Subjective and objective health according to the characteristics of older adults
Using data from a national survey of older Koreans

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Abstract

As society rapidly ages, older adults are becoming an important national issue. Health is a multidimensional concept and both objective and subjective health must be managed. This study investigated factors that influence the subjective and objective health of older adults. This study analyzed the data of 9391 people aged ≥65 years using raw data from a 2020 survey of senior citizens. The relationships among the characteristics of older adults, such as demographic variables, lifestyle, external activities, environment, physical function, depression, cognition, activities of daily living, satisfaction with life and health, perceived health level, and number of diseases, were investigated. Older adults who drink and do not exercise generally have good objective health but poor subjective health. Older adults who mainly engage in external activities tend to have poor subjective health despite good objective health. The factors affecting subjective health in older adults were depression, cognition, physical factors, activities of daily living, and satisfaction. This study identified the differences between subjective and objective health based on the characteristics of older adults. As many variables affecting the health of older adults have been identified, these basic data will help prepare various programs to promote a healthy life for older adults.

Abbreviations: ADL = activities of daily living, IADL = instrumental activities of daily living, MMSE = Mini-Mental State Examination.

Keywords: Korea, national survey, objective health, older adults, subjective health

1. Introduction

Worldwide, life expectancy is rapidly increasing owing to advances in medical technology and expanded access to medical services. The proportion of the elderly population is also increasing owing to low birth rates. South Korea has the fastest population aging process among the Organization for Economic Cooperation and Development countries. In 2017, South Korea became an aging society, with older people exceeding 14% of the total population, and it is expected to become a super-aged society by 2025, with older people exceeding 20.3% of the total population.[1]

An aging population is experiencing various social and economic problems. In particular, as the number of complex chronic diseases in older people increases, the social burden of medical expenses also increases, which in turn increases the burden on the social security system as the dependency costs increase.[2,3] Therefore, healthcare for older adults is an important national issue.

The World Health Organization defines health as a state of physical, mental, and social well-being, not simply the absence of disease or infirmity. In other words, health must be judged as a multidimensional concept and there are limits to judging health using objective indicators. Therefore, unlike in the past, when health status was measured using objective indicators such as life expectancy and prevalence, there has been an increase in recent research to determine the level of health through subjective health conditions that reflect an individual's physical and mental state.[4]

A subjective health condition is a method of evaluating an individual's health that encompasses physical, physiological, psychological, and social aspects. It is easy to measure and is positively correlated with objective clinical indicators.[5] It is reliable because it reflects an individual's perception of life in general[6] and is a strong predictor of health-related outcomes, including mortality and suicidal ideation in people with diseases.[7–10] Negative subjective health influences health behaviors and has negative consequences on disease patterns, whereas positive evaluations influence self-health behavior motivation, disease prevention, and mortality reduction. Therefore, the management of both objective and subjective health conditions

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is important, and the research and management of the influencing factors are necessary.

Previous studies have shown that the subjective health of older people includes not only health-related factors, such as objective health condition, disease, medical use status, and mental health,[11–13] but also personality traits,[14,15] smokers in particular reported that it is also related to gender, age, and income level.[16] Most studies have focused on subjective health-related factors and sociodemographic characteristics. However, research examining the relationship between the overall factors affecting older adults and their subjective health is lacking. Accordingly, this study investigated the relationship between subjective and objective health and various factors, such as lifestyle patterns, activities of daily living (ADL), and functions, as well as the demographic characteristics of older adults. The hypotheses of this study are as follows:

1. There will be differences between subjective and objective health depending on demographic variables (gender, age, and family members living together).
2. There will be differences between subjective and objective health depending on lifestyle (drinking, eating alone, medication, and exercise).
3. There will be differences between subjective and objective health depending on external activities (travel, leisure, social gatherings, and economic participation) and the environment (urban or rural).
4. Physical function, depression, cognition, ADL, and satisfaction with life and health will affect subjective and objective health.

