The Journal of Behavioral Science
2021, Vol. 16, Issue 3, 59-71
Copyright © Behavioral Science Research Institute
ISSN: 1906-4675 (Print), 2651-2246 (Online)

The Journal of Behavioral Science (TJBS)

Original Article

Factors Related to Healthy Aging among Older Persons

Warinthorn Arayasajapong[1], Sungwean Pinagalung[2], Piyawan Srisuruk[3], Suchat Paholpak[4], and Korrawan Mongput[2*]

Author Affiliation

[1] Master's Degree Student, School of Educational Psychology and Counselling, Faculty of Education, Khon Kaen University, Thailand

[2] Lecturer, School of Educational Psychology and Counselling, Faculty of Education, Khon Kaen University, Thailand

[3] Associate Professor, School of Educational Psychology and Counselling, Faculty of Education, Khon Kaen University, Thailand

[4] Professor Emeritus, Department of Psychiatry, Faculty of Medicine, Khon Kaen University, Thailand

[*]Corresponding author e-mail: korrru@kku.ac.th

Article Information

Received: *13.6.21*
Revised: *16.7.21*
Accepted: *22.7.21*

Keywords

Elderly, healthy aging, Psychological, spiritual, psychosocial

Abstract

This study investigated the healthy aging levels and the factors of healthy aging among the elderly in Khon Kaen Province, which has been identified as having the highest level of healthy aging in Thailand. The sample (n = 449) was obtained from multistage random sampling. Physical factors, psychological, and spiritual factors, and a healthy aging instrument were part of the instruments. Findings revealed that elderly had an excellent level of healthy aging (M = 4.66, SD = .36). Correlation analysis showed eight independent variables were significantly associated with healthy aging. The first step of the hierarchical regression model showed that civil service was statistically significant to healthy aging (β = -.17, *adj.* R^2 = .09, p = .01). In the second step, health perception (β = .15, p < .001) and active daily living (β = .21, p < .001) were statistically significant to healthy aging. In the third step, self-esteem (β = .15, p < .001) and psychological spiritual needs (β = .56, p < .001) were statistically significant to healthy aging. In the final model, psychosocial factors were statistically significant (β =.18, p < .001, *adj.* R^2 = .56). These findings suggest that promoting health perceptions, active daily living, self-esteem, psychological and spiritual needs, and psychosocial necessities could assist individuals healthy aging. This presents an opportunity for behavioral science research to be utilized to promote healthy aging by engaging the specific areas and identifying chances where behavioral promotion may be used to create behavior that contribute to healthy aging.

Rapidly aging societies have become one of the most concerning issues that many countries, including Thailand, are now facing. Global statistics show that the aging demographic is comprehensively progressing as a significant segment of the total population. This is in large part due to various nations' development and advancements covering science, modern technology, and including innovative medical procedures aiding in treatment, disease control, and distribution of medical services in the public health sectors at the community and national levels. In addition, family planning has also reduced fertility rates. Societal values and attitudes have shifted, leading to lower marriage rates, higher divorces, and fewer children, leading to a decline in the proportion of births as the age increases. According to the most recent study on healthy aging, Thailand has an elderly population of more than 12 million people, or 20% of the total population (United Nations, 2019), classified as an aged society and will enter the highest level of an aging society to a super-aged society by 2035 (United Nations Department of Economic and Social Affairs Population Division, 2015). Demographic structure is an important part of driving, planning, developing, and is an indicator of a country's gross domestic product (GDP).

The World Health Organization has proposed healthy aging as an important issue by setting goals and strategies for the elderly to have healthy aging (World Health Organization, 2021). At the same time, the government has given importance to promoting the quality of life of the elderly, as can be seen from the formulation of strategies, measures,

and operational plans in various fields in the preparation of an elderly society and to ensure a high quality of life for those of advanced age (Prasrkul, 2016). The current COVID 19 epidemic has also disproportionately afflicted the elderly. The present demographic and epidemiological shifts within the community necessitate changes in how to manage and respond to the needs of older people, particularly in emergency circumstances (United Nations, 2020).

Aging is a normal part of life, and as life expectancy rises, it is becoming more common to reach older ages. Normal aging causes a reduction in the functioning level of the body, both physically and cognitively, which can lead to chronic illnesses (World Health Organization, 2011). Many physical changes occur, including sensory impairment and brain cells reduction. In addition to physical changes, older adults also experience psychological and spiritual changes such as increased depression, anxiety, and memory loss. Moreover, senior citizens also experience social changes, along with isolation, relocation, and a shift in wealth (Cacioppo et al., 2011). A majority of the elderly face frailty as a result of several complex health states including mental, social, and spiritual changes, as well as related to their living environment, the economy, and the changing context of social functions. This results in the elderly suffering many problems (Fried et al., 2001). In the long run, these problems could halt or even reverse the progress in aging well that we have made as a society if not addressed (Kim et al., 2021). The objectives of this research are (1) to investigate the level of healthy aging among the elderly of Khon Kaen Province, and (2) to identify factors that influence healthy aging in this population.

