of Thai elderlies are low educated which results to the lack information and basic knowledge to protect and take care for their own health since young to older. This is the life-long consequence. It has been found that the first three groups of disease mostly found in elderlies are Musculoskeletal system, Respiratory tract, and Heart and Cardiovascular disease. Currently, there are some preparations for qualified Aging Society by identifying as one strategy of the 10th National Economic and Social Development Plan and The 2nd National Plan on The Elderly (2002-2021), in which includes four major strategies: Readiness preparation of the people for their quality ageing, Strategy on the elderly promotion and development, Strategy on the social safeguards for the elderly, Strategy on management of developing the national comprehensive system for undertakings and developing the personnel for the elderly involving missions (Foundation of Thai Gerontology Research and Development Institute (TGRI), & Institute for Population and Social Research, Mahidol University, 2016; National Elderly Committee, Ministry of Social Development and Human Security, 2010).

Therefore, the development of elderlies' life quality together is the matter that several sections should cooperate. Elderlies are considered a sensitive group in which their bodies are getting degenerated, both bodies and minds change, and organs are getting deteriorated. According to the survey of elderlies' health condition in the country, it is found that there is a large number of elderlies facing with hypertension, insomnia, flue-like syndrome, frozen shoulder, vertigo, Amyotrophic Lateral Sclerosis, etc. Ministry of Health introduces the Plan of the Elderly with a purpose that elderlies can live their lives appropriately (Bureau of Health Promotion, Department of Health, Ministry of Public Health, 2013). According to the researched data, elderlies have faced health problems and suffered with chronic diseases, so it effects on the loss of budget to take care and heal the people. In order to respond to the National Strategy (B.E. 2560-2570), which desires to encourage the elderlies to become a part of key driving force for national growth, it is worth building a process and offering community knowledge sharing by developing elderlies' health promotion places in the form of rehabilitation and promotion of the elderlies' health park. The park should be clear with its form and appropriate for health education. This is aimed for general people, especially elderlies, to be able to access information and knowledge about health and to exercise accurately according to their health conditions. This will be a method to health elderlies to have a good health and life quality so that they can reduce the state of being dependent and save the cost of curing diseases.

The researcher is interested in studying to create a process and to offer the learning opportunity to the people, especially elderlies, by introducing a health promotion place. Therefore, the researcher develops the elderlies' health promotion place to become the rehabilitation and promotion of health which contains a clear form for health study. An architecture principle for community usage by Walaisathien (2018) is applied in order to facilitate the elderlies to have a space for relaxing and doing exercises. Together with the principles of parks to physical activity and public health by Division of Physical Activity and Health, Department of Health, Ministry of Public Health (2014), the aspects of administration, responding users, and physical management are employed as the bases to develop rehabilitation and promotion of the elderlies' health in order for the people, especially elderlies, to be able to access information about health. Moreover, that place motivates and facilitates about health development of

elderlies who are in the remote places and lack opportunities so that it becomes health behavior adjustments for the good quality of life.

Objectives

1. To develop and build a health rehabilitation and promotion park for the elderlies in a community
2. To study the results of the park's utilization

Instruments and Methodology

This is a research and development study conducted with data collection through documents and structure interview as well as an experimental research, which examines only the sample group for the results of the study. The study is classified into three phrases as described below.

Phrase 1: The survey of basic information of the elderlies about the health status and physical performances, health behavior on doing exercises, and knowledge on exercises, was conducted within the sample community in Kamphaeng Saen District, Nakhon Pathom Province. The experts for discovering the community problems and model for the park design verified the structure interview in this phrase.

Sample Group: The sample group consisted of 69 elderlies who were older than 60 years old via volunteering method to answer the interview about health behavior, and 80 elderlies to take the physical performance test.

Study Tools: The study applied an interview form of health behavior (made by the researcher and verified by five experts which the Index of Item-objective Congruence: IOC is 0.94), and a test and physical performance indicator for 60-89-year-old elderlies (Department of Physical Education, Ministry of Tourism and Sports, 2016).

