THE INTERNATIONAL JOURNAL OF BUSINESS & MANAGEMENT

Management of the Residence Prototype for the Happiness of Elderly People

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Abstract:
The purposes of this research were 1) to study the components of management of the residence of the elderly people, 2) to study the components of the happiness of the elderly people, 3) to analyze the confirmatory factors of management of the residence for the happiness of elderly people, and 4) to propose the model of management of the residence prototype for the happiness of elderly people. The researcher applied the Mixed Methodology Research; beginning with the quantitative research method and used the qualitative research method to confirm the quantitative data. The research results show that the components of management of the residence prototype of the elderly people in total were at the highest level. In particular, Environment had the highest mean score, followed by Technology, and Pattern and Style respectively. The hypotheses analysis results show that the model of management of the residence is relevant to the empirical data. Regarding the analysis of prediction power of each predictive variable affecting the happiness of elderly people; it was found that 6 factors of Pattern and Style, 6 factors of Environment, and 7 factors of Technology had prediction power at 80.90%. It can create the prediction equation in the form of standard score, as follows;

$Y=2.029 + .174PA_4 + .238\ PA_8 + .051\ PA_9 + .371\ PA_{10} + .245\ EN_1 + .348\ EN_2 + .140\ EN_7 + .092\ EN_{10} +.290\ TE_1 + .151\ TE_4 + .320\ TE_5 + .356\ TE_7 + .121\ TE_8 + .570\ TE_{10}$

Keywords: *Management, residence prototype, happiness of elderly people*

1. Introduction

United Nations (UN) assessed the world situation and reported that the year 2001 – 2100 will be the century of elderly people; it means there will be the populations aged 60 and above more than 10% of the number of world population (Sukhothai Thammathir at Open University, 2014). Thai population structure has been changed so fast in these 3-4 decades. Thailand has entered the aging society since 2000 – 2001 (Information and Communication Technology Center, 2014).

The physical decay or depressed mind causes an effect on the happiness of elderly people. One factor that makes the elderly people happy is to realize their self esteem towards their family and society. In addition to the relationship in family, the elderly people also have neighbors; living together can make the elderly feel warm and not lonely. Regarding the challenges of elderly people to live happily, the residence is a vital factor affecting both physical and mental happiness. Pattern and style, and environment must contribute to the daily routine of the elderly. The residence management should prioritize the structure, decoration, arrangement, or the installation of equipment facilities to support the physical decay of the elderly people (Baania, 2017).

The lower physical performance of elderly people goes inversely to the technology advance. Therefore, the residence management to suit the living of elderly people to support their self help and to reduce the accident is very important. Most elderly people did not want to migrate from their present house but would like to improve it to be in better conditions (Pathomkulvasarat, 2011). In addition, every residence has its communication system and modern appliances for convenience. However, most elderly people have less opportunity to learn and use the information technology than people in other age. In addition to the improvement of pattern and style, and environment to suit the living of the elderly people, nowadays there is the development of new health-care innovation that is easy to use at home. Furthermore, Thai elderly people will rely more on themselves; the advanced technology will be the supportive factor making the self-reliance of elderly people easier (Chula Unisearch, Chulalongkorn University, 2017).

Phichit province is located at upper central Thailand. The numbers of population in 2017 was 542,347 people; 101,146 people aged 60 and above (Phichit Provincial Public Health Office, 2017), which was 18.78% of all Phichit populations. Phichit province has integrated the collaboration from every sector; Provincial Administration Organization, Provincial Public Health Office, and other agencies in public sector, including the strong communities, to drive on these 8 policies of age-friendly city. These policies consisted of 1) residence, 2) social participation, 3) social acceptance, 4) local

involvement and employment, 5) information and communication access, 6) support from community and health service, 7) condition of the exterior and interior of the building, and 8) public transport system (Wichitsaengsri, 2018). These are the reasons why Phichit province is ready for this study.

From the problems above about the aging society, the preparation about the appropriate residence is important to support this upcoming change. The researcher is interested in studying the residence prototype for the happiness of elderly people. The research results will lead to the management of modern facilities, the application of inexpensive innovation in order to meet the needs beyond the basic necessities. Every component focused on creating convenience and safety, reducing the risk of accident, and supporting the physical and mental happiness under the natural environment.

2. Research purposes

- To study the components of management of the residence of the elderly people.
- To study the components of the happiness of the elderly people.
- To analyze the confirmatory factors of management of the residence for the happiness of elderly people.
- To propose the model of management of the residence prototype for the happiness of elderly people.