Healthy Aging

Healthy aging is a concept which in all dimensions aims to promote holistic well-being, whether it is physical factors, mental factors, spiritual factors, and psychosocial factors for the elderly to learn, understand, and accept the changes that occur naturally in order to live a quality and happy life (Hansen-Kyle, 2005). The concept of healthy aging is not uniform around the world; while biological processes of aging are shared between cultures, the social and cultural understanding of healthy aging varies (Wahl, 2020). As Wahl (2020) notes, there are also differences in the biological potential for healthy aging between individuals, with differences in genetics, earlier life experience of health and well-being, and behavioral practices leading to different healthy aging outcomes between individuals. Therefore, healthy aging should not be considered as a single, set outcome which all individuals can achieve, but one that varies a lot between individuals and between different social settings. Therefore, to promote good practices in healthy aging, all concepts must be integrated to be consistent and appropriate at the same time. Furthermore, from a behavioral science perspective, there is a need to identify individual behaviors that can be targeted to promote healthy aging (Santacreu et al., 2019). Some behaviors, including physical activity, risk avoidance, and others, have already been identified as influencing mental health and ultimately having an effect on healthy aging. At the same time, there are questions about how achievable successful and healthy aging is for everyone (Wahl, 2020). Therefore, to investigate the concept of healthy aging is not just a matter of investigating health behaviors, but also to examine how such behaviors can be promoted. Thus, there is both a gap in the research on what factors influencing healthy aging and how behaviors can be promoted within an aging population. This is a gap that can be addressed in the context of behavioral science.

There is also the question of what successful aging or healthy aging means in the context of Thailand. One previous study has established a model of healthy aging that identifies some specific conditions where healthy aging can occur, including physical and cognitive activity, socialization (or social interaction), social relationships and support with family members and others in the community (Thiamwong et al., 2008). Healthy aging also includes good levels of physical activities, which are influenced by mental and physical health, sociodemographics and other factors (Andrade de Sousa et al., 2021). There are also attitudes that can be identified as influencing aging, including self-awareness, self-care, acceptance of the aging process, and stress coping behaviors. Emotional functioning, for example a sense of belonging and hope, are also associated with healthy aging (Waldman-Levi et al., 2020). Perceptions of healthy aging are also important, with a growing distance between subjective and objective health as individuals age (Tseng et al., 2020). Moreover, self-sufficiency and living simply, as well as making merit and doing good deeds, are behavioral supports that impact the psychological and spiritual well-being of the elderly (Thiamwong et al., 2008). Several subsequent research have backed up the relevance of these characteristics while also

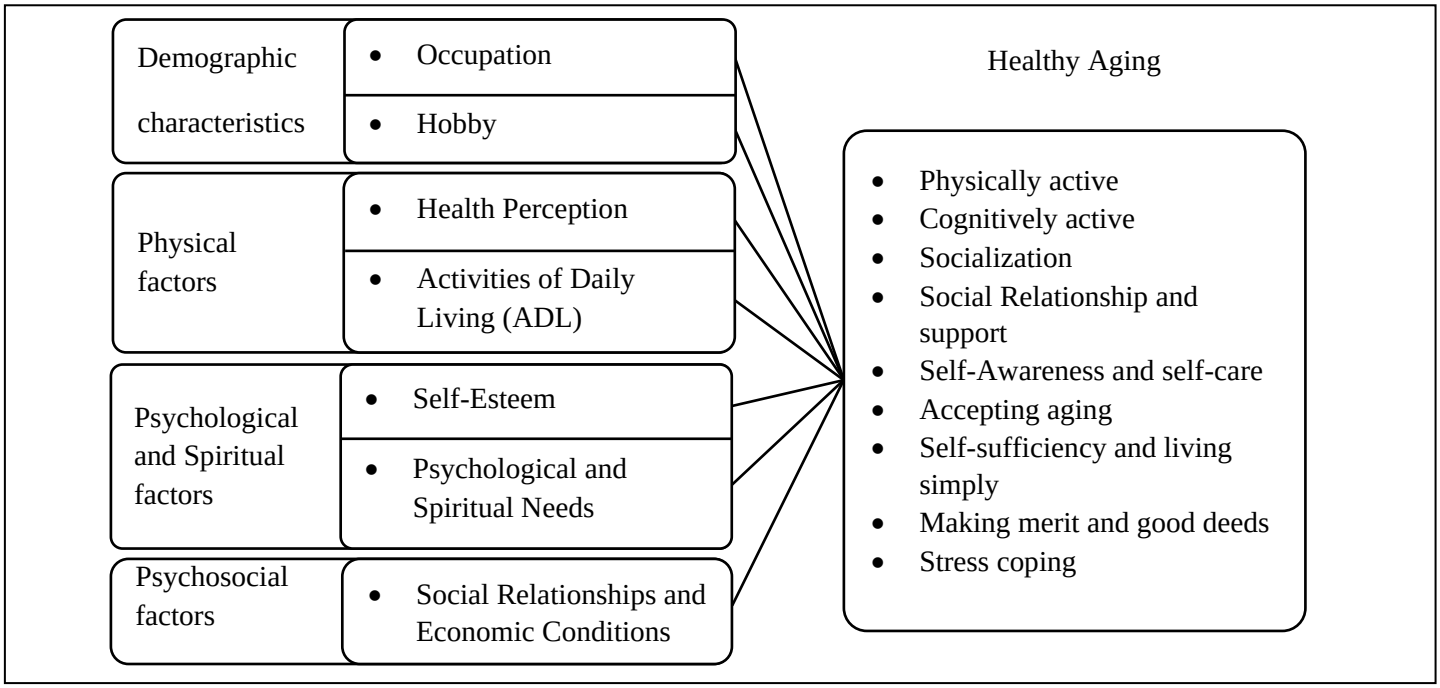
revealing some additional unique Thai viewpoints on healthy aging. One of these researches looked at the elderly's well-being using the sufficiency economy concept, which is a Thai take on sustainability. These authors demonstrated that the implementation of sufficiency economy concepts pertaining to basic (but adequate) economic circumstances and livelihoods that lead to well-being promotes the health of the Thai elderly. Furthermore, their research found that wellness treatments, which were activities that encouraged sufficiency economy-oriented behaviors, improved wellbeing. Another behavioral intervention aimed at improving psychological immunity or psychological variables to enhance aging outcomes (Choochom et al., 2019). This intervention demonstrated the importance of psychological health for Thai seniors and their healthy aging process. Eventually, a research on the elderly in Chiang Mai revealed that behavioral treatments focused on health and social behavior may be utilized to enhance the health of the aged (Sutipan & Intarakamhang, 2017). Overall, these data show that there is a distinct Thai concept of healthy aging, which may be promoted through behavioral interventions if researchers and service providers know which factors to target.