Phrase 2: The development and design of the health rehabilitation and promotion park for elderlies. The researcher went to survey the area in order to make a plan of health rehabilitation and promotion park for elderlies in which is suitable with the results of Phrase 1. The operation of this phrase is classified into four steps as follows:

1. Develop and design the health rehabilitation and promotion for elderlies that is in accordance with the area condition, the information of health status and physical performance, and the health behavior of doing exercise from the results of Phrase 1. The researcher applied the principles of parks to physical activity and public health by Division of Physical Activity and Health, Department of Health, Ministry of Public Health (2014), which emphasize the aspects of administration, responding users, and physical management, together with the architecture principle for community usage by Walaisathien (2018) in accordance with the health problems and the community elderlies' demand based on the results of the Phrase 1.

2. Build the health rehabilitation and promotion park for elderlies, consisting of three stations in the area being responsible by Wang Nam Khiao Health Promoting Hospital, Kamphaeng Saen District, Nakhon Pathom Province. The area was selected via purposive sampling based on the area readiness and the community demand. Then, the researcher examined the utilization and makes a manual.

3. Make a manual for stations utilization and the knowledge management of health in the form of information science system and electronic manual.

4. Investigate the quality of the tool for "health rehabilitation and promotion park for elderlies", the manual for the stations utilization, and knowledge management of health in the form of information science system and electronics manual via Data Triangulation (Gratton & Jones, 2004). This step aimed to assure the accordance of the information by verifying the survey data documents and observation and interview data of related people, and

to test the participating utilization in order to obtain the reliable and accurate data in which cover the context of the development of the health rehabilitation and promotion park for the elderlies' life quality improvement before using with the elderlies within the area.

The sample group of the study consisted of five experts on appropriateness verification and possibility of the area accordance and the utilization, and the utilization manual. The sample group for the experiment of exercising tools utilization in the park consists of 10 people.

The study tools consisted of the evaluation form of the health rehabilitation and promotion park for elderlies, as well as the evaluation form of the stations utilization and the knowledge management on health.

Phrase 3: The study of the results of the utilization of the health rehabilitation and promotion park for elderlies through the examination of doing exercises was based on the manual for three months. It evaluated the park performance and studied the results of the utilization in the physical aspects. This phrase offered a workshop for the sample group before the utilization.

The sample group consisted of 31 elderlies from Wang Nam Khieo Sub-district Administrative Organization via volunteering to do exercises at the health rehabilitation and promotion park for elderlies for three months. The sample group went through the physical 4-content tests both before and after doing exercises. The evaluation of satisfaction on the park utilization was also applied in this phrase.

The study tools were: (1) the health rehabilitation and promotion park for elderlies, created by the researcher, which consists of 3 stations; and (2) the test and physical performance test for 60-89-year-old elderlies (Department of Physical Education, Ministry of Tourism and Sports, 2016). The test consisted of: 1) sit and reach test to evaluate the flexibility of the back and the hamstring; 2) 30-second chair stand test to evaluate the strength and tolerance of the leg muscle; 3) 30-second-arm curl test to evaluate the strength and tolerance of the arm muscle; and 4) back scratch test to evaluate the flexibility of the shoulder. The evaluation of the park utilization satisfaction was also applied in this step.

This study was approved on human ethics by the Committe of Human Subject Research, Kasetsart University. The research was conducted under the project code: KUREC-HS62/101 on April 9, 2018.

Data Analysis and Statistics

1. Percentage, mean, and standard deviation were calculated by using the data from the survey of the elderlies' health improvement problems and obligations, the basic behaviors in doing exercises, knowledge about exercises, health status, and physical performance.

2. Validity was calculate to consider the appropriateness of the contents, cover, and accordance by investigating the Index of Item Objective Congruence (IOC) of the experts to the park and the manual.

3. Qualitative data was analyzed via content analysis.

4. The data analysis was verified for the validity by triangulation technique with the perspective of the "health rehabilitation and promotion park for elderlies", the manual of stations utilization, and knowledge management on health in the form of information science and electronics manual.

5. The test of four physical performances was analyzed both before and after the park utilization by Paired-Samples T-Test through a calculation with an instance program.

