การประเมินความต้องการจำเป็นการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อสนับสนุนการรู้สุขภาพในศูนย์การเรียนรู้สำหรับผู้สูงอายุในกรุงเทพมหานครและปริมณฑล [1]

The Needs Assessment of Information and Communication Technology to Support Health Literacy in the Learning Center for the Elderly in Bangkok and its Vicinities

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บทคัดย่อ

การวิจัยนี้มีวัตถุประสงค์เพื่อประเมินความต้องการจำเป็นการใช้เทคโนโลยีสารสนเทศและการสื่อสารเพื่อสนับสนุนการรู้สุขภาพของผู้สูงอายุ และสร้างแนวทางการดำเนินงานของศูนย์การเรียนรู้สำหรับผู้สูงอายุเพื่อสนับสนุนการรู้สุขภาพ โดยใช้วิธีวิจัยแบบผสมผสาน เครื่องมือที่ใช้ในการวิจัย ได้แก่ แบบสอบถาม และแบบสัมภาษณ์แบบมีโครงสร้าง กลุ่มตัวอย่างที่ใช้ในการวิจัย ได้แก่ ผู้สูงอายุที่อาศัยในกรุงเทพและปริมณฑล จำนวน 434 คน และผู้เชี่ยวชาญด้านสุขภาพ ด้านผู้สูงอายุ ด้านเทคโนโลยีสารสนเทศและการสื่อสาร และด้านศูนย์การเรียนรู้สำหรับผู้สูงอายุ จำนวน 6 คน สถิติที่ใช้ในการวิเคราะห์ข้อมูล ได้แก่ ค่าความถี่ ค่าร้อยละ ค่าเฉลี่ย ส่วนเบี่ยงเบนมาตรฐาน และใช้วิธี Priority Needs Index แบบปรับปรุง ($PNI_{modified}$) ผลการวิจัยการประเมินความต้องการจำเป็น พบว่า ผู้สูงอายุมีความต้องการจำเป็นในด้านการมีศูนย์การเรียนรู้ในชุมชนเป็นลำดับแรก ($PNI_{modified}$ = 0.69) เมื่อพิจารณารายข้อของความต้องการจำเป็นด้านเทคโนโลยีสารสนเทศและการสื่อสาร พบว่า ผู้สูงอายุมีความต้องการจำเป็นในเรื่องการใช้โปรแกรมในสมาร์ตโฟนหาความรู้สุขภาพเป็นลำดับแรก ($PNI_{modified}$ = 0.97) ส่วนลักษณะของศูนย์การเรียนรู้สำหรับผู้สูงอายุเพื่อสนับสนุนการรู้สุขภาพ พบว่า ช่วงเวลาที่ผู้สูงอายุส่วนใหญ่เข้าใช้บริการ คือ ช่วงเวลา 10.00 –12.00 น. ระยะเวลาที่เหมาะสมในการจัดกิจกรรมให้ความรู้ด้านสุขภาพสำหรับผู้สูงอายุ คือ 1 ชั่วโมง และผู้สูงอายุต้องการเข้าใช้ศูนย์การเรียนรู้ด้านสุขภาพ 1 ครั้งต่อสัปดาห์ โดยต้องการความรู้ดูแลสุขภาพตนเอง พบปะพูดคุยและแลกเปลี่ยนเรียนรู้ ผู้สูงอายุชอบการเรียนรู้เป็นกลุ่ม ชอบเรียนรู้จากการดูโทรทัศน์ และใช้อุปกรณ์สมาร์ตโฟน

Abstract

This research aims to assess the needs for information and communication technology to support health literacy in the learning center for the elderly and to create a guideline of the learning center for the elderly by using a mixed research method. The research was conducted by surveying through the use of a questionnaire on 434 elderly people living in Bangkok and its vicinities and a structured interview tool with health experts, as well as experts on the elderly,information and communication technology, and on learning center, totaling 6 persons. The research statistics include frequency, percentage, arithmetic mean, standard deviation and the modified Priority Needs Index to assess needs. The results of the needs assessment found that the primary need of the elderly was to have a learning center in the community ($PNI_{modified}$ = 0.69). When considering the list of needs regarding information and communication technology, it was found that the primary need of the elderly was the need for using smartphone applications to find health-related information ($PNI_{modified}$ = 0.97). In terms of the characteristics of the learning center, most of the elderly accessed the services from 10:00 a.m. to 12:00 p.m. The appropriate duration of time for organizing health education activities is one hour, and need to use the health learning center at least one time per week, and need knowledge on how to take care of one's health, meet, chat and exchange knowledge. The elderly prefer group learning and like to learn from televisions and smartphone devices.