2. Materials and methods

2.1. Study design

This study used raw data from the 2020 Survey on the Elderly.[17] This study analyzed the relationship between overall factors (demographic characteristics, lifestyle, outdoor activities and environment, physical function, depression, cognition, ADL, and satisfaction with life and health) and subjective and objective health based on the socio-ecological model.

2.2. Participants and data collection

In this study, raw data from the 2020 Survey on Senior Citizens conducted by the Ministry of Health and Welfare were analyzed, and raw data were provided as a file and used according to the data use procedures presented in the Health and Welfare Data Portal.[18] The Elderly Survey is a statutory survey to determine the living conditions and characteristics of the elderly and is conducted every 3 years for elderly people aged 65 years or older. Raw data were sampled using a stratified cluster sampling method, first stratifying the entire country into 17 cities and provinces, and then secondarily stratifying the 9 provinces, excluding 8 special cities and metropolitan cities, by dividing them into eastern regions, towns, and villages. Thus elderly people living in 969 survey districts across the country were selected. According to the Ministry of Health and Welfare, 169 trained interviewers conducted the survey using the tablet-PC assisted personal interview method from September to November 2020. The survey included 10,097 people aged 65 years or older. In this study, out of the raw data of 10,097 people from the 2020 Survey on the Status of the Elderly, only 9391 people data were analyzed, excluding 706 people who did not respond to the items related to the variables needed for this study.

2.3. Theoretical framework

This study used a socio-ecological model to identify factors affecting the health of the elderly in a multidimensional manner.

This model explains human relationships with the environment and the behavior expressed by the interaction between humans and the environment.[19] From a socio-ecological perspective, human behavior can be explained in many ways. Human behavior is explained by inherited and acquired individual characteristics, which include activities and roles in the immediate environment; interpersonal, which is a type of interpersonal relationship; organization, which refers to cooperation or relationship formation for a specific purpose; community, which is the main scope of life and society; and systems such as social policies or norms.[20] This explains humans from a multidimensional and integrated perspective, rather than a one-dimensional perspective (Fig. 1).[21]

In this study, the following variables were analyzed for each area, except for the system. In the person domain, sex, age, drinking, medication use, regular exercise, physical function, depression, cognition, ADL, and satisfaction variables were used for analysis. In the interpersonal domain, the variables of family members living together, eating alone, travel, leisure, and social gatherings were used; in the organizational domain, the participation in economic activities variable was used; and in the community domain, the residential environment (city or rural) variable was used for the analysis.[22]

2.3.1. Demographic variables. The 2020 Survey on Senior Citizens included 185 questions in 10 areas: general household information, health status and behavior, functional status and caregiving, and leisure and social activities. The responses to these questions were then extracted and analyzed. Gender, age, and family members living together were investigated as the demographic variables.

2.3.2. Lifestyle, external activities, and environment. Lifestyle factors including drinking, eating alone, number of medications taken, and regular exercise were also investigated. External activities include travel, leisure, social gatherings, and participation in economic activities. Questions regarding the environment included whether the place of residence was city.

2.3.3. Depression and cognition. The Korean Version of the Short Form of Geriatric Depression Scale was used to measure depression. It consists of 15 questions on depression-related symptoms over the course of 1 week, with higher scores indicating greater depression.[23] The internal consistency Cronbach alpha value of the Short Form of the Geriatric Depression Scale was .8585, and its concurrent validity was verified to be high through correlation analysis with the Hamilton Rating Scale for Depression and the Center for
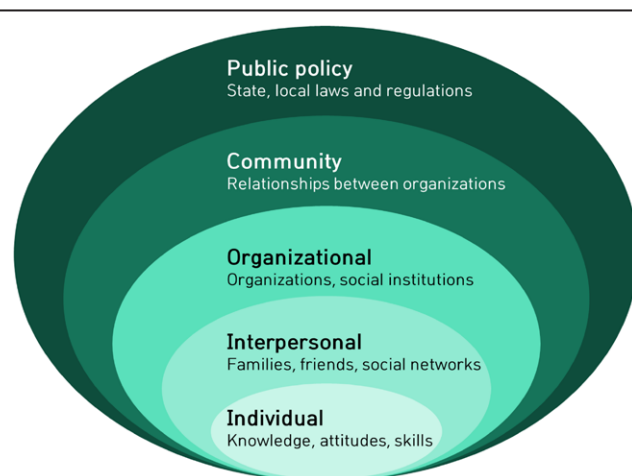