Purpose of the Study

The purpose of this study was to optimize possibilities for improving and sustaining physical, social, mental, wellbeing, independence, quality of life, and perhaps even increasing effective life-course transitions among the elderly in Khon Kaen Province. Khon Kaen Province was selected as the site for the study because the National Statistical Office, which has conducted a prior study on aging in Thailand, has found that Khon Kaen also has Thailand's highest Active Aging Index. The World Health Organization developed the active aging index to measure the quality of senior life. By investigating the elderly in Khon Kaen, it is possible to identify the factors that affect healthy aging. This information can be used to develop behavioral science interventions that can improve the health of the elderly and lead people into healthy aging across Thailand.

Figure 1

Conceptual Framework of the Purposed Correlation between Related Factors and Healthy Aging



As shown in Figure 1, the conceptual framework of this research was based on Hansen-Kyle's concept of healthy aging (2005). This definition of healthy aging defined it as a naturally occurring process of physical and mental functioning through adjustment and compensation for the condition, as well as the work of all bodily parts. Furthermore, these concepts addressed all elements of an individual's requirements, including physical, mental, spiritual, and social needs, in order to reach the highest possible quality of life. This research utilized descriptive correlational research with the objectives of studying the healthy aging level and the related factors among elderly individuals in Khon Kaen

Province. The factors related to healthy aging were demographic characteristics factors, physical factors, psychological and spiritual factors, and psychosocial factors.

Hypotheses

The research examined the associations between four different clusters of attitudes, beliefs and perceptions and healthy aging in the Thai elderly. These hypotheses are tested cumulatively, investigating the overall effect of these factors.

The four hypotheses that were used to test these factors included:

H1: Occupation and hobbies predict healthy aging among Thai elderly.
H2: Physical factors (health perceptions and active daily life) predict healthy aging among Thai elderly.
H3: Psychological and spiritual factors (self-esteem, psychological and spiritual needs) predict healthy aging among Thai elderly.
H4: Psychosocial factors (family, community and social relationships and economic conditions) predict healthy aging among Thai elderly.

Method

This research utilized descriptive correlational research to understand the phenomenon related to healthy aging of the elderly in Thai context. The objectives of this study were to identify and document the healthy aging levels and the related causal factors among the elderly population. The locality for this study was in 26 districts of Khon Kaen Province in the northeastern part of Thailand. Data was collected from March to May 2021.

Participants

The elderly people aged 60 years and over participated in this study. The samples size was 400 elderly by using Taro Yamane (Yamane, 1973) formula with 95% confidence level. In order to obtain reliable of data using a multi-stage sampling method (n=449). The inclusion criteria as Thai nationality who able to communicate and no brain injuries

Instruments

Instruments used in this study were self-report questionnaires, which consisted of factors related to healthy aging and the healthy aging instrument (HAI) (Thiamwong et al., 2008). The instruments were presented to a panel of three experts in psychological and psychosocial research to assess the validity of its content. The draft instrument was pre-tested to find out the reliability with a convenience sample (n = 30) of older adults with the inclusion criteria of the research participants.

The Questionnaire

The questionnaire on factors related to healthy aging consisted of four parts (summarized in Table 1):

Part 1. This included a self-reported items which asked about demographic characteristics such as occupation and hobbies.

Part 2. The physical factors are a self- report questionnaire, which consisted of the health status perception, and daily activities living questionnaires. The health status perception questionnaire was developed based on Wang and Laffrey's scale, which consisted of 3 items (Wang & Laffrey, 2001). The daily activities living (ADL) questionnaire was developed from the Barthel ADL index (Collin et al., 1998), which consisted of 10 items. The alpha coefficients were suitable for all scales (>.80).

Part 3. The psychological and spiritual factors were measured using a self- report questionnaire developed for the study. The researcher developed the self-esteem questionnaire based on Coopersmith's concept, explaining that self-esteem was how individuals perceive and assess themselves in terms of self-acceptance or non-acceptance of oneself to the extent of personal beliefs (Potard, 2017). The Psychological Needs Questionnaire was developed based on a combination of the psychological dynamics of older adults (Jung, 1969) and Maslow's Hierarchy of Human Needs Theory, which describes how individuals will have internal needs according to the hierarchy that affected individual behavior (Maslow, 1943). This questionnaire consisted of 15 questions. The alpha coefficient (Table 1) was acceptable.

Part 4. Psychosocial factors was measured using a self-report questionnaire, which consisted of inquiries into family relationships, society, communities, and economic conditions. The researcher developed this questionnaire based on age-stratification theory, which is a sociological theory that the elderly are part of society and society is part of the life of the elderly (Bell, 2014).

Therefore, interpersonal and intersocial interactions play an important role for each other. This questionnaire consisted of 10 questions. Its alpha coefficient was suitable (Table 1).

