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Factors Related to Health-Related Quality of Life across the Life Cycle in One-Person Households among Korean Adults

Myung-Ock Chae

Associate Professor, Department of Nursing, College of Health and Medical Sciences, Cheongju University, Cheongju, Korea

Purpose: This study is to identify factors related to health-related quality of life in one-person households across the life cycle by analyzing data from the 2021 Korean National Health and Nutrition Examination Survey.
Methods: The subjects of one-person households were divided into 195 young adults, 273 middle-aged people, and 490 elderly people according to life cycle. Data were analyzed by complex sample cross tabulation, complex sample t-test, complex sample ANOVA, and complex sample multiple regression analysis using IBM SPSS 26.0.
Results: In young adults, subjective health status, daily activity limitation, and stress level explained 41% of health-related quality of life, and in middle age, income level, education level, occupation, marital status, subjective health status, stress level, and depression had a 60% explanatory power. In old age, education level, subjective health status, daily activity limitation, stress level, and depression explained 53% of health-related quality of life.
Conclusion: In order to effectively improve the health-related quality of life of one-person households, it is necessary to establish a customized program considering the influencing factors across the life cycle and systematically manage it according to the flow of the life cycle.

Keywords: Adult; Family characteristics; Korea; Life cycle stages; Quality of life

Introduction

Background

In the past five years, the proportion of one-person households in Korea has shown a continuous increase from 28.6% in 2017 to 29.3% in 2018 to 30.2% in 2019, and even after exceeding 30% in 2019, it has been continuously increasing from 31.7% in 2020 to 33.4% in 2021 [1]. As of around 2020, the proportion of one-person households has exceeded 15% of the total households in the major member countries of the Organization for Economic Co-operation and Development (OECD), and one-person households take up over 30% of the total households in countries such as U.K., France, and Japan, and account for more than 40% of the total households in Germany and Sweden [2]. This increase of one-person households in many countries is thought to have resulted from a combination of social phenomena such as late marriage, an increase of people living alone, a high rate of divorce, extended lifespan, and widowhood in old age, the increased levels of individual autonomy and independence, and migration due to occupations [3,4].

In a comparative analysis of the socioeconomic characteristics of one-person households and multi-person households, one-person households were found to have a relatively lower income level and education level [5]. Among one-person households, the unemployment rate was shown to increase with age [6], so older one-person households were found to have a lower income level than younger ones, and elderly people aged 70 or older living in one-person households were reported to show a very high level of out-of-pocket health expenditure [7], showing that the level of socioeconomic status varies depending on life

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Corresponding author: Myung-Ock Chae
Department of Nursing, College of Health and Medical Sciences, Cheongju University, 298 Daeseong-ro, Cheongwon-gu, Cheongju 28503, Korea
Tel: +82-43-229-7922 Fax: +82-43-229-8969 E-mail: 7702cmo@cju.ac.kr

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cycle stages even among one-person households. Compared to multi-person households, one-person households were found to be more likely to be heavy smokers (smoking ≥ 25 cigarettes per day) [8]. They were also found to have a lower level of health-promoting behaviors, compared to multi-person households, and among young, middle-aged, and elderly one-person households, middle-aged one-person households showed the lowest score for health behaviors [5,9]. In addition, the average frequency of eating out per month in one-person households was reported to be 19 times per month, a higher level compared to the average frequency of 13 times per month in the total households [10], and one-person households aged 20 to 39 were shown to have more undesirable eating habits such as unbalanced diet and salty food preference, compared to multi-person households [5]. As described above, since one-person households are not likely to have family members' direct discouragements or restrictions on negative health behaviors [6], they tend to show poorer management of their health, and there were differences in health behaviors according to life cycle stages among one-person households. In connection with the undesirable lifestyle habits and negative health behaviors of one-person households as described above, one-person households were found to be more likely to have metabolic syndrome compared to multi-person households [5]. In a previous study, one-person households were found to have a 1.465 times higher risk of cardiovascular diseases than multi-person households [11].

Meanwhile, health-related quality of life (HRQoL) is considered to be a measure that reflects individuals' subjective experience of their health status [12], and it includes all of the physical, mental, and social domains of health. In Korean adults, the levels of stress and depression were found to be negatively correlated with HRQoL, and they showed a significantly correlation with HRQoL in both males and females [13]. Meanwhile, in Iranian adults, HRQoL was reported to have a positive correlation with physical activity, income level, and post-secondary education, and was shown to have a negative correlation with age, marital status of being married, presence of chronic disease, and smoking [14]. Regarding the findings of previous research on quality of life in one-person households by life cycle stage, a study found that stress level, subjective health perception, and health-promoting behaviors had a direct effect on quality of life in adult one-person households, including young adult, middle-aged, and elderly one-person households [15]. For young adults living in one-person households, residential and economic environments and health were identified as factors related to quality of life [16], and a higher frequency of participation in cultural events was found to be associated with better physical health and a higher level of life satisfaction [17], and job satisfaction and subjective housing cost burden were shown to affect quality of life [18]. In the case of middle-aged one-person households, activity limitation, depression, practice of physical activity, and life-time amount of smoking have been reported to influence HRQoL [19]. Another previous study reported that activity limitation, economic activity, drinking status, presence of eyesight problems, level of anxiety, and presence of suicidal ideation were associated with HRQoL in middle-aged one-person households [20]. Regarding factors affecting HRQoL in elderly one-person households, a previous study found that subjective health status, metabolic syndrome, activity limitation, and perceived stress are associated with HRQoL among males, while subjective health status, activity limitation, and income level are influencing factors for HRQoL among females [19]. As described above, factors affecting quality of life were different according to the life cycle stage, and even among people in the same life cycle stage, there were differences in factors associated with quality of life between countries. In addition, there are differences in the formation background and characteristics of one-person households according to the life cycle stage [6,9], and there are differences in subjective perceived health status according to the life cycle stage [9]. Therefore, it is necessary to explore factors associated with HRQoL through a multi-dimensional approach considering various factors across the life cycle.

With respect to the participants of recent domestic and foreign studies on factors related to quality of life, there have been studies of adults [13,14,21], middle-aged people [22], elderly people [23], menopausal women [24], patients with a specific disease [25], workers [26], and Chinese international students in Korea [27], and in the case of prior studies on quality of life focused on one-person households, previous studies have been conducted with one-person households without the division of life cycle stages [15], young adults [16-18], middle-aged people [19,20], elderly females and males [19], females [28], and unmarried people [29]. In short, previous studies have been mainly conducted with the overall adult population, specific age groups or some subgroups of adults, and there is a severe lack of studies that were focused on one-person households and analyzed influencing factors by life cycle stage by including all adults across the life cycle. Therefore, there is a need to comprehensively investigate factors related to HRQoL by life cycle stage in the total adult one-person households. In view of the above circumstances, this study aimed to identify factors related to HRQoL by life cycle stage among adults living in one-person households, whose

health management urgently need to be improved, by using the raw data from the KNHANES, which is a representative data of the Korean population. The findings derived through this study can be used as basic data for the establishment of differentiated and systematic health promotion policies for one-person households by life cycle stages.

Objectives

This study aimed to investigate general and health-related characteristics and health-related quality of life (HRQoL) of one-person households among Korean adults across the life cycle, examine differences in HRQoL according to general and health-related characteristics by life cycle stage, and identify factors affecting HRQoL by life cycle stage.

Methods

Study design

The present study is a secondary analysis study using data from the 2021 Korea National Health and Nutrition Examination Survey, and is a correlational analysis research to identify factors associated with health-related quality of life in one-person households among Korean adults by life cycle stage.