Figure 1. A socio-ecological model to identify multidimensional factors affecting the health of the elderly (theoretical framework).

Epidemiological Studies-Depression Scale, depression scales whose validity has been previously verified.[23]

Cognitive function was assessed using the Korean Mini-Mental State Examination (MMSE-K). It consisted of 19 questions on orientation, memory, attention, calculation, understanding, judgment, and language function. The maximum score is 30, with higher scores indicating better cognition.[24] MMSE, developed by Folstein in 1975, has a test–retest reliability of 0.887, internal consistency of 0.86, and inter-examiner reliability of 0.97.[25] MMSE-K had a sensitivity of 0.811 and specificity of 0.815, based on the screening criteria for definite dementia of 19/20 points. The MMSE-K is a useful assessment tool for screening dementia.[26]

2.3.4. Physical function.
Physical function was assessed on a four-point Likert scale (1 = very easy; 2 = easy; 3 = difficult; 4 = very difficult). Higher scores indicate lower physical function.

2.3.5. Activities of daily living.
The ADL assessment used in this study was the Korean Activities of Daily Living and Instrumental Activities of Daily Living (K-ADL and K-IADL) scale. This scale was developed by the Geriatric Functional Evaluation Research Group of the Korean Geriatrics Society at the request of the Ministry of Health and Welfare, in 2002.[27] K-ADL is a modified version of Katz questions to suit the Korean environment and culture. Basic ADL was assessed on a three-point Likert scale (1 = independent, 2 = partially dependent, and 3 = dependent) to determine how much help was needed to perform the following 7 activities: dressing, self-help skills, bathing, eating, changing posture, toileting, and toilet control. IADL were measured by helping others perform ten activities over the past week: grooming, housework, meal preparation, laundry, taking medicine, money management, going short distances, shopping, using the phone, and using transportation. The degree to which human help was required was measured on a four-point Likert scale (1 = independent, 2 = partially dependent, 3 = more dependent, and 4 = completely dependent) for 3 activities: shopping, using the phone, and using transportation. Other items were assessed using a three-point Likert scale (1 = independent, 2 = partially dependent, and 3 = dependent). The ADL and IADL scores were analyzed using the total score, with lower scores indicating greater independence. According to Park and Park (2017),[28] the reliability Cronbach alpha value was 0.98, and validity was verified through factor analysis.

2.3.6. Satisfaction with life and health.
Satisfaction consisted of 7 questions on health status, economic status, relationships with friends and community, and life satisfaction in general. The score was based on a five-point Likert scale (1 = very satisfied, 2 = satisfied, 3 = average, 4 = not satisfied, and 5 = not satisfied at all).

2.3.7. Subjective and objective health condition.
Subjective health conditions were assessed using a five-point Likert scale (1 = very healthy, 2 = healthy, 3 = neutral, 4 = not too healthy, and 5 = not healthy). Objective health conditions were assessed based on the number of diseases suffered from among the 31 chronic diseases in the 9 categories. Chronic diseases include the circulatory system (hypertension, stroke, hyperlipidemia, angina pectoris/myocardial infarction, and other heart diseases), endocrine system (diabetes and thyroid disease), musculoskeletal system (arthritis, osteoporosis, and back pain/sciatica), respiratory system (chronic bronchitis/emphysema, asthma, and tuberculosis), sensory system (cataracts, glaucoma, chronic otitis media, and presbycusis), cancer, digestive system (stomach/duodenal ulcer, hepatitis, and liver cirrhosis), urogenital system (chronic kidney disease, benign prostatic hyperplasia, and urinary incontinence), and other diseases (anemia, skin disease,

depression, dementia, fractures/dislocations/aftereffects of accidents, insomnia, and parkinsonism). Hypertension was the most common comorbidity observed. Responses were coded on a five-point Likert scale (1 = 0, 2 = 1, 3 = 2, 4 = 3, and 5 = ≥4 diseases).