คำสำคัญ: เทคโนโลยีสารสนเทศและการสื่อสาร การรู้สุขภาพ ผู้สูงอายุ ศูนย์การเรียนรู้สำหรับผู้สูงอายุ

Keywords: Information and communication technology, Health literacy, The elderly, Learning center for the eldery

Introduction

Currently, Thailand is entering into an "aged society", due to changes in the population structure of Thailand, as it was found that the proportion of the elderly population has increased gradually while the working-age population that provides support and cares for the elderly is on the decline. Since 2010, there is an average of 6 working-age persons providing care for one elderly, and this will be reduced to only two persons in the year 2030. As a result, an increased burden will be imposed on the working-age population (Foundation of Thai Gerontology Research and Development Institute, 2012; 2015).

The Elderly Person Act, B.E. 2546 (2003), Section 3, has defined the elderly in Thailand, as a person who is aged 60 or above, which is the same criteria which was defined by the General Assembly on the Elderly, organized by the United Nations in 1982 (Surang Kowtrakul, 1993), the 2nd National Plan for Elderly Persons (B.E. 2545-2564), 1st amendment (B.E. 2552) (National Committee for the Elderly, 2010), states that Thai elderly tend to live longer but will suffer from illnesses or will be unable to help themselves proportionate with the increase in age. The illnesses of the elderly will be difficult to be cured and will need continuous care throughout their lifetime. Moreover, from the trend of the increase in the number and proportion of the late elderly population (aged 80 years and over), which is considered as a fully-fledged old age, physical health will naturally decline accordingly which will ultimately be unable to avoid illness and would have to rely on others. The demand for long-term care services for the elderly in the final period of their lives has increased dramatically. The elderly people tend to accept physical changes due to biological changes which cause health issues, as being natural. As they get older, they do not expect to be physically healthy young people, and thus do not care much about doing anything, and eventually end up having health problems and various illnesses. There is also a misconception that these illnesses are typical for the elderly. Currently, scientists and doctors who study aging and the aging processes have found that longevity and living a quality life, i.e. free of any illnesses, is possible, and the illnesses that are considered as "old-age" illnesses are preventable (Surang Kowtrakul, 1993).

In planning guidelines to help and solve problems for the elderly, careful attention must be made to the activities that meet the needs of the elderly as well. From the study, it was found that elderly people also have the need to study and receive information and knowledge similar to other age groups, and use it as supporting information for self-care and appropriate adaption. This is due to the fact that elderly people still desire to help themselves and be self-reliant as much as possible before becoming a burden to their children. They also want to help their children, family, and society in their own way as well. Most elderly people have a tremendous need for education or lifelong learning. Elderly people need education to promote the quality of their lives especially in terms of hygiene. Education should be provided to

enhance the quality of their lives through informational activities the most, followed by skills training activities, and basic knowledge activities respectively (Sumalee Sangsri, 1997)

In the 1st Amendment (B.E. 2552) of the 2nd National Plan for the Elderly (B.E. 2545-2564) (National Committee for the Elderly, 2010), a guideline was established which acknowledged the awareness of the needs of the elderly, which was issued as measures for the education and lifelong learning under the 1st strategy for the preparation of the population in support of quality elderly, which are 1) to promote access to, and the development of educational services and continuous learning throughout their lives, both in formal and informal education, in order to gain a better understanding of life and the development at each age level, and to be prepared to enter into old age appropriately. 2) to promote and support all types of media to have programs in support for the elderly, and support the elderly to acquire knowledge and the ability to access news and media. Under the 2nd strategy, in the promotion and development of the elderly, which are 2.1) promote and support all types of media to have programs relating to the elderly, 2.2) promote production, access to various media, and disseminating news for the elderly. 2.3) Providing access to information from various media continuously for the elderly.