Participants

This study used the 2021 (the 3th year) raw data of the 8th Korean National Health and Nutrition Examination Survey (KNHANES), and this KNHANES data is provided by the Ministry of Health and Welfare and the Korea Disease Control and Prevention Agency. In this study, out of the total samples of 7,090 people, 958 adults aged 19 or older living in one-person households were initially selected as subjects in the first stage. In the second stage, after classifying ages 19~39 as the young adult period, ages 40~64 as middle age, and ages 65 and above as old age according to life cycle stages [30-32], 195 young adults, 273 middle-aged people, and 190 elderly people were selected, respectively, from each age group, and their data was analyzed. The participants selection process for this study is shown in Figure 1.

Research variables

Regarding the classification criteria of general and health-related characteristics, the classification criteria of the KNHNES data were employed by modifying them to suit the purpose of this study, based on previous studies on health that considered age [6,19,23,28,33,34].

General characteristics

General characteristics of participants included gender, income level, education level, occupation, housing type, and marital status. The income level of the participants was divided into 'low, medium, and high', based on the income quartiles of individuals. Education level was divided into 'middle school or less, high school, and college or more.' Occupation was divided into the 'presence and absence' of an occupation, based on the reclassification of occupations and unemployment/ economic inactivity. Housing type was divided into the two categories of 'apartment and others', based on the responses to the question about whether the housing type is an apartment building or not. Marital status (Marriage) was divided into 'Yes' for married and 'No' for unmarried, based on whether a person is married or not.

Health-related characteristics

Health related characteristics analyzed in this study were as follows: subjective perceived health status, daily activity limitation, drinking frequency, stress level, presence or absence of depression, cigarette smoking status, and e-cigarette smoking status. The level of subjective perceived health status was divided into 'poor, fair, and good', based on the subjective perception of health status. Daily activity limitation was divided into 'Limited and Not limited', based on the presence and absence of limitations on daily activities.' Drinking frequency was divided into '4 times or less per month, 2-3 times per week, and 4 times or more per week', based on the drinking frequency in the past year. Stress

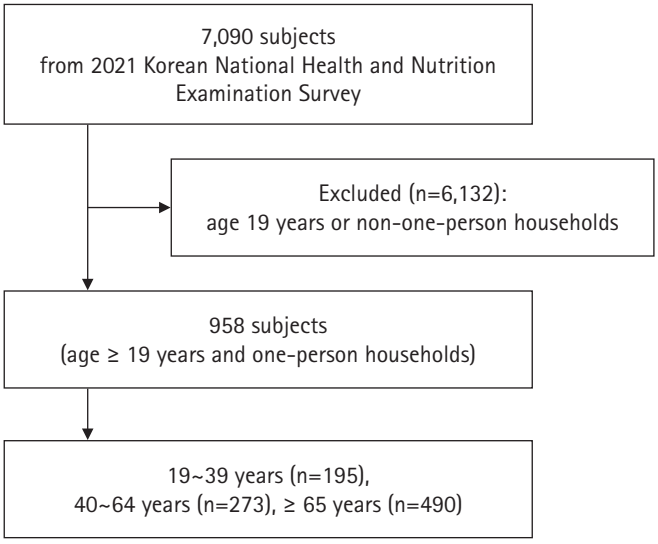

Figure 1. Flow-chart for study participants selection.

level was divided into 'Hardly feel stressed', 'Feel stressed a little', and 'Feel stressed a lot,' based on the degree of perceived stress usually experienced. Depression was divided into 'Yes and No (presence and absence of depression)', based on the experience of depression lasting continuously for 2 weeks or longer. Cigarette smoking and e-cigarette smoking status were divided into 'Yes and No (smoking and non-smoking)' for current smoking status, based on current and life-time smoking status.

Health-related quality of life

Health-related quality of life (HRQoL) was measured using the Health-Related Quality of Life Instrument with 8 items (HINT-8) developed by the Korea Disease Control and Prevention Agency. This instrument consists of 8 questions about an individual's health status over the past week. In other words, it includes 8 items about climbing stairs, pain, strength, working, depression, memory, sleep, and happiness, and each item is rated on a 4-point scale. When HRQoL is measured by HINT-8, the highest level of HRQoL is represented as 11111111, and the lowest level of HRQoL as 44444444. Using a formula developed for the entire population of Korea, the health utility index can be calculated for each health status measured by HINT-8. More specifically, the HINT-8 index for 11111111 indicating the highest level of HRQoL is 1 and the HINT-8 index for 44444444 indicating the lowest level of HRQoL is 0.132. In other words, the HINT-8 index ranges from 0.312 to 1, and HINT-8 index values closer to 1 indicate better health-related quality of life, while lower HINT-8 index values indicate worse health-related quality of life [35].

Data collection

This study used raw data from the Korea National Health and Nutrition Examination Survey (KNHANES) conducted by selecting representative samples by applying the multi-stage stratified cluster sampling method, and used the basic variables and health survey data of the KNHANES data. The health survey data was conducted using mobile health check-up vehicles, and was performed by individual interviews and a self-administered survey. The raw data of the 2021 KNHANES was collected from January to December, 2021, and the survey was conducted after obtaining written informed consent from the participants. The results of the survey are made public after deleting identifiable or sensitive information to guarantee anonymity.

Data analysis

This study used a complex sample analysis method considering weights, variance estimation strata, and enumeration district cluster variables in accordance with the guidelines for analyzing raw data from the KNHANES, and cases of 'Not applicable' or 'Do not know/No response' were changed into missing values and included in the analysis by setting them as valid values. Collected data was analyzed using SPSS/WIN 26.0, and general and health-related characteristics and quality of life were analyzed by calculating weighted percentages, means and standard deviations. To analyze differences in general and health-related characteristics and health-related quality of life by life cycle stage of adult one-person households, complex sample cross tabulation and complex sample ANOVA were performed. Also, complex sample t-test and complex sample ANOVA were used to analyze the level of HRQoL according to general and health-related characteristics by life cycle stage in adult one-person households. In addition, complex sample multiple regression analysis was conducted to analyze factors related to HRQoL by life cycle stage in adult one-person households. Data analysis was carried out from February 1 to 28, 2023.

Ethical considerations

This study received an exemption determination from the IRB of Cheongju University (IRB No. 1041107-202306-HR-005-01), and was conducted after obtaining approval for the use of the raw data of the 2021 KNHANES at the website of the KNHANES.

Results

Differences in general and health related characteristics and health-related quality of life (HRQoL) according to the life cycle stage in one-person households

Table 1 shows general and health-related characteristics and health-related quality of life (HRQoL) according to the life cycle stage among adults in one-person households. Among 958 adults aged 19 or older living in one-person households, the proportions of people in each life cycle stage were as follows: Young adults aged 19~39 comprised 32.3% of the participants, middle-aged people aged 40~64 took up 32.6%, and elderly people aged 65 or older accounted for 35.1%. Regarding general characteristics, there were significant differences in gender ($\chi^2 = 107.69$, $p < .001$), income level ($\chi^2 = 150.33$, $p < .001$), education level ($\chi^2 = 319.37$, $p < .001$), occupation ($\chi^2 = 90.35$, $p < .001$), housing type ($\chi^2 = 28.88$, $p < .001$), and marital status ($\chi^2 = 452.21$, $p < .001$). Middle-aged people showed the highest proportion of the 'low' income group with 45.9%. Meanwhile, young adults showed the highest proportion of people with occupations with 74.9%.

