

An Empirical Study on Self-Esteem and Life Satisfaction of the Elderly

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Abstract. The purpose of this study was to investigate the effects of self-esteem and life satisfaction on the depression of the elderly living alone. It used the data extracted from the 15th Korea Welfare Panel Survey (KOWEPS) carried out between June 5, 2020 and September 24, 2020 by the Korea Institute for Health and Social Affairs and the Seoul National University Institute of Social Welfare. The subjects were 1,533 elderly (≥ 65 years) living alone. Their data were analyzed using a t-test, ANOVA, Pearson correlation, and multiple linear regression via SPSS/WIN 23.0 software. The subjects of this study had a slightly lower depression score. The levels of depression differed significantly by age, education level, health status, employment type, and cultural and entertainment expenses. The result showed that depression was negatively correlated with self-esteem and life satisfaction. Self-esteem and life satisfaction accounted for 34.3% of the variance in depression among the elderly living alone. These results of this study confirm that self-esteem and life satisfaction are predictors of depression in the elderly living alone. In other words, high self-esteem and life satisfaction, including physical health, can help prevent and manage depression in elderly single-person households, which are increasing due to population aging. We hope that the findings of this study will provide useful foundational data, contributing to intervention programs designed to promote health in the elderly living alone.

Keywords: Self-esteem, life satisfaction, depression, elderly, living alone

1. Introduction

As a result of a growing elderly population, Korea has become an aged society in the recent years. Since August 2017, it has met the definition of an aged society, with more than 14% of its population 65 or older. Based on this trend, the country is projected to become a superaged society, with more than 20% of its population 65 or older by 2025 (KOSIS, 2021). Alongside population aging, sociocultural changes, including industrialization and the nuclearization of families, have changed the lifestyle of the elderly (Yi et al., 2014). Traditionally, the elderly people were supported and cared for by their adult children during their later years of life; today, the number of elderly people living alone without receiving care from their adult children is increasing (Lee, Jung, 2021). According to a Statistics Korea report, the percentage of elderly living alone has increased from 16.0% of the elderly population in 2000 to 19.6% in 2021, suggesting that one out of every five elderly people now lives alone.

Older adulthood is a time of life when people are particularly vulnerable to depression, due to the following causes: physical illnesses caused by aging; psychological conflicts, such as separation from significant others; isolation and loneliness; and social maladjustment (Yeo, Yoo, 2010). Depression provokes various symptoms, including sleep disorders, helplessness, physical inactivity, and memory loss (Heo, 2021), thus having an adverse impact on the lives of the elderly. It causes life satisfaction and life expectations to deteriorate, leading to suicide in severe cases. For this reason, depression in the elderly is a critical topic, which must be addressed (Lee, Park, 2006). The causes of depression in older adulthood include reduced physical functioning due to aging, role loss at work or home, increased isolation and loneliness due to the death of a spouse or others, and financial difficulties caused by diminished economic activity. Furthermore, symptoms of depression are more prevalent among older people, those who are widowed, women as opposed to men, single-person households rather than married couples, and older people with less education and lower incomes (KOSIS, 2021). In general, the elderly living alone tend to be less educated, with lower incomes, poorer self-rated health, and lower perceived socioeconomic status than the non-living alone elderly (Nam et al., 2019). Most of the elderly living alone are over 70 years old and mostly women, so they are financially dependent as a result. Their social networks are family-focused, unlike those of the elderly who do not live alone; as a result, depression is more prevalent within this population (Song, 2015). These results call for more aggressive management and preventive measures that target depression among elderly living alone, who are socially, economically, and mentally vulnerable.

Even within this group, however, levels of depression can be alleviated by environmental and exogenous factors, such as participation in various social or leisure activities and financial stability (Kim, 2015). It is therefore essential to explore

psychological protective factors that can mitigate and prevent depression among the elderly living alone.