3. Research Hypotheses

- H_1: The model of confirmatory factors of Pattern and style of residence is relevant to the empirical data.
- H_2: The model of confirmatory factors of Environment of residence is relevant to the empirical data.
- H_3: The model of confirmatory factors of Technology of residence is relevant to the empirical data.
- H_4: The model of confirmatory factors of Happiness of elderly people is relevant to the empirical data.
- H_5: Pattern and style, Environment and Technology of the residence can predict the happiness of elderly people.
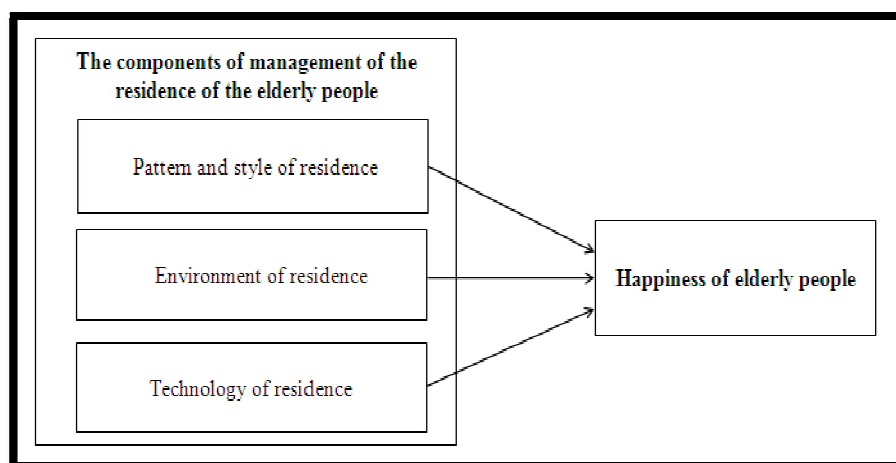
4. Research Paradigm

Figure 1: Research Paradigm

5. Literature Review

5.1. Concept and Theory about the Elderly People

United Nations and Elderly Person Act, B.E. 2546 described the elderly people that they are people who aged 60 and above with degenerative conditions, less power, slower action, and being deserved the foster care and help (Srisantisuk, 2007). Being aging can be divided into 3 stages; 1) the young old, aged 60-69 years, 2) the middle old, aged 70-79 years, and 3) the old, aged 80 years and above (Thongchroen, 2011). Regarding the situation of Thai elderly people, the registered population numbers of the year 2017 of Thailand were 66,188,503 people. From this numbers, 10,225,322 people aged 60 and above (National Statistical Office, 2017). Thai society nowadays is encountering the important change in population structure which is introduced to the aging society. According to the meaning of aging society, Thailand has started to enter the aging society since 2004; when the proportion of elderly people aged 60 and above was more than 10%. In the future, Thailand will enter the complete aged society in 2024, when the proportion of populations aged 60 and above reaches 20% (Phromphak, 2013). Therefore, it is necessary for Thailand to prepare ourselves by mobilizing the resources, creating personnel, adjusting the role and duty, increasing the collaboration among organizations/agencies, revising and improving the regulations, and developing types and systems to provide health-care service equally to the elderly people whose numbers will more and more increase in this near future.

5.2. Concept and Theory about Pattern and Style of the Residence of the Elderly People

The concept of living of elderly people focuses on the aspect of aging in place. The management of the facilities and living space suitable to the life style of elderly people need the elderly care system. The thinking method of residence and surrounding environment of the community must be changed to the design for all and living environment for all (Hawanon and Wattanothai, 2009). The residence pattern for the elderly people should focus on easy method to use, for

example, to make a slope path for a wheelchair or to design to allow the elderly to pick up things easily. Regarding the physical safety of elderly people, the facilitators should be specially designed for elderly people, such as a handle and enough lighting. Regarding the privacy of elderly people, they would like the concealment in doing daily routines, such as sleeping, taking a bath and dressing up. Regarding the easy method to use, the inside of the house should be designed to be easily used without the complexity. Moreover, the motivation is to manage the residence to impress the elderly people (Hooyman and Kiyak, 1996). Regarding the residence standard of elderly people, they should have rights to choose based on their satisfaction, or other legal rights. Regarding the pattern and style of the house, there should be CCTV, safety system, rest area, activity area, dining area, area for outdoor activity, communication system in the house, alarming signal, lighting and ventilation, as indicated in Care Homes for Older People, National Minimum Standards, Care Standard Act 2000 (Jarutach et al., 2005).

5.3. Concept and Theory about Environment of the Residence of the Elderly People
Friendly environment for elderly people means the environment which is safe and appropriate to daily routine and does not cause danger to elderly people. The environment management for elderly people can be divided into 3 parts. First, the individual environment; it is to let elderly people to take more part in doing activities depending on the condition of each elderly people. Second, social environment; it should focus on the interaction with others. Third, physical environment; it should emphasize the security and safety of elderly people (Leawrungruang et al., 2009). Regarding the management of home environments for the elderly people, there should be enough lighting, ventilation, colorful parts of house for distinguishing things more easily, and home appliances that can be easily maintained (Bureau of Environmental Health, 2015; An Appropriate Environment for Elderly and Disabled People Research Unit, 2013). Regarding the environment in the community, there should be the area for elderly people to do activities as the multi-purposes area, activities relating to interest and aptitude of elderly people, green area or public parkin the community, elderly parking area, and other signal that the elderly people can easily recognize (Bureau of Environmental Health, 2015).

5.4. Concept and Theory about Technology of the Residence of the Elderly People
"Smart home" is to apply the technology for living or other automatic systems both outside and inside the house by connecting to the home appliances to provide the convenience and to save the electric cost, including increasing the safety. This is the innovation of living to develop the quality of life of residents (At Kitchen, 2017). Regarding the residence style in the future, the house will have an ability of self checking, a technology to check the housing system. The material and method used in the construction will be more ready-made and environmental friendly. There will be all kind of communication system in a house. The house will have the better flood protection system. The house design will benefit residents at every age. The style will be more contemporary Thai, and have more green area and better drainage system. The roof garden will be more popular because it can be used as the thermal insulation. In addition, the house will be easier to be maintained because of the smaller size but changeable. The safety efficiency in preventing the robbery will be necessary for the safety of life and property of the residents.