Regarding health-related characteristics, there were significant

Table 1. Differences in General and Health-Related Characteristics and Health-Related Quality of Life according to the Life Cycle of Adults in One-Person Households (*N*=958)

Characteristics	Categories	Young (n = 195, 32.3%†)	Middle-aged (n = 273, 32.6%†)	Older (n = 490, 35.1%†)	χ^2 or F (*p*)
		n (%†) or M ± SE†	n (%†) or M ± SE†	n (%†) or M ± SE†	
Gender	Men	113 (65.1)	135 (58.2)	111 (23.2)	107.69 (< .001)
	Women	82 (34.9)	138 (41.8)	379 (76.8)	
Income	Low	82 (40.4)	128 (45.9)	189 (37.4)	150.33 (< .001)
	Medium	94 (49.2)	99 (36.6)	238 (49.6)	
	High	19 (10.4)	42 (17.5)	54 (12.9)	
Education	Middle school or less	4 (2.4)	69 (22.6)	326 (74.7)	319.37 (< .001)
	High school	65 (36.5)	104 (41.2)	58 (17.5)	
	College or more	120 (61.1)	78 (36.1)	31 (7.7)	
Occupation	Yes	145 (74.9)	162 (63.3)	153 (34.0)	90.35 (< .001)
	No	44 (25.1)	89 (36.7)	263 (66.0)	
Housing type	Other	160 (76.3)	166 (62.7)	324 (61.8)	28.88 (< .001)
	Apartment	35 (23.7)	107 (37.3)	166 (38.2)	
Marriage	Yes	13 (8.6)	175 (56.6)	470 (95.7)	452.21 (< .001)
	No	182 (91.4)	98 (43.4)	20 (4.3)	
Subjective perceived health	Bad	24 (12.7)	71 (25.9)	149 (35.2)	130.73 (< .001)
	Moderate	92 (48.8)	122 (51.7)	192 (44.2)	
	Good	73 (38.5)	58 (22.4)	84 (20.6)	
Daily activity	Limited	7 (4.2)	40 (13.5)	65 (15.4)	142.93 (< .001)
	Not limit	182 (95.8)	211 (86.5)	352 (84.6)	
Alcohol drinking	≤ 4 times per month	152 (76.3)	196 (74.6)	268 (86.9)	19.72 (.021)
	2–3 times per week	30 (15.7)	32 (14.1)	21 (7.0)	
	≥ 4 times per week	13 (8.0)	27 (11.2)	17 (6.1)	
Stress	Hardly	21 (11.1)	38 (13.6)	171 (35.2)	82.04 (< .001)
	A little	110 (58.8)	155 (59.0)	223 (47.7)	
	A lot	64 (30.1)	77 (27.4)	76 (17.1)	
Depression	Yes	31 (13.8)	50 (15.8)	74 (16.7)	20.27 (< .001)
	No	164 (86.2)	220 (84.2)	398 (83.3)	
Current smoking (cigarette)	Yes	45 (22.3)	84 (32.0)	39 (8.9)	134.26 (< .001)
	No	150 (77.7)	189 (68.0)	438 (91.1)	
Current smoking (e-cigarette)	Yes	12 (6.5)	9 (4.6)	3 (0.6)	247.59 (< .001)
	No	183 (93.5)	261 (95.4)	468 (99.3)	
HINT-8		0.82 ± 0.01	0.78 ± 0.01	0.74 ± 0.01	59.81 (< .001)
Climbing stairs	No problems	154 (81.0)	140 (55.9)	150 (28.1)	526.48 (< .001)
	Little problems	38 (17.8)	97 (33.0)	190 (40.6)	
	Serious problems	2 (0.8)	30 (9.3)	113 (23.7)	
	Extreme problems	1 (0.4)	2 (0.5)	17 (3.6)	
Pain	No problems	99 (53.1)	88 (35.2)	144 (28.9)	360.24 (< .001)
	Little problems	89 (43.5)	143 (49.6)	200 (41.9)	
	Serious problems	6 (3.2)	29 (10.9)	108 (21.6)	
	Extreme problems	1 (0.3)	10 (3.1)	18 (3.5)	
Strength	No problems	41 (20.9)	89 (32.8)	142 (29.4)	389.70 (< .001)
	Little problems	102 (50.8)	86 (32.2)	86 (18.1)	
	Serious problems	48 (25.8)	79 (28.1)	165 (33.7)	
	Extreme problems	4 (2.5)	16 (5.7)	74 (14.0)	

(Continued to the next page)

Table 1. Continued

Characteristics	Categories	Young (n = 195, 32.3%†)	Middle-aged (n = 273, 32.6%†)	Older (n = 490, 35.1%†)	χ^2 or F (p)
		n (%†) or M ± SE†	n (%†) or M ± SE†	n (%†) or M ± SE†	
Work	No problems	114 (55.6)	121 (45.7)	164 (31.9)	410.85 (< .001)
	Little problems	73 (40.7)	103 (37.6)	188 (39.6)	
	Serious problems	8 (3.7)	31 (9.3)	81 (16.5)	
	Extreme problems	0 (0.0)	15 (6.1)	36 (7.8)	
Depression	No problems	96 (49.0)	114 (43.3)	237 (47.4)	304.01 (< .001)
	Little problems	87 (45.5)	127 (47.0)	175 (37.0)	
	Serious problems	11 (5.0)	22 (6.3)	25 (5.2)	
	Extreme problems	1 (0.5)	7 (2.2)	31 (6.0)	
Memory	No problems	109 (55.3)	103 (41.7)	158 (31.2)	296.43 (< .001)
	Little problems	79 (41.4)	142 (49.3)	254 (52.7)	
	Serious problems	7 (3.3)	24 (7.2)	51 (10.4)	
	Extreme problems	0 (0.0)	1 (0.6)	5 (1.2)	
Sleep	No problems	81 (43.0)	101 (39.7)	205 (40.6)	294.96 (< .001)
	Little problems	81 (41.2)	121 (43.1)	171 (35.4)	
	Serious problems	31 (14.9)	41 (13.3)	79 (17.0)	
	Extreme problems	2 (0.9)	7 (2.7)	15 (3.0)	
Happiness	No problems	36 (18.3)	44 (16.2)	130 (24.9)	450.93 (< .001)
	Little problems	89 (45.1)	75 (28.5)	84 (18.4)	
	Serious problems	65 (33.8)	120 (43.2)	180 (37.1)	
	Extreme problems	5 (2.8)	31 (10.9)	74 (15.1)	

†Data are weighted; HINT-8 = health-related quality of life instrument with 8 items

differences in all of the following variables: subjective perceived health status ($\chi^2 = 130.73$, $p < .001$), presence or absence of daily activity limitation ($\chi^2 = 142.93$, $p < .001$), drinking frequency ($\chi^2 = 19.72$, $p = .021$), stress level ($\chi^2 = 82.04$, $p < .001$), presence or absence of depression ($\chi^2 = 2027$, $p < .001$), cigarette smoking status ($\chi^2 = 134.26$, $p < .001$), and e-cigarette smoking status ($\chi^2 = 247.59$, $p < .001$). The proportions of people perceiving their subjective health as 'poor' and people with daily activity limitation were highest among elderly people with 35.2% and 15.4%, respectively. The proportion of people reporting feeling stressed 'a lot' was highest among young adults with 30.1%. The proportion of people with depression was highest among elderly people with 16.7%.