Self-esteem is an important psychological protective factor, which can help the elderly overcome the psychological problems provoked by common unfortunate life events, including retirement, social isolation, separation from family, loss of self-confidence, anxiety about death, and hopelessness. Self-esteem is generally associated with happiness and a better quality of life among the elderly (Dong et al., 2010). People with high self-esteem are satisfied with themselves and positively evaluate themselves as valuable human beings. For this reason, high self-esteem serves as a crucial foundation for the elderly, making it easier for them to maintain good health and a good quality of life during their later years (Lee, 2013). People with low self-esteem perceive problems more negatively and respond in a more critical way; thus, low self-esteem is strongly associated with depression (Kim, Jeon, 2013). Physical changes, including deterioration of physical function in old age, and social changes, including retirement and separation, can cause individuals to see themselves as useless (Paudel, 2019). This change in self-awareness leads to a decrease in self-esteem.

Life satisfaction is another mental-health indicator that reflects the quality aspect of life. It encompasses successful adjustment to old age, successful aging, and satisfaction with one's own life (Banjare et al., 2015). This comprehensive evaluation of an individual's economic, social, cultural, and living standards can counteract emotions such as regret and emptiness. It is therefore an important determinant of individual mental health (Heo, Jung, 2017).

Most past studies of depression among the elderly living alone have set out to identify the causes of depression. In recent years, researchers have attempted to help such individuals overcome life difficulties by achieving psychological goals, including self-acceptance, positive relationships with others, autonomy, and self-determination, whatever their physical health (Kim, 2010).

Given this background, this study aims to investigate the effects of self-esteem and life satisfaction on depression of the elderly living alone, a group that is particularly vulnerable to depression. The purpose of this study is to present basic data that can help develop health promotion programs for this population and to prevent depression and improve health in this group. The specific goals are as follows.

First, to investigate general characteristics, self-esteem, life satisfaction, depression, and differences of the elderly living alone.

Second, to investigate the correlation between self-esteem, life satisfaction, and depression of the elderly living alone.

Third, to investigate the effect of self-esteem and life satisfaction on depression of the elderly living alone.

2. Theoretical background

2.1. Depression of elderly living alone

As the population rapidly enters a super-aged society, the elderly population faces various health problems (Park, Kim, 2017). Depression is a common mental health problem that can be experienced in old age, but severe depression not only negatively affects life satisfaction, but also leads to suicidal intentions or mental illness in serious cases, so social efforts are needed to prevent depression and improve life satisfaction (Choi, Shin, 2014). When the elderly people suffer from depression, they are restricted from daily activities and functions, and the joy of life disappears. They also feel lonely or worthless, so they live more isolated from others. Depression worsens medical problems in old age, and in serious cases, the risk of suicide increases (Park, Kim, 2017).

As a result of measuring using the Short Form of Geriatric Depression Scale (SGDS) of the '2020 Survey Report on the Elderly' of the Korea Institute for Health and Social Affairs [19], 13.5% of all elderly people had depressive symptoms. By gender, female elderly (15.5%) had a 4.6% higher rate of depressive symptoms than male elderly (10.9%). According to the ratio of depressive symptoms by age, 8.4% of the 65-69 year-old group and 24.0% of the 85 year-old or older group were found to be about three times higher than that of the 65-69 year-old group. Depressive symptoms by education level tend to be higher when they are less educated, wherein 23.5% are non-educated elderly, 16.5% are elementary school graduates, 13.6% are middle school graduates, 7.2% are high school graduates, and 10.6% are vocational college graduates. Depending on the employment status, 7.8% of the employed elderly are depressed, while 16.7% of the unemployed elderly are depressed, indicating that the depression of the unemployed elderly tends to be more than twice as high as that of the employed elderly. By household income, the lower the income, the higher the incidence of depression symptoms. By Activity of Daily Living (ADL), the proportion of depressive symptoms of the elderly with functional restrictions (41.8%) was more than four times higher than that of the elderly without functional restrictions (10.0%). The difference according to marital status was 8.5% higher in depressive symptoms of the elderly without spouses (19.2%) than the elderly with spouses (10.7%). By type of household, the rate of depressive symptoms in other households was the highest at 21.7%, followed by the rate of depressive symptoms in elderly households living alone at 18.7%, 16.8% living with children, and 10.4% of elderly couple households (Lee et al., 2020). As such, people who are vulnerable to depression are economically poor, low-educated, elderly women, and living alone and have no jobs.

