



# Factors Associated with Self-Rated Health among Korean Elderly

Jeehye Jun<sup>1</sup>, \*Dahye Park<sup>2</sup>

1. School of Nursing, University of Washington, Seattle, WA, USA
2. Department of Nursing, Semyung University, Jecheon-si, Chungcheongbuk-do, Republic of Korea

\*Corresponding Author: Email: [dhpark@semyung.ac.kr](mailto:dhpark@semyung.ac.kr)

(Received 21 Aug 2022; accepted 16 Oct 2022)

## Abstract

**Background:** South Korea has the fastest growing aging population in the world, and the Korean older adult population has been reported to have poor self-rated health (SRH). This cross-sectional descriptive survey aimed to examine the SRH and associated factors among the Korean older adult population using the 2019 Korea National Health and Nutrition Examination Survey (KNHANES) data.

**Methods:** The differences in SRH according to socioeconomic, health-related, and mental health-related factors and their relationships were analyzed using chi-square tests and logistic regression, using data from 1,521 older adults in Korea from the 8<sup>th</sup> KNHANES.

**Results:** Self-rated health was higher among older adults with a high family income (odds ratio [OR]=1.58, 95% CI: 1.05–2.36), those who finished elementary school or lower as opposed to those with a middle school diploma (OR=0.52, 95% CI: 0.29–0.95), those with a low body mass index (BMI) compared to those with a higher BMI (OR=0.43, 95% CI: 0.21–0.88), those with no unmet health needs (OR=2.00, 95% CI: 1.31–3.06), those with better diet-related circumstances (OR=1.98, 95% CI: 1.15–3.39), those with lower stress (OR=1.77, 95% CI: 1.28–2.44), those with no suicidal ideation (OR=2.92, 95% CI: 1.75–4.87), and those without a history of psychiatric counseling (OR=2.10, 95% CI: 1.02–4.34).

**Conclusion:** The findings highlight the importance of health behaviors in promoting SRH among older adults in Korea, and emphasize the need for developing and implementing educational programs that reflect these findings.

**Keywords:** Older adults; Mental health; Health behaviors; Socioeconomic status

## Introduction

According to Statistics Korea, the older population in Korea is projected to surpass that of Japan (36.7%)-the country with the oldest population in the world-by 2045 (1). Furthermore, life expectancy has also been extended substantially to 82.4 yr, and interest in older adults' health is mounting. However, the healthy life expectancy in Korea is lower by 17.5 yr than the global statis-

tic at 64.9 yr, indicating that Korean older adults live an unhealthy life with morbidity and frailty (2). Self-rated health (SRH) is an important index related to death in terms of older adults' life expectancy. It measures health based on well-being, as opposed to disease (3), and reflects an individual's overall life and perceived health (4,5). Self-rated health can predict disability and mortality in



older adults, and thus, is commonly used in the health management of older adults (6,7). Moreover, it is an important predictor of increased demand for healthcare services by older adults (8). The Korean older adult population has poor SRH (9). Predictors of older adults' SRH include socioeconomic factors such as income, education level, occupation, and assets (10,11), as well as various health-related factors, such as past or current smoking status (12), regular exercise, sleep dissatisfaction (13), drinking frequency, muscle training, and walking (14,15). Further, some studies have examined older adults' SRH focusing on quality of life and depression (16). Since poor SRH among older adults reflects negative trends—including shortened life expectancy, anxiety and depression, and increased suicide rates—as well as various societal problems, it is significantly associated with survival (16). Thus, it is necessary to identify the predictors of SRH in older adults to promote their well-being. Structuring a health-promotion project by comprehensively considering the target population's age; sex; and socioeconomic, health-related, and mental health-related characteristics is conducive to providing tailored policies and resources. Therefore, examining Korean older adults' SRH is essential for promoting their health and well-being. However, it is difficult to collect data that is representative of the entire Korean population. Most previous studies that used nationally representative data, such as the KNHANES and census data, limited themselves to the economically active population aged 20–64 yr (17), adults aged 25 yr or older (18), or adult cancer patients. Moreover, these studies viewed SRH only as a predictor of quality of life (19). Therefore, we used the 8<sup>th</sup> KNHANES data—established reliability and representativeness—to analyze the association between SRH and socioeconomic status (SES), health-related factors, and mental health factors in Korean older adults aged 65 or older to present foundational data for devising policies to ameliorate health disparities.