Regarding the level of HRQoL, there were significant differences between life cycle stages not only in the score for HRQoL but also in all the 8 items : climbing stairs ($\chi^2 = 526.48$, $p < .001$), pain ($\chi^2 = 360.24$, $p < .001$), strength ($\chi^2 = 389.70$, $p < .001$), work ($\chi^2 = 410.85$, $p < .001$), depression ($\chi^2 = 304.01$, $p < .001$), memory ($\chi^2 = 296.43$, $p < .001$), sleep ($\chi^2 = 294.96$, $p < .001$), and happiness ($\chi^2 = 450.93$, $p < .001$). The score for HRQoL was lowest in elderly people with 0.74 (± 0.01) points. In addition, elderly people showed the highest proportions of responses to the following items: 3.6% for 'I cannot climb stairs', 3.5% for 'I have experienced severe pain', 14.0% for 'I have no strength', 7.8% for 'I cannot work', 6.0% for 'I have always been depressed', 1.2% for 'I cannot remember things at all', 3.0% for 'I cannot sleep well', and 15.1% for 'I am not happy at all.' These results indicated that there are distinct differences in HRQoL between life cycle stages.

Differences in HRQoL according to general and health-related characteristics by life cycle stage in one-person households among Korean adults

Table 2 shows the analysis results of differences in HRQoL according to general and health-related characteristics by life cycle stage in one-person households among Korean adults. Among young adults, in terms of general characteristics, there were statistically significant differences in HRQoL according to gender ($t = 2.35$, $p = .020$) and marital status ($t = 1.98$, $p = .049$), and regarding health-related characteristics, there were statistically significant differences in HRQoL according to subjective perceived health status ($F = 12.89$, $p < .001$), daily activity limitation ($t = -4.02$, $p < .001$), drinking frequency ($F = 4.54$, $p = .012$), and stress

Table 2. Differences in Health-Related Quality of Life according to General and Health-Related Characteristics across the Life Cycle of Adults in One-Person Households (*N*=958)

Characteristics	Categories	Young (n = 195)	t or F (*p*)	Middle-aged (n = 273)	t or F (*p*)	Older (n = 490)	t or F (*p*)
		M ± SE†		M ± SE†		M ± SE†	
Gender	Men	0.83 ± 0.01	2.35 (.020)	0.78 ± 0.01	-0.13 (.901)	0.76 ± 0.01	2.69 (.008)
	Women	0.81 ± 0.01		0.78 ± 0.01		0.73 ± 0.01	
Income	Low	0.82 ± 0.01	0.72 (.490)	0.75 ± 0.01	18.44 (< .001)	0.72 ± 0.01	1.99 (.140)
	Medium	0.83 ± 0.01		0.78 ± 0.01		0.74 ± 0.01	
	High	0.84 ± 0.02		0.84 ± 0.01		0.77 ± 0.02	
Education	Middle school or less	0.81 ± 0.02	1.32 (.269)	0.72 ± 0.01	11.75 (< .001)	0.72 ± 0.01	15.85 (< .001)
	High school	0.83 ± 0.01		0.78 ± 0.01		0.80 ± 0.01	
	College or more	0.82 ± 0.01		0.81 ± 0.01		0.76 ± 0.03	
Occupation	Yes	0.83 ± 0.01	0.24 (.810)	0.80 ± 0.01	4.05 (< .001)	0.76 ± 0.01	2.43 (.016)
	No	0.82 ± 0.01		0.73 ± 0.02		0.73 ± 0.01	
Housing type	Other	0.83 ± 0.01	0.96 (.338)	0.78 ± 0.01	0.31 (.760)	0.74 ± 0.01	1.41 (.160)
	Apartment	0.81 ± 0.01		0.77 ± 0.02		0.72 ± 0.01	
Marriage	Yes	0.86 ± 0.02	1.98 (.049)	0.76 ± 0.01	-2.48 (.014)	0.74 ± 0.01	-0.02 (.984)
	No	0.82 ± 0.01		0.80 ± 0.01		0.74 ± 0.04	
Subjective Perceived health	Bad	0.77 ± 0.02	12.89 (< .001)	0.68 ± 0.02	42.13 (< .001)	0.65 ± 0.01	75.19 (< .001)
	Moderate	0.82 ± 0.01		0.79 ± 0.01		0.76 ± 0.01	
	Good	0.86 ± 0.01		0.85 ± 0.01		0.83 ± 0.01	
Daily activity	Limited	0.71 ± 0.03	-4.02 (< .001)	0.65 ± 0.03	-5.64 (< .001)	0.62 ± 0.02	-7.79 (< .001)
	Not limit	0.83 ± 0.01		0.80 ± 0.01		0.76 ± 0.01	
Alcohol drinking	≤ 4 times per month	0.82 ± 0.01	4.54 (.012)	0.78 ± 0.01	0.90 (.410)	0.74 ± 0.01	3.32 (.039)
	2–3 times per week	0.84 ± 0.01		0.77 ± 0.03		0.79 ± 0.02	
	≥ 4 times per week	0.86 ± 0.02		0.75 ± 0.03		0.72 ± 0.04	
Stress	Hardly	0.86 ± 0.02	14.05 (< .001)	0.86 ± 0.01	35.40 (< .001)	0.79 ± 0.01	40.74 (< .001)
	A little	0.84 ± 0.01		0.79 ± 0.01		0.74 ± 0.01	
	A lot	0.78 ± 0.01		0.70 ± 0.02		0.62 ± 0.02	
Depression	Yes	0.77 ± 0.01	-4.58 (< .001)	0.64 ± 0.03	-6.16 (< .001)	0.61 ± 0.02	-10.44 (< .001)
	No	0.83 ± 0.01		0.80 ± 0.01		0.76 ± 0.01	
Current smoking (cigarette)	Yes	0.81 ± 0.01	-0.90 (.372)	0.75 ± 0.02	-1.98 (.050)	0.74 ± 0.03	-0.04 (.972)
	No	0.83 ± 0.01		0.79 ± 0.01		0.74 ± 0.01	
Current smoking (e-cigarette)	Yes	0.82 ± 0.02	-0.24 (.809)	0.78 ± 0.02	0.04 (.689)	0.75 ± 0.08	0.19 (.850)
	No	0.83 ± 0.01		0.78 ± 0.01		0.74 ± 0.01	

†Data are weighted

level (F = 14.05, p < .001), and depression (t = -4.58, p < .001). More specifically, among young adults in one-person households, in terms of health-related characteristics, the group with poor subjective health status showed the lowest level of HRQoL, and the group without daily activity limitation showed a higher level of HRQoL than the group with daily activity limitation. Regarding stress level, the group that feel stressed a lot showed the lowest level of HRQoL.

In middle-aged one-person households, regarding general characteristics, there were significant differences in HRQoL according to income level (F = 18.44, p < .001), education level (F = 11.75, p < .001), occupation (t = 4.05, p < .001), and marital status (t = -2.48, p = .014), and regarding health-related characteristics, there were significant differences in HRQoL according to subjective perceived health status (F = 42.13, p < .001), daily activity limitation (t = -5.64, p < .001), stress level (F = 35.40, p < .001), and depression (t = -6.16, p < .001). More specifically, among middle-aged people, in terms of income level among general characteristics, the low income group had the lowest level of HRQoL. Regarding education level, the level of HRQoL was

highest in the group with the education level of college or more, and it was lowest in the group with the education level of middle school or less. Also, the group with an occupation had a higher level of HRQoL than the group without an occupation, and regarding marital status, the unmarried group had a higher level of HRQoL than the married group. In relation to health-related characteristics, the group with poor subjective health status had the lowest level of HRQoL. As to stress level, the group that feel stressed a lot showed the lowest level of HRQoL. Regarding depression, the group without depression showed a higher level of HRQoL than the group with depression.