Ministry of Public Health (2011), Ministry of Public Health, defines health literacy, as the ability and skill of accessing information, knowledge, and understanding for analysis, evaluate actions and manage oneself, including being able to point out personal, family, and community, health issues for good health. From research studies to improve the public health operation of the Health Education Division, the Department of Health Service Support found that one factor that helps to drive the development of people and communities to create good health is that every sector must provide the opportunity to learn and give people access to information and knowledge thoroughly and covering all areas, by providing resources to learning or the health learning center at all levels, from the provincial, district, subdistrict, and community level, with support of the operation provided centrally. There must also have coordination which facilitates work at all levels so that all people can learn by themselves, which will be an actual opportunity to learn and access public information. (Ministry of Public Health, 2015).

The Canadian Education Research Information System (CERIS), indicates that skills in using modern technology, technological literacy, media literacy, and computer literacy, are important characteristics that contribute to public health literacy (Kickbusch, 2001). The World Health Organization has defined it as, social and intellectual skills that cause the motivation and ability of a person in order to access, understand, and use the information received. In addition, at the 7th Global Health Promotion Conference, on health promotion in Nairobi, Kenya in 2009, the importance of knowing health in promoting and preserving health in support of personal health promotions, the important factors are, increasing access to health information through

information and communication technology (Benjamas Suramitmitri, 2013), because information and communication technology has provided many benefits in connecting to receiving information, and is convenient to share ideas, knowledge, experiences, and is a flexible and convenient learning tool. However, for the elderly, it is still a group that accesses and uses information technology less than other age groups due to several learning limitations, which includes 1) attitude towards technology and resistance to change, with the belief that information technology is only for young people and an attitude that they are too old to learn and the fear that they do not have the ability to learn. 2) Elderly people were born and raised before the proliferation of technology, and therefore, did not have the opportunity to experience technology in school and at work. 3) The physical condition of the elderly is deteriorated, such as vision, hearing, insanity, reduced agility in hand movements, slow response, illness, and congenital diseases, and including short-term memory loss, which is a major obstacle for most of the elderly. 4) Understanding and awareness of the importance of accessing information through information technology. During their long lives, elderly people did not come in contact much with information technology, have made them less likely to realize the importance of information technology in life, therefore, elderly people are not aware of the importance of using information technology (Saman Loyfah, 2011). Therefore, a strategy must be determined to help elderly people understand the benefits of using information technology. In learning to use information technology, elderly people are different from the learning of young children or young people born in the technological era and are familiar with the behavior of learning to use technology through trial and error, and from group-learning. While elderly people give importance to reasoning, systematic thinking, and a step-by-step process. The learning methods of elderly people have different patterns from the learning methods of other ages. Using technology that is easy to use, as a tool for elderly people to have a true learning experience arising from their constant practices, creating efficiency and assisting elderly people to learn in the long term. From all of the above priorities, this research aims to study the needs for information and communication technology to support health literacy of the elderly and the characteristics of the learning center for the elderly, so that the relevant parties may utilize it as a guideline to promote, procure, and provide services in the health learning center in the community.

Research Objectives

1. To assess the needs for information and communication technology to support health literacy in the learning center for the elderly

2. To create the guideline for the learning center to support health literacy for the elderly

Research Methodology

This research conducted the mixed-method research approach such as surveying research and interviewing experts as follows;

1. Surveying research

The population consisted of 1,816,598 people aged 60 years and over, living in Bangkok and its vicinities (Department of Geriatric Affairs, 2018). The sample group was determined to be 400 people by the use the Yamane's formula, at the confidence level of 95 percent.

Data collection is through the questionnaire about needs to use technology and communication to support health literacy in learning centers for the elderly. The questions consisted of closed-ended and open-ended questions, with Likert's 3 rating scales (Low = 1, Medium = 2, High = 3). The questionnaire had 33 items divided into 3 parts which are, 1) general data of the respondent, 2) physical health of the elderly, and 3) current conditions and the needs for information and communication technology to support health literacy in the learning center for the elderly. Subsequently, the questionnaires were given to 3 research and evaluation experts to consider the consistency of objectives, content, idioms, and suggestions, in which the researcher selected the questions with an IOC value between 0.60 -1.00. The evaluation of the experts determined the average content validity was at 0.93, which is in the appropriate criteria (Pisanu Fongsri, 2011), and reliability checking using Cronbach's Alpha Coefficient. The reliability of the whole questionnaire is 0.85. The researcher thereafter used the questionnaire to collect data with the sample group.