## Materials and Methods

### *Study design*

This study is a secondary analysis of nationally representative data from the 8<sup>th</sup> KNHANES (2019), focusing on the association between SRH and SES, health-related factors, and mental health factors in older adults in Korea.

### *Study population*

Overall, 8,110 participants completed the health questionnaire in the 2019 KNHANES, of whom 1,735 were adults aged 65 or older. Of these, 1,521 without missing values were selected as the study population (Fig. 1).

### *Instruments*

#### *Self-rated health*

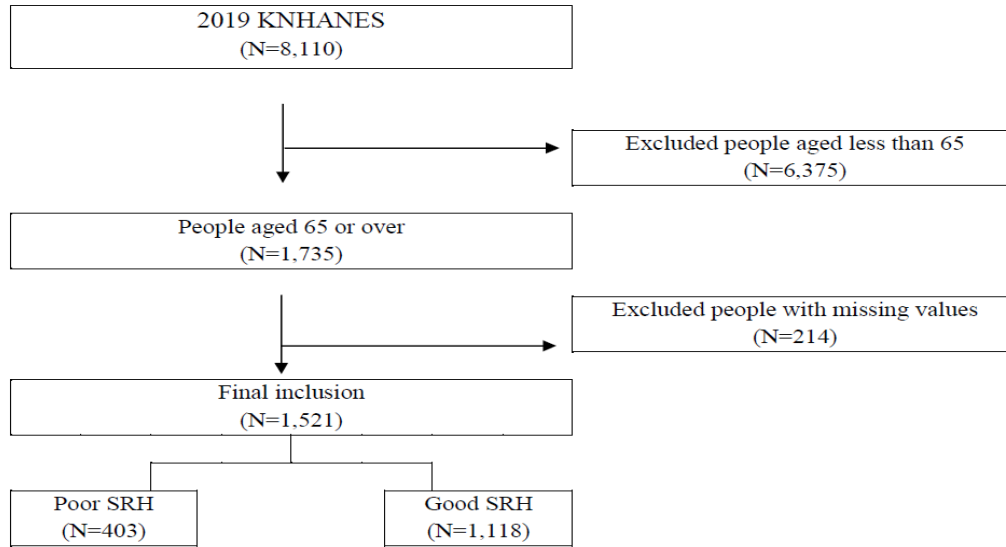
The participants responded to the question, “How do you rate your health?” With reference to the binary classification of SRH into “good” and “poor” in past studies conducted in Korea (20).

#### *Demographic factors*

Demographic factors included sex, age, marital status, and household size. Marital status was categorized into married and single (separated, widowed, divorced, and never married). Household size was determined by the question, “How many people do you live with in your household?”

#### *Socioeconomic factors*

Socioeconomic factors included income level, education level, employment status, homeownership, National Basic Livelihood Security (NBLs), type of health insurance, and private health insurance membership. National Basic Livelihood Security was divided into “yes” or “no,” and the type of health insurance was divided into national health insurance and medical aid. Private health insurance membership was determined using a yes/no question, “Do you own a private health insurance plan that provides assistance for the cost of healthcare, such as cancer insurance, cardiovascular insurance, and accident insurance?”



**Fig. 1:** Flow diagram for the inclusion and exclusion criteria of the study

### *Health-related factors*

Health-related factors included multimorbidity, metabolic syndrome, drinking, smoking, body mass index (BMI), sleep, physical activity, unmet medical needs, and diet-related circumstances.

In this study, we defined multimorbidity as having three or more of the following diseases: hypertension, dyslipidemia, stroke, myocardial infarction, angina, osteoarthritis, rheumatic arthritis, asthma, diabetes mellitus, kidney failure, and thyroid disease; only conditions diagnosed by a physician and currently present were counted.

Metabolic syndrome was diagnosed using the criteria proposed by the Adult Treatment Panel III of the National Cholesterol Education Program (21).

Unmet medical needs refer to the failure to receive necessary healthcare (testing or treatment) at a hospital or clinic in the past year.

Diet-related circumstances were classified as “good” if the participants had enough food to eat and “poor” if they did not have enough food to eat due to financial hardship.

### *Mental health factors*

Mental health factors included stress, depression, suicidal ideation, suicidal planning, and psychiatric counseling.