According to Korean statistics, the elderly living alone are more likely to be poor than the elderly without family or friends, and there are more elderly women than the elderly with high education and the elderly with low education than the elderly with

high education (KOSIS, 2021). The elderly living alone have a lot of desires in society as they psychologically feel loneliness, alienation, and depression due to health problems caused by physical aging, lack of living expenses and medical expenses due to economic poverty, opportunities for social participation, and loss of social status and role. They often experience various psychological and emotional problems such as mental stress, complaining of loneliness and isolation due to their inability to eat balanced meals (Kim, 2021). Living alone in old age may vary depending on personal, family, and economic background, but it is generally due to divorce, unmarried, or bereavement. Most of the elderly living alone involuntarily live alone due to industrialization, nuclear family, and weakening awareness of elderly support, but voluntary life is also increasing, such as avoiding conflicts due to changes with their children. According to a Statistics Korea report, the percentage of elderly living alone has increased from 16.0% of the elderly population in 2000 to 19.6% in 2021, suggesting that one out of every five elderly people now lives alone (KOSIS, 2021). The elderly living alone experienced low self-esteem, suicidal thoughts, depression, and despair due to the relatively weak lack of economic ability, social activity, and social support of the elderly living alone compared to the non-living-alone elderly (Lee et al., 2021). As the number of elderly people living alone increases along with the rapid increase in the elderly population, more active depression management and prevention are needed for the elderly living alone who are vulnerable to depression due to social, economic, and mental isolation.

2.2. Self-esteem of elderly living alone

Self-esteem is an evaluative element of self-concept, which positively accepts oneself and perceives oneself as a valuable human being, and refers to the degree to which one evaluates oneself favorably or unfavorably, or believes that one is successful and valuable (Rosenberg, 1965). Since self-esteem is important in coping with various challenges faced in life, people with high self-esteem can feel satisfaction with life, lead a progressive self-directed life, increase satisfaction and intimacy with human relationships, and obtain productive results. On the other hand, people with low self-esteem evaluate themselves as worthless, causing inferiority by abusing them and negatively affecting mental health, such as depression (Kim, Jeon, 2013).

The components of self-esteem include value, competence, and belonging, and if one factor is insufficient, self-esteem decreases. In the case of the elderly, not only the ability, capacity, interest, and affection that affect others, but also health, reputation, friends, and economic power, which were considered self-expansion decrease, and eventually self-esteem decreases (Seo, Jung, 2010). The high self-esteem of the elderly accepts the past they have passed without regret, is satisfied with their present life, has a harmonious view between the past, present, and future, and ultimately has an attitude of waiting, acknowledging the death to come. In order to achieve the successful aging and happy old life that everyone dreams of, it is

important to have a stable psychological well-being, and for this, the improvement of self-esteem is paramount (Bae, 2018).

The elderly face problems different from the past, such as bereavement with their spouses and eternal separation from friends or neighbors who were emotional supporters. The pain of loss in this process is the main cause of psychological change in old age and reduces self-esteem (Song et al., 2010). Decreased self-esteem can make life difficult in old age, increasing the likelihood of eventually having a maladaptive and unhappy retirement. As positive psychological capital, such as self-esteem, can maximize personal potential through the positive elements and strengths of ordinary people rather than through the modification of the negative aspects, the fact that it draws attention as an alternative to overcome the limitations of the existing human resource development seems to be meaningful in preventing geriatric depression and suicide intention (Kwon, Ko, 2021).

In a study examining the relationship between self-esteem and depression of the elderly living alone, it was confirmed that the elderly living alone have lower self-esteem and are a strong predictor of depression than the elderly living together due to difficulties in physical health and economic life. In another study of the elderly, self-esteem affects life satisfaction (Lee, 2016), and there is a result that the elderly's self-esteem is an important variable predicting depression in the elderly (Kim, 2021). Self-esteem is the most important variable that distinguishes between happy and unhappy people, and it also affects life satisfaction (Lee, 2018).

2.3. Life satisfaction of elderly living alone

Life satisfaction refers to the degree of individual subjective satisfaction felt in the overall area of life. In other words, it refers to the level of satisfaction perceived by individuals in various areas of life such as economic aspects and health, social activities, and family relationships (Choi, Choi, 2021).