5.5. Concept and Theory about Happiness of the Elderly People
According to PERMA Model, there are 5 components of happiness (Seligman, 2011). First, Positive emotions; it is a capability to be optimistic, and to think positively about the past, present and future time. Second, Engagement; it is important to the development of intelligence, skill, an emotional ability of human. Third, Relationships; having the strong relationships will help survive through the difficult time. Forth, Meaning; it is to know the meaning of life and to realize the greater life goal. Fifth, Achievement; it will create the pride and success in life. The happiness of elderly people is the realization on life satisfaction and good feeling towards present living conditions. The happiness in life must come from the balance between the physical and mental aspect in order to live the normal life (Chaiyo, 2012; Metheekul and Tuicomepee, 2012; Tantichaiwanit, 2008). The 5 components of happiness of the elderly people consist of: 1) comfort – to take good care of physical health to be strong, 2) fun - choosing a pleasant lifestyle with fun activities to create a happy mood, 3) pride – life satisfaction, self-pride, self-confidence, and self-esteem, 4) enlightening – the capability of the elderly people about memory, reasonable thinking, communication, planning, and problem solving, and 5) calmness – the recognition and understanding of one's own feeling, the emotion control, and the ability to handle the emotional state that occurs effectively (Department of Mental Health, Ministry of Public Health, 2013).

6. Research Methodology
The researcher applied the Mixed Methodology Research; beginning with the quantitative research method and used the qualitative research method to confirm the quantitative data. The secondary date were studied and retrieved from reviewing the concepts and theories from documents and related researches; collecting the quantitative data by distributing questionnaires to 500 samples, elderly people aged 60 and above living in Phichit province. The qualitative data were collected from conducting the focus group with 10 key informants. The statistics used in this research were frequency, percentage, mean, standard deviation, Confirmatory Factor Analysis (CFA) and Multiple Regression Analysis (MRA).

7. Research Results

7.1. The Analysis of Demographic Profiles

With regard to the demographic profiles, the results show that from 500 respondents, most are female, aged 60-64 years, married and lived with their spouse, finished the primary school, lived with their family, and worked as agriculturist. With regard to the participation in the activities of the elderly, most participated in the activities of the elderly organized in the communities for 1-2 times per month, and most respondents were happy and wanted to participate in every activity.

7.2. The Analysis of the Components of Management of the Residence of the Elderly People

With regard to the components of management of the residence of the elderly people, the results show that the components were at the highest level ($\overline{X}$ = 4.38, S.D. = 0.46). In particular, Environment of residence had the highest mean score ($\overline{X}$ = 4.50, S.D. = 0.53), followed by Technology of residence ($\overline{X}$ = 4.44, S.D. = 0.63), and Pattern and style of residence ($\overline{X}$ = 4.19, S.D. = 0.78) respectively (see table 1).

Management of the Residence of the Elderly People	$\overline{X}$	S.D.	Translation	Ranking
1.Environment of residence) EN_T(	4.50	0.53	Highest	1
2 .Technology of residence) TE_T(	4.44	0.63	Highest	2
3. Pattern and style of residence) PE_T(	4.19	0.78	High	3
Total	4.38	0.46	Highest	

Table 1: Mean and Standard Deviation of the Components of Management of the Residence of the Elderly People in Total and in Particular

7.3. The Analysis of the Components of the Happiness of the Elderly People

With regard to the components of the happiness of the elderly people, the results show that the components were at the highest level ($\overline{X}$ = 4.68, S.D. = 0.43). In particular, Be happy when doing something beneficial to family had the highest mean score ($\overline{X}$ = 4.77, S.D. = 0.46), followed by Be self-help in the daily routine ($\overline{X}$ = 4.77, S.D. = 0.50), Do activities that they are proud of ($\overline{X}$ = 4.69, S.D. = 0.59), Feel warm and cheerful ($\overline{X}$ = 4.68, S.D. = 0.56), Take care of their health ($\overline{X}$ = 4.68, S.D. = 0.57), Live with goals ($\overline{X}$ = 4.67, S.D. = 0.62), Participate in activities to improve memory and body performance ($\overline{X}$ = 4.65, S.D. = 0.54), Feel fresh and lively with the environment ($\overline{X}$ = 4.65, S.D. = 0.58), Recognize and control emotions ($\overline{X}$ = 4.63, S.D. = 0.58), and Be happy to live in a familiar atmosphere ($\overline{X}$ = 4.63, S.D. = 0.69) respectively (see table 2).

The Happiness of the Elderly People	$\overline{X}$	S.D.	Translation	Ranking
Be happy when doing something beneficial to family	4.77	0.46	Highest	1
Be self-help in the daily routine	4.77	0.50	Highest	2
Do activities that they are proud of	4.69	0.59	Highest	3
Feel warm and cheerful	4.68	0.56	Highest	4
Take care of their health	4.68	0.57	Highest	5
Live with goals	4.67	0.62	Highest	6
Participate in activities to improve memory and body performance	4.65	0.54	Highest	7
Feel fresh and lively with the environment	4.65	0.58	Highest	8
Recognize and control emotions	4.63	0.58	Highest	9
Be happy to live in a familiar atmosphere	4.63	0.69	Highest	10
Total	4.68	0.43	Highest	

Table 2: Mean and Standard Deviation of the Components of the Happiness of the Elderly People in Total and in Particular