### *Data analysis*

Data were analyzed using SPSS 25.0 (IBM Corp., Armonk, NY, USA) statistics program. The differences in SRH according to SES, health-related factors, and mental health factors in older adults were analyzed using chi-square tests. To identify the factors associated with older adults’ SRH, we tested the multicollinearity of demographic, socioeconomic, health-related, and mental health factors; additionally, the regression results and significance of the differences in regression coefficients were analyzed using three different models with the Wald  $\chi^2$ . That is, we performed a multivariate analysis using three models: SES, health-related factors, and mental health factors.

### *Ethical considerations*

Approval to conduct the KNHANES was obtained from the Institutional Review Board (IRB) at the Korea Disease Control and Prevention Agency (KDCA) (No: 2018-01-03-C-A). The KDCA provides the raw data on their website, and we obtained permission to download and use the data on May 4, 2021. Additionally, we obtained an exemption for review of this study from the IRB of Semyung University (No: SMU-EX-2021-07-003).

**Results**

***Difference in SRH status according to participants' demographic and socioeconomic factors***

Of the 1,521 participants, 1,118 had good SRH, whereas 403 had poor SRH. In terms of demo-

graphic factors, SRH significantly differed according to sex ( $P<0.001$ ).

In terms of SES-related factors, SRH significantly differed according to income ( $P=0.001$ ), education level ( $P<0.001$ ), employment status ( $P<0.001$ ), household size ( $P=0.006$ ), homeownership ( $P=0.001$ ), NBLs ( $P<0.001$ ), type of health insurance ( $P<0.001$ ), and private health insurance membership ( $P<.001$ ) (Table 1).

**Table 1:** Difference in self-rated health condition according to demographic and socioeconomic factors

Characteristics	Self-rated health condition		$\chi^2$ P-value*
	Poor n(%)	Good n(%)	
N	403	1118	
Sex:			0.001**
Male	145(36.0)	513(45.9)	
Female	258(64.0)	605(54.1)	
Age:			0.144
<75 yr	232(57.6)	690(61.7)	
≥75 yr	171(42.4)	428(38.3)	
Marital Experience:			0.432
Unmarried	5(1.2)	9(0.8)	
Married	398(98.8)	1109(99.2)	
Single-Person Household	116(28.8)	246(22.0)	0.006**
Multi-Person Household	287(71.2)	872(78.0)	
Family income:			<0.001**
Low	122(30.3)	246(22.0)	
Mid-low	128(31.8)	262(23.4)	
Mid-high	68(16.9)	314(28.1)	
High	85(21.1)	296(26.5)	
Education:			<0.001**
≤Elementary	270(67.5)	566(50.6)	
Middle	62(15.5)	186(16.6)	
High	48(12.0)	237(21.2)	
≥College	20(5.0)	129(11.5)	
Economic status:			<0.001**
Unemployed	294(73.0)	700(62.6)	
Employed	109(27.0)	418(37.4)	
Home ownership:			0.001**
No	130(32.3)	262(23.4)	
Yes	273(67.7)	856(76.6)	
National Basic Livelihood Security:			<0.001**
No	345(85.6)	1025(91.7)	
Yes	69(14.4)	93(8.3)	
Type of health insurance:			<0.001**
National health insurance			
Medical aid	345(85.6)	1055(94.4)	
Private health insurance membership:	58(14.4)	62(5.6)	<0.001**
No	234(58.2)	524(47.2)	
Yes	168(41.8)	586(52.8)	

Note. \* $P<.05$ , \*\* $P<.01$ .

**Differences in SRH status based on participants' health-related and mental health factors**

SRH significantly differed according to multimorbidity ( $P<0.001$ ), metabolic syndrome ( $P=0.028$ ), drinking ( $P<0.001$ ), smoking

( $P<0.001$ ), BMI ( $P=0.018$ ), sleep ( $P<0.001$ ), physical activity ( $P<0.001$ ), unmet medical needs ( $P<0.001$ ), diet-related circumstances ( $P<0.001$ ), stress ( $P=0.001$ ), depression ( $P<0.001$ ), suicidal ideation ( $P=0.003$ ), suicide planning ( $P<0.001$ ), and psychiatric counseling ( $P<0.001$ ) (Table 2).