The survey on the elderly in Korea classifies health, economy, family relations, social activities, and relations with society as the evaluation items of life satisfaction, so the following are examined by five factors.

First, the health factor of the elderly their aging, and the resulting decrease in physical function decreases physical satisfaction through physical and chronic diseases and affects subjective health status.

Second, the economic factor of the elderly is a factor that greatly affects life satisfaction by maintaining and developing their status and self in various forms as well as satisfying their basic needs for social life. In addition, it was found that the healthier the elderly were, the more positive they were about their daily lives, actively participated in social activities, and satisfied with their own economic life. On the other hand, health problems may cause economic problems for medical expenses such as pharmacies and hospitals, which may lead to emotional problems due to increased alienation and loss of self-esteem. Housing type is one of the factors that can infer the

economic status of the elderly, and stability of housing type is psychological and economic stability, which can be a requirement related to the quality of life obtained from old age, that is, life satisfaction (Lee et al., 2021).

Third, the family relationship factors of the elderly can be understood through the presence, absence, or cohabitation of children, and it is reported that the presence and number of adult children for the elderly provide a sense of stability in life by increasing sociality.

Fourth, in the social activity factors of the elderly, social relationships encountered in old age can be examined, and the elderly experience reduction, alienation, and isolation in relationships as they get older. If you overcome this, work more actively, and live freely, you can enjoy your old life more with high confidence.

These social activities of the elderly maintain and develop mental health for the elderly through the fifth factor, relationship with society, which affects life satisfaction by dealing with emotional aspects in depth and increasing the degree of social activities and participation of the elderly.

Psychological and social factors such as self-esteem and social support are reported to have a high effect on the life satisfaction of the elderly living alone, so the higher the self-esteem, the higher the social support by positively recognizing and respecting their lives (Lee, 2011). The frequency and depression of the elderly participating in leisure life are negatively correlated, and social activities, going out and traveling, exercise, and volunteer activities are negatively correlated with depression (Han, 2015).

3. Methods

3.1. Study design

This is a secondary analysis of data drawn from the 15th Korea Welfare Panel Survey (KOWEPS) conducted by the Korea Institute for Health and Social Affairs (KIHASA) and the Seoul National University (SNU) Institute of Social Welfare. It is a descriptive research that examines the degree of depression, self-esteem, and life satisfaction in the elderly living alone, identifies the correlation between variables, and identifies the factors influencing the depression of the elderly living alone. This study is a cross-sectional quantitative survey study.

3.1. Study population

The KOWEPS data selected a total 6,029 panel households using stratified double extraction methods nationwide from total population census data. In the first round, a total of 517 survey districts surveyed household income and economic activity status of household members, and selected a total of 7,000 households, 3,500 households each for general and low-income households. Of these, 6,029 households that faithfully responded to the response were selected as the fifth data. From 6,029

sample households documented in the 15th KOWEPS, 1,533 elderly single-person households (≥ 65 years of age) were included in the analysis.

3.2. Instruments

1. Self-Esteem

The Rosenberg (1965) Self-Esteem Scale has been used in the present study. This 10-item scale contains five reverse-scored items, which are rated using a four-point Likert scale, with responses ranging from 1 “generally not true” to 4 “always true.” Higher scores indicate higher self-esteem. The reliability (Cronbach’s α) of the tool was .85 at the time of development and .76 in this study.

2. Life Satisfaction

Life satisfaction was assessed using items in seven KOWEPS categories: satisfaction with health, family income, living environment, family relationships, occupation, social relationships, and leisure life. Each item was rated using a five-point Likert scale, with responses ranging from 1 “very dissatisfied” to 5 “very satisfied.” Higher scores indicated greater life satisfaction. The reliability of the tool (Cronbach’s α) was .80 in this study.

3. Depression

Depression, the dependent variable, was measured using a short form (11 items) of the 20-item Center for Epidemiologic Studies of Depression (CES-D) developed by Radloff (1977). This 11-item form used a four-point Likert scale, with responses ranging from 1 “rarely” to 4 “most of the time.” The measured items were converted on a scale of 1–4 to 0–3 and positively worded items were reverse-coded. The sum of all item scores was multiplied by 20/11 to generate the depression score. The highest possible total score was 60, with higher scores indicating greater depression symptoms. In this tool, a total score of 16 or more is the cutting point of depression. The reliability (Cronbach’s α) of the tool was .84–.89 in the 7th–14th KOWEPS and .87 in this study.