7.4. The Analysis of the Confirm Factor of Management of the Residence of the Elderly People

7.4.1. Confirmatory Factor Analysis of Pattern and Style of Residence

With regard to the model analysis, Chi-Square = 9.549, df = 6, p = 0.145, CMIN/DF = 1.592, GFI = 0.992, RMSEA = 0.039. It shows that the model of Pattern and style of residence was relevant to the empirical data. Considering the sub-element of Pattern and style of residence, the results show that 6 variables had the important weight to indicate Pattern and style of residence, which can be ranked by priority as follows: Design the residence to be clear and airy (PA_{10}), Design the floor of the house and the surrounding area to be smooth and unobstructed (PA_5), Keep the bedroom and rest area clean and safe(PA_4),Use the non-slip material which is easy to be cleaned to build the floor (PA_3),Set up a bedroom and relaxation area to allow the sun to reach the room (PA_9), and Arrange the bathroom area close to the bedroom and use modern sanitary ware (PA_8), with the important weight value at 0.88, 0.86, 0.85, 0.84, 0.81 and 0.73 respectively. Variation

of the model indicator of Pattern and style of residence was at 78%, 74%, 73%, 71%, 66% and 53% respectively (see figure 2).
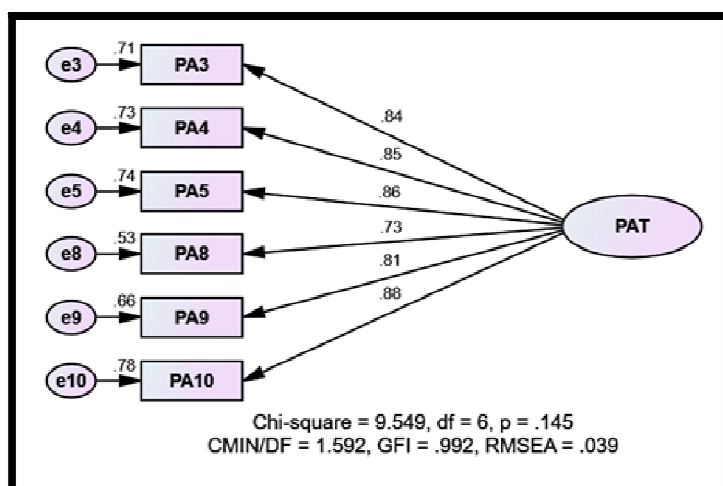

Figure 2: Model of Pattern and Style of Residence

7.4.2. Confirmatory Factor Analysis of Environment of Residence

With regard to the model analysis, Chi-Square = 10.653, df = 6, p = 0.100, CMIN/DF = 1.775, GFI = 0.991, RMSEA = 0.044. It shows that the model of Environment of residence was relevant to the empirical data. Considering the sub-element of Environment of residence, the results show that 6 variables had the important weight to indicate Environment of residence, sort by priority; Adjust the area to be proportionate to the utility of the elderly (EN_8), Place the items neatly so that they are easy to pick up (EN_6), Set up a wide area for open space without obstruction (EN_7), Set up a residential area for easy access (EN_{10}), Decorate the area with various items used in the old times (EN_2), and Adjust the area to have naturalness and good air (EN_1), with the important weight value at 0.85, 0.83, 0.82, 0.78, 0.50 and 0.44 respectively. Variation of the model indicator of Pattern and style of residence was at 72%, 69%, 67%, 61%, 25% and 19% respectively (see figure 3).
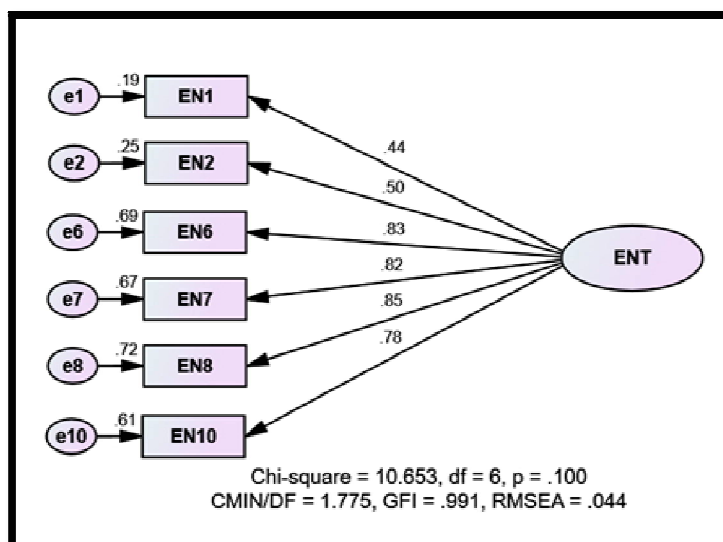