In elderly one-person households, regarding general characteristics, there were significant differences in HRQoL according to gender ($t = 2.69$, $p = .008$), education level ($F = 15.85$, $p < .001$), and occupation ($t = 2.43$, $p = .016$), and regarding health-related characteristics, HRQoL was significantly different according to subjective perceived health status ($F = 75.19$, $p < .001$), daily active limitation ($t = -7.79$, $p < .001$), drinking frequency ($F = 3.32$, $p = .039$), stress level ($F = 40.74$, $p < .001$), and depression ($t = -10.44$, $p < .001$). More specifically, in elderly people, with respect to health-related characteristics, the group with poor subjective health status had the lowest level of HRQoL, and the group without daily activity limitation showed a higher level of HRQoL than the group with daily activity limitation. In terms of stress level, the group feeling stressed a lot showed the lowest level of HRQoL. The group without depression showed a higher level of HRQoL than the group with depression.

Factors associated with HRQoL by life cycle stage in one-person households among Korean adults

To analyze factors related to HRQoL by life cycle stage in one-person households among Korean adults, complex sample multiple regression analysis was conducted by including all the variables in the hypotheses (Table 3).

Among young adults in one-person households, subjective perceived health status, daily activity limitation and stress level were found to explain 41% of the variance of HRQoL. In terms of subjective perceived health status, compared to the poor health status group, the good health status group ($B = .07$, $p < .001$) and the fair health status group ($B = .04$, $p = .026$) showed a higher level of HRQoL. As to daily activity limitation, the group with daily activity limitation showed a lower level of HRQoL than the group without daily activity limitation ($B = -.11$, $p < .001$). Also, compared to the group not feeling stressed, the group feeling stressed a lot ($B = -.07$, $p < .001$) and the group feeling stressed a little ($B = -.04$, $p < .001$) showed a lower level of HRQoL.

In middle-aged people, income level, education level, presence or absence of occupation, marital status, subjective perceived health status, stress level, and presence or absence of depression explained 60% of HRQoL. The group with occupations showed a higher level of HRQoL than the group without occupations ($B = .03$, $p = .007$). In terms of subjective perceived health status, the good health status group ($B = .08$, $p < .001$) and the fair health status group ($B = .06$, $p < .001$) showed a higher level of HRQoL than the poor health status group. Regarding income level, compared to the high income group, the low income group ($B = -.04$, $p = .007$) and the medium income group ($B = -.04$, $p = .005$) showed a lower level of HRQoL. The group with the education level of middle school or less showed a lower level of HRQoL than the group with the education level of college or more the group with the education level of middle school or less ($B = -.04$, $p = .036$). The married group had a lower level of HRQoL than the unmarried group ($B = -.03$, $p = .009$). Compared to the group that do not feel stressed, the group that feel stressed a lot and ($B = -.10$, $p < .001$) and the group that feel a little stressed ($B = -.03$, $p = .023$) showed a lower level of HRQoL ($B = -.09$, $p < .001$). Also, the group with depression was found to have a lower level of HRQoL than the group without depression ($B = -.09$, $p < .001$).

Among elderly people, education level, subjective perceived health status, daily activity limitation, stress level, and depression explained 53% of HRQoL. In terms of subjective perceived health status, compared to the group with poor health status, the group with good health status ($B = .12$, $p < .001$) and the group with fair health status ($B = .07$, $p < .001$) were found to have a higher level of HRQoL. The group with the education level of middle school or less was found to have a lower level of HRQoL than the group with the education level of college or more ($B = -.05$, $p = .046$). The group with daily activity limitation showed a lower level of HRQoL than the group without daily activity limitation ($B = -.05$, $p = .040$). Compared to the group without stress, the group that feel stressed a lot ($B = -.14$, $p < .001$) and the group that feel a little stressed ($B = -.04$, $p = .011$) exhibited a lower level of HRQoL. The group with depression showed a lower level of HRQoL than the group with the group without depression ($B = -.09$, $p < .001$).

Discussion

This study attempted to identify factors associated with HRQoL among adults aged 19 or older in one-person households by us-

Table 3. Factors Related to Health-Related Quality of Life across the Life Cycle of Adults in One-Person Households (N=958)

Characteristics	Young (n = 195)			Middle-aged (n = 273)			Older (n = 490)		
	B	SE	*p*	B	SE	*p*	B	SE	*p*
(Constant)	.82	0.02	< .001	.84	0.04	< .001	.75	0.04	< .001
Gender Men (Women†)	.01	0.01	.532	-.02	0.01	.153	.00	0.01	.953
Income (High†)									
Low	-.00	0.02	.833	-.04	0.01	.007	-.03	0.02	.190
Medium	-.00	0.02	.883	-.04	0.01	.005	-.03	0.02	.202
Education (College or more†)									
Middle school or less	-.03	0.02	.119	-.04	0.02	.036	-.05	0.02	.046
High school	.01	0.01	.352	-.01	0.01	.562	.00	0.02	.986
Occupation Yes (No†)	.02	0.01	.078	.03	0.01	.007	.02	0.01	.209
Housing type Other (Apartment†)	.01	0.01	573	.00	0.01	.722	.01	0.01	.369
Marriage Yes (No†)	.03	0.02	.157	-.03	0.01	.009	-.02	0.02	.517
Subjective perceived health (Bad†)									
Good	.07	0.02	< .001	.08	0.02	< .001	.12	0.02	< .001
Moderate	.04	0.02	.026	.06	0.02	< .001	.07	0.01	< .001
Daily activity Limited (Not limit†)	-.11	0.02	< .001	-.03	0.02	.107	-.05	0.02	.040
Alcohol drinking (≥ 4 times per week†)									
≤ 4 times per month	-.01	0.01	.433	.00	0.02	.954	.00	0.03	.877
2–3 times per week	-.02	0.02	.363	.02	0.02	535	.01	0.03	.760
Stress (Hardly†)									
A lot	-.07	0.01	< .001	-.10	0.02	< .001	-.14	0.02	< .001
A little	-.04	0.01	< .001	-.03	0.01	.023	-.04	0.01	.011
Depression Yes (No†)	-.02	0.01	.206	-.09	0.02	< .001	-.09	0.02	< .001
Current smoking (cigarette) Yes (No†)	-.00	0.01	.930	-.00	0.02	.910	-.01	0.02	.506
Current smoking (e-cigarette) Yes (No†)	-.01	0.01	.504	-.02	0.02	.157	.01	0.03	.646
R^2		.41			.60			.53	
F (*p*)		16.28 (< .001)			12.33 (< .001)			24.28 (< .001)	

†Reference

ing raw data of the 3rd year (2021) of the 8th Korean National Health and Nutrition Examination Survey (KNHNES) carried out by the Ministry of Health and Welfare and the Korea Disease Control and Prevention Agency with the aim of providing basic data for practical programs and policies for the health promotion of adults living in one-person households by life cycle stage. As for factors associated with HRQoL in one-person households among Korean adults, in young adults, subjective health status, daily activity limitation, and stress level were identified as factors affecting HRQoL. Meanwhile, in middle-aged people, income level, education level, presence of occupation, marital status, subjective health status, stress level, and presence of depression were found to be influencing factors for HRQoL. In elderly people, factors associated with HRQoL were education level, subjective health status, daily activity limitation, stress level, and presence of depression.

In this study, subjective health status and stress level were found to be factors affecting HRQoL in all the groups of one-person households, including young adult, middle-aged, and elderly one-person households. In relation to stress as a signification factor affecting HRQoL, the results of this study are similar to the findings of a prior study of middle-aged people, which reported that stress was the only significant influencing factor for HRQoL and had the strongest impact on [22], although the participants of the study were not middle-aged one-person households. A study of elderly one-person households found that subjective health status and the degree of perceived stress were influencing factors for HRQoL in male older adults [19], and these results are in agreement with the findings of this study. In addition, according to a prior study of elderly people rather than elderly one-person households, subjective health status was found to be a significant influencing factor for HRQoL [23], and these re-

sults are also consistent with the findings of this study. In a study that compared scores for health behaviors between people living in different types of living arrangement, the score for health behavior was 3.57 points for one-person households and 3.96 points for multi-person households, showing that one-person households exhibited a lower score for health behaviors and are more likely to neglect health management, compared to multi-person households [9]. These vulnerable health management behaviors were shown to deteriorate subjective health status in one-person households [34], and were found to cause subjective health status to become worse with increasing age in one-person households [9]. Therefore, it is necessary to apply a customized health management method for one-person households that can be continuously implemented across the life cycle from the young adult period to old age so that individuals in one-person households will perceive their subjective health status positively and thus improve their health-related qualify of life.