Part 5. The Healthy Aging Instrument (HAI) (Thiamwong et al., 2008), developed from a review of the literature and concept of Hansen-Kyle (2005), was used to assess healthy aging of the elderly in the context of Thai society. The instrument consisted of 35 questions. It showed adequate internal consistency based on the Cronbach's alpha (table 1).

Table 1
The instrument Scales

Instruments	Total items	Sample Item	Likert scale	Index of Congruence (>.5)	Cronbach's alpha (>.8)
Health Perception *(Self-report)*	3 items	How is your overall health?	4-point Likert from a scale of 1 (Excellent) to 4 (Poor)	1	.97
Activities of Daily Living (ADL) *(Self-report)*	10 items	Changing your poster (standing up, sitting, and standing still)	4-point Likert from a scale of 1 (Independent) to 4 (No attempt)	.67 - 1	.97
Self-Esteem and Psychological Need *(Self-report)*	15 items	I have the confidence to express my thoughts to others.	4-point Likert from a scale of 1 (Strongly agree) to 4 (Strongly disagree)	.67 - 1	.97
Psychosocial *(Self-report)*	10 items	I spend time with my family participating in activities.	4-point Likert from a scale of 1 (Strongly agree) to 4 (Strongly disagree)	.67 - 1	.97
Healthy Aging Instrument (HAI) *(Self-report)*	35 items	I try to perform a variety of activities every day	5-point Likert from a scale of 1 (Strongly agree) to 5 (Strongly disagree)	.69 - .80	.88

Procedures

The researchers requested a letter from Khon Kaen University asking for permission and cooperation in data collection for public health in 26 sub-districts in Khon Kaen Province, which is located in Thailand's northeastern region. The researchers conducted data collection with each participant individually at the sub-district health promotion hospital or the volunteer's home. The questionnaire response time was approximately 20 minutes. The data collection and analysis period were carried out over three months, from March to May 2021.

Ethics

This research has been approved by the Human Research Ethics Accreditation Committee of Khon Kaen University (Project Certificate No. HE633206). Every participant had to give a consent form before participating.

Results

Statistical Analysis

In this study, the researchers analyzed the data by descriptive statistics such as frequency distribution, mean, and standard deviation. Correlation between all variables was analyzed using multiple correlation statistics with a significant value set at the .05 level. A hierarchical regression linear analysis was used to investigate to investigate the effects of the clusters of factors (demographic, physical, psychological, spiritual, and psychosocial needs) on healthy aging. Hierarchical regression

analysis was suitable for the research because it controls for the effect of prior factors (Hair et al., 2010).

Demographics

The demographic characteristics of the sample were as follows. Most of the respondents were female (77.7%), with a smaller group of male participants (22.3%). The average was 70.4 years (range 60-104 years, SD = 7.18 years). Most respondents were Buddhists (99.6%), with only a few Christians (.4%). Most were married (62.8%) or divorced (29.2%), although a few were single (4.7%) or widowed (3.3%). Most respondents had at least finished primary school education (74.8%), but only a small number had post-secondary education (11.2%). They were most often agriculturists (425%), but were also housewives (36%), business owners (7.8%) and civil service employees (7.8%). About 73.1% had monthly income lower than 5,000 baht. About 61% of respondents had hobbies including housework, gardening, social service, and religious activities. 69.7% had medical conditions. Diabetes, high blood pressure, lipids and osteoporosis were most common diseases in the elderly in Khon Kaen Province.

Table 2

The Healthy Aging Questionnaire and its Sub-Categories Score

Variable	Categorization	Mean	SD	Level
Healthy Aging Instrument (HAI)	1. Physically active	4.55	.67	Excellent
	2. Cognitively active	4.56	.59	Excellent
	3. Socialization	4.70	.65	Excellent
	4. Social Relationship and support	4.77	.52	Excellent
	5. Self-Awareness and self-care	4.64	.50	Excellent
	6. Accepting aging	4.85	.44	Excellent
	7. Self-sufficiency and living simply	4.71	.38	Excellent
	8. Making merit and good deeds	4.86	.31	Excellent
	9. Stress coping	4.48	.60	Good
	Total	4.66	.36	Excellent

Note. n = 449. The level of the HAI score was as follows: 1.00 – 1.50 = lowest level of HAI, 1.51 – 2.50 = low level of HAI, 2.51 – 3.50 = moderate level of HAI, 3.41 – 4.50 = good level of HAI, 4.51 – 5.00 = excellent level of HAI respectively.

Healthy Aging Level of The Elderly in Khon Kaen Province

The average HAI score (M = 4.66, SD = .36) was excellent (table 2). The HAI sub-categories were also rated as excellent on average. These can be ranked as follows: stress and coping (M = 4.48, SD = .60); physically active (M = 4.55, SD = .67); cognitively active (M = 4.56, SD = .59); self-awareness and self-care (M = 4.64, SD = .50); socialization (M = 4.70, SD = .65); self-sufficiency and living simply (M = 4.71, SD = .38); social relationships and support (M = 4.77, SD = .52); accepting aging (M = 4.85, SD = .44); and making merit and good deeds (M = 4.86, SD = .31).

Correlation Analysis

From the correlation (table 3), the demographic characteristics revealed that only agriculturist, business owner and civil service were significantly associated with healthy aging ($p < .05$). In terms of physical factors which included health perception and activities daily living (ADL), psychological and spiritual factors which included self-esteem, psychological and spiritual needs, and also psychosocial factors which included family, community, social and the economic condition all of which were significantly associated with healthy aging ($p < .01$). The correlation test leads to the identification of eight independent variables as candidates for the regression model, based on their significant correlations to HAI ($p < .05$). These factors included agriculturist, business owner, civil service, health perception, active daily living (ADL), self-esteem, psychological and spiritual needs, and psychosocial factors.

