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Analysis of Factors Influencing Health Conservation of Elderly Citizens Living in Rural Environments

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Abstract

Purpose: The purpose of this study was to investigate the general characteristics, lifestyle, social network and the degree of health conservation of elderly people living in the community, And to provide the basic data necessary for developing the nursing interventions.

Methods: This study is a descriptive research study, which collected data from 147 elderly people living in the community in Chungbuk C city using questionnaires. The collected data were analyzed by descriptive statistics, Pearson's correlation coefficients and hierarchical regression. **Results:** The degree of health conservation of the subjects was 2.70 ± .27 (1 ~ 4). In the present study, factors affecting health preservation were social network (β = .60, p <.001) lifestyle (β = .26, p <.001), spouse (β = .18, p = .013), Age (β = .16, p = .009), religion (β = -. 12, p = .046), and the explanatory power of these variables was 55.9%. **Conclusion:** The findings of this study showed that the social network is the most influential factor for the health care of the elderly. Therefore, in order to promote the social network of the elderly, it is necessary to expand individual support for the formation and maintenance of diverse social relations, as well as policy support and economic support to ensure individual social participation and leisure activities.

Keywords: Community, elderly, health conservation, lifestyle, social network

INTRODUCTION

Life expectancy in Korea is relatively high at 82.3 years, but the healthy life expectancy is 73.2 years [1], indicating that approximately 9 years are sent suffering from illness. The Survey on the Life of the Elderly [2] shows that 90.4% of all elderly people have chronic illnesses. Among them the elderly with at least one chronic illness account for 18.2%, those with two chronic illnesses take up 22.8%, and those with three or more chronic illnesses account for 49.4. In terms of the type of illness, 56.7% has hypertension, 33.4% has osteoarthritis, 22.6% has diabetes, and 21.1% has lower back pain or sciatica. As the healthy life expectancy of the Korean elderly is shorter by 9 years than life expectancy, they were suffering from illness for a long period, most of them suffering from chronic illness. What is most important to the elderly who are healthy at the moment is to prevent chronic illnesses and diagnose them early to receive proper treatment and management. This can contribute to reducing the burden of medical costs and welfare costs incurred by illness and extend the healthy life expectancy as well. Under the 4th Comprehensive Plan to Improve Public Health (2016-2020) that was recently announced in association with initiatives to extend healthy life expectancy, health policies that promote healthy life habits and management of risk factors and chronic degenerative diseases have been implemented [3].

But 47.7% of the Korean elderly perceive their health status to be “bad”, with those in their 70s or older perceiving their health to be in a worse state. This is the lowest self-perception of health status among all OECD countries. This shows that the Korean elderly are feeling very anxious about their health [4]. As such, it is important for the elderly themselves to proactively manage their health and maintain a healthy life style to preserve their health as much as possible and extend the healthy life expectancy. Moreover, health management and health improvement activities to extend the healthy life expectancy must bring about a positive change in perceived health.

Health conservation to the elderly means maintaining physical, mental and social well-being, as well as maintaining a balance on all aspects of the body, the mind, social life and psychology. When health is preserved, illness can be prevented and energy conserved to ward off fatigue. The function of both the body and mind can be recovered and maintained [5]. Genetic and environmental factors, management of illnesses and daily lifestyle habits affect the

health of the elderly greatly. In particular, health-related daily habits associated with nutrition, exercise, rest, alcohol intake and smoking significantly affect one's health status or illness and is highly correlated with death rates [6]. Since chronic illnesses in the elderly are closely related to unhealthy life style habits, practicing a healthy habit is very important [7]. Life style habits, exercise habits and dietary habits that contribute to the improvement of quality of life in the elderly [8] are all associated with health conservation in the elderly and therefore nursing must be provided on these aspects to understand the habits of the elderly.

Meanwhile, social support for the elderly is a factor affecting their psychological health and positive emotional expression and behavioral support are identified as a main factors generating interaction with others. Social network also refers to social contact and is often used inter-changeably with the term social support. It is a concept that emphasizes the size of the network, the homogeneity of the members, frequency of contact and opportunities for interactive support [9]. Perception of such social network helps meet the needs for stability and confidence in oneself and a subjective sense of happiness [10] helping to maintain a healthy life in one's later years. As such, social networks are expected to be a predicting factor that affects the health conservation of the elderly, along with life style habits.