**Table 2:** Differences in self-rated health status according to health-related factors

Health-related factors	Self-rated health status		P-value*
	Poor n(%)	Good n(%)	
Multimorbidity: None			<0.001**
Have	174(43.2)	713(63.8)	
	229(56.8)	405(63.2)	
Metabolic syndrome			0.028*
None	355(88.1)	1023(91.8)	
Have	48(11.9)	92(8.2)	
Alcohol:			<0.001**
High-risk drinker	323(80.1)	763(68.2)	
Non-high-risk drinker	80(19.9)	355(31.8)	
Smoking:			<0.001**
Non-current smokers	369(91.6)	1008(90.2)	
Current smokers	34(8.4)	110(9.8)	
BMI:			0.018*
<Normal BMI	20(5.1)	27(2.4)	
Normal BMI	230(58.4)	703(63.2)	
≥Normal BMI	144(36.5)	383(34.4)	
Sleep duration:			<0.001**
5≤h <9	291(72.2)	938(83.9)	
<5 or ≥9 h	112(27.8)	180(16.1)	
Exercise:			<0.001**
No	367(91.1)	946(84.6)	
Yes	36(8.9)	172(15.4)	
Unmet medical needs:			<0.001**
No			
Yes	336(83.4)	1047(93.6)	
	67(16.6)	71(6.4)	
Diet-related circumstances:			<0.001**
Poor		975(95.8)	
Good	331(87.1)	43(4.2)	
	49(12.9)		
Stress:			0.001**
Not stressed	87(21.6)	338(30.2)	
Stressed	316(78.4)	780(69.8)	
Depression:			<0.001**
None	320(79.4)	993(88.8)	
Have	83(20.6)	125(11.2)	
Suicidal ideation:			<0.001**
No	339(84.1)	1070(95.7)	
Yes	64(15.9)	48(4.3)	
Suicide planning:			0.003**
No	389(96.5)	1105(98.8)	
Yes	14(3.5)	13(1.2)	
Psychiatric counseling:			<0.001**
No	380(94.3)	1099(98.3)	
Yes	23(5.7)	19(1.7)	

Note. \* $P<.05$ , \*\* $P<.01$

**The relationship of SRH with SES, health-related factors, and mental health factors**

Model 1 examined the association between SES and SRH. Compared to the referent category, the high-income group (1.57, 95% CI=1.08–2.27),

middle school graduates (0.39, 95% CI=0.23–0.66) and high school graduates (0.50, 95% CI=0.27–0.89), the employed group (0.69, 95% CI=0.52–0.90) had a significant odds ratio (OR) (Table 3).

**Table 3:** Factors related to poor self-reported health status according to multivariate analysis

Categories	Factors	Model 1		Model 2		Model 3	
		OR	95% CI	OR	95% CI	OR	95% CI
Sex	Men (Ref.)						
	Women	1.20	0.92–1.56	0.99	0.64–1.53	0.96	0.62–1.50
Family income	Low (Ref.)						
	Mid-low-mid	0.89	0.62–1.28	0.97	0.65–1.45	1.09	0.73–1.64
	Mid-high	0.78	0.55–1.11	0.85	0.58–1.24	0.93	0.63–1.38
	High	1.57	1.08–2.27*	1.45	0.98–2.16	1.58	1.05–2.36*
Education	≤Elementary (Ref.)						
	Middle	0.39	0.23–0.66*	0.46	0.25–0.83*	0.52	0.29–0.95*
	High	0.50	0.27–0.89*	0.56	0.29–1.04	0.63	0.33–1.18
	≥College	0.79	0.44–1.41	0.84	0.45–1.59	0.99	0.52–1.88*
Economic status	Unemployed (Ref.)						
	Employed	0.69*	0.52–0.90	0.75	0.56–1.00	0.69	0.51–0.94
Household size	Single-Person (Ref.)						
	Multi-Person	1.01	0.75–1.36	1.12	0.81–1.55	1.02	0.72–1.43
Home ownership	No (Ref.)						
	Yes	0.83	0.62–1.12	0.85	0.62–1.17	0.86	0.62–1.19
NBL5	No (Ref.)						
	Yes	0.78	0.47–1.30	0.70	0.40–1.24	0.69	0.38–1.24
Type of health insurance	Medical aid (Ref.)						
	National health insurance	2.15	1.25–3.71	1.89	1.02–3.51*	1.84	0.97–3.51
Private health insurance	No (Ref.)						
	Yes	0.80	0.63–1.03	0.94	0.72–1.24	0.91	0.68–1.20
Multimorbidity	Have (Ref.)						
	None			1.95	1.47–2.59**	2.00	1.49–2.67
Metabolic syndrome	None (Ref.)						
	Have			0.97	0.62–1.52	0.96	0.61–1.52
Alcohol	High-risk drinker (Ref.)						
	Non-high-risk drinker			0.69	0.50–0.97*	0.68	0.48–0.96*
Smoking	Non-current smokers (Ref.)						
	Current smokers			1.15	0.76–1.73	1.19	0.78–1.82