Table 3
Correlations Between Independent Variables and Healthy Aging

Variables	Healthy Aging	1	2	3	4	5	6	7	8	9	10
Demographic characteristics											
1. Agriculturist	.26**	1									
2. Housewife	-.07	-.65**	1								
3. Business owner	-.15**	-.25**	-.22**	1							
4. Civil service	-.19**	-.25**	-.22**	-.09*	1						
5. Having hobby	.06	.04	-.20**	.11**	.14**	1					
Physical Factors											
6. Health Perception	.22**	.06	-.04	-.08*	.06	.11**	1				
7. ADL	.25**	.15**	-.30**	.09*	.08*	.24**	.28**	1			
Psychological and Spiritual factors											
8. Self-Esteem	.50**	.09**	-.10**	-.01	.04	.06	.27**	.18**	1		
9. Psycho & Spirit Needs	.71**	.18**	.01	-.14**	-.19**	.05	.22**	.20**	.56**	1	
Psychosocial factors and Spiritual factors											
10. Family, community, social relationship, and economic condition	.50**	.06	.08*	-.06	-.05	-.02	.23**	.14**	.37**	.53**	1
Healthy Aging (HAI)	1	-.26**	-.07	-.15**	-.19**	.06	.22**	.25**	.50**	.71**	.50**

Note. $n = 449$, *$p < .05$. **$p < .01$. The number in the most upper row had the same meaning as in the most left column. ADL = Activities of daily living.

This study used hierarchical regression analysis with the enter method to compute model parameters. Table 4 shows the findings of a hierarchical regression model to illustrate variable(s) that can predict healthy aging. When all the independent variables were included in the hierarchical regression equation, their variance inflation factor (VIF) is less than 10. Therefore, even if related, factors with VIF < 10 are not constrained by multicollinearity (Hair et al., 2010). The first step results (adj. $R^2 = .09$) showed that only civil service ($p = .01$) was significant ($p < .05$). The second step, physical factors (health perception and ADL) were then added to the regression equation. There was a significant change in variance accounted for compared to Step 1 ($\Delta R^2 = .08$, $p < .001$). The third step included psychological and spiritual variables (self-esteem and psychological & spiritual needs). This step also showed a significant increase in variance ($\Delta R^2 = .37$, $p < .001$). In step 4, the psychosocial variables were added, producing an even larger change in variance ($\Delta R^2 = .56$, $p < .001$). The results revealed that six factors were statistically significant ($p < .05$) throughout the last stage of the process with healthy aging (HAI): business owner, civil service, self-esteem, ADL, psychological and

spiritual, and psychosocial factors. As regards demographic characteristics variables, it can also be discovered that the business owner (β = -.11, p = .02) and civil service (β = -.13, p = .01) were negatively related to healthy aging. Therefore, hypothesis 1 was partially supported. Of the physical factors, only ADL was associated with healthy aging (β = .09, p = .02). Hypothesis 2 was also partially supported. Of the psychological and spiritual factors, self-esteem (β = .14, p < .001) and psychological and spiritual needs (β = .48, p < .001) were both positively associated with healthy aging, hypothesis 3 was fully supported. In the psychosocial factors, family, community, social, and economic relationship were positively associated with healthy aging (β = .18, p < .001); thus hypothesis 4 was fully supported.

Table 4

Hierarchical Regression Analysis Evaluating Predictive Factors for Healthy Aging

Variables	R^2	R^2 adj	ΔR^2	Δ Sig. F	Unstandardized Coefficients		Standardized Coefficients	t	P
					B	$SE_{(B)}$	β		
Step 1 Demographic Characteristics factors									
	.10	.09	.10	< .001					
Agriculturist					.13	.07	.17	1.73	.08
Housewife					-.00	.08	-.00	-.03	.98
Business owner					-.17	.09	-.13	-1.90	.06
Civil service					-.23	.09	-.17	-2.5**	.01
(agriculturist=1, housewife=2, business owner=3, civil service = 4, others = 0)									
Having hobby (yes = 1, no = 0)					.07	.03	.09	1.90	.06
Step 2 Demographic Characteristics and Physical factors									
	.18	.17	.08	< .001					
Agriculturist					.13	.07	.18	1.8	.07
Housewife					.04	.07	.05	.55	.58
Business owner					-.16	.09	-.12	-1.81	.07
Civil service					-.23	.09	-.18	-2.68**	.01
Having hobby					.02	.03	.03	.72	.47
Health Perception					.09	.03	.15	3.29**	.00
ADL					.23	.05	.21	4.41**	<.001
Step 3 Demographic Characteristics, Physical and Psychological and Spiritual factors									
	.55	.54	.37	< .001					
Agriculturist					.05	.05	.07	.89	.37
Housewife					-.02	.06	-.03	-.36	.72
Business owner					-.10	.07	-.08	-1.56	.12
Civil service					-.13	.07	-.10	-1.93	.06
Having hobby					.01	.03	.01	.39	.70
Health Perception					.01	.02	.02	.58	.56
ADL					.10	.04	.10	2.63**	.009
Self-Esteem					.14	.04	.15	3.85**	<.001
Psychological & Spirit Needs					.56	.04	.56	13.53**	<.001

Table 4 (*Continued*)

Variables	R^2	R^2 *adj*	ΔR^2	Δ *Sig. F*	Unstandardized Coefficients		Standardized Coefficients	*t*	*p*
					B	$SE_{(B)}$	β		
Step 4 Demographic Characteristics, Physical, Psychological & Spiritual and Psychosocial factors	.57	.56	.02	< .001					
Agriculturist					.01	.05	.01	.18	.86
Housewife					-.07	.05	-.09	-1.26	.21
Business owner					-.15	.06	-.11	-2.27*	.02
Civil service					-.18	.07	-.13	-2.71**	.01
Having hobby					.02	.02	.02	.72	.47
Health Perception					.00	.02	.00	.06	.95
ADL					.09	.04	.09	2.43*	.02
Self-Esteem					.13	.04	.14	3.56**	<.001
Psycho & Spirit Needs					.48	.04	.48	10.82**	<.001
Family, community, social relationship and economic condition.					.17	.04	.18	4.74**	<.001

Note.: n = 449, **p* <.05. ***p* <.01.