Figure 3: Model of Environment of Residence

7.4.3. Confirmatory Factor Analysis of Technology of Residence

With regard to the model analysis, Chi-Square = 7.736, df = 8, p = 0.460, CMIN/DF = 0.967, GFI = 0.994, RMSEA = 0.000. It shows that the model of Technology of residence was relevant to the empirical data. Considering the sub-element of Technology of residence, the results show that 7 variables had the important weight to indicate Technology of residence, sort by priority; Install the electricity generator system with solar cell panels (TE_7), Use the energy-saving electric appliances and lighting (TE_8), Install the CCTV to maintain security and reduce anxiety (TE_4), Use the thermal-insulation roof to reduce the temperature and save the electricity bill (TE_3), Apply the housing technology, such as emergency signal to help in an urgent situation (TE_1), Use the inexpensive modern material instead of the natural materials (TE_{10}), and Set the communication system so that the elderly people can contact other family members all the time when they live alone at home (TE_5), with the important weight value at 0.85, 0.77, 0.77, 0.70, 0.67, 0.66 and 0.60 respectively. Variation of the model indicator of Pattern and style of residence was at 72%, 60%, 59%, 49%, 46%, 44% and 35% respectively (see figure 4).
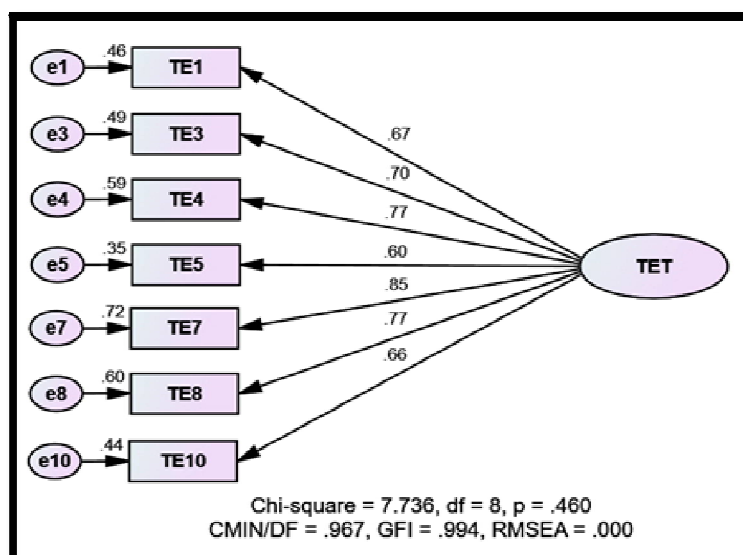
Figure 4: Model of Technology of Residence

7.4.4. Confirmatory Factor Analysis of Happiness of the Elderly People

With regard to the model analysis, Chi-Square = 6.271, df = 4, p = 0.180, CMIN/DF = 1.568, GFI = 0.994, RMSEA = 0.038. It shows that the model of Happiness of the elderly people was relevant to the empirical data. Considering the sub-element of Happiness of the elderly people, the results show that 5 variables had the important weight to indicate Happiness of the elderly people, sort by priority; Feel warm and cheerful (HA_7), Feel fresh and lively with the environment (HA_6), Be happy when doing something beneficial to family (HA_8), Take care of their health (HA_2), and Do activities that they are proud of (HA_4), with the important weight value at 0.84, 0.78, 0.77, 0.72 and 0.67 respectively. Variation of the model indicator of Pattern and style of residence was at 70%, 61%, 60%, 52% and 45% respectively (see figure 5).
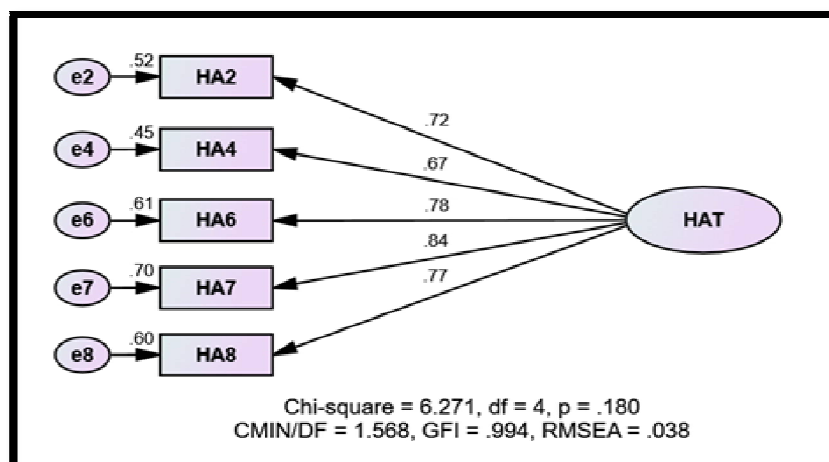

Figure 5: Model of Happiness of the Elderly People

7.5. The Analysis of Prediction Power of Each Predictive Variable Affecting the Happiness of the Elderly People

The researcher selected the good predictors with stepwise regression, tested the significance of the multiple regression of good predictive variables and criterion variables with the F-test. The results show that the multiple regressions of 11 variables had the statistical significance at the level of .01; which were Keep the bedroom and rest area clean and safe(PA_4), Arrange the bathroom area close to the bedroom and use modern sanitary ware (PA_8), Design the residence to be clear and airy (PA_{10}),Adjust the area to have naturalness and good air (EN_1), Decorate the area with various items used in the old times (EN_2), Set up a wide area for open space without obstruction (EN_7), Apply the housing technology, such as emergency signal to help in an urgent situation (TE_1), Install the CCTV to maintain security and reduce anxiety (TE_4), Set the communication system so that the elderly people can contact other family members all the time when they live alone at home (TE_5), Install the electricity generator system with solar cell panels (TE_7), and Use the inexpensive modern material instead of the natural materials (TE_{10}). Besides, 3 variables had the statistical significance at the level of .05; which were Set up a bedroom and relaxation area to allow the sun to reach the room (PA_9), Set up a residential area for easy access (EN_{10}), and Use the energy-saving electric appliances and lighting (TE_8). All these 14 variables can well be the criterion variable by that the prediction power had the statistical significance at the level of .01 and .05. All predictors had the prediction power at 80.90%; the multiple regressions were .899; the standard error of estimate was .202; the constants of prediction equation was 2.029 (see table 3).