Result

The results of the study of the development of health rehabilitation and promotion park for elderlies are explained as follows. According to the health behavior information based on the interview of 69 samples, it has been found that there were 39 males, 56.52 percentage, whose average age was 68.90 years old; and 30 females, 43.48 percentage, whose average age was 67.70 years old. It was 54.86 percent of the sample that had underlying disease: 36.83 percent had diabetes with hypertension, etc.; while 16.28 percent had hypertension with hyperlipidemia, etc.; and 1.75 percent had asthma, allergy, and artherosclerosis. 92.73 percent of the sample did exercises by walking for 72.73 percentage. 47.5 percent of the sample had knowledge about doing exercises while 8.9 percentage didnot, and no information for 12.6 percentage. Regarding the exercising behaviors, it has been found that 35 percent of the sample rarely did exercises while 7 percent did it occasionally, 7.75 did it sometimes, and 19.25 did exercises regularly. The regular exercising behavior was 52.17 percentage of house working and occupation while 73.91 percent of the sample never did which means they never did exercises or sports. Regarding the information of physical information, it has been found that elder males' leg strength was very low; while the arm strength and shoulder flexibility were in the fair level. On the other hand, females' back flexibility and the leg strength were in a low level, while the shoulder flexibility was found very low.

According to the community survey, it was found that Wang Nam Khieo Sub-district Health Promotion Hospital, Kampaeng Saen District, Nakorn Pathom Province, was the area where the elderlies were interested in and able to attend the participating exercises, as well as there were public health staff who could take care of them. Therefore, it was selected as a sample area by considering the feature and size of the area to design this 135-square-meter lawn as the health rehabilitation and promotion park for elderlies for this study. The elderlies' health and exercising behavior, problems and threats of health development, knowledge about doing exercises, and health status and physical performances collected in Phrase 1 were also co-considered with the purpose of this park design.

The researcher team applied the information as the conceptual framework to consider the design of the park with the information from literature review. The design also employed the principles of users responses management, physical management, and the public park design based on the principle of architecture (Walaisathien, 2018) in accordance with the community elderlies' health problems and demands. Based on the data collection, the researcher team built the health rehabilitation and promotion for elderlies that emphasized physical performance development, including strengthening muscles; back, hips, and hamstrings flexibility; and shoulder flexibility. It aimed to help the elderlies do activities based on their ages and reduce the seriousness of underlying disease. This park building was verified by sports scientists, public health officers and engineers, in which its purpose was to be the place where the elderlies could attend the participating exercises. This park took three months of building in the area of Wang Nam Khieo Health Promotion Hospital. The park consisted of three stations as shown below.