BMI	< Normal BMI (Ref.)				
	Normal BMI	0.95	0.72–1.25	0.94	0.71–1.25
	≥Normal BMI	0.43	0.21–0.87*	0.43	0.21–0.88*
Sleep duration(SD)	SD<5 or ≥9 h (Ref.)				
	5≤ h <9	1.42	1.03–1.95*	1.39	1.01–1.92
Exercise	No (Ref.)				
	Yes	0.74	0.47–1.15	0.71	0.45–1.11
Unmet medical needs	Have (Ref.)				
	No	2.18	1.45–3.30**	2.00	1.31–3.06*
Diet-related circumstances	Poor (Ref.)				
	Good	2.08	1.24–3.48*	1.98	1.15–3.39*
Stress	Stressed (Ref.)				
	Not stressed			1.77	1.28–2.44*
Depression	Have (Ref.)				
	None			1.18	0.80–1.72
Suicidal ideation	Yes (Ref.)				
	No			2.92	1.75–4.87*
Suicide planning	Yes (Ref.)				
	No			0.67	0.24–1.85
Psychiatric counseling	Yes (Ref.)				
	No			2.10	1.02–4.34*
N-2LL		.093	.157	.204	
Wald $\chi^2$ (df)		1643.471	1440.430	1389.661	
		4.850(8).773	6.303(8).613	17.318(8).057	

Note. \* $P < .05$ , \*\* $P < .01$ .  
OR = odds ratio, CI = confidence intervals

Health-related factors were added to Model 1 to establish Model 2. The SES factors were examined first. Compared to the referent category, the middle school graduates (0.46, 95% CI=0.25–0.83) and the national health insurance subscribers (1.89, 95% CI=1.02–3.51) had a significant OR.

Compared to the referent category, the “no multimorbidity” (1.95, 95% CI=1.47–2.59), non-high-risk drinkers (0.69, 95% CI=0.50–0.97), the higher-than-normal group (0.43, 95% CI=0.21–0.87), 5–8 h of sleep (1.42, 95% CI=1.03–1.95), the “no unmet medical needs” group (2.18, 95% CI=1.45–3.30) and the diet-related circumstances “good” group (2.08, 95% CI=1.24–3.48) had a significant OR.

Mental health factors were added to Model 2 to establish Model 3. The SES factors were examined first. Compared to the referent category, the

high-income group (1.58, 95% CI=1.05–2.36), middle school graduates (0.52, 95% CI=0.29–0.95) and college graduates or higher (0.99, 95% CI=0.52–1.88) had a significant OR.

The health-related factors were also examined. Compared to the referent category, the high-risk drinkers (0.68, 95% CI=0.48–0.96), the higher-than-normal group (0.43, 95% CI=0.21–0.88), the “no unmet medical needs” group (2.00, CI=1.31–3.06) and the diet-related circumstances “good” group (1.98, 95% CI=1.15–3.39) had a significant OR.

Next, we examined mental health factors. Compared to the referent category, the non-stressed group (1.77, 95% CI=1.28–2.44), the “no suicidal ideation” group (2.92, 95% CI=1.75–4.87) and the “no psychiatric counseling” group (2.10, 95% CI=1.02–4.34) had a significant OR.

## Discussion

This study investigated the differences in SRH according to demographic factors, SES, health-related factors, and mental health factors, as well as the relationships among them in the Korean older adult population using the 2019 KNHANES raw data.

Although studies have demonstrated SRH's practicality and ability to comprehensively reflect individuals' overall health status and disease severity, SRH is influenced by the phrasing of the questions and types of responses available in health surveys, and older adults tend to perceive themselves as having poorer health than their younger counterparts (6).