Discussion and Conclusion

The aim of this study was to determine the healthy aging levels and the factors related to healthy aging among elderly in Khon Kaen Province. A look at the healthy aging of the elderly in Khon Kaen Province revealed that most of the elderly could be considered to have healthy aging at an excellent level. It can be explained that healthy aging of the elderly must consist of; being able to perform daily activities to keep oneself healthy, interacting and communicating with neighbors, and exchanging information to aid their memory. Having good relationships with family members and participating in community activities also helps seniors achieve higher life satisfaction. This, in addition to taking care of oneself, living a simple, self-sufficient life, and acknowledging that aging was a natural process and one that maintains good health, coping with cognitive processes, stress relief, optimism, and adherence to religious guidelines were other elements that contributed to healthy aging. Healthy aging is a cognitive process that prepares them to adapt and cope with changes which arise from aging to conduct oneself appropriately in society (Hansen-Kyle, 2005). It was also consistent with the study by the National Statistical Office (2017) that showed the elderly in Khon Kaen Province had the highest level of active aging index value in Thailand. The World Health Organization (WHO) defined active aging as the way of thinking and working on "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age" (World Health Organization, 2002).

The relationship demographic characteristics factors and healthy aging of the elderly in Khon Kaen Province found that business owner and civil service were negative statistical correlated with healthy aging. This can be explained that the aging process, most organs lose functional capacity and ability to maintain homeostasis. Therefore, the unsatisfactory regression of the ability causes stress for senior citizens. With the body's reaction to stress, this was consistent with previous study, which found that some older adults still have to work due to certain necessities, this created stress and health problems (Nilsson, 2017). Another study contended that according to activity theory, older individuals who retired full-time deteriorated both mentally and physically at different rates (Minami et al., 2015). The reduction would be minimal if they switched to part-time work. It demonstrates that employment is a beneficial method of social involvement for Japanese seniors aged 65 and over.

In term of physical factors, the activity of daily living (ADL) was positive statistical correlated with healthy aging. The study found that coping with functional mobility in daily life is an important component of assessing functional health. This was congruent with the World Health Organization's findings that preserving one's capacity to conduct daily activities (ADL) demonstrated how elders may adjust to a downturn. The quality of people's social

life is heavily influenced by their health and functional abilities. The amount to which individuals can cope independently in the community, engage in activities, visit other people, use the resources and facilities offered by organizations and society, and generally enhance their life and the lives of those closest to them is determined by functional capacity. It expresses the capacity to play a part in decreasing reliance and promoting healthy aging in oneself, family, community, and society (World Health Organization, 2015).

Psychological and spiritual aspects are critical for healthy aging and elderly people's quality of life. Self-esteem was found to be positive statistical related to healthy aging. It is described as an individual's view of the culture and value systems in which seniors live, as well as their objectives, expectations, standards, and concerns. This leads to older adults feeling good, which also makes them feel more attractive to other people (Tavares et al., 2017). It demonstrated that self-esteem was dynamic in later life developments. This was consistent with Buhler's Course of human life theory that healthy personalities were thus the active mediators of their own existence, motivated to fulfill biological and psycho-emotional needs and spiritual values. This was also similar with another study, which examined variables related to late-life self-esteem (Wagner et al., 2015). Senior citizens who had strong self-esteem had a greater quality of life and a better relationship with their environment. Regarding the psychological and spiritual needs, there was a positive statical relationship to healthy aging. It showed that later in life there were often questions that arise about their beliefs, dreams, finding and fulfilling goals in life, and their role in family and society. These were all part of the spiritual needs based on Jung's theory of individualism (Jung, 1969). It was also consistent with findings that the most influential factor for a healthy life in later years was understanding one's own mental state at the end of life, a self-discovery for accepting the possibility of deteriorating physical, mental, and environmental conditions, and bringing about the mental well-being of the elderly (McKee & Schüz, 2015).

Psychosocial factors, namely family, community, social, and economic ties were shown to be significantly related with the healthy aging of older individuals in Khon Kaen Province. It has been shown that the environment around the elderly can be a trigger for reduced mental states, relationships, and roles. As a person grows older, recession may have a dampening impact on change as a person ages, which directly impacts the individual's capacity to adapt with the environment and society (Kristof, 1996). Loneliness and isolation among the aging can worsen when personal ties decline, with social isolation leading or aggravating geriatric depression. This was similar with studies which revealed that the elderly's well-maintained connections and support from family and society were mental supportive (Han et al., 2015; Näsman et al., 2020). In addition, the elderly were more accepting of their own changes and were ready to learn how to live in the later stages of life, leading to a healthier perception of aging. Another research attempted to explore the health of the elderly by evaluating the impact of socio-demographic and economic activities on an individual's lifestyle (Kim et al., 2017). According to the findings of the comprehensive study, socio-economic position was one of the most important variables in the health of the elderly. It is thought that employees' and self-employed people's labor, output, and economic consumption have a beneficial impact on their subjective health and other aspects. The reported subjective health status was likewise greater in the working and high-income groups, and it fostered friendship with others. Their economic activities would be influenced by their perceived health. As a result, it is critical to examine the elderly's health equity and to provide health care by enacting suitable policies to address health inequities.