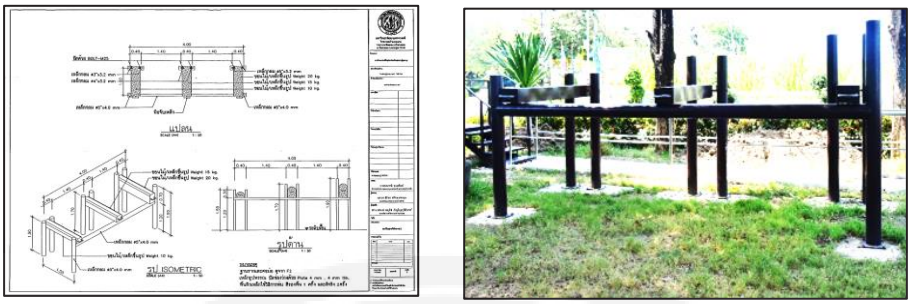

Figure 1 Rehabilitating and Enhancing Shoulder and Arm Flexibility Station

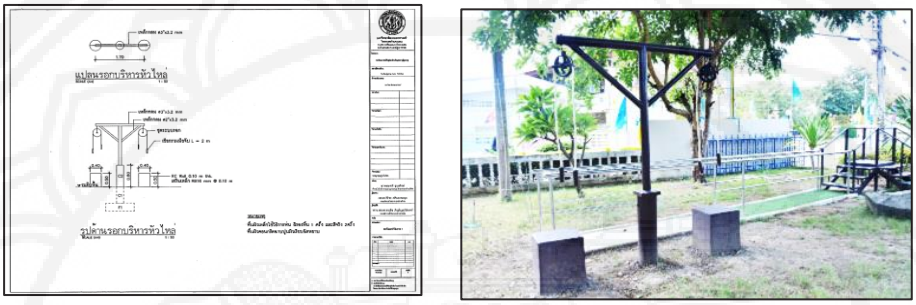

Figure 2 Rehabilitating and Enhancing Shoulder and Arm Strength Station

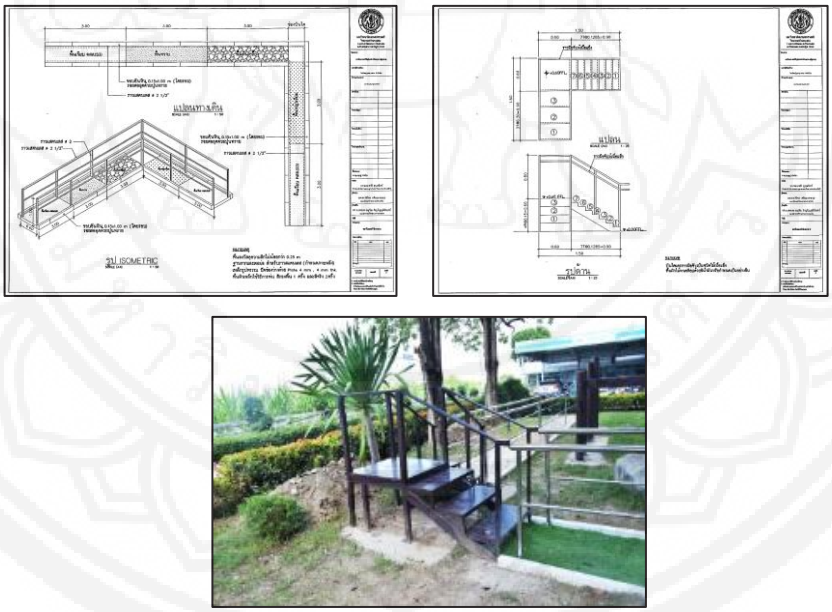

Figure 3 Rehabilitating and Enhancing Legs Strength Station

A manuscript and video clips were made for the elderlies to access the information easily which they did exercises correctly and safely with the highest benefit of physical development. Each station included contents and knowledge about health for elderlies in the form of information science and electronic manuscripts, and the LINE bot system via a smartphone as shown below.

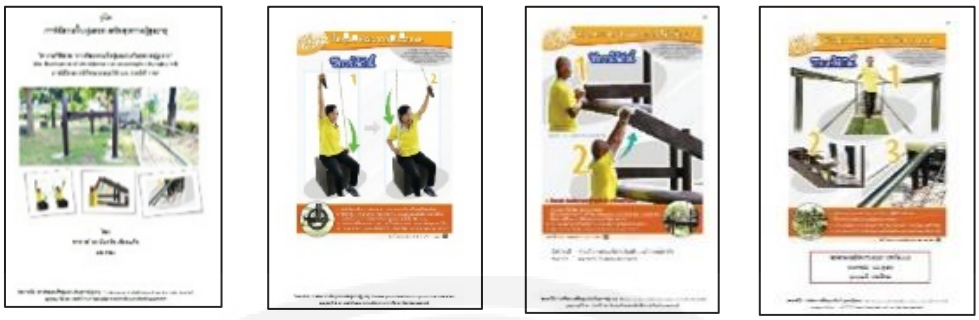

Figure 4 The Example of the Manuscript

Figure 5 The Electronic Manuscript in the Form of LINE Bot System

The manuscript was verified for its reliability in the aspects of content accuracy and tool appropriateness before real usage by experts, which revealed that its contents were accurate. The experts also gave some suggestions to check the completeness and safety for the most beneficial usage, to set up a large signboard of each station's usability, and to invite the staff from Wang Nam Khieo Health Promotion Hospital to attend the workshops in order to help informing the elderlies and other people.

The workshop on operation was related to staff and the group of sample of 31 people, who volunteered to do exercises at the health rehabilitation and promotion park for elderlies for three months and attended physical fitness test before and after using the stations. The results revealed as follows.

Table 1 Comparison of Females' Physical Fitness Test Before and After Using the Health Rehabilitation and Promotion Park for Elderlies

Details	n	$\bar{x}$	Levels of Physical Performance	S.D.	t	Sig
Back and Leg Flexibility (Hrs.)						
Before using the stations	25	7.48	Fair	8.79	-4.92	.000
After using the stations	25	10.36	Good	9.26		
Leg Muscle Strength (Times)						
Before using the stations	25	13.52	Low	4.11	-2.753	.011
After using the stations	25	15.20	Low	5.39		
Arm Muscle Strength (Times)						
Before using the stations	25	13.64	Good	3.95	-3.361	.003
After using the stations	25	16.36	Very Good	4.40		
Right Shoulder Strength (Right Hand Upside) (Hrs.)						
Before using the stations	25	18.56	Fair	8.74	.613	.546
After using the stations	25	18.24	Fair	8.28		

Table 1 (Cont.)