In particular, as of 2021, in one-person households, the proportion of people aged 29 or younger corresponding to the young adult period is reported to be 19.8%, taking up the largest proportion of the total one-person households [2]. Young adult one-person households are formed as young adults get to live independently from their parents for reasons such as education or employment, and since job opportunities tend to be concentrated in large cities [9], the proportion of young adult one-person households is generally higher in the capital area in developed countries such as Japan and South Korea, compared to the national average proportion of young adult one-person households [36]. In addition, according to previous studies, young adult one-person households tend to eat irregular meals due to a lack of time and inconvenience as they live alone [37], and they were found to show higher rates of undesirable health behaviors in terms of smoking, drinking, and sleep duration, compared to multi-person households [9]. These findings are consistent with the results of a prior study reporting that the type of living arrangement was found to be a major factor affecting healthy lifestyle habits in young adults, although it is not a significant influencing factor in middle-aged people or elderly people [6]. As described above, repetitive undesirable health behaviors influence subjective health status in young adult one-person households, and thereby deteriorate the level of HRQoL in young adults. In this way, since undesirable health behaviors influence subjective health status and eventually affect HRQoL in a kind of vicious cycle, subjective health status is thought to be significantly associated with HRQoL in young adult one-person households in this study. Therefore, there is a need to strengthen their ability for healthy dietary lifestyle by providing practical dietary education about knowledge about nutrition, how to choose healthy foods, and cooking methods for young adult one-person households [10]. Regarding the nonparticipation rates of health checkups by life cycle stage in one-person households, the nonparticipation rate of health checkup in young adults was reported to be 49.9%, which is higher than 40.4% in middle-aged people and 43.4% in elderly people [6], and these findings suggest that it is necessary to improve HRQoL in young adult one-person households by encouraging their regular participation in health checkup and reducing their vague anxiety about subjective health status.

Previous studies reported that lifetime amount of smoking [19] and drinking [20] were found to be factors affecting quality of life in middle-aged one-person households. On the other hand, in this study, current cigarette smoking status and drinking frequency were not significantly associated with HRQoL. However, in this study, the rate of current cigarette smoking in middle-aged people was 32%, which is much higher than 22.3% in young adults and 8.9% in elderly people. Also, in middle-aged people, the proportion of people drinking 4 times or more per week was 11.2%, which is much higher compared to 8.0% in young adults and 6.1% in elderly people. It is thought that these high frequencies of smoking and drinking acted as a factor leading people to perceive their health status as poor, thereby affecting subjective perceived health status, which is presumed to be related to the fact that subjective perceived health status was found to be a factor affecting HRQoL in middle-aged one-person households. Therefore, it is necessary to provide community-level and government-level support through related policies in order to encourage middle-aged one-person households with poor self-perceived health status to actively manage their health status.

In addition, in this study, the proportion of people feeling stressed 'a lot' was highest in young adult one-person households compared to other life stages, and stress level was identified as a major factor associated with HRQoL in young adult one-person households. For young adult one-person households, in an unexpected crisis situation, they may feel stressed due to the absence of an assistant who can provide help, and this stress was found to cause self-neglect behaviors such as not performing even the minimum management of hygiene and cleanliness [38]. As described above, stress may affect basic health behaviors in young adults, and this is thought to be the reason why stress was identified as a factor associated with HRQoL in young adult one-person households in this study. These results suggest that there is a need for the development and distribution of various online and offline counseling or education program for young adult one-per-

son households without cohabitants to help them to manage their stress level for themselves.

In this study, daily activity limitation was identified as a factor affecting HRQoL in young adult one-person households and elderly one-person households. In particular, in the case of elderly one-person households, a previous research showed that elderly one-person households showed a higher rate of physical inactivity than multi-person households, and they exhibited the highest rate of physical inactivity among all age groups [9]. In agreement with such previous findings, this study also found that elderly one-person households showed the highest rate of daily life limitation (15.4%), and daily life limitation was shown to be a factor associated with HRQoL in elderly one-person households. These results may be attributed to daily life limitation due to rapid aging in old age. A prior study reported that elderly people's social participation is a significant predictor for individuals' health status, and based on the finding, the study suggested that maintaining active social participation through various activities including health education by social welfare institutions can positively influence the health status of elderly people [39]. In view of these findings, daily activity limitation, which poses an obstacle to social participation, is expected to inevitably negatively affect HRQoL in elderly people. As Korea's populating aging is progressing rapidly, the proportion of one-person households aged 29 or less is estimated to decrease from 22.8% in 2005 to 7.5% in 2050, but the proportion of one-person households aged 70 or older is estimated to increase from 17.3% in 2005 to 42.9% in 2050 [2]. Therefore, to improve the level of HRQoL in elderly one-person households, their social participation activities should be promoted by minimizing daily activity limitation and improving the rate of physical activity as much as possible in the continuously growing elderly population.

In this study, depression was associated with HRQoL only in middle-aged and elderly one-person households. This finding is consistent with a prior study [13] showing that depression is statistically significantly associated with HRQoL in adults, although the previous study was not conducted with one-person households. However, in a previous study of middle-aged people regardless of the type of living arrangement, although a lower score for depression was significantly correlated with a higher level of HRQoL, depression was not identified as an influencing factor for HRQoL [22]. These results are partially in disagreement with the findings of the present study. In addition, another prior study [19] reported that depression was an influencing factor for HRQoL in middle-aged one-person households, but it did not significantly affect HRQoL in elderly one-person households, so the results of this study also showed some disagreement with the findings of this study. These discrepancies in research findings may be attributed to differences in the assessment tools used. In this study, depression was measured using 'Yes or No' responses to the question about 'the experience of depression lasting continuously for 2 weeks or longer', and HRQoL was assessed using HINT-8, while a depression screening tool (Patient Health Questionnaire-9; PHQ-9) and EuroQoL-5Dimension (EQ-5D) were used in a previous study [19]. Thus, there is a need to conduct a replication study using the same instruments to confirm whether the same results are obtained.

Meanwhile, in this study of one-person households, elderly people showed a higher rate of depression, compared to young adults and middle-aged people. However, a previous study comparing the mean scores for depression reported that the mean score for depression and 4.18 points in middle-aged people, 2.31 points in male elderly people, and 4.09 points in female elderly people, showing that the mean score for depression was highest in middle-aged people [19]. Taken together, the above research findings about depression seem to show that the prevalence rate of depression is lower in middle-aged people than in elderly people, but the level of depression is higher in middle-aged people than elderly people. Compared to multi-person households, middle-aged one-person households showed higher rates of unhealthy behaviors in smoking, drinking, and duration of sleep, and they had the lowest score for health behaviors among three life cycle stages [9]. These undesirable health behaviors in middle-aged one-person households influenced metabolic syndrome, and consequently, the prevalence rate of metabolic syndrome was found to be significantly higher in middle-aged one-person households than in middle-aged multi-person households [5]. These results are consistent with a prior research reporting that chronic disease was an influencing factor for HRQoL in adults aged 18 or older [21]. BMI and waist circumference, which are closely related to metabolic syndrome, have been reported to have a significant association with depression [40]. In light of the above findings, it is thought that metabolic syndrome influences depression, and thereby deteriorates HRQoL in middle-aged people, which is presumed to explain the significant association between depression and HRQoL in middle-aged one-person households in the present study. Therefore, in order to improve HRQoL in middle-aged people, it is necessary to manage metabolic syndrome through the improvement of undesirable health behaviors such as smoking and excessive drinking and provide psychological support to reduce depression at the same time.