2.4. Data analysis
We used an independent t test, one-way analysis of variance, and Scheffe test to compare subjective and objective health according to older adults' characteristics. The Pearson correlation coefficient was used to determine the relationship between health and other factors. Multiple regression analysis was used to identify the factors affecting subjective health conditions. We used SPSS software (ver. 18.0 for Windows; SPSS, Chicago, IL) for data analysis. The level of statistical significance was set at $P < .05$.

3. Results

3.1. General characteristics of subjects
The data from 9391 participants were included in the analysis. The participants were women (59.8%) and men (40.2%). The age distributions were as follows: 65 to 74 years old (60.7%), 75 to 84 years old (33.4%), and over 85 years (6.0%). In terms of family composition, the majority of participants were living with a spouse (50.0%), followed by those living alone (32.3%) and others (17.8%). The general characteristics of the participants are presented in Table 1.

3.2. Comparison of subjective and objective health according to general characteristics in older adults
Except for objective health, there were significant differences according to sex ($P = .797$) and age ($P = .709$). Women and older individuals tend to perceive themselves as being relatively unhealthy. In terms of family type, those living with a spouse reported the worst subjective health, followed by those living with others, and those living alone. Conversely, those living alone had the poorest objective health, followed by those living with others, and those living with a spouse (Table 2).

3.3. Comparison of subjective and objective health according to lifestyle in older adults
We found significant differences in all items. Participants who reported drinking, eating with someone else, taking 3 or more medications, and not exercising tended to perceive themselves as being relatively unhealthy. Nondrinkers, those eating alone, those who took 3 or more medications, and those who exercised regularly had many chronic diseases (Table 3).

Table 1

Characteristics of the subjects (n = 9391).

Variables	Categories	Frequency (n)	Percentage (%)
Sex	Man	3772	40.2
	Woman	5619	59.8
Age (years)	65–74	5697	60.7
	75–84	3132	33.4
	≥85	562	6.0
Family	Alone	3031	32.3
	Spouse	4693	50.0
	Others	1667	17.8

Table 2

Comparison of subjective and objective health according to general characteristics in older adults.

		Subjective health condition			Objective health condition		
		M ± SD	t or F	P Post hoc	M ± SD	t or F	P Post hoc
Sex	Man	2.49 ± 0.84	-14.370	<.001	2.78 ± 1.25	0.257	.797
	Women	2.75 ± 0.87			2.77 ± 1.24		
Age (years)	65–74	2.44 ± 0.79	456.826	<.001	2.77 ± 1.24	0.343	.709
	75–84	2.93 ± 2.93		a < b, b < c, a < c	2.77 ± 1.25		
	≥85	3.14 ± 0.91			2.81 ± 1.28		
Family	Alone	1.89 ± 0.32	2948.691	<.001	2.98 ± 1.25	74.901	<.001
	Spouse	3.09 ± 0.85		a < b, b > c, a < c	2.63 ± 1.22		a > b, b < c, a > c
	Others	2.77 ± 0.62			2.81 ± 1.24		

M ± SD = mean ± standard deviation.

Table 3

Comparison of subjective and objective health according to lifestyle in older adults.