Details	n	$\bar{x}$	Levels of Physical Performance	S.D.	t	Sig
Left Shoulder Strength (Left Hand Upside) (Hrs.)						
Before using the stations	25	23.16	Fair	7.80	2.274	.032
After using the stations	25	22.20	Fair	7.49		

p < .05

Table 2 Comparison of Males' Physical Fitness Test Before and After Using the Health Rehabilitation and Promotion Park for Elderlies

Details	n	$\bar{x}$	Level of Physical Performance	S.D.	t	Sig
Back and Leg Flexibility (Hrs.)						
Before using the stations	6	-3.83	Low	8.86	-1.784	.135
After using the stations	6	-1.50	Low	9.85		
Leg Muscle Strength (Times)						
Before using the stations	6	18.33	Low	9.29	-4.339	.007
After using the stations	6	21.00	Low	10.04		
Arm Muscle Strength (Times)						
Before using the stations	6	18.00	Very Good	5.37	-.473	.656
After using the stations	6	18.50	Very Good	4.18		
Right Shoulder Strength (Right Hand Upside) (Hrs.)						
Before using the stations	6	37.00	Very low	16.83	1.569	.177
After using the stations	6	33.67	Very low	13.32		
Left Shoulder Strength (Left Hand Upside) (Hrs.)						
Before using the stations	6	38.33	Low	13.22	2.314	.069
After using the stations	6	33.50	Low	10.13		

p < .05

Table 3 Mean and Standard Deviation of the Sample Group and Related Persons' Satisfactions on the Health Rehabilitation and Promotion Park for Elderlies

Details	($\bar{x}$ ± S.D.) Sample Group	($\bar{x}$ ± S.D.) Related Persons	Level of Satisfactions
1. Educating and workshop about the possibilities of the stations	2.84 ± 0.37	2.60 ± 0.97	High
2. Manual of health information and usability of the stations	2.32 ± 1.01	2.30 ± 0.95	Fair
3. Knowledge source about health in the form of information science system and electronic manual	2.35 ± 0.84	2.80 ± 0.42	High
4. Benefits from using the health rehabilitation and promotion park for elderlies	2.65 ± 0.75	2.90 ± 0.32	High
Total	**2.54 ± 0.74**	**2.65 ± 0.67**	**High**

Conclusion and Discussion

The health rehabilitation and promotion park for elderlies was built into three stations, including Rehabilitating and enhancing shoulder and arm flexibility station, Rehabilitating and enhancing shoulder and arm strength station, and Rehabilitating and enhancing legs strength station, under the limitations of area and budget. The area was adapted based on budget and landscape in order to response the behaviors and health problems of the user, which employed the standard of public health for doing exercises by Division of Physical Activity and Health, Department of Health, Ministry of Public Health (2014). This design was in accordance with the principles of community public park design (Walaisathien, 2018) in the form of dynamic parks. There should be clear activities appropriate to the area and the community demands. The location should be near the community, 0.8-2.4 km. from the housing area. Therefore, there is the first aid area and emergency medical service. Locating the health rehabilitation and promotion park for elderlies in the area of Wang Nam Khieo Health Promotion Hospical, Kamphaeng Saen District, Nakhon Pathom Province, was an appropriate place to be developed as the community health rehabilitation and promotion park for elderlies. This design of exercising stations applied materials based on the elderlies' health problems. The information from the survey revealed that the percentage of the elderlies who had chronic disease was 61.40 percent, which was not communicable disease but physical degeneration. This park slowed down the seriousness of the diseases and rehabilitate physical performance by doing exercises. The health rehabilitation and promotion park for elderlies was built in accordance with the health problems and society conditions, in which emphasized on the development of strengthening arms and legs muscle which was the gross motor as well as shoulder flexibility. It could adjust frequencies and time of doing exercises in order to improve the performances of cardiovascular system, which emphasized of the physical changes. As reported by Cotton & American Council on Exercise (1998); Heyward & Gibson (2014) about key structural and function changes of the elderlies, the elderly's anatomy and physiology tend to be degenerated; the heart and lung performances become weaker; bodies' abilities to adjust and recover with the environment are lower; muscle can be easily weakness; bones, joints and ligament are degenerated; the chance of muscular pain is high; balancing acts and muscles performances are worse, etc. Like American College of Sports Medicine (2017), it reveals that the obvious change is the nervous system change which the size and amount are reduced so that the ability to feel is slower; sense is defected; loss feeling of pain; and reactions get slower, etc. Structural changes cause of calcium decalcification so that so that easily to osteoarthritis and deformity, ostealgia; which results in limited movements, muscle weakness and reduced performance. In the aspect of heart, it results in the slower heart rates, lower systole and enlarged heart, which results in reduced stroke volume and blood circulation, causing of vessel narrow, aortic stenosis, vascular disease, in conjunction with decrease pulmonary circulation and slower breathing rate result in dyspnea and getting tired easily. Those are in accordance with Samahito (2007) that has concluded that elder people's perception will be reduced or lost, in which results in the ability changes of seeing, listening, smelling, testing and touching. When the reactions time is reduced, the reposes for things take longer time; and it tends to be tiring and easy to be sick but hard to be recovered. If it takes longer, they will be weakened or found having chronic diseases in elderlies including knee osteoarthritis, heart disease, hypertension, osteoporosis, diabetes, allergy, cancer, parkinson's disease, and short-term memory or Attention Deficit Hyperactivity Disorder (ADHD). According to the changes based of ages, if there is a constant health care and promotion well and appropriately with ages, it becomes the grant of body strengthening, the delay of getting into degenerate state, the reduction of incurrent diseases or chronic diseases, and the reduction of dependent state. A good health promotion methodology is to do exercises in