The researchers conducted the coordination and personally delivering the questionnaires and collecting data from 500 elderly people in the area and the elderly clubs, and received 434 completed questionnaires, which was classified into 225 from Bangkok (51.84%), and 209 copies from the vicinities (48.16%). The data was then analyzed with the use of frequency, percentage, arithmetic mean, standard deviation, and the use of the modified Priority Needs Index (PNImodified) calculated from the average value of the condition that should be (I), and the average of the actual condition (D) (Suvimol Vongvanich, 2015), to analyze the information for the necessity of the elderly to use information and communication technology in the learning center to promote health literacy.

2. Interviewing experts

The qualifications were determined for 3 groups of experts, which was categorized into, two health experts, two elderly experts, and two information and communication technology and learning center experts, totaling six persons, which were selected by purposive sampling. The researcher used a structured interview to study the opinions of experts about the need to use the information and communications technology to support health literacy in learning centers for the elderly as a means of data collection. The questions consisted of the interviewee information, characteristics

of the elderly learning center, suggestions on how to support health literacy for the elderly, the use of information and communication technology to support health literacy for the elderly, and recommendations. Thereafter, the information was analyzed by content analysis by classifying the issues or categories of ideas and conducting the analysis of the ideas.

Research Results

1. The demographics of the sample group found that the majority of the elderly samplings were 350 females (80.65%), most of the 233 elderlies were married (53.69%), followed by widows/ divorced/separated, totaling 141 persons (32.49%). 322 of the majority of the elderlies were living with their spouse or children (74.19%), 132 of the elderlies have completed primary education (30.41%), followed by lower secondary education, 76 persons (17.51%). The majority of the elderlies were no longer working, 173 persons (39.86%), followed by private businesses, 109 persons (25.12%). Most of the elderlies attended activities or are members of organizations/ clubs/ groups, 386 persons (88.94%), the number of elderlies who attended most activities of at least once a week is 136 persons (31.34%), followed by 2-3 times a week, 117 persons (26.96%).

With regards to the physical health data of the elderly, it was found that overall, the top three health issues of the elderlies were insomnia (124 persons, 28.57%), mobility difficulties (120 persons, 27.65%), and visibility issues (99 persons, 22.81%). In Bangkok, the top three elderly health issues were mobility difficulties (62 persons, 14.29%), insomnia (48 persons, 11.06%), and visibility issues, (46 persons, 10.60%). The top three health issues of the elderlies in the vicinities were insomnia (76 persons, 17.51%), mobility difficulties (58 persons, 13.36%), and visibility issues (53 persons, 12.21%). Overall, the top three medical conditions and illnesses of the elderlies were high blood pressure (217 persons, 50.00%), osteoarthritis (122 persons, 28.11%), and diabetes (83 persons, 19.12%). In Bangkok, the top three medical conditions and illnesses of the elderlies were high blood pressure (114 persons, 50.00%), osteoarthritis (77 persons, 17.74%), and cataracts (39 persons, 8.99%). The top three health issues for elderlies in the vicinities were high blood pressure (103 persons, 23.73%), diabetes (49 persons, 11.29%), and osteoarthritis (45 persons, 10.37%).

2. The assessment of the needs for the use of information and communication technology to support health literacy in the learning center for the elderly in 3 areas, which is the learning center in the community, knowledge of health, and information and communication technology. The research found that the primary need of the elderly was to have a learning center in the community (PNImodified = 0.69), followed by information and communication technology ($PNI_{modified}$ = 0.57), and health literacy ($PNI_{modified}$ = 0.35) respectively.

When considering each item, it was found that, on the issue of information and communication technology, the elderly had the primary need to use smartphone applications to find health-

related information knowledge ($PNI_{modified}$ = 0.97), followed by the need for training to increase their ability to use technology ($PNI_{modified}$ = 0.76), and the ability to search for information from the internet ($PNI_{modified}$ = 0.57) respectively. In the community learning center, the elderly had the primary need to have technology to promote health education ($PNI_{modified}$ = 0.78), followed by learning media in the center that was modern and easy to use ($PNI_{modified}$ = 0.76), and media and activities contents that can practically be applied to the present situation ($PNI_{modified}$ = 0.74) respectively. In the field of health literacy, the elderly had the primary need for ways to check the accuracy of health knowledge obtained ($PNI_{modified}$ = 0.40), followed by the method of searching for health-related information ($PNI_{modified}$ = 0.39), and inviting others to accept practices that will lead to a healthy life ($PNI_{modified}$ = 0.38) respectively, as summarized in Table 1.