Studies to date show that factors affecting health conservation in the Korean elderly are wisdom, degree of pain, religion, whether they have a partner, positive thinking and perceived health status, physical weakening due to old age, self-nursing acts, subjective health status, interest in health, meaning of life, gender (male), educational background, familial support, and those who foot the medical costs (children or parents) [11][12][13][14][15]. However, the degree to which the health conservation of the elderly is affected is subtle and various factors such as physical, mental or cognitive factors were not addressed. In particular, studies conducted on the elderly rarely analyzed the correlation between health conservation of the elderly with their life style habits or social networks. There is also a need for studies that review the general characteristics that affect the health conservation of the elderly, factors related to energy conservation and social or psychological factors, as well as how the explanatory powers change with these factors.

As such, the primary study [16] verified the mediating effects of wisdom of the elderly in the correlation between their health status and health conservation, but there is a need for analysis on how the general characteristics of the elderly and their characteristics from a personal, social and psychological and energy perspective affect their health conservation. We used the general characteristics of the elderly which are personal factors, life style habits which are energy conservation factor, and social networks which are social and psychological factors to identify the correlation with health preservation and analyze the factors affecting health conservation. The resulting data is expected to contribute to the development of programs for nursing intervention programs for the health conservation of the elderly.

PURPOSE

This study seeks to identify the general characteristics, life style habits, social networks and degree of health preservation of the elderly residing in the local community, review the correlation between the variables and identify the predicting indicators of health preservation in the elderly to provide a basic set of data that can contribute to the development of a nursing intervention programs that can improve the health preservation of the elderly in local communities.

METHODS

Research design

This study is a secondary analysis study that uses the data from the primary study [16] to analyze the correlation between the lifestyle habits of the elderly living in local communities, their social networks and their health preservation and identify the factors affecting the degree of health preservation.

Subjects

The subjects of the primary study [16] were the elderly who live in J Gun of C City and who used the services of the elderly welfare center. The purpose of the study and its methodology were explained to the head of the elderly welfare center and the president of the association of the elderly and an approval on data collection was acquired. We then visited the elderly welfare center to explain the purpose of the study and its methodology. A total of 147 senior citizens signed the consent form and filled out the questionnaire. More specifically, senior citizens aged 65 or older who had not been diagnosed with dementia or difficulty in hearing, who can read and understand Korean and who can respond to questions by the study assistant were selected as subjects. For the correlation analysis and regression analysis, a significance level of .05, effect size of .15, a power test of 0.95 and two predicting factors were applied. Using the G*Power 3.0.10 program for analysis, the number of samples needed was found to be 107 subjects. Taking into a possible drop-out rate, a total of 150 subjects were randomly selected and a total of 147 copies of their questionnaire were used for analysis in the end.

Instruments

The tools used in the primary study [16] were as follows.

Lifestyle Habits

The health improvement behavior evaluation scale by Wilson and Ciliska [17] which had been translated by Ro [18] was used to measure lifestyle habits. The tool consisted of a total of 25 questions of which four were on dietary habits, one was on weight control, one was on smoking, two were on caffeine or drug addiction, two were on drinking habits, two were on exercise or leisure activities, two were on safety awareness, one was on sleep, one was on stress, two were on personality type, two were on anxiety or depression, two were on job satisfaction, and three were on family or friends. Measured on a 5 point Likert scale, the total average score ranged from 1 point to 5 points, with a higher point indicating a healthier life style. At the time of development, the study by Wilson and Ciliska [17] had a confidence coefficient of Cronbach's α=0.88 while for the study by Ro [18], it was 0.85 and for this study the confidence level was 0.74.

Social Network

The tool used to measure the social network of the elderly was that developed by Lee [19]. The tool consists of a total of 15 questions, with five on social participation activities, five on self-development activities and five on familial activities. Each question was answered on a 5 point scale, with the possible score ranging from 15 to 75. A higher score indicates a higher degree of social network. At the time the tool was developed, the confidence coefficient was Cronbach's α=.88, and in this study it was 0.92.