Variables	b	β	SE_b	T
PA_4	.086	.174	.032	2.651**
PA_8	.109	.238	.023	4.838**
PA_9	.024	.051	.011	2.098*
PA_{10}	.187	.371	.033	5.717**
EN_1	.130	.245	.014	9.144**
EN_2	.174	.348	.027	6.346**
EN_7	.099	.140	.018	5.483**
EN_{10}	.066	.092	.031	2.146*
TE_1	.183	.290	.030	6.010**
TE_4	.072	.151	.017	4.155**
TE_5	.219	.320	.030	7.298**
TE_7	.151	.356	.024	6.228**
TE_8	.073	.121	.030	2.392*
TE_{10}	.319	.570	.024	13.216**
	R = .899 SE_{est}= .202		F = 116.109	
	R^2 = .809 a = 2.029			

*Table 3: The Multiple Regression of Prediction Power of the Components of
Pattern and Style, Environment, and Technology; Each Good Predictive Variable
Affects Happiness of the Elderly People
**The Statistical Significance at .01
* The Statistical Significance at .05*

The researcher can create the prediction equation with the standard score, as follows;
The prediction equation of management of the residence prototype for the happiness of elderly people
$Y = 2.029 +.174 PA_4 +.238 PA_8 +.051 PA_9 +.371 PA_{10} +.245 EN_1 +.348 EN_2 +.140 EN_7 +.092 EN_{10} +.290 TE_1 +.151 TE_4 +.320 TE_5 +.356 TE_7 +.121 TE_8 +.570 TE_{10}$

7.6. The Presentation of Model of Management of the Residence Prototype for the Happiness of Elderly People
        The researcher created this model from 14 components of the management of the residence prototype for the happiness of elderly people (see figure 6).
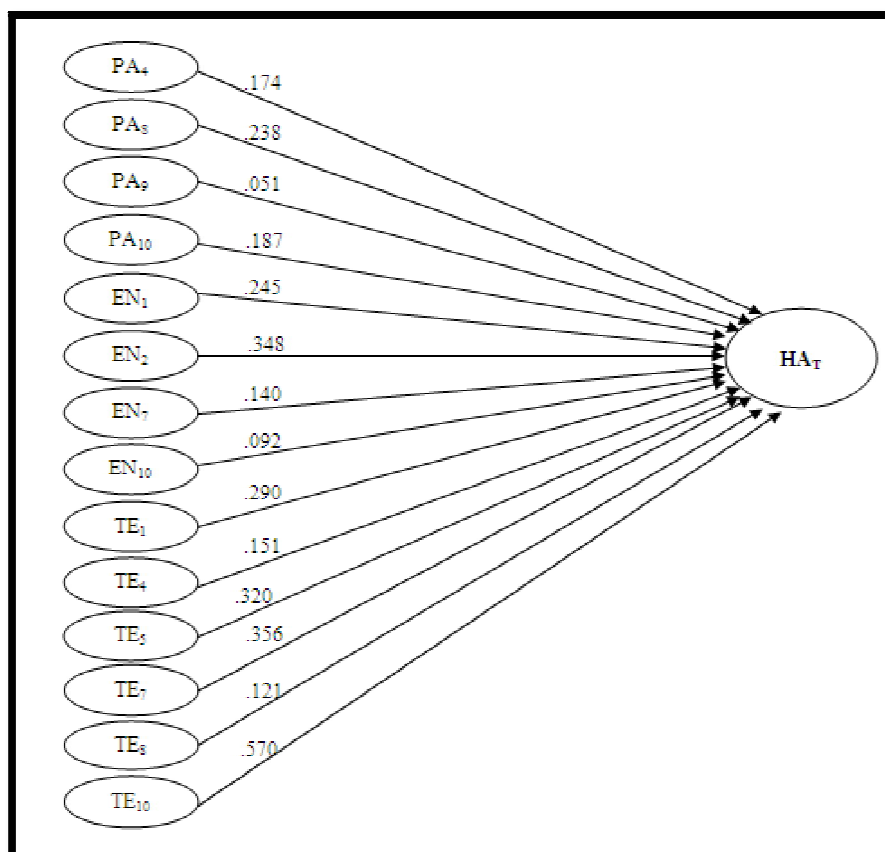

*Figure 6: The Model of Management of the Residence Prototype for the
Happiness of Elderly People*

7.7. The Analysis of Qualitative Data

With regard to the qualitative data retrieved from conducting the focus group with 10 key informants, the elderly people agreed with management of the residence prototype for the happiness of elderly people. With regard to their opinion on Pattern and style of residence, the house should be safe and clean. The facilitators should be ready and easy to use, and suitable to the elderly people. The construction style should be simple, not complicated, and in Thai contemporary style. The materials used in the construction should be easily found in local area. The house should be single-storey and compact. In case of two-storey house, the steps should be convenient for the elderly people to go up and down. The restroom should be located in the house; in the restroom, there should be ventilation window, handle, and water closet. The kitchen should not be located too far from the house building. In addition, the house building should be clear and airy to allow air to flow, and should have enough light to use.

With regard to their opinion on Environment of residence, the surrounding area of the house should be clean and livable. There should be green area and nearby pond to increase the shade to the house. In addition, it should be non-pollution area, such as odor and air pollution as well as other disturbances. There should be the multi-purpose area for doing activities; this area should be clear and unobstructed. The house should be a bit far from the urban society for the serenity, but should not be too far from the hospital.