Table 1 The needs for the use of information and communication technology to support health literacy in the learning center for the elderly

Use of information and communication technology to support health literacy in the learning center for the elderly	I			D			I-D/D			Order		
	BKK	Vicinities	Total	BKK	Vicinities	Total	BKK	Vicinities	Total	BKK	Vicinities	Total
1. The learning center in the community	2.57	2.52	2.55	1.20	1.85	1.51	1.14	0.36	0.69	1	2	1
1.1 Presence of technology to promote health education	2.55	2.52	2.53	1.07	1.79	1.42	1.38	0.41	0.78	1	1	1
1.2 Materials in learning centers are modern and easy to use.	2.57	2.53	2.55	1.13	1.80	1.45	1.27	0.41	0.76	2	1	2
1.3 Content of media and activities can be applied to the current situation	2.58	2.50	2.54	1.16	1.78	1.46	1.22	0.40	0.74	4	2	3
1.4 Providing health related information.	2.56	2.50	2.53	1.15	1.88	1.50	1.23	0.33	0.69	3	3	4
1.5 Presence of speakers providing advice on health-related information	2.57	2.52	2.54	1.25	1.90	1.56	1.06	0.33	0.63	5	3	5
1.6 Providing appropriate activities for the elderly	2.61	2.54	2.58	1.42	1.99	1.69	0.84	0.28	0.53	6	4	6

Use of information and communication technology to support health literacy in the learning center for the elderly	I			D			I–D/D			Order		
	BKK	Vicinities	Total	BKK	Vicinities	Total	BKK	Vicinities	Total	BKK	Vicinities	Total
2. Information and Communication Technology	2.27	2.38	2.32	1.34	1.64	1.48	0.69	0.45	0.57	2	1	2
2.1 Use of smarphone applications to find health-related information	2.20	2.33	2.27	0.91	1.41	1.15	1.42	0.65	0.97	1	1	1
2.2 Training to enhance the ability to use technology	2.25	2.33	2.29	1.14	1.46	1.30	0.97	0.60	0.76	2	2	2
2.3 Ability to search for information from the internet	2.16	2.36	2.26	1.28	1.61	1.44	0.69	0.47	0.57	3	3	3
2.4 Use of devices to find health-related information	2.34	2.41	2.37	1.45	1.66	1.55	0.61	0.45	0.53	4	4	4
2.5 Use of online social media network	2.33	2.43	2.38	1.62	1.84	1.72	0.44	0.32	0.38	5	5	5
2.6 Use of the camera/ video applications of smartphones	2.31	2.41	2.36	1.64	1.87	1.75	0.41	0.29	0.35	6	6	6
3. Health Literacy	2.67	2.55	2.61	1.84	2.02	1.93	0.45	0.26	0.35	3	3	3
3.1 Ability to verify the accuracy of the acquired health-related information	2.68	2.56	2.62	1.80	1.95	1.87	0.49	0.31	0.40	1	1	1
3.2 Knowing how to search for health-related information.	2.64	2.54	2.59	1.79	1.95	1.87	0.47	0.30	0.39	2	2	2
3.3 Persuading others to accept good health practices	2.64	2.55	2.60	1.80	1.96	1.88	0.47	0.30	0.38	2	2	3
3.4 Can understand and remember health-related information	2.65	2.52	2.59	1.85	1.99	1.91	0.43	0.27	0.36	4	3	4

Use of information and communication technol-ogy to support health literacy in the learning center for the elderly	I			D			I-D/D			Order		
	BKK	Vicinities	Total	BKK	Vicinities	Total	BKK	Vicinities	Total	BKK	Vicinities	Total
3.5 Ability to choose practices that promote good health	2.71	2.59	2.65	1.88	2.11	1.99	0.44	0.23	0.33	3	4	5
3.6 Ability to conduct themselves to possess good health	2.68	2.58	2.63	1.94	2.16	2.05	0.38	0.19	0.28	5	5	6

3. The guidelines for the learning center to support health literacy for the elderly was found in four aspects as follows;