Health Conservation

To measure the degree of health conservation, the health conservation scale developed by Sung [20] was used. This scale consists of a total of 37 questions, with 14 questions on individual integration, eight questions on energy conservation, eight questions on structural integration and seven questions on social integration. Each question was responded to on a 4 point scale. Six questions that were stated in a reverse question was calculated in a reverse manner. The range of possible scores is from 37 points to 148 points. A higher score indicates a higher degree of health conservation. At the time of development, the confidence coefficient of the tool was Cronbach's α=.94. The confidence coefficient of all questions in the study by Sung [20] was Cronbach's α=.96 while in this study it was 0.83.

Ethical considerations and data collection

This study used data from the primary study [16]. Data of the existing study were collected as follows. Data were collected from July 11 to September 4, 2016, from the elderly who live in J Gun of C City and who frequented the elderly welfare center. The researcher and four research assistants collected the data. To ensure accuracy of the data, meetings were held to discuss the purpose of the study, data collection methods, anticipated questions and responses recommended. A structured questionnaire was used for data collection. If the subject found it difficult to fill out the questionnaire on her own, the researcher or research assistant read the questionnaire and wrote the response in the questionnaire form on the subject's behalf. Approval on the content and methodology of the primary study was granted by the ethical review committee of K University and the ethics guidelines were observed during the study period. The purpose and goal of the study were explained to the subjects before data collection. It was also explained that at any point in time, subjects could withdraw the study. A written consent from that explained the anonymity and autonomy of the subjects were guaranteed was offered to and signed by the subjects, after which the questionnaire was distributed.

For the secondary analysis, an approval from the ethical review committee of K University was acquired before conducting the study (KNU_IRB_2017_37).

Data analysis

The data collected during the primary study [16] was analyzed using the SPSS/WIN 22.0 program.

- The general characteristics, life style habits, social networks and health conservation were analyzed for frequency, percentage, average and standard deviation.
- The difference in health conservation across different general characteristics of the subjects was analyzed with a t-test and ANOVA. If significant difference was found between groups, a Scheffe test was used for post-validation.
- Correlation between variables was analyzed using the Pearson's correlation coefficients.
- To identify predicting factors that affect health conservation, a hierarchical regression analysis was conducted.

RESULTS

General characteristics of the subjects

The general characteristics of the subjects were as seen in Table 1. The mean age of the subjects was 78.56 years, with

those in their 70s accounting for the largest share, totaling 77 people (51.7%). There were 92 females (61.7%) and 104 of the subjects (69.8%) did not have a partner. In terms of educational background, 57 subjects(38.3%) received no official education, 43 were elementary school graduates (28.9%), 22 subjects were high school graduates(14.8%), 18 were middle school graduates (12.1%), and 9 were university graduates (6%). There were 136 subjects(91.3%) without a profession, and 88 subjects (59.1%) were religious. Forty-four of the subjects (29.5%) were on two medications, 40 subjects (26.8%) were on one medication, 26 subjects(17.4%) were on no medication, 23 subjects (15.4%) were on three medication, and 16 subjects(10.9) were on four or more medications. The largest share at 76 subjects (51%) responded that they sometimes exercised, while 45 subjects(30.2%) said they regularly exercised, and 28 subjects (18.8%) said they did not exercise at all. Seventy-six subjects (53%) said they were financially sufficient, while 70 subjects(47%) said they were not financially sufficient. Seventy-four subjects (49.7%) were living alone, while 75 subjects (50.3%) were living with their families.

Difference in the degree of health conservation across different general characteristics of subjects

The difference in the degree of health conservation across different general characteristics of subjects is as shown in Table 1. Health conservation scores were higher in younger subjects than in older subjects, which was statistically significant (F=3.38, p=.037).