Conclusion

In conclusion, senior citizens in Khon Kaen Province can be said to have an excellent level of healthy aging, and have higher levels of other factors. Meanwhile, the study showed that physical, psychological, spiritual, and psychosocial factors were positively correlated with healthy aging of the elderly in Khon Kaen Province. More importantly, psychological and spiritual factors have been shown to be the most positively linked to healthy aging. This can explain that mental and spiritual resilience can help individuals cope with their own aging. Personal commitment is a unique psychological and spiritual way to engage that provides aging people a sense of meaning and purpose, connects or reconnects them with the community in which they experience a sense of well-being, respond to suffering, and develops coping mechanisms to improve their quality of life.

This study sheds light on the key aspects that health care providers and academics should consider when implementing systematic reviews and programs to promote healthy aging. Moreover, it can also serve as a guide for the general public or those entering old age to prepare before they enter old age, and also as a driving force for policies to promote healthy aging appropriately.

Acknowledgments

We would like to thank all the elderly people for their excellent cooperation in answering the questionnaire to the best of their ability, and the personnel of health promoting hospitals in 26 sub-districts for their assistance and facilitation of data collecting.

References

Andrade de Sousa, B., Cascaes da Silva, F., Lemes Ribeiro, Í., Braga da Lima, D., & da Silva, R. (2021). Sociodemographic, anthropometric, functional and psychosocial factors associated with physical activity in older adults. *Ageing International*. https://doi.org/https://doi.org/10.1007/s12126-021-09450-w

Bell, K. (2014). Age stratification theory. *Open Education Sociology Dictionary.* https://sociologydictionary.org/age-stratification-theory/

Cacioppo, J. T., Hawkley, L. C., Norman, G. J., & Bernston, G. G. (2011). Social isolation. *Annals of the New York Academy of Sciences, 1231*(1), 17–22. https://doi.org/10.1111/j.1749-6632.2011.06028.x

Choochom, O., Sucaromana, U., Chavanovanich, J., & Tellegen, P. (2019). A model of self-development for enhancing psychological immunity of the elderly. *Journal of Behavioral Science, 14*(1), 84–96. https://doi.org/10.20472/iac.2019.048.009

Collin, C., Wade, D. T., Davies, S., & Horne, V. (1998). The Barthel ADL Index: A reliability study. *International Disability Studies, 10*(2), 61–63. https://doi.org/10.3109/09638288809164103

Fried, L. P., Tangen, C. M., Walston, J., Newman, A. B., Hirsch, C., Gottdiener, J., Seeman, T., Tracy, R., Kop, W. J., Burke, G., & McBurnie, M. A. (2001). Frailty in older adults: Evidence for a phenotype. *Journals of Gerontology - Series A Biological Sciences and Medical Sciences, 56*(3), 146–157. https://doi.org/10.1093/gerona/56.3.m146

Foundation of Thai Gerontology Research and Development institute. (2019). *Situation of the Thai Elderly 2019*. https://thaitgri.org/?p=39473

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis. Vectors* (7th ed.). Pearson Prentice Hall. https://doi. org/10.1016/j. ijpharm.2011.02.019

Han, K. H., Lee, Y. J., Gu, J. S., Oh, H., Han, J. H., & Kim, K. B. (2015). Psychosocial factors for influencing healthy aging in adults in Korea. *Health and Quality of Life Outcomes, 13*(1), 1–10. https://doi.org/10.1186/s12955-015-0225-5

Hansen-Kyle, L. (2005). A concept analysis of healthy aging. *Nursing Forum, 40*(2), 45–57. https://doi.org/10.1111/j.1744-6198.2005.00009.x

Jung, C. G. (1969). Psychological factors determining human behavior (R. F. C. Hull, Trans.). In H. Read et al. (Eds.), The collected works of C. G. *Jung: Vol. 8. Structure and dynamics of the psyche* (2nd ed., pp. 114-125). Princeton University Press. (Original work published 1937)

Kim, C.-B., Yoon, S.-J., & Ko, J. (2017). Economic Activity and Health Conditions in Adults Aged 65 Years and Older: Findings of the Korean National Longitudinal Study on Aging. *Healthcare, 5*(4), 63. https://doi.org/10.3390/healthcare5040063

Kim, E. S., Tkatch, R., Martin, D., MacLeod, S., Sandy, L., & Yeh, C. (2021). Resilient Aging: Psychological Well-Being and Social Well-Being as Targets for the Promotion of Healthy Aging. *Gerontology and Geriatric Medicine, 7*, 1–12. https://doi.org/10.1177/23337214211002951

Kristof, A. L. (1996). Person-organization fit: An integrative review of its conceptualizations, measurement and implications. *Personnel Psychology, 49*(1), 1–49.