3.3. Data collection

The study data were drawn from the 15th KOWEPS, which was conducted between June 5 and September 24, 2020 by KIHASA and the SNU Institute of Social Welfare. A trained surveyors visited each household in person and collected data using a questionnaire. The 15th Korea Welfare Panel Survey prioritized the safety of panel households and investigators in the spread of COVID-19, and temporarily deleted some questions to prevent the spread of infectious diseases, drastically reducing the survey table and shortening the survey time. It was not investigated only for questions that do not change much every year, questions that have low academic use, and questions that contain somewhat socially sensitive contents in the spread of COVID-19 infectious diseases.

3.4. Data analysis

The collected data were analyzed using the SPSS/WIN 23.0 software. The participants' general characteristics, self-esteem, life satisfaction, and levels of depression were analyzed using descriptive statistics: frequency, percentage, mean, and standard deviation. Differences in the study parameters that reflected the participants' general characteristics were analyzed using t-tests and an ANOVA, followed by Dunnett's T3 test for the post-hoc analysis. The relationships between participants' general characteristics (self-esteem, life satisfaction, and depression) were analyzed using Pearson correlation coefficients. The predictors of depression in older adults living alone were identified using a multiple linear regression analysis.

4. Results

4.1. Participant's general characteristics

There were more older women ($n=1,259$; 82.1%) than older men ($n=274$; 17.9%) in the study. The largest age group was 75–84 years ($n=735$; 47.9%), followed by 65–74 years ($n=409$; 26.7%) and ≥ 85 years ($n=389$; 25.4%). In relation to marital status, 1,268 (82.7%) were widowed, 233 (15.2%) were divorced or separated, and 32 (2.1%) were single individuals. The largest group were elementary-school dropouts ($n=643$; 41.9%), followed by elementary-school graduates ($n=495$; 32.3%), middle-school graduates ($n=203$; 13.2%), and high-school graduates or above ($n=151$; 9.8%). The largest group had an annual income of 5–10 million KRW ($n=709$; 46.2%), followed by 10–15 million KRW ($n=439$; 28.6%), ≥ 15 million KRW ($n=313$; 20.4%), and < 5 million KRW ($n=72$, 4.7%). Although most participants ($n=1,075$; 70.1%) were unemployed, 300 (19.6%) were paid employees, including public workers, and 155 (10.1%) were self-employed or employers. The participants lived in cities ($n=515$; 33.6%), rural or smaller districts ($n=466$; 30.4%), metropolitan cities ($n=370$; 24.7%), and in Seoul ($n=173$; 11.3%). Their monthly culture and entertainment expenses (e.g., TV subscriptions, tours) were 10–19.99 thousand KRW ($n=67$; 44.3%), < 10 thousand KRW ($n=293$; 19.1%), ≥ 30 thousand KRW ($n=287$; 18.7%), and 20–20.99 thousand KRW ($n=274$; 17.9%) (Table 1).

Table 1: General characteristics (N=1533)

Variables	Categories	n	%
Gender	Male	274	17.9
	Female	1259	82.1
Age	65~74	409	26.7

	75~84	735	47.9
	≥85	389	25.4
Marital state	Bereavement	1268	82.7
	Divorce, Separation	233	15.2
	Not married	32	2.1
Education	None or Elementary	643	41.9
	Elementary graduate	495	32.3
	Middle School	203	13.2
	≥High School	151	9.8
Annual Income (10,000 KRW)	≤ 500	72	4.7
	501~1000	709	46.2
	1001~1500	439	28.6
	> 1500	313	20.4
Occupation	Employee	300	19.6
	Employer or Self Employed	155	10.1
	No Job	1075	70.1
Residential area	Seoul	173	11.3
	Metropolitan	379	24.7
	City	515	33.6
	Rural	466	30.4

Expense for entertainment (KRW/mon)	< 10,000	293	19.1
	10,000~20,000	679	44.3
	20,000~30,000	274	17.9
	≥ 30,000	287	18.7

4.2. Self-esteem, life satisfaction, and depression of the elderly living alone

The mean self-esteem score was 2.85 ± 0.41 and the mean life-satisfaction score was 3.29 ± 0.48 . Among types of life satisfaction, satisfaction with family relationships (3.71 ± 0.70) was ranked the highest, followed by satisfaction with living environments (3.62 ± 0.72), social relationships (3.53 ± 0.69), occupation (3.28 ± 0.71), leisure life (3.19 ± 0.73), family income (2.96 ± 0.80), and health (2.67 ± 0.92). The mean depression score was 11.84 ± 10.20 (Table 2).