Health conservation score was higher in women than in men, which was a statistically significant difference (t=2.62, p=.010), while subjects with a partner had a higher health conservation score than those without a partner, which was also a statistically significant difference (t=5.35, p<.001). There was a statistically significant difference in health conservation across different levels of educational background (F=4.15, p=.003). A Scheffe post-test analysis showed that elementary school graduates had a higher health conservation score than those who had received no official education. Subjects with a profession had a higher health conservation score than those without a profession, a difference that was statistically significant (t=-.27, p=.011). There was also a statistically significant difference in health conservation across different numbers of medication the subjects were on (F=6.02, p<.001). Subjects who were on no medication had a higher health conservation score than those who were taking one medication, and those who were taking one medication had a higher health conservation score than those on four medications. There was a statistically significant difference in health conservation scores across different exercise habits (F=17.04, p<.001). Those who exercised regularly had a higher health conservation score than those who sometimes exercised, and those who sometimes exercised had a higher health conservation score than those who did not exercise at all. Health conservation across different wealth levels showed that those who deemed themselves to be financially sufficient had a higher health conservation score, with the difference being statistically significant(t=-3.03, p=.003). Subjects who were living with family had a higher health conservation score than those living alone, with the difference being statistically significant (t=-7.67, p<.001). There was no statistically significant difference in health conservation between subjects who were religious and those who were not.

Table 1: General characteristics of participants and difference in health conservation by general characteristics

Characteristics	Categories	n(%) or M±SD	Health Conservation		
			M±SD	t or F	p
Age	Total	78.56±6.17		3.38	.037
	65-69	7(4.7)	2.81±.181		
	70-79	77(51.7)	2.75±.272		
	80 or older	65(43.6)	2.64±.283		
Gender	Male	57(38.3)	2.78±.244	2.62	.010
	Female	92(61.7)	2.66±.289		
Partner	Yes	45(30.2)	2.87±.243	5.35	<.001
	No	104(69.8)	2.63±.260		
Education	No official education[a]	57(38.3)	2.59±.269	4.15 a<b	.003
	Elementary school[b]	43(28.9)	2.77±.286		
	Middle school[c]	18(12.1)	2.75±.311		
	High school[d]	22(14.8)	2.79±.211		
	University or higher[e]	9(6.0)	2.81±.148		

Profession	Yes	13(8.7)	2.89±.230	-2.57	.011
	No	136(91.3)	2.69±.276		
Religion	Yes	88(59.1)	2.73±.246	-1.33	.183
	No	61(40.9)	2.67±.317		
Number of medications	0[a]	26(17.4)	2.84±.3.3	6.02 a>b>e	<.001
	1[b]	40(26.8)	2.76±.259		
	2[c]	44(29.5)	2.69±.244		
	3[d]	23(15.4)	2.63±.277		
	4 or more[e]	16(10.9)	2.46±.206		
Exercise	Regularly[a]	45(30.2)	2.87±.317	17.04 a>b>c	<.001
	Sometimes[b]	76(51.0)	2.66±.220		
	Not at all[c]	28(18.8)	2.54±.210		
Wealth	Sufficient	79(53.0)	2.77±.272	-3.03	.003
	Insufficient	70(47.0)	2.63±.268		
Living alone	Yes	74(49.7)	2.55±.196	-7.67	<.001
	No	75(50.3)	2.85±.269		

The lifestyle habits, social networks and degree of health conservation in subjects

The lifestyle habits, social networks and degree of health conservation in subjects were as seen in Table 2. Out of a total of 5 points, the subjects' lifestyle habits had a mean of 3.27±.34 points. Their social network recorded 2.58±.87 points on a scale of 5, and degree of health conservation scored 2.70±.27 points, both of which were in the middle range.

Table 2: The degree of lifestyle, social networks and health conservation in subjects

Variable	M±SD	Range
Lifestyle habits	3.27±.34	1~5
Social networks	2.58±.87	1~5
Health conservation	2.70±.27	1~4

Correlation between health conservation and other variables

The correlation between health conservation and variables is shown in Table 3. Health conservation had a positive correlation with having a spouse (r=.40, p<.001), education(r=.19, p=.020), profession(r=.20, p=.011), exercise(r=.28, p=.001), financial wealth(r=.24, p=.003), whether one was living alone(r=.53, p<.001), lifestyle habits(r=.57, p<.001), and social networks(r=.69, p<.001), while it had a negative correlation with gender (r=-.21, p=.010) and number of medications taken (r=-.39, p<.001). In other words, when a subject had a spouse, a higher education, a profession, exercised more regularly, had more financial wealth, lived with others, had better lifestyle habits, and had a wider social network, their degree of health conservation was higher, while when the subject was male or had a greater number of medications they were on, the degree of health conservation was lower.