In this study, the SRH of Korean older adults varied with sex, consistent with a previous finding (22). As older women have a longer average lifespan than their male counterparts, and thus live alone for a longer period than older men (2,9), they should be given more opportunities to be involved in society, along with employment training and opportunities and comprehensive healthcare facilities. Therefore, education and training that boosts positive SRH tailored to each sex needs to be implemented.

Further, Korean older adults' SRH differed according to socioeconomic factors. Those with lower income and lower education levels were at substantially higher odds of perceiving themselves to be in poor health, similar to past findings that SRH decreases with decreasing education level and improves with increasing education level (23). However, it is practically difficult to deliver health-promotion and disease-prevention services to those with poor SRH due to their hindered access to health information and services (23). Thus, healthcare policies and services targeting older adults with low SES are imminently required. Moreover, we observed that Korean older adults' SRH differed according to their employment status, consistent with another study (24), which reported that SRH significantly differed according to older adults' economic activity status. Economic activity in older adulthood not

only ensures financial abundance but also has a positive impact on health (24), and economic status is an important predictor of physical health, mental health, and SRH (25). The health disparity affecting older adults with low SES is an important societal issue, and fundamental and long-term measures should be implemented to tackle the health problems of the rapidly growing older adult population. Furthermore, considering the unique Korean culture in which adult children of older adults play a crucial role in their physical and mental health, as compared to Western societies where such involvement is lacking (26), it is necessary to involve cohabiting family members in health-promoting and chronic disease management programs for older adults.

The health-related predictors of Korean older adults' SRH are multimorbidity (15,26), metabolic syndrome (27), drinking (14,23), BMI (23), smoking (12,28), sleep duration (29), physical activity (8,14), unmet medical needs, and diet-related circumstances (15,30). Particularly, the odds of poor SRH were considerably higher among heavy drinkers, those with higher BMI, those with unmet medical needs, and those with poor diet-related circumstances.

Our finding that heavy drinking is a predictor of poor SRH is consistent with a US study's finding (31). These results highlight the need for campaigns to reduce drinking and implement alcoholism prevention programs. Older adults who consume nutritious food and exercise maintain good health, and their objective health status affects their SRH (23). With this perspective, older adults with a high BMI perceive themselves to be in poor physical health. Further, the results pertaining to unmet medical needs were consistent with a previous study (32) reporting that older adults with low SES have high unmet medical needs. As unmet health needs widen this health disparity, it is important to implement measures to increase older adults' access to the healthcare system. Continuously engaging in self-care through health behaviors that promote physical health, such as receiving periodic health check-ups, not only extends older adults' lifespan and improves their quality of life but may also reduce



the family's and country's caregiving burden (33). The recommended nutrient intake of proteins, vitamins, and minerals for older adults is largely similar to that for younger individuals (30), the results pertaining to older adults' SRH according to their diet-related circumstances are alarming. Thus, community nurses should provide information about or help older adults enroll in nutrition programs.

Regarding mental health factors, SRH significantly differed according to stress, depression, suicidal ideation, suicide planning, and psychiatric counseling in the Korean older adult population. Furthermore, the odds for poor SRH were high among older adults who were stressed, engaged in suicidal ideation, and had received psychiatric counseling. These results are similar to previous studies that showed people with lower perceived stress report good SRH compared to those with high perceived stress (17,34). People with high perceived stress may develop poor lifestyle habits and may perceive themselves to be in poor health. Furthermore, mental health was also significantly associated with SRH, indicating that exacerbation of psychological and emotional states such as anxiety, depression, insomnia, and stress can lead to poor SRH (34). Further research is needed to investigate the effects of mental health, including stress, on SRH, and stress management education is crucial to be included in health-promoting interventions. These programs should provide content that addresses suicidal ideation and highlights the importance of psychological counseling, also found to be associated with SRH. Medical and health-promotion educational programs that consider these differences will be more effective.

This study has some limitations. First, due to the nature of a cross-sectional survey that does not consider temporal precedence, we could only examine the associations among SES, health-related factors, mental health factors, and SRH and were unable to establish causality among them.

Second, certain parameters could not be used from the data source because of the small sample size. If an adequate sample was ensured, we could have performed subgroup analyses accord-

ing to sex for identifying which sex was more heavily influenced by SES factors.