		Subjective health condition			Objective health condition		
		M ± SD	t	P	M ± SD	t	P
Drinking	No	2.59 ± 0.82	-8.526	<.001	2.86 ± 1.33	9.677	<.001
	Yes	2.75 ± 0.93			2.61 ± 1.06		
Eating	Alone	1.96 ± 0.43	-62.287	<.001	3.14 ± 1.27	14.708	<.001
	No alone	2.82 ± 0.86			2.68 ± 1.22		
Mediation	≥3	2.70 ± 0.77	3.792	<.001	4.20 ± 0.83	96.464	<.001
	3>	2.63 ± 0.89			2.26 ± 0.93		
Exercise	Yes	2.55 ± 0.79	-10.760	<.001	2.83 ± 1.28	5.090	<.001
	No	2.75 ± 0.92			2.70 ± 1.21		

M ± SD = mean ± standard deviation.

3.4. Comparison of subjective and objective health according to external activities and environment in older adults

We found significant differences in all items. Participants who reported traveling, enjoying active leisure, attending social clubs, working, or living in rural areas tended to perceive themselves as being relatively unhealthy. Those who did not travel, did not enjoy active leisure, did not attend social clubs, did not work, or lived in rural areas had more chronic diseases (Table 4).

3.5. Relationship between health and other factors in older adults

This study examined the relationship between health and other factors among older adults. We found significant differences between subjective health and the other factors. Additionally, there was a negative correlation between all items and cognition and a positive correlation between subjective health and all items except cognition. However, there were no significant differences in depression, physical factors, life satisfaction, and objective health (Table 5).

3.6. Factors affecting the subjective health condition in older adults

In this study, we performed a correlation analysis to identify factors affecting the health of older adults. Significant differences were found only in subjective health; therefore, we conducted regression analysis on subjective health. The analysis showed that psychological factors had an explanatory power of 20%, with depression ($\beta = 0.383$) and cognition ($\beta = -0.158$) affecting subjective health. Physical factors had an explanatory power of 19%, with stepping ($\beta = 0.172$),

kneeling ($\beta = 0.156$), running ($\beta = 0.152$), lifting ($\beta = 0.130$), and reaching ($\beta = -0.089$) affecting subjective health. ADL had an explanatory power of 13%, with IADL ($\beta = 0.326$) and ADL ($\beta = 0.041$) affecting subjective health. Satisfaction had an explanatory power of 43%, with health ($\beta = 0.641$) and life satisfaction ($\beta = 0.030$) affecting subjective health (Table 6).

4. Discussion

This study aimed to compare subjective and objective health according to the characteristics of the older adults in South Korea. The results showed differences in subjective and objective health based on sex, age, family type, residential area, drinking, exercise, external activities, eating alone, number of medications, depression, cognition, physical function, ADL, and satisfaction. Although some results were expected, unexpected findings were obtained.

According to the results of this study, based on the general characteristics of older adults, women reported poorer subjective health than did men, which is consistent with several previous studies.[29–32] Some studies have reported different results.[33,34] Some studies have noted the need for further research owing to the mixed results regarding sex differences in subjective health measures and ambiguous findings in twin studies.[35,36] Older individuals tended to respond more pessimistically to subjective health, a finding that aligns with that of previous studies.[37] There were differences in subjective and objective health, depending on the type of family living arrangement. Individuals living alone reported poor objective health, whereas married couples reported poor subjective health. Living alone has been associated with poor health and increased mortality rates,[38,39] therefore, it is likely that the prevalence of chronic diseases among older individuals living alone is high. This finding is consistent with the results of previous studies.[40] Another study

Table 4

Comparison of subjective and objective health according to external activities and environment in older adults.