Table 3: Correlations among observed variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Age	1												
2.Gender[†]	.04 (.630)	1											
3. Partner[‡]	-.35 (<.001)	-.23 (.004)	1										
4. Education[§]	-.34 (<.001)	-.30 (<.001)	.44 (<.001)	1									
5. Profession[‖]	-.12 (.130)	-.09 (.229)	.31 (<.001)	.23 (.003)	1								
6. Religion[¶]	-.08 (.282)	.04 (.571)	.22 (.007)	.06 (.468)	.11 (.173)	1							

7. Number of medications taken	.22 (.007)	.12 (.145)	-.35 (<.001)	-.33 (<.001)	-.24 (.003)	-.06 (.433)	1						
8. Exercise[#]	-.25 (.001)	-.13 (.111)	.16 (.042)	.26 (.001)	.14 (.070)	.19 (.018)	-.17 (.031)	1					
9. Financial wealth[††]	-.13 (.099)	-.22 (.794)	.29 (<.001)	.14 (=.080)	.05 (.523)	.11 (.149)	-.41 (<.001)	.09 (.235)	1				
10. Whether one lives alone[‡‡]	-.40 (<.001)	-.20 (.014)	.59 (<.001)	.43 (<.001)	.26 (.001)	.07 (.371)	-.51 (<.001)	.31 (<.001)	.32 (<.001)	1			
11. Lifestyle habits	-.23 (.004)	-.16 (.051)	.31 (<.001)	.09 (.262)	.15 (.055)	.21 (.009)	-.36 (<.001)	.26 (.001)	.22 (.006)	.47 (<.001)	1		
12. Social networks	-.34 (<.001)	-.15 (.053)	.45 (<.001)	.36 (<.001)	.26 (.001)	.24 (.003)	-.49 (<.001)	.33 (<.001)	.35 (<.001)	.75 (<.001)	.55 (<.001)	1	
13. Health conservation	-.12 (.136)	-.21 (.010)	.40 (<.001)	.19 (.020)	.20 (.011)	.11 (.183)	-.39 (<.001)	.28 (.001)	.24 (.003)	.53 (<.001)	.57 (<.001)	.69 (<.001)	1

Predicting factors for health conservation in subjects

Table 4 summarizes the predictors of health conservation. A hierarchical regression analysis was conducted for statistical analysis in this study. Among the independent variables, gender, whether one had a partner, education, profession, religion, whether one exercised regularly, financial wealth and whether one lived alone were treated as dummy variables for regression analysis. For gender, male was treated as 0, female as 1. Those without a partner were treated as 0, and those with a partner were treated as 1. Those of elementary school graduates or lower were treated as 0 and those who had received education of middle school or higher were treated as 1. Those without a profession were treated as 0, while those with a profession were treated as 1. Those without a religion were treated 0 and those with a religion was treated as 1. Those who did not exercise regularly was treated as 0 while those who did were treated as 1. Those who found their financial wealth to be insufficient were treated as 0, while those with sufficient financial wealth were treated as 1. Those who lived alone were treated as 0 and those who were living with others were treated as 1.

A verification of the basic assumptions used in the regression analysis showed that the Durbin-Watson statistics value was 1.877 which is close to the reference value of 2, indicating that there were no issues of self-correlation. The tolerance level was .302~.852 which is higher than 0.1, indicating there were no issues of multi-linearity. The Variance Inflation Factor (VIF) was 1.173~3.308, which does not exceed the reference value of 10, thus indicating there are no issues of multi-linearity for the independent variables.

As the first stage of the hierarchical regression analysis, the individualistic elements which are age, gender, existence of a partner, education, profession, religion, number of medications, whether one exercised regularly and whether one lived alone were entered into the model. The result identified whether one exercised regularly (β=.15, p=.045) and living alone (β=.39, p<.001) as predicting factors for health conservation, and the explanatory power of exercise and living alone was found to be 32.3% (F=8.07, p<.001).