In this study, factors affecting HRQoL only in middle-aged one-person households were income level, presence of occupation, and marital status. According to a study of factors affecting HRQoL in unmarried one-person households, factors affecting HRQoL were found to be social support, anxiety about mental health, and gender in never-married people, gender and anxiety about employment and income activity in separated and divorced people, and social support, anxiety about preparations for old age, anxiety about mental health, and age in widowed people [29]. These findings in a prior study showed that there are distinct differences in influencing factors for quality of life according to marital status among unmarried one-person households, and these results are consistent with the finding of this study that marital status was identified as an influencing factor for HRQoL in middle-aged one-person households. However, in this study, marital status was binarily classified into married and unmarried, so there is a need to repeatedly verify the relationship between marital status and HRQoL in one-person households by life cycle stage through a more detailed classification of marital status. Such a follow-up study can provide important basic data for the development of the optimal intervention measure for the improvement of HRQoL in one-person households across the life cycle according to marital status.

In addition, middle age is the period when individuals carry out more activities at home and in various social areas and show higher productivity, compared to other life cycle stages [41], so marital status can have a direct impact on individuals' economic, social, and health aspects. Moreover, middle-aged one-person households are formed as middle-aged people live separately from the family mainly due to economic problems or the education of children or they are formed due to divorce [42], so resulting changes in income level and marital status will inevitably have a significant impact on HRQoL in middle-aged one-person households. In particular, Korea's median age in the population is estimated to be continuously increased from 45.6 years in 2023 to 50.4 years in 2031 to 60 years in 2056 [43], and with the rapid progression of population aging in Korean society, the age criterion of elderly people is expected to be changed upwardly, which will lead to the extension of the period of middle age. As mentioned above, middle age is expected to be continuously extended with time in the future, and HRQoL in middle age will inevitably be linked to HRQoL in old age and continuously affect quality of life in old age until the end of the life cycle. Therefore, it is necessary to develop and implement a program for the management of HRQoL by considering the income level and marital status characteristics of middle-aged one-person households in order to ensure that middle-aged one-person households will properly prepare for a healthy old age.

Conclusions

This study attempted to identify factors associated with health-related quality of life (HRQoL) in one-person households by life cycle stage by using data from the 2021 Korea National Health and Nutrition Examination Survey. With respect to the explanatory power of factors affecting HRQoL in one-person households by life cycle stage, in young adults, subjective health status, daily activity limitation, and stress level explained 41% of the variance of HRQoL. In the case of middle age, income level, education level, occupation, marital status, subjective health status, stress level, and depression had an explanatory power of 60%. In old age, education level, subjective health status, daily activity limitation, stress level, and depression explained 53% of HRQoL. Therefore, to effectively promote HRQoL in one-person households, it is necessary to develop a customized program by considering influencing factors for HRQoL by life cycle stage and carry out the systematical management of HRQoL in one-person households according to the flow of the life cycle.

The present study can be differentiated from previous studies in that this research comprehensively analyzed and derived factors associated with HRQoL for each life cycle stage by encompassing all one-person households among Korean adults. Based on the research findings of this study, the following suggestions are presented. First, since this study analyzed the raw data of the 2021 Korean National Health and Nutrition Examination Survey (KNHANES), which is the most recent data of the KNHANES, in the future, a replication study should be conducted with more samples of one-person households by life cycle stage by using the integrated data accumulated over many years. Second, it is necessary to develop and implement programs to improve health-related quality of life in one-person households across the life cycle, based on the influencing factors for HRQoL identified in this study. Third, one of the limitations of this study is that this analysis did not include survey data about dietary patterns and food consumption and variables such as cohabitants and social activities of the KNHNES, so these factors should also be comprehensively considered in a future exploration of factors associated with HRQoL.

ORCID

Myung-Ock Chae, https://orcid.org/0000-0003-1067-5960

Conflict of interest

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Authors' contributions

Myung-Ock Chae contributed to conceptualization, data curation, formal analysis, methodology, writing – original draft, review & editing, and validation.

Data availability

Please contact the corresponding author for data availability.

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References

1. Korean Statistical Information Service (KOSIS). Percentage of single-person households [Internet]. Daejeon: KOSIS. 2023 [cited 2023 Jul 19]. Available from: https://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1YL21161&vw_cd=MT_GTITLE01&list_id=102&seqNo=&lang_mode=ko&language=kor&obj_var_id=&itm_id=&conn_path=MT_GTITLE01
2. Korean Statistical Information Service (KOSIS). One-person households by 2022 statistics. Daejeon: KOSIS; 2022. 78 p.
3. Cheung AKL, Yeung WJJ. Socioeconomic development and young adults' propensity of living in one-person households: Compositional and contextual effects. Demographic Research. 2021;44:277–306. https://doi.org/10.4054/DemRes.2021.44.11
4. Esteve A, Reher DS, Treviño R, Zueras P, Turu A. Living alone over the life course: Cross-national variations on an emerging issue. Population and Development Review. 2020;46(1):169–189. https://doi.org/10.1111/padr.12311
5. Cho YK, Shim KW, Suk HW, Lee HS, Lee SW, Byun AR, Lee HN. Differences between one-person and multi-person households on socioeconomic status, health behavior, and metabolic syndrome across gender and age groups. Korean Journal of Family Practice. 2019;9(4):373–382. https://doi.org/10.21215/kjfp.2019.9.4.373
6. Lee ES. Relationship between household types, health-related lifestyle, health service usage, and health outcomes across age groups. Korean Journal of Health Education and Promotion. 2021;38(3):1–12. https://doi.org/10.14367/kjhep.2021.38.3.1
7. Piekut M. The segmentation of Polish one-person households due to consumption. Sustainability. 2019;11(1):177. https://doi.org/10.3390/su11010177
8. Han BH, Kang HS, Lee KM, Jung SP. Comparison of heavy smoking and related risk factors for one-person and multi-person households. Korean Journal of Family Practice. 2022;12(2):79–85. https://doi.org/10.21215/kjfp.2022.12.2.79
9. Ha JK, Lee SL. The effect of health-related habitual consumption and lifetime on subjective health of one-person households: Focusing on comparison between non-one person households and generations. Family and Environment Research. 2017;55(2):141–152. https://doi.org/10.6115/fer.2017.011
10. Lee SL, Choi IS, Kim JH. Healthy eating capability of one-person households-The effects of eating alone, meal types, and dietary lifestyles. Family and Environment Research. 2020;58(4):483–496. https://doi.org/10.6115/fer.2020.034
11. Shim SB, Lee KM, Lee KW, Jeong JM, Park YS, Shin SY. Cardiovascular risk of one-person households. Korean Journal of Family Practice. 2018;8(1):8–14. https://doi.org/10.21215/kjfp.2018.8.1.8
12. Karimi M, Brazier J. Health, health-related quality of life, and quality of life: What is the difference? Pharmacoeconomics. 2016;34:645–649. https://doi.org/10.1007/s40273-016-0389-9
13. Kim ES, Shin MH, Yang JH, Ahn SK, Na BJ, Nam HS. Associations of regional-level perceived stress and depression with health-related quality of life in Korean adults: A multilevel analysis of 2017 Korea Community Health Survey data. Epidemiology and Health. 2021;43:e2021062. https://doi.org/10.4178/epih.e2021062
14. Rezaei S, Hajizadeh M, Kazemi A, Khosravipour M, Khosravi F, Rezaeian S. Determinants of health-related quality of life in Iranian adults: Evidence from a cross-sectional study. Epidemiology and Health. 2017;39:e2017038. https://doi.org/10.4178/epih.e2017038
15. Lee EH, Lee JH, Kim CG. A study influential factors the quality of life of one-person households: Medication effect verification of perceived health and health promotion behavior. Korean Comparative Government Review. 2018;22(4):179–203. https://doi.org/10.18397/kcgr.2018.22.4.179