		Subjective health condition			Objective health condition		
		M ± SD	t	P	M ± SD	t	P
Travel	Yes	2.74 ± 0.85	6.328	<.001	2.57 ± 1.18	-9.562	<.001
	No	2.61 ± 0.86			2.84 ± 1.26		
Leisure	Yes	2.67 ± 0.89	4.922	<.001	2.75 ± 1.25	-2.539	.011
	No	2.57 ± 0.77			2.83 ± 1.21		
Attend social clubs	Yes	2.76 ± 0.86	10.749	<.001	2.54 ± 1.20	-15.385	<.001
	No	2.57 ± 0.85			2.94 ± 1.25		
Work	Yes	2.70 ± 0.87	4.581	<.001	2.49 ± 1.17	-17.062	<.001
	No	2.61 ± 0.86			2.94 ± 1.25		
District	Urban	2.61 ± 0.87	-5.865	<.001	2.53 ± 1.26	-34.887	<.001
	Rural	2.73 ± 0.85			3.38 ± 0.97		

M ± SD = mean ± standard deviation.

Table 5

Relationship between health and other factors in older adults.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Depression	1													
2. Cognition	-.237**	1												
3. Running	.184**	-.283**	1											
4. Walking	.232**	-.279**	.612**	1										
5. Stepping	.313**	-.327**	.553**	.668**	1									
6. Kneeling	.308**	-.289**	.491**	.607**	.764**	1								
7. Reaching	.258**	-.273**	.439**	.606**	.696**	.751**	1							
8. Lifting	.289**	-.283**	.448**	.551**	.676**	.685**	.721**	1						
9. ADL	.197**	-.123**	.128**	.197**	.222**	.224**	.227**	.219**	1					
10. IADL	.285**	-.205**	.191**	.267**	.317**	.316**	.285**	.284**	.793**	1				
11. Satisfaction (health)	.395**	-.234**	.330**	.264**	.358**	.351**	.242**	.309**	.256**	.330**	1			
12. Satisfaction (life)	.356**	-.179**	.147**	.121**	.208**	.203**	.127**	.189**	.170**	.214**	.559**	1		
13. Subjective health	.420**	-.249**	.334**	.305**	.391**	.375**	.299**	.349**	.299**	.359**	.658**	.388**	1	
14. Objective health	.001	-.045**	-.036**	-.020	-.005	-.013	.006	-.011	-.052**	-.044**	-.038**	-.016	-.031**	1

ADL = activities of daily living, IADL = instrumental activities of daily living.

*P < .05, **P < .01, ***P < .001.

Table 6

Factors affecting the subjective health in older adults.

Variables	Categories	Subjective health condition			
		β	P	VIF	Adj. R^2
Psychological factors	Depression	.383	<.001	1.059	.20
	Cognition	-.158	<.001	1.059	
Physical factors	Running	.152	<.001	1.715	.19
	Walking	-.015	.275	2.284	
	Stepping	.172	<.001	3.176	
	Kneeling	.156	<.001	3.222	
	Reaching	-.089	<.001	2.992	
	Lifting	.130	<.001	2.454	
ADL	ADL	.041	.010	2.690	.13
	IADL	.326	<.001	2.690	
Satisfaction	Health	.641	<.001	1.455	.43
	Life	.030	.001	1.455	

Adj. R^2 = Adjusted R^2, ADL = activities of daily living, IADL = instrumental activities of daily living, VIF = variance inflation factors.

found that subjective health outcomes vary across countries. In Mexico, married couples are associated with better subjective health, whereas in Costa Rica, Puerto Rico, and Brazil, married couples are associated with poorer subjective health.[41]

The results, according to lifestyle in older adults, showed that those who did not drink alcohol, eat alone, take no more than 3 medications, and exercise usually had good subjective health. Previous studies have found a positive association between subjective health and physical activity, as was observed in this

study.[42,43] However, unexpected results were found for objective health, and the health of people who were sobers and exercised was worse. Many studies have shown an association between high alcohol consumption and chronic diseases such as cardiovascular disease,[44] diabetes,[45] and cancer.[46] Similarly, exercise has been shown to prevent chronic diseases such as cardiovascular disease,[47] cancer,[48] and musculoskeletal diseases.[49] However, the different results from previous studies in this study are considered to be the result of efforts to improve lifestyle

habits such as abstinence and exercise in subjects with chronic diseases. Individuals with deteriorating health are motivated to maintain health as they age. Previous studies have shown a tendency for increased participation in physical activity owing to poor health among older adults.[42]