As the second stage of the hierarchical regression analysis, lifestyle habits which is an element associated with energy conservation, was added to the regression model. Lifestyle (β=.38, p<.001) was found to be a variable that increases health conservation when it was controlled for age, gender, partner, education, profession, religion, number of medications taken, exercise, financial wealth and whether one lived alone. With the addition of lifestyle, the explanatory power was increased by 10.0% (F=10.99, p<.001). In addition, living alone (β=.25, p=.008) was still found to be a significant variable that explains health conservation, and age ((β=.15, p=.029), too, was verified as a significant variable that explains health conservation.

For the third stage of the hierarchical regression analysis, the social psychological factor of social networks was added to the regression model for analysis. Social networks were found to have a statistically significant effect on health conservation. After the addition, health conservation was explained by an additional 12.6% . (F=16.65, p<.001).

Even after social networks are added to the regression model, age (β=.16, p=.009), partner (β=.18, p=.013), religion (β=-.12, p=.046) and lifestyle were found to be significant variables explaining health conservation.

This study found that social networks, lifestyle, partner, age and religion affected health conservation in a descending order, with the total explanatory power of 55.9 %.

Table 4: Hierarchical multiple regression analysis with health conservation

	Model Ⅰ			Model Ⅱ			Model Ⅲ		
	β	t	*p*	β	t	*p*	β	t	*p*
Age	.13	1.68	.095	.15	2.21	.029	.16	2.63	.009
Gender†	-.10	-1.41	.158	-.05	-.84	.402	-.05	-.99	.323
Partner‡	-.15	1.62	.106	.13	1.61	.110	.18	2.50	.013
Education§	-.14	-1.68	.094	-.04	-.57	.568	-.08	-1.20	.231
Profession‖	.03	.45	.651	.02	.41	.677	-.00	-.04	.966
Religion¶	.02	.37	.710	-.03	-.51	.611	-.12	-2.01	.046
Number of medications taken	-.15	-1.85	.066	-.08	-1.10	.271	-.05	-.73	.466
Whether one exercises#	.15	2.02	.045	.10	1.56	.120	.08	1.42	.157
Financial wealth††	.01	.24	.810	.01	.19	.846	-.03	-.54	-.090
Whether one is living alone‡‡	.39	4.00	<.001	.25	2.68	.008	-.10	-1.01	.310
Lifestyle				.38	5.07	<.001	.26	3.77	<.001
Social networks							.60	6.51	<.001
F(*p*)			8.07(<.001)			10.99 (<.001)			16.65 (<.001)
R^2 change			.369			.100			.126
R^2			.369			.469			.595
Adjusted R^2			.323			.426			.559

β=Standardized beta; †Dummy variable(0: man, 1: woman), ‡Dummy variable(0: Without partner, 1: With partner), §Dummy variable(0: ≤Elementary school), 1: ≥Middle school), ‖Dummy variable(0: No, 1: Yes), ¶Dummy variable(0: No, 1: Yes), #Dummy variable(0: No, 1: Yes), ††Dummy variable(0: Not sufficient, 1: Sufficient), ‡‡Dummy variable((0: Yes, 1: No)

DISCUSSION

This study was conducted to review the general characteristics, lifestyle habits, social networks and degree of health conservation of the elderly living in local communities, identify the correlation between the variables and the predicting factors for health conservation in the elderly, in order to provide a basic set of data that can be used for the development of a nursing intervention program to promote the health conservation of the elderly in the communities.

The mean score for lifestyle of the study subjects was 3.27 points (1～5), which was higher than the median value. This result was similar to that of the study by Yoo [21] conducted on middle-aged women, where the mean score for exercise habits, daily lifestyle habits and dietary habits was 3.30~3.45 points (1～5). Moreover, there was a negative correlation between exercise habits, lifestyle habits and cardiovascular disease, indicating that incorrect exercise habits and dietary habits increased the cardiovascular disease factor, and a need for improved dietary habits and appropriate exercise.