accordance with the physical performance test of the sample group after using the health rehabilitation and promotion park for elderlies built by the researcher team. The test took three months for four aspects: Sit and Reach, to evaluate the flexibility of the back and leg. The results of the test reveal that elder females has (Table 1) of the lower back and leg flexibility, strength leg muscle, the strength of the arm muscle; while the flexibility of the shoulder shows significantly statistical difference only when the right arm is upside whereas no differences with the left arm. For the elder males, there are significantly statistical differences (Table 2) only the leg muscle strength, while other body performance results have no significantly statistical differences. However, when considering the mean, it manifests that the body performances become better. Doing exercises with the stations at health rehabilitation and promotion park for elderlies obviously improves the elderlies' physical performance, in which female is found more obviously improved. Having a good physical performance is one of the indicators for good health, as suggested by Howley & Franks (1992) that doing exercises is considered the key factor for not only promoting and rehabilitating the physical performances, but also slowing down the body degeneration and senility. However, this study does not conduct deep evaluation concerning the changes of non-communicable diseases that has been found health problems of the sample group such as blood sugar and cholesterol, in which ought to be tracked in the next phrases. In the aspect of satisfactions (Table 3), the sample group has high satisfaction on informing and workshop on the usability of the stations, knowledge base about health in the form of information sciences and electronic manual, and the benefits from using the health rehabilitation and promotion park for elderlies. Furthermore, the sample group has a fair satisfactions on the manual of health information and station usability.

The method of health promotion is to improve knowledge about body changes according to ages. The problems of organs deterioration according to ages, health care, and self-adjustment with changes are the methods to keep body strength, by doing exercises, eating, learning more about health. Doing exercises is not only the key factor for health promotion and rehabilitation, it also slows down the body deterioration and senility. Even though doing exercises is beneficial for elderlies, it perhaps causes serious harms if it is done inappropriately with ages and body conditions. According to the design of this study, it can be concluded that the stations for doing exercises can improve the elderlies' body performances, is built in an appropriate location, and develop body, mind and social aspects. It the elderlies keep using this park, their health condition and body performance will become better. In conclusion, this design of health rehabilitation and promotion park for elderlies is considered a participatory innovation to develop the elderly life quality.

Suggestions

1. There should be the support and encouragement for people in the community to participate in order to develop the body performances and the highest benefits.

2. There should be a distribution to other health promotion hospitals and related organizations in order to be the model for some communities that face similar problems

3. There should be a physiology deep-evaluation relating to non-communicable diseases such as blood sugar, cholesterol and hormones.

Limitations

The study of the performances of health rehabilitation and promotion park for elderlies has been designed according to the limitations of the area size where is ready in the aspects of attending activities and budget. The sample group selection of this study cannot cover the physical and levels of health problem differences. The time period of doing exercises each time is not controlled either.

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