Table 2: The level of self-esteem, life satisfaction, and depression of the elderly living alone (N=1533)

Variables	Min	Max	M±SD
Self-Esteem	1.30	3.90	2.85 ± 0.41
Life satisfaction	1.00	4.88	3.29 ± 0.48
Health	1.00	5.00	2.67 ± 0.92
Family Income	1.00	5.00	2.96 ± 0.80
Residential Environment	1.00	5.00	3.62 ± 0.72
Family Relationship	1.00	5.00	3.71 ± 0.70
Job	1.00	5.00	3.28 ± 0.71
Social Relationship	1.00	5.00	3.53 ± 0.69
Leisure life	1.00	5.00	3.19 ± 0.73
Depression	.00	52.73	11.84 ± 10.20

4.3. Differences in self-esteem, life satisfaction, and depression according to the general characteristics

Table 3 shows how self-esteem, life satisfaction, and depression differ, reflecting general subject characteristics. Although no significant differences were associated with gender, self-esteem ($F=17.954$, $p<.001$) and depression ($F=9.255$, $p<.001$) differed significantly by age, with self-esteem decreasing and depression increasing as age increased.

Self-esteem ($F=4.539$, $p=.011$) and life satisfaction ($F=14.599$, $p<.001$) differed significantly, in accordance with marital status. Although a post-hoc test confirmed that there were no significant intergroup differences in self-esteem, widowed individuals had more life satisfaction than single individuals.

In relation to educational level, self-esteem ($F=28.608$, $p<.001$), life satisfaction ($F=12.111$, $p<.001$), and depression ($F=12.272$, $p<.001$) all differed significantly by level of education. Elementary-school graduates had higher self-esteem than uneducated elementary-school dropouts and middle-school graduates had higher self-esteem than less educated individuals. Life satisfaction was higher among elementary-school graduates and middle school graduates than among uneducated elementary-school dropouts.

Depression levels were higher among uneducated elementary-school dropouts than among more educated individuals. Annual income also had an impact, with self-esteem ($F=19.364$, $p<.001$), life satisfaction ($F=29.124$, $p<.001$), and depression ($F=4.075$, $p=.007$) showing significant differences by annual income. A post-hoc test confirmed that self-esteem was higher among subjects with an annual income of more than 15 million KRW than among those with an annual income of less than 15 million KRW.

Life satisfaction increased in relation to income. There were no significant differences in levels of depression between the groups. When it came to employment type, self-esteem ($F=73.201$, $p<.001$), life satisfaction ($F=46.154$, $p<.001$), and depression ($F=29.892$, $p<.001$) all differed significantly by employment type, with employed individuals showing greater self-esteem and life satisfaction and lower levels of depression than unemployed individuals. Self-esteem, life satisfaction, and depression did not differ significantly by area of residence.

However, all three parameters differed significantly in relation to monthly culture and entertainment expenses, with elderly who spent more than 30,000 KRW a month having greater self-esteem than those who spent less than 30,000 KRW. Furthermore, life satisfaction increased and depression decreased as culture and entertainment expenses increased (Table 3).