The perceived social network of subjects scored 2.58 points (1～5), which was similar to the results of a study conducted on the male elderly [22] where the score was 2.65 points (1～5). But in the study conducted on the elderly living in urban areas and who are socially vulnerable [23], out of a total of 25 points, the social network score was a very low 6.98 points. But in the study conducted on middle-aged adults [24] the score was 2.81 points (0～5), which was higher than this study or the one conducted on the urban elderly who were socially vulnerable. As such, the degree of social networks of subjects in this study was lower than middle-aged adults, but higher than urban elderly deemed socially vulnerable. One of the reasons the degree of social network is lower than that of middle-aged adults seem to be due to negative changes including undermined physical functions and reduced social role, while one of the reasons that the degree of social network is higher than that of urban elderly deemed socially vulnerable seems to be due to active participation in various programs at the elderly welfare center and interaction with friends. Social networks had a negative correlation with depression in the elderly, with a greater degree of social networks correlated with lower depression [25]. In terms of social network, 80.4% of the elderly who fall into the category of 'isolation' perceived their own health status to be bad, indicating that a worse health status is correlated with passive social relations, and that health status is a very important factor in the maintenance and formation of social relations

[26]. In addition, social networks of the elderly reduce social psychological issues and help maintain a rich and healthy life for the elderly [27]. In order to improve the elderly's social network, various programs must be provided through the elderly welfare center and recreation center for the elderly in local communities, with subsidies that can help guarantee the social participatory activities and leisure activities of the elderly. It is also necessary for people to maintain continued interaction with family, relatives, friends and neighbors starting in middle age to form and maintain a social network that can provide social support [24].

The health conservation score of subjects was 2.70 points (1～4). This is a similar to the result of a study conducted on the elderly living in local communities, where the score was 2.73 points (1～4) [28], as well as that of a study on the elderly with chronic illnesses where the score was 2.40~2.76 points (1～4). However, in the study conducted on middle-aged adults [24], the score was 2.85 points, indicating that compared to middle-aged adults, the degree of health conservation in the elderly is lower. When health is conserved, illnesses can be prevented, energy can be conserved, fatigue can be warded off and the overall body's function can be restored and maintained. Moreover, mental and psychological integration can be achieved to restore self-awareness and self-esteem, while socially smoother interactions and social integration can be achieved, leading to overall balance in life [5]. As such, measures that can help improve health conservation in the elderly are needed.

Differences in the degree of health conservation across different general characteristics of the subjects show that subjects of a younger age (F=3.38, p=.037), who are female(t=2.62, p=.010), who have a partner(t=2.62, p=.010), who have a higher education level (F=4.15, p=.003), who have a profession(t=-.27, p=.011), who take a fewer number of medications (F=6.02, p<.001), who exercise regularly (F=17.04, p<.001), who are financially sufficient (t=-3.03, p=.003), and who live with family(t=-7.67, p<.001) had a higher degree of health conservation which was statistically significant. In a study on the elderly [11] those with a high education level and those with a partner had a higher degree of health conservation, which was a similar result to that of this study. The study on the elderly with chronic illnesses, too [12] showed that those who are female, younger in age, who have a higher education level, who have a partner and who have had a short period of illness since diagnosis had a significantly higher health conservation degree. In the study conducted on senior citizens living with family [13] those who are female, younger in age, who have a higher education level, who have a profession, who have sufficient allowances, who do not suffer from illness or have few illnesses were found to have a higher degree of health conservation. In the study on the elderly with diabetes, those who are of younger age, who are female, with a higher education level and who were living with someone else had a higher degree of health conservation, which was a similar result of this study. As such, age, gender, whether one has a partner, education level, whether one has a profession, number of medications taken, illnesses, whether one exercises regularly, financial wealth and whether one lives with family were identified as variables that positively affect the health conservation of the elderly. However, religion did not show any statistically significant difference. In preceding studies, too [14][15] no difference in health conservation was found in accordance with religion, but in other studies [11][12][13] subjects with a religion had a higher health conservation degree than those without a religion, showing inconsistent results. Therefore, follow-up studies are needed on the identification of general characteristics that affect health conservation and the difference in health conservation degrees across different characteristics.