3.1 As for the characteristics of the learning center supporting the health literacy for the elderly, it was found that, in general, the period when most elderly people use the service is from 10:00 a.m. - 12:00 p.m. (201 persons, 46.31%), next is between 08:00 a.m. - 10:00 a.m. (157 persons, 36.18%). In Bangkok, the most frequent time period for most elderly to use the service is during 10:00 a.m. - 12:00 p.m. (103 persons, 23.73%), followed by the period 08:00 a.m. - 10:00 a.m. (89 persons, 20.51%). In the vicinities, the majority of the elderly use the service is between 10:00 a.m. - 12:00 p.m. (98 persons, 22.58%), followed by the period of 08:00 a.m. - 10:00 a.m. (68 persons, 15.67%). As for the most appropriate period to organize health education activities for the elderly, the majority of the elderly revealed that the optimal duration should be only one hour (267 persons, 61.52%), followed by 2-3 hours (82 persons, 18.89%). In Bangkok, the majority of the elderly had an opinion that the optimal duration should be one hour (137 persons, 31.57%), followed by 30 minutes (45 persons, 10.37%). In the vicinities, the most suitable duration was recommended to be one hour (130 persons, 29.95%), followed by 2-3 hours (42 persons, 9.68%). As for the frequency that the elderlies want to use the health learning center, most of them wanted to access the health learning center once a week (216 persons, 49.77%), followed by 2-3 times a week (124 persons, 28.57%). In Bangkok, most of the elderlies wanted to access the health learning center at least once per week (111 persons, 25.58%), followed by 2-3 times per week (67 persons, 15.44%). In the vicinities, the elderlies wanted to use the health learning center once a week (105 persons, 24.19%), followed by 2-3 times a week (57 persons, 13.13%). In terms of the purposes that the elderlies would want to use the service, overall the purpose that most of the elderlies participated in the health learning center's activities was to take care of their own health (338 persons, 77.88%), followed by for meeting and exchanging knowledge purposes (277 persons,

63.82%). In Bangkok, the objective of most the elderlies was to take care of their own health (194 persons, 44.70%), followed by the objective of meeting and exchanging knowledge (132 persons, 30.41%). In the vicinities, the objective of most of the elderlies was to meet, chat and exchange knowledge (145 persons, 33.41%), followed by taking care of their own health (144 persons, 33.18%). As for the types of services or learning activities that the elderlies need in general, overall most of the elderlies required learning as a group (230 persons, 53.00%), followed by learning as a group combined with individual self-study (186 persons, 42.86%). In Bangkok, the majority of the elderlies required learning as a group (133 persons, 30.65%), followed by learning as a group combined with individual self-learning (81 persons, 18.66%). In the vicinities, most of the elderlies wanted to learn in the form of group learning combined with individual self-learning (105 persons, 24.91%), followed by group learning (97 persons, 22.35%). In terms of media characteristics/learning tools that the elderlies use regularly, overall the elderlies would learn through television on a regular basis (300 persons, 69.12%), followed by learning through smart devices (232 persons, 53.46 percent). In Bangkok, most of the elderlies learned through television on a regular basis (159 persons, 36.64%), followed by learning through smartphone devices (131 persons, 30.18%). In the vicinities, the elderlies would learn through television (141 persons, 32.49%), followed by smartphone devices (101 persons, 23.27%).

3.2 The characteristics of learning centers for the elderly were agreed by six experts that the learning center for the elderly should be a mobile learning center or set up in a community, or a place where the local elderly club regularly meets and should be used as a place to conduct activities regularly and providing an environment that is appropriate for the community. The experts also suggested that there should also have volunteers who have been trained on how to transfer knowledge and how to use the learning centers effectively, to assist members and recommend how to learn from the learning center. The personnel can be an elderly as well as younger person.

3.3 The methods of supporting health literacy for elderly people are in many ways. The experts suggested that the learning center management should define a group of not more than 5 persons. Since elderly people can access knowledge conveniently and can be easily memorized, the learning content should be familiar and interested to elderly people, such as topics on food, nutrition, how to take medicines correctly, exercise for the elderlies, physical examination, and observation of various illnesses, oral health care, common diseases among elderly people, adjusting to their environment, and how to avoid from falling down. The activity model should utilize examples to provide case studies, as well as ways to enable elderly people to learn continuously by inspiring them or let them create their own life motivation, or let them learn along with a group of friends, create an activity model as a recreation by emphasizing practices and providing knowledge during these practice activities. Activities should

also be organized with special attention to eye problems and body movements, and should not exceed 1-3 hours.