With regard to their opinion on Technology of residence, the emergency signal should be installed to ask for help in emergency time. The facilitators for the elderly people should be convenient, easy to use, non-complicated, and long-lived. CCTV should be installed for the safety. Other necessary appliances were, for example, communication system for the elderly people to contact with other family members when they live alone at home, solar cell panels, and automatic electric system. Importantly, the elderly people should be taught to use all these technologies.

With regard to their opinion on happiness of the elderly people, the elderly people should be loved, accepted, and cared from family members. They would like to live near their relatives. Their house should be safe among the peaceful society. They can take care of themselves and satisfy with what they already have. Their living should be based on sufficiency and peace of mind. They should follow the religious principles, for example, Brahmavihār as 4 (sublime attitudes) for Buddhist people. The good food for strong health should be well prepared for the elderly people. They should participate in the activities to develop their memory and physical performance. Moreover, the elderly people also thought that the public sector or other agencies responsible to the elderly people affairs should set the welfare policy for the elderly people, and operate the elderly care continually and seriously, especially the elderly people with low income.

8. Discussion

The good predictive variables of Pattern and style of residence affecting the happiness of the elderly people consist of 4 variables; Keep the bedroom and rest area clean and safe (PA_4), Arrange the bathroom area close to the bedroom and use modern sanitary ware (PA_8), Set up a bedroom and relaxation area to allow the sun to reach the room (PA_9), and Design the residence to be clear and airy (PA_{10}). This is relevant to the concept of Hooyman and Kiyak (1996), Hawanon and Wattanothai (2009), Pathomkulvasarat (2011), and Khrusuwat (2013) that the management of pattern and style of residence of the elderly people should be concerned about living with all people, environment similar to the original, necessary facilitators to provide convenience depending on the sage patterns that the elderly people need, for example, easy and safe to use and pick up. Regarding the space management, the living area should be proportionate, for example, the bedroom should be near the restroom; the multi-purposes area should be clear and unobstructed; and the floor and surrounding area should have the same level. In addition, this is relevant to the study of Khrusuw at (2013) that elderly people did not want a gigantic house, but they want the house to be natural and safe for their physical, mental, and property. The house should be where they can do their daily routine without anxiety. The physical attribute of the house should be single-storey or two-storey house, have enough living space and sufficient appliances and furniture. Each room is exactly proportionate. In the restroom of the elderly people, its floor should be covered with rough tile; with other sanitary ware, for example, the water closet, strong handle, round faucet, and good drainage. This is also relevant to the study of Pathomkulvasarat (2011) who presented the guidelines to improve and develop the residence prototype which is safe for the quality living of the elderly people. In the restroom, there should be the installation of strong handle and the water closet. The walkway inside or outside the house or at the terrace should have the same level without the obstruction, which its floor with non-slip surface. At the steps, their handle must be strong and firm. In the bedroom, there should be windows to receive light and help in ventilation; the bed should suit the physical of the elderly people with the handle next to the bed. The bedroom should have enough lighting and non-slip surface floor which is easy to be cleaned. In the kitchen, the handle should be installed at the frequently-use area; the same-level flooring; enough light from the electric bulb and window; ventilation appropriate to Thai style kitchen. This is accordingly relevant to the qualitative research results that the house should be safe and clean. The facilitators should be ready and easy to use, and suitable to the elderly people. The construction style should be simple, not complicated, in Thai contemporary style. The materials used in the construction should be easily found in local area. The house should be single-storey and compact. In case of two-storey house, the steps should be convenient for the elderly people to go up and down. The restroom should be located in the house; in the restroom, there should be ventilation window, handle, and water closet. The kitchen should not be located too far from the house building. In addition, the house building should be clear and airy to allow air to flow, and should have enough light to use. The good predictive variables of Environment of residence affecting the happiness of the elderly people consist of 4 variables; Adjust the area to have naturalness and good air (EN_1), Decorate the area with various items used in the old times (EN_2), Set up a wide area for open space without obstruction (EN_7), and Set up a residential area for easy access (EN_{10}). This is relevant to the concept of Leawrungruang et al. (2009), An Appropriate Environment for Elderly and Disabled People Research Unit (2013), and Bureau of Environmental Health (2015) that the environment of residence of the elderly people means the management of both inside and outside housing area in the aspects of personal, social, and physical by relying on maintaining the original condition to be the same or the most similar as possible. This aims to keep the mental feeling of the elderly people. It is also important to be concerned about colorful

appliances, brightness from natural source and electric bulb, and convenience in doing activities in accessible living area. The safety in daily life is also essential to the elderly people. Moreover, this is relevant to the study of Chaikittiporn, Sukkasem, and Semamon (2013) that The principle of '5 sor' was applied to adjust the environment to suit the usage and to be in order, for example, the multi-purpose area of the house should be wide, orderly, and accessible. The handle should be installed in this area so that the elderly people can support themselves to stand up or move to other parts of the house easily. However, the appropriateness and necessity of usage of the elderly people should be considered for the handle installation. The landscape around the house should be always improved by coloring for the bright and beauty. This is also relevant to the study of Tawha and Chaiwisit (2016) that the attitude of elderly people towards the management of environment and residence in the aspects of the more accessibility, the safety of the houses, easy maintenance and motivation building for the elderly was at high level. The guidelines for managing the environment of residence of elderly people were such as installing of handles at the walkway, adjusting the activity area for recreation and entertainment, using color and surface of the equipment to distinguish the different living space, and adjusting the light from natural source and electric bulb in specific spot. The elderly people can see the scenery outside the house. This is accordingly relevant to the qualitative research results that the surrounding area of the house should be clean and livable. There should be green area and nearby pond to increase the shade to the house. In addition, it should be non-pollution area, such as odor and air pollution as well as other disturbances. There should be the multi-purpose area for doing activities; this area should be clear and unobstructed. The house should be a bit far from the urban society for the serenity, but should not be too far from the hospital.