This study conducted a hierarchical regression analysis in three stages. A hierarchical regression analysis is a method that surveys changes in the regression coefficient(β) and increases in the determining coefficient at each stage (R^2) by entering independent variables in each stage following local considerations. In this study, during the first stage, individualistic factors were entered, while in the second stage energy conservation factors were entered and social, psychological factors were entered in the third stage. The result showed that in the first stage, whether one lived alone was found to be a significant variable. In the second stage, age, whether one lived alone and their lifestyle habits were found to be significant variables. In the third stage, social networks were found to be the variable that affects health conservation in the elderly the most. Health conservation was affected by lifestyle habits, partner, age and religion in descending order, with the total explanatory power of variables being 55.9%.

This result is similar to that of a study conducted on middle-aged adults [24] where a higher degree of social networks was correlated with a higher degree of health conservation. In the analysis of factors affecting health conservation, the explanatory power of health improvement behavior was found to be 26.6%, confirming it to be an important factor affecting health conservation. In the study by Choi [14] too, familial support was identified as a major factor explaining health conservation. This seems to be due to the fact that through social networks and familial support, interaction time is increased as is interest in one another's health, leading to proactive and positive health management. This is also a similar result to that of a study that showed lifestyle habits related to hypertension, where those with a higher intake of meat had a higher risk of hypertension incidence [29], and those who rarely exercised had the highest share of obese people. The same study also showed that a higher degree of obesity was correlated with saltier food seasoning and a lower score on dietary habits [30]. This indicates the importance of lifestyle habits affecting health conservation. This study showed that the health conservation degree of the elderly with

a partner was high. This was also verified in the study by Sung [12] and Chang [13]. This finding seems to indicate that those without a partner feel more lonely and isolated as they lose the social network that was formed with their partner. In this study, younger age was correlated with a higher degree of health conservation, which was a similar result to that of preceding studies [13][14][15]. This seems to be due to the fact that those of younger age are more likely to realize the importance of health management and the hindrances caused by aging or illness, leading them to take more proactive health conservation acts. In this study, religion, too, was found to have a significant effect on health conservation. However, this is in contrast with the results of preceding studies [11][13][14][15] that had found religion to make no significant difference and did not confirm religion as a factor affecting health conservation. However, the study by Oh & Kim [11] and Chang [13] showed significant difference between the group that had religion and the group without religion even though religion was not confirmed as a factor affecting health confirmation. This seems to be due to religion having a positive effect on the physical, psychological and social health of the elderly as it helps them adjust better to the physical changes and psychological and social loss they experience.

This study identified social networks as the factor that affects the health conservation in the elderly the most. The study on the correlation between social networks and the quality of life [31], the core elements of social networks that improve the quality of life in the elderly were found to be activeness in social relationships, independence from children and satisfaction with familial relations. The elderly were found to have a greater level of satisfaction with their life when their relationships were wider and they had more active social participation. This confirms that social networks are one important factors in improving the quality of life for the elderly. As such, in order to promote social networks of the elderly, personal efforts to form and maintain social relations must be made, in addition to policies and subsidies that can guarantee social participation and leisure activities of the elderly. Various social participatory programs should be prepared at the elderly welfare center and recreational center for the elderly in local communities to encourage the elderly to take part in such activities.

CONCLUSION

This study was conducted to provide a basic set of data that can contribute to the development of nursing intervention programs to improve the health conservation of the elderly in local communities. This study is meaningful in that it increased the understanding of health conservation in the elderly living in local communities while verifying the factors affecting health conservation, thereby providing data for developing nursing intervention programs that can promote the health conservation of the elderly in local communities. The study found that social networks, lifestyle habits, whether one has a partner, age and whether one has a religion were significant predicting factors that affect health conservation. The explanatory power of these five variables was 55.9%. In particular, social networks were found to be the most important variable affecting health conservation. Based on these findings, specific efforts are needed to promote the awareness on the importance of improved health conservation among the elderly and to develop measures to improve health conservation of the elderly in local communities. Suggestions based on the findings of this study are as follows. First, measures to improve the social networks of the elderly should be identified to be applied to the development of local community programs for improved health conservation. Second, an iterative study is needed to include various factors in addition to the variables used in this study as those affecting the health conservation of the elderly.

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