3.4 The use of information and communication technology to support health literacy for elderly people are recommended by the experts which should be communicated through pictures with big font sizes, clear colors, concise text, and divided into topics with highlight on illustrations as infographics, motion graphics, holograms, video calls, QR code, databases, health knowledge sources, and health professionals. There should also be media that elderly people are familiar with, such as paper brochures, books, manuals, etc.

Discussion

Due to Thailand's imminent evolvement into becoming an aged society, health literacy, is therefore important for elderly people, so that they can become self-reliant and reduce the medical expense burdens and gain a sustainable good quality of life. The objective of this research is to study the needs for information and communication technology to support health literacy in learning centers for the elderly, and the characteristics of the learning center contains important issues that should be discussed as follows;

Regarding the general information of the elderlies, the majority of the elderlies are married and live with their spouses or children. The majority of the elderlies have completed primary education and are no longer employed. For the elderlies in Bangkok, if they are members of a university club, most have a degree higher than a bachelor's degree and are retired government officials. Most elderlies participate in activities or are members of organizations/ clubs/ groups, and attend these activities at least once a week. In terms of physical data of the elderlies, they mostly have health issues, such as insomnia, mobility difficulties, and visibility problems. The majority of the elderlies have chronic diseases and illnesses, such as high blood pressure, osteoarthritis, and diabetes, which is consistent with the 2013 Thai Elderlies Health Survey, which shows that 41% of the elderlies have high blood pressure. 18% have diabetes, and 9% suffer from osteoarthritis (Foundation of Thai Gerontology Research and Development Institute, 2015)

The needs of the assessment for the use of information and communication technology to support health literacy in the learning center for the elderly, in the area of the learning center in the community, the elderly have the needs for technology to promote health education that also provides learning materials that are modern and convenient to use. In terms of health knowledge, the elderly have the need to verify the health information that they acquire as the first priority, followed by the method of searching for health-related information. On the aspect of information and communication technology, the elderlies have the need to use smartphone applications to search for health-related information as the primary priority, followed by training to increase the ability to use technology and the ability to search for information from the

internet. This is consistent with the research of the Office of the Thai Health Insurance Research (2015), which found that the elderlies have limited access to reliable health information and the ability to judge reliable information. This is also in accordance with the research results of Pimjai Tayati Chamaiporn Disathaporn and Rittichai Onming (2017), which found that the elderly tend to use the internet increasingly and have becoming a new risk group of being deceived and becoming unaware of the dangers of the cyber world which they comprehend that the information received has already been carefully filtered. This is also in accordance with the research results of Jin Bora (2018), which found that American elderlies use smartphone technology to find health-related information.

On the aspect of the learning center arrangement, the time that most of the elderly access the service is during 10:00 a.m.' 12:00 p.m. The appropriate duration for organizing health education activities is one hour, and they require to use the health learning center at least once a week. The elderly require information regarding on how to take care of one's own health, as well as come to meet, talk, and exchange knowledge amongst themselves. The elderly prefer group learning, group learning in the community makes it more accessible and convenient for the elderly, as well as making them feel safe and provide an incentive for continuous learning. This is consistent with the principles of Cass (1956) proposed that the principles of learning for the elderly must be voluntary learning. It is useful and can be applied immediately. The elderly do not want to be just viewers but want to participate too that in accordance with the information from the Office of the Education Council (2018) which states that the elderlies will feel inconvenient to participate in activities when there are physical and mental health problems. Elderly like to learn from watching television and use smartphone devices. Which is consistent with the data of Samoer Nimngern (2019) which found that the elderlies will learn and receive news from trusted sources or trusting traditional media such as television, newspaper, but are more open to learning from new media.

Recommendations and suggestions

From the research results, it was found that most elderlies have completed primary education. However, for the elderly in Bangkok, if they are members of a university club, most of them would have graduated with a degree that is higher than a bachelor's degree. Therefore, the use of information and communication technology and learning activities should be considered to be easy and appropriate according to the level of education for the elderly in each group. In organizing the learning center, the appropriate duration for organizing health education activities for the elderly should not be longer than 1 hour and the arrangement as a place for meeting, exchanging and learning will be conducive to the learning characteristics of the elderly who prefer group learning. The learning center should have practice using the

program on the smartphone to find health knowledge with the training design that is suitable for the elderly with pictures, big font size, clear color, concise context and divided into topics. A study should be conducted for the needs to use information and communication technology to support health literacy in learning centers for specific groups of elderlies, such as age groups, through the method of interviewing and group discussions.

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