The good predictive variables of Technology of residence affecting the happiness of the elderly people consist of 6 variables; Apply the housing technology, such as emergency signal to help in an urgent situation (TE_1), Install the CCTV to maintain security and reduce anxiety (TE_4), Set the communication system so that the elderly people can contact other family members all the time when they live alone at home (TE_5), Install the electricity generator system with solar cell panels (TE_7), Use the energy-saving electric appliances and lighting (TE_8), and Use the inexpensive modern material instead of the natural materials (TE_{10}). This is relevant to the concept of the ptaranon (2009), Morris et al. (2013), Yu (2017), and At Kitchen (2017) that the technology of residence of the elderly people was to apply the modern equipment and material in the housing construction by installing the automatic controlling system. The material used in the house should be new, environmentally friendly, and help provide the convenience and safety to elderly people. Moreover, the communication technology should be easily accessible so that the elderly people can access the news and public services. In another, in case of emergency, other people can help the elderly people promptly. The technology selection depended on the life style and living condition of elderly people. In addition, it is relevant to the study of Booranrom, Watanapa, and Mongkolnam (2014) who presented Kinect sensor which is designed to capture the unusual signal that might happen to the elderly in the bedroom, for example, to prevent the elderly people from falling out of bed, to check the abnormity of daily waking up, to send the signal to ask for help, and to help the elderly turn off or turn on electric devices in the bedroom. It is also relevant to the study of Yu (2017) that older people need new technologies with easy installation and usage. It is predicted that the further development of smart home requires the integrated design of artificial intelligence, sensor technology, wireless charging technology and RFID-based positioning technology. It has a significant role in improving the quality of life of the elderly and diluting the annoyance and loss caused by aging. Good smart home should also reduce the economic, physical and psychological burden on the elderly, improve the quality of home environment, and promote physical and psychological health. It is relevant to the study of Morris et al. (2013) that this systematic review highlights the wide range of smart home technologies currently available to support older adults to live at home. These included passive and active sensors, monitoring systems, environmental control systems and electronic aids to daily living. A variety of smart-home technologies are available that are readily accepted by older adults and their family members, healthcare professionals and carriers. The feasibility and utilization of smart-technologies can be improved by addressing issues related to safety and privacy. In addition, exploring how feelings of safety and more control over one's life contributes to social and emotional well-being as well as the capacity to continue participating in outside interests and activities. This is accordingly relevant to the qualitative research results that the emergency signal should be installed to ask for help in urgent time. The facilitators should be convenient, easy to use, non-complicated, and long-lived for the elderly people. CCTV should be installed for the safety. Other necessary appliances were, for example, communication system for the elderly people to contact with other family members when they live alone at home, solar cell panels, and automatic electric system. Importantly, the elderly people should be taught to use all these technologies.

9. Recommendations

9.1. Environment of Residence

- The elderly people should be supported to have the ready-made green house or green area for planting vegetables or other kinds of plant that are fast growing. The elderly will be proud of themselves that they can work. When other family members eat the products, the elderly people will be pleased and realize their self value.
- The public sector, such as Ministry of Agriculture and Cooperatives, should support the cheap ready-made green house and plant seeds. The house where the elderly people live in can pick the seeds for free from the agricultural agency in the village or Agricultural Extension Officer.
- Allocation of seed quotas will bring about benefit in case that they are planted and nurtured. The elderly people can observe their growth, which make the elderly people happy and learn to wait. This is to generate the immunity because the elderly will realize that time is valuable and meaningful.

9.2. Technology of Residence
- The government should set the policy to cope with the aging society, for example, the house where elderly people live in can access Wifi for free as a necessary infrastructure.
- The CCTV should be installed to record and observe the elderly people.
- The sensor system should be installed to notify the elderly people to be more careful, and to be conscious, for example, when the elderly people walk pass the risky position, the light will be automatically turned on to warn them; this is also to practice their self awareness. In addition, the lighting system should be used in night time; and the sound system should be used in day time in order to warn the elderly people to be careful.
- Ministry of Social Development and Human Security or Ministry of Interior of the Kingdom of Thailand should set the policy that the house where the elderly people live in can access the telephone signal for free. Moreover, there should be the necessary safety appliance that can send the signal to the center.

9.3. Happiness of the Elderly People
- In case that the elderly people already have their occupation from the OTOP project (One Tumbol One Product), the management details should be increased, for example, the OTOP group will buy the products made by elderly people in good price. In addition, the elderly people should do the productivity accounting, writing down how many pieces of work that they can produce per day. The family members can help them do the productivity account. The elderly people will recognize their success, pride, self value, enthusiasm, and hope in life.
- There should be the health care report for the elderly people made by the health center of the village. The elderly people who can always take well care of their health, for example, the blood pressure, fat, and obesity are in the normal rate. They will get the reward from Provincial Health Office, such as tree or young plants. This can motivate the elderly people to realize the importance of health care.

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