Finally, the health survey was a self-reported questionnaire, which is vulnerable to participant bias based on their characteristics or circumstances, as well as recall bias.

Based on these findings, we propose the following. First, intervention programs that consider the predictors identified in this study, as well as policies that promote continued use of these programs are needed to improve older adults' SRH and well-being. Second, replication studies should be conducted to identify health behaviors that predict SRH for launching health projects that reflect a continuously evolving society.

## **Conclusion**

Korean older adults' SRH is associated with high family income, education level, high-risk alcohol drinking, higher-than-normal BMI, unmet medical needs, diet-related circumstances, stress, suicidal ideation, and psychiatric counseling. The associated health behaviors differed according to each factor, suggesting that the differences in the predictors should be considered while developing and implementing health policies and programs targeting older adults. Furthermore, SRH is an important predictor of older adults' health and mortality; therefore, SRH should be continuously monitored, and various societal measures should be implemented to improve SRH in older adults, including programs that promote health behaviors.

## **Journalism Ethics considerations**

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

## **Acknowledgements**

This work was supported by the Ministry of Education of the Republic of Korea and the Na-

tional Research Foundation of Korea (NRF-2020S1A5A8046754).

## Conflict of interest

The authors declare that there is no conflict of interests.

## References

1. Statistics Korea (2019). Population status and prospects of the world and Korea. Statistics Korea, Daejeon, South Korea. [http://kostat.go.kr/portal/korea/kor\\_nw/1/1/index.board?bmode=read&aSeq=377226](http://kostat.go.kr/portal/korea/kor_nw/1/1/index.board?bmode=read&aSeq=377226)
2. Statistics Korea (2017). Life expectancy and disability adjusted life expectancy. Statistics Korea, Daejeon, South Korea. [http://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx\\_cd=2758](http://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx_cd=2758)
3. Cislighi B, Cislighi C (2019). Self-rated health as a valid indicator for health-equity analyses: Evidence from the Italian health interview survey. *BMC Public Health*, 19 (1): 533.
4. Ocampo JM (2010). Self-rated health: Importance of use in elderly adults. *Colombia Médica*, 41 (3): 275-89.
5. Prieto-Flores ME, Moreno-Jimenez A, Fernandez-Mayoralas G, Rosenberg MW, Rojo-Perez F, Forjaz MJ (2012). The relative contribution of health status and quality of life domains in subjective health in old age. *Soc Indic Res*, 106: 27-39.
6. Idler EL, Benyamini Y (1997). Self-rated health and mortality: A review of twenty-seven community studies. *J Health Soc Behav*, 38: 21-37.
7. Ishizaki T, Kai I, Imanaka Y (2006). Self-rated health and social role as predictors for 6-year total mortality among a non-disabled older Japanese population. *Arch Gerontol Geriatr*, 42 (1): 91-9.
8. Stanojevic Jerkovic O, Sauliune S, Šumskas L, Birt CA, Kersni KJ (2017). Determinants of self-rated health in elderly populations in urban areas in Slovenia, Lithuania and UK: Findings of the EURO-URHIS 2 survey. *Eur J Public Health*, 27 (2): 74-9.
9. Statistics Korea (2019). Society survey 2019. Statistics Korea, Daejeon, South Korea. <http://kostat.go.kr/portal/korea>.
10. Kennedy J, Minkler M (1998). Disability theory and public policy: Implications for critical gerontology. *Int J Health Serv*, 28 (4): 757-76.
11. Lee OJ (2017). Meta-analysis of the factors related to self-rated health among elderly-Focused on psychological dispositions, socio-economic status. *J KoCon.a*, 17 (4): 424-33.
12. Conry MC, Morgan K, Curry P, McGee H, Harrington J, Ward M, Shelley E (2011). The clustering of health behaviours in Ireland and their relationship with mental health, self-rated health and quality of life. *BMC Public Health*, 11 (1): 692.
13. Darviri C, Artemiadis AK, Tigani X, Alexopoulos EC (2011). Lifestyle and self-rated health: A cross-sectional study of 3,601 citizens of Athens, Greece. *BMC Public Health*, 11 (1), 619.
14. Nam YH, Nam JR (2011). A study on the factors affecting the subjective health status of elderly people in Korea. *Korean Journal Fam Wellf*, 16 (4): 145-62.
15. Kim HS (2017). Effect of pain, nutritional risk, loneliness, perceived health status on health-related quality of life in elderly women living alone. *Journal of the Korea Convergence Society*, 8 (7): 207-18.
16. Pitkala K, Laakkonen ML, Strandberg TE, Tilvis RS (2004). Positive life orientation as predictor of 10-year outcome in an aged population. *J Clin Epidemiol*, 57: 409-14.
17. Kim M, Chung W, Lim S, Yoon S, Lee J, Kim E, Ko L (2010). Socioeconomic inequity in self-rated health status and contribution of health behavioral factors in Korea. *J Prev Med Public Health*, 43 (1): 50-61.
18. Yoon B (2016). Differential effects on self-rated health by socioeconomic class. *J Health Info Stat*, 41 (1): 35-42.
19. Kang S (2016). Factors influencing quality of life among cancer survivors: Using KNHANES 2010-2014. *Jour. of KoCon.a*, 16 (9): 628-37.
20. Molarius A, Janson S (2002). Self-rated health, chronic diseases, and symptoms among middle-aged and elderly men and women. *J Clin Epidemiol*, 55: 364-70.