Maslow, A. H. (1943). A theory of human motivation. *Psychological Review, 50*(4), 370–396. https://doi.org/https://doi.org/10.1037/h0054346

McKee, K. J., & Schüz, B. (2015). Psychosocial factors in healthy ageing. *Psychology and Health, 30*(6), 607–626. https://doi.org/10.1080/08870446.2015.1026905

Minami, U., Nishi, M., Fukaya, T., Hasebe, M., Nonaka, K., Koike, T., Suzuki, H., Murayama, Y., Uchida, H., & Fujiwara, Y. (2015). Effects of the change in working status on the health of older people in Japan. *PLoS ONE*, *10*(12), 1–10. https://doi.org/10.1371/journal.pone.0144069

Näsman, M., Niklasson, J., Saarela, J., Nygård, M., Olofsson, B., Gustafson, Y., & Nyqvist, F. (2020). Morale in Old Age and Its Association with Sociodemographic, Social, and Health-Related Factors in Different Age Groups. *Journal of Aging Research*. https://doi.org/10.1155/2020/3939718

National Statistical Office. (2017). *The elderly population survey in Thailand*. http://www.nso.go.th/sites/2014en/Pages/survey/Social/Demographic,%20Population%20and%20Housing/The-Survey-Of-Elderly-In-Thailand.aspx

Nilsson, K. (2017). The Influence of Work Environmental and Motivation Factors on Seniors' Attitudes to an Extended Working Life or to Retire. A Cross Sectional Study with Employees 55 - 74 years of Age. *Open Journal of Social Sciences*, *5*(7), 30–41. https://doi.org/10.4236/jss.2017.57003

Potard, C. (2017). Self-esteem Inventory (Coopersmith). In V. Zeigler-Hill & T. K. Shackelford (Eds.), *Encyclopedia of Personality and Individual Differences* (pp. 1–3). Springer international. https://doi.org/10.1007/978-3-319-28099-8_81-1

Santacreu, M., Rodríguez, M. A., & Molina, M. Á. (2019). Behavioral health. In Fernández-Ballesteros, A. Benetos, & J.-M. Robine (Eds.), *The Cambridge Handbook of Successful Aging* (pp. 299–320). Cambridge University Press. https://doi.org/https://doi.org/10.1017/9781316677018.019

Sutipan, P., & Intarakamhang, U. (2017). Healthy Lifestyle Behavioral Needs among the Elderly with Hypertension in Chiang Mai, Thailand. *International Journal of Behavioral Science*, *12*(1), 1–12.

Tavares, R. E., Jesus, M. C. P. de, Machado, D. R., Braga, V. A. S., Tocantins, F. R., & Merighi, M. A. B. (2017). Healthy aging from the perspective of the elderly: An integrative review. *Revista Brasileira de Geriatria e Gerontologia*, *20*(6), 878–889. https://dx.doi.org/10.1590/1981-22562017020.170091

Thiamwong, L., Maneesriwongul, W., Malathum, P., Jitapunkul, S., Vorapongsathorn, T., & Stewart, A. L. (2008). Development and Psychometric Testing of the Healthy Aging Instrument. *Pacific Rim International Journal of Nursing Research*, *12*(4), 285-296. https://he02.tci-thaijo.org/index.php/PRIJNR/article/view/5866

Tseng, H. Y., Löckenhoff, C., Lee, C. Y., Yu, S. H., Wu, I. C., Chang, H. Y., Chiu, Y. F., & Hsiung, C. A. (2020). The paradox of aging and health-related quality of life in Asian Chinese: Results from the Healthy Aging Longitudinal Study in Taiwan. *BMC Geriatrics*, *20*(1), 1–10. https://doi.org/10.1186/s12877-020-1446-y

United Nations. (2020). *Policy brief: The impact of COVID-19 on older persons*. https://unsdg.un.org/sites/default/files/2020-05/Policy-Brief-The-Impact-of-COVID-19-on-Older-Persons.pdf

United Nations. (2019). *World Population Prospects 2019*. United Nations Population Division. https://population.un.org/wpp/Download/Standard/Population/

United Nations Department of Economic and Social Affairs Population Division. (2015). *World population aging 2015 - Highlights (ST/ESA/SER.A/368)*. http://esa.un.org/unpd/wpp/publications/files/key_findings_wpp_2015.pdf

Wagner, J., Hoppmann, C., Ram, N., & Gerstorf, D. (2015). Self-esteem is relatively stable late in life: The role of resources in the health, self-regulation and social domains. *Developmental Psychology*, *51*(1), 136–149. https://doi.org/https://doi.org/10.1037/a0038338

Wahl, H. W. (2020). Aging Successfully: Possible in Principle? Possible for all? Desirable for all? *Integrative Psychological and Behavioral Science*, *54*(2), 251–268. https://doi.org/10.1007/s12124-020-09513-8

Waldman-Levi, A., Bar-Haim Erez, A., Katz, N., & Stancanelli, J. M. (2020). Emotional Functioning and Sense of Hope as Contributors to Healthy Aging. *OTJR Occupation, Participation and Health*, *40*(4), 253–260. https://doi.org/10.1177/1539449220920728

Wang, H.-H., & Laffrey, S. C. (2001). A predictive model of well-being and self-care for rural

elderly women in Taiwan. *Research in Nursing and Health, 24*(2), 122–132. https://doi.org/https://doi.org/10.1002/nur.1015

World Health Organization. (2002). *Active ageing: A policy framework*. https://apps.who.int/iris/handle/10665/67215

World Health Organization. (2011). *Global health and ageing*. https://www.who.int/ageing/publications/global_health.pdf

World Health Organization. (2015). *World report on aging and health*. http://apps.who.int/iris/bitstream /10665/186463/1/9789240694811_ eng.pdf?ua=1

World Health Organization. (2021). *Decade of healthy ageing: Baseline report*. https://www.who.int/publications/i/item/9789240017900

Yamane, T. (1973). *Problem to accompany statistics: An introductory analysis* (3rd. ed.). Harper & Row.