Table 3. Differences in Self-Esteem, Life Satisfaction, and Depression according to the General Characteristics (N=1533)

Characteristic	Classification	Self-Esteem			Life sStisfaction			Depression		
		M±SD	F or t (p)	Dunnett T3	M±SD	F or t (p)	Dunnett T3	M±SD	F or t (p)	Dunnett T3
Gender	Male	2.84±.43	-.248 (.804)		3.24±.49	-1.848 (.065)		10.97±10.43	-1.566 (.118)	
	Female	2.85±.41			3.30±.47			12.03±10.14		
Age	65~74 (a)	2.92±.41	17.954 (<.001)	c<b<a	3.31±.52	.463 (.629)		10.37±10.16	9.255 (<.001)	a,b<c
	75~84 (b)	2.85±.41			3.29±.47			11.81±10.20		
	≥85 (c)	2.76±.39			3.28±.44			13.47±10.03		
Marital state	Bereavement (a)	2.86±.39	4.539 (.011)		3.32±.46	14.599 (<.001)	c<a	11.67±9.88	1.096 (.334)	
	Divorce, Separation(b)	2.79±.46			3.17±.52			12.69±11.59		
	Not married (c)	2.72±.44			3.02±.51			12.67±11.83		
Education	None (a)	2.75±.41 2.88±.39 2.98±.37 2.96±.42	28.608 (<.001)	a<b<c	3.21±.46	12.111 (<.001)	a<c,d	13.56±10.74	12.272 (<.001)	b,c,d<a
	Elementary graduate(b)				3.31±.46			11.22±9.62		
	Middle School (c)				3.42±.50			9.53±9.09		
	≥High School (d)				3.37±.51			11.05±8.18		
Annual Income (10,000 KRW)	≤ 500 (a)	2.83±.41	19.364 (<.001)	b<c<d	3.17±.51	29.124 (<.001)	a<c<d	13.48±11.64	4.075 (.007)	
	501~1000 (b)	2.78±.42			3.20±.46			12.62±10.58		
	1001~1500 (c)	2.87±.39			3.32±.47			11.16±9.33		
	≥ 1500 (d)	2.98±.38			3.48±.46			10.66±9.98		
Occupation	Employee (a)	3.04±.36	73.201 (<.001)	c<a,b	3.49±.42	46.154 (<.001)	c<a,b	8.47±8.36	29.892 (<.001)	a,b<c
	Employer (b)	3.03±.37			3.42±.42			9.55±10.37		
	No Job(c)	2.77±.40			3.22±.48			13.12±10.39		
Residential area	Seoul (a)	2.83±.36	.534 (.659)		3.30±.47	1.139 (.332)		10.32±8.49	2.551 (.054)	
	Metropolitan (b)	2.87±.44			3.25±.54			12.62±10.83		
	city (c)	2.84±.40			3.31±.46			12.20±10.6		
	Rural (d)	2.85±.41			3.30±.45			11.38±10.35		
Expense for Entertainment (won/mon)	< 10000 (a)	2.76±.42 2.82±.38 2.83±.43 3.02±.39	22.640 (<.001)	a,b,c<d	3.17±.47	29.040 (<.001)	a<c<d	13.94±11.43	12.242 (<.001)	d,<c,b< a
	10000~20000 (b)				3.24±.46			12.25±10.14		
	20000~30000 (c)				3.32±.48			11.56±9.66		
	≥ 30000 (d)				3.50±.46			9.00±8.84		

4.4. The correlation between self-esteem, life satisfaction, and depression

The correlations between the three parameters were analyzed using a Pearson correlation analysis (Table 4). Depression was negatively correlated with self-esteem ($r=-.537$, $p<.001$) and life satisfaction ($r=-.505$, $p<.001$). Self-esteem was positively correlated with life satisfaction ($r=.586$, $p<.001$).

Table 4: The correlation between self-esteem, life satisfaction, and depression

Variables	Self-Esteem (r)	Life Satisfaction (r)	Depression (r)
Self-Esteem	1		
Life Satisfaction	.586 ($p<.001$)	1	
Depression	-.537 ($p<.001$)	-.505 ($p<.001$)	1

4.5. Factors affecting the depression of the elderly living alone

Multiple regression was used to analyze the effects of self-esteem and life satisfaction on the depression of the elderly living alone (Table 5).

Multicollinearity among the independent variables was tested using tolerance and the variance inflation factor (VIF). A tolerance of 0.1 or lower or a VIF of 10 or higher indicated multicollinearity. The results confirmed that there was no multicollinearity among the independent variables. The coefficient of determination, which indicated the model's explanatory power, was .343. In other words, self-esteem and life satisfaction accounted for 34.3% of the total variance of depression in elderly living alone. The F statistic of the regression model was 399.416 ($p<.001$), confirming that the regression model was statistically significant. Both self-esteem ($t=-14.341$, $p=.003$) and life satisfaction ($t=-11.321$, $p=.002$) were confirmed to be significant predictors of depression. The autocorrelation between error terms was tested using the Durbin-Watson statistic; a value of 1.784 confirmed the absence of autocorrelation Table 5.