16. Lee SY. A study on the living environment and quality of life of young single-person households. The Journal of Humanities and Social Science. 2022;13(5):1017–1032. https://doi.org/10.22143/HSS21.13.5.71
17. Han SM, Lee SJ. Quality of life of youth living alone: With the focus of social capital influence. The Journal of Convergence Society and Public Policy. 2018;12(1):60–85. https://doi.org/10.37582/CSPP.2018.12.1.60
18. Lee TH, Yun SW. Effect of housing and employment status of youth single households on quality of life: Focused on young single households living in Gyeonggi-do. Korea and Global Affairs. 2023;7(3):103–127. https://doi.org/10.22718/kga.2023.7.3.005
19. Kwon JS. Influencing factors on health-related quality of life in middle and old adult one-person households. The Journal of the Convergence on Culture Technology. 2019;5(1):153–167. https://doi.org/10.17703/JCCT.2019.5.1.153
20. Choi SE, Kim JO, Wee H, Park MJ. Influencing factors on health related quality of life in middle aged single person households. The Journal of the Korea Contents Association. 2023;23(7):546–554. https://doi.org/10.5392/JKCA.2023.23.07.546
21. Karyani AK, Rashidian A, Sefiddashti SE, Sari AA. Self-reported health-related quality of life (HRQoL) and factors affecting HRQoL among individuals with health insurance in Iran. Epidemiology and Health. 2016;38:e2016046. https://doi.org/10.4178/epih.e2016046
22. Chang HK. Influencing factors on health-related quality of life in middle age. Korean Journal of Adult Nursing. 2012;24(4):339–347. https://doi.org/10.7475/kjan.2012.24.4.339
23. An JS, Choi HY. Trend of influencing factors on health-related quality of life in Korean elderly. Journal of Korean Public Health Nursing. 2018;32(2):275–287. https://doi.org/10.5932/JKPHN.2018.32.2.275
24. Kang JH, Kim MJ. Factors influencing the health-related quality of life in Korean menopausal women: A cross-sectional study based on the theory of unpleasant symptoms. Korean Journal of Women Health Nursing. 2022;28(2):100–111. https://doi.org/10.4069/kjwhn.2022.05.29
25. Kim SH, Kim MO. Factors affecting health-related quality of life in patients with chronic obstructive pulmonary disease using health-related quality of life instrument with 8 items. The Journal of the Korea Contents Association. 2022;22(8):347–357. https://doi.org/10.5392/JKCA.2022.22.08.347
26. Mahirah D, Sauter C, Thach TQ, Dunleavy G, Nazeha N, Christopoulos GI, Soh CK, Car J. Factors associated with health-related quality of life in a working population in Singapore. Epidemiology and Health. 2020;42:e2020048. https://doi.org/10.4178/epih.e2020048
27. Kim SJ, Choi KO. Health promotion behavior and health-related quality of life by acculturation levels among Chinese university students in Korea. The Journal of the Korea Contents Association. 2017;17(8):66–79. https://doi.org/10.5392/JKCA.2017.17.08.066
28. Chae HJ, Kim MJ. Health behavior, health service use, and health related quality of life of adult women in one-person and multi-person households. Korean Journal of Women Health Nursing. 2019;25(3):299–314. https://doi.org/10.4069/kjwhn.2019.25.3.299
29. Park MS, Chun JW. The effect of daily anxiety and social support on the quality of life of unmarried single person households. Journal of Families and Better Life. 2017;35(4):25–42. https://doi.org/10.7466/JKHMA.2017.35.4.25
30. Lee SE. Risk factors for suicidal ideation across the life cycle among Korean adults: Korean psycho-social anxiety survey. Korean Journal of Adult Nursing. 2017;29(2):109–118. https://doi.org/10.7475/kjan.2017.29.2.109
31. Jang JM, Park JI, Oh KY, Lee KH, Kim MS, Yoon MS, et al. Predictors of suicidal ideation in a community sample: roles of anger, self-esteem, and depression. Psychiatry Research. 2014;216(1):74–81. https://doi.org/10.1016/j.psychres.2013.12.054
32. Ra CK, Cho Y. Differentiated effects of social participation components on suicidal ideation across age groups in South Korea. BMC Public Health. 2013;13:1–8. https://doi.org/10.1186/1471-2458-13-890
33. Shin MA. Comparison of self-rated health in middle-aged according to households: Analysis of data from the Korea National Health and Nutrition Examination Survey in 2020. Journal of Wellness. 2022;17(4):101–107. https://doi.org/10.21097/ksw.2022.11.17.4.101
34. Kim EJ, Kim H, Yoon JY. Trajectories of self-rated health among one-person households: A latent class growth analysis. Journal of Korean Academy of Community Health Nursing. 2019;30(4):449–459. https://doi.org/10.12799/jkachn.2019.30.4.449
35. Jo MW. Valuation of Korean health-related quality of life instrument with 8 items (HINT-8). Policy Monographs. Cheongju: Korea Centers for Disease Control and Prevention; 2017. Report No. 11-1352159-000695-01.
36. Ronald R. The remarkable rise and particular context of younger one-person households in Seoul and Tokyo. City and

Community. 2017;16(1):25–46. https://doi.org/10.1111/cico.12221
37. Heo YK, Shim KH. Dietary attitude of single households in metropolitan areas. The Korean Journal of Food and Nutrition. 2016;29(5):735–745. https://doi.org/10.9799/ksfan.2016.29.5.735
38. Nam YJ, Kim JE. Relationships between social support, self-neglect, and stress from no helper of single-person households in their early and middle adulthood: Examining the mediating role of stress from no helper. Journal of Family Relations. 2021;25(4):61–76. https://doi.org/10.21321/jfr.25.4.61
39. Chang SJ, Kim SY. The relationship between socioeconomic status and health inequality in later life: The mediation effects of psycho-social mechanisms. Journal of the Korean Gerontological Society. 2016;36(3):611–632.
40. Chu JE, Lee JM, Cho HI, Park YJ. Relationships between obesity, blood and urinary compositions, and dietary habits and depressed mood in Koreans at the age of 40, a life transition period. Journal of Nutrition and Health. 2013;46(3):261–275. https://doi.org/10.4163/jnh.2013.46.3.261
41. Chang HK. Influencing factors on fatigue of middle-aged women. Korean Journal of Adult Nursing. 2010;22(6):634–643.
42. Han JM, Lee YH. Analysis of the effect of increase of one-person household on consumer spending. KIET Monthly Industrial Economics. 2013;177(3):22–31.
43. Korean Statistical Information Service (KOSIS). Key population indicators [Internet]. Daejeon: KOSIS. 2023 [cited 2023 Jul 24]. Available from: https://kosis.kr/statHtml/statHtml.do?orgId=101&tblId=DT_1BPA002&vw_cd=MT_ZTITLE&list_id=A41_10&scrId=&seqNo=&lang_mode=ko&obj_var_id=&itm_id=&conn_path=MT_ZTITLE&path=%252FstatisticsList%252FstatisticsListIndex.do