Based on the results of external activities in older adults, we found that participants who traveled, enjoyed active leisure, attended social clubs, and worked had good objective health. However, unexpected results were found for subjective health, which was worse for older adults who were mainly engaged in external activities. Although most studies have stated that subjective and objective health are consistent,[50–52] objective health is generally positively associated with subjective health, which cannot be regarded as a simple reflection of physical health.[53] Some older adults tend to perceive and overestimate their health positively, whereas others tend to think that their health is worse than that of others with similar objective health conditions.[54] In other studies, participants perceived themselves as healthy even though social participation was low,[42] subjective health was good if they did not work,[35] and people with good subjective health often used medical care.[55] These results surprisingly showed that people with poor objective health thought good subjective health. It is necessary to conduct a follow-up study on the health changes of people with poor objective health but good subjective health and those with good objective health but poor subjective health.

The factors affecting subjective health in older adults were depression, cognition, physical factors, ADL, and satisfaction. In previous studies on depressed persons,[56,57] participants with low cognitive function,[58] low ADL ability,[39] and low satisfaction had poor subjective health.[59,60] In terms of physical factors, activities such as stepping, kneeling, and running affect subjective health, and it has been shown that individuals feel unhealthy when these activities are physically impossible. Therefore, it is important to holistically manage older adults' subjective health, including mental functions such as depression and cognition, as well as physical functions.

This study is significant because it analyzed various variables that may be related to the health of older adults in Korea. Unexpectedly, objective health was worse in the case of non-drinking and regular exercise, whereas subjective health was worse in the case of external activity. However, this finding implies that more efforts are required to protect public health. The results of this study suggest that the environment of older adults is important for maintaining and promoting their health in Korea and that lifestyle, mental, and physical functions must be well managed.

4.1. Study limitations

This study had some limitations that must be considered when interpreting the data. First, in the older adults survey used as analysis data for this study, smoking status, frequency of meeting or contacting people (family, friends, and neighbors), and housing satisfaction were factors that could affect the health of older adults. However, these variables could not be analyzed because the frequency differences in each group were too large. Second, this study was based on the responses of older adults, which may be biased owing to respondent bias and may differ from the actual situation. Third, the subjective health status was treated as a continuous variable. Subjective health was assessed using a 5 point Likert scale. The Likert scale is an interval scale that can be considered as a continuous variable.[61] Previous studies have also analyzed subjective health as a continuous variable.[39,60,62] However, because data obtained using a Likert scale to measure a respondent's attitude or opinion do not always show a continuous distribution,[63] considering the Likert scale as a continuous variable may be limited. Fourth, objective health was judged by the number of diseases

the subject had, regardless of the disease severity. Previous studies have examined objective health based on whether a disease has been diagnosed,[64] hospitalization experience,[65] medical expenses,[66] and accident experiences.[67] These studies did not consider disease severity. Studies have also evaluated objective health as the number of diseases a subject suffers from regardless of disease severity.[39,67] The severity must be considered when assessing objective health. However, studies that conduct a secondary analysis of existing data, such as this study, can only utilize surveyed data. The existing data used in this study were collected through a large-scale survey. Although many evaluations in various areas were conducted on the subjects, the researcher was unable to investigate the desired items in depth. In future research, it will be necessary to overcome these limitations and analyze additional factors that can affect the health of older adults. It is also expected that clearer results can be obtained by applying more accurate methods such as observing the daily lives of older adults.

5. Conclusions

In this study, we identified differences between subjective and objective health based on the characteristics of older adults. As many variables affecting the health of older adults have been identified, this basic data will be helpful in preparing various programs to promote a healthy life for older adults.

Author contributions

Conceptualization: Chun-Yeop Lee, Nam-Hae Jung.
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