21. World Health Organization (2000). *The Asia-Pacific perspective: Redefining obesity and its treatment*. Sydney: Health Communications Australia.
22. Yoon SP, Yoon YK, Jeong HW, et al (2016). Differences in healthy by women's social position and roles: 1st-4th Korean Longitudinal Survey of Women and Families. *Korean J Fam Pract*, 6 (5): 470-78.
23. Lee MA, Kim DC (2013). Predictors of Korean elderly people's self-rated health status and moderating effects of socioeconomic position. *Journal of the Korean Society of Community Living Science*, 24(1): 37-49
24. Jeon HO, Kim OS (2012). Comparison of health status, sleep, and depression by the employment status in the elderly. *JKAIS*, 13 (3):1203-11.
25. Demakakos P, Nazroo J, Breeze E, Marmot M (2008). Socioeconomic status and health: The role of subjective social status. *Soc Sci Med*, 67 (2): 330-40.
26. Kim KS (2017). Effects of the health status and health behavior on health-related quality of life of the elderly living alone and living with their families: Using data from the 2014 community health survey. *J Korean Acad Community Health Nurs*, 28 (1): 78-87.
27. Cho YK, Shim KW, Suk HW, et al (2019). Differences between one-person and multi-person households on socioeconomic status, health behavior, and metabolic syndrome across gender and age groups. *Korean J Fam Pract*, 9 (4): 373-82.
28. Mendoza-Romero D, Urbina A, Cristancho-Montenegro A, Rombaldi A (2019). Impact of smoking and physical inactivity on self-rated health in women in Colombia. *Prev Med Rep*, 16: 100976.
29. Xiao Q, Keadle SK, Hollenbeck AR, Matthews CE (2014). Sleep duration and total and cause-specific mortality in a large US cohort: Interrelationships with physical activity, sedentary behavior, and body mass index. *Am J Epidemiol*, 180: 997-1006.
30. Lee YH, Im JY (2014). Analysis of expenditure of food consumption by population aging. *Korean Journal of Agricultural Management and Policy*, 41 (1): 112-33.
31. Otiniano ME, Du XL, Ottenbacher K, Markides KS (2003). The effect of diabetes combined with stroke on disability, self-rated health, and mortality in older Mexican Americans: Results from the Hispanic EPESE. *Arch Phys Med Rehabil*, 84 (5): 725-30.
32. Hoebel J, Rommel A, Schröder S, Fuchs J, Nowossadeck E, Lampert T (2017). Socioeconomic inequalities in health and perceived unmet needs for healthcare among the elderly in Germany. *Int J Environ Res Public Health*, 14 (10): 1127.
33. Chung KH, Yeom JH, Hwang NH, Kim JS, Lee KR, Oh SH (2013). *Quality of life of middle-aged and older persons. Research report 2013-31-14*. Chungcheongnam-do, South Korea: Korea Institute for Health and Social Affairs.
34. Lachytova M, Katreniakova Z, Mikula P, Jendrichovsky M, Nagyova I (2017). Associations between self-rated health, mental health problems and physical inactivity among urban adolescents. *Eur J Public Health* 27 (6): 984-9.