Table 5. Factors affecting the depression of the elderly living alone

Variables	B	S.E	β	t(p)	Multicollinearity	
					Tolerance	VIF
(constant)	58.419	1.663		35.128 ($<.001$)		
Self Esteem	-9.189	.641	-.367	-14.341 ($<.001$)	.656	1.524
Life Satisfaction	-6.198	.547	-.290	-11.321 ($<.001$)	.656	1.524

$$R^2=.343 \text{ Adj-}R^2=.343 \text{ DurbinWatson}=1.784 \text{ F}=399.416 \text{ } p<.001$$

5. Discussion

This study set out to investigate the effects of self-esteem and life satisfaction on depression in 1,533 elderly (≥ 65 years) living alone; it also provides foundational data, which can be used to prevent depression in the elderly who live alone, while also promoting good health in the elderly population.

The mean depression score among participants was 11.84, below the CES-D cutoff score (16) for depression. However, 368 elderly (24%) who lived alone scored 16 or higher, indicating that the issue of depression among the elderly living alone should not be neglected. The general characteristics that predicted depression in the elderly living alone were age, education level, employment type, and culture and entertainment expenses. These are partially in line with previous findings that levels of depression differ significantly by education level, economic status, and income (Lee, 2011). Self-evaluation health, monthly average income, and participation in social activities were found to be partially consistent with previous studies predicting depression (Chun, Kim, 2021). In the present study, depression did not differ significantly statistically by gender. Prior studies have also reported contradictory results, finding a higher prevalence of depression among older women than older men living alone or vice versa. As this gender gap may be attributed to the predominantly female composition of the study samples, additional studies are needed to examine gender-specific differences. By age, the elderly aged 85 or older had more depression than their younger counterparts. Among the elderly, chronic diseases increased and social roles decreased with age, suggesting that the risk of depression may increase with age. Indeed, the results of this study confirm that age is a predictor of depression. Employed elderly showed a lower level of depression than their unemployed counterparts, in line with previous findings that employment status has an impact on depression of the elderly (Yoon, Jun, 2009). Having a job can solve poverty, the greatest agony of old age, while reducing feelings of alienation or loneliness through social activities, thus boosting life satisfaction and self-esteem, while lowering depression. There is thus a pressing need to create jobs for the elderly, not just simple labor, such as public work, but other steady work for older workers. Depression increases as self-rated health declines. According to a previous study, the elderly living alone demonstrated poorer self-rated health, highlighting the need for measures to promote their physical health and reduce depression. Cultural entertainment expenses, including TV channel subscriptions, movie and show tickets, tourism products, and plants to be grown at home, reduce depression. This is consistent with the previous report that depression decreased as satisfaction with leisure activities increased (Lee, Jung, 2021). Leisure activities represent an important coping resource, enhancing the quality of life by reducing stress. In particular, leisure activities in older adulthood are more significant than hobbies or activities carried out for fun because

they reduce feelings of alienation or idleness that are closely linked to mental health. The results of this study show that the elderly who spend more money on culture and entertainment exhibit greater life satisfaction, including satisfaction with their leisure activities. This has been shown to help reduce depression. Participating in various social activities and meeting people through leisure activities can also reduce depression. It is therefore important to develop welfare programs that engage solitary elderly in various hobbies, for example by providing more travel and tour opportunities.

The mean self-esteem score of the elderly living alone was 2.85, which is similar to older women living alone (2.74), measured using the same instrument (Choi, Kim, 2018). The general characteristics that influence self-esteem in older adults living alone are age, education level, income, employment type, and culture and entertainment expenses. Adults aged 65–74 demonstrated the highest level of self-esteem. Self-esteem was higher among middle-school graduates, people with higher annual income, employed older adults, and those with greater culture and entertainment expenses. This finding partially reflects previous results, which have shown that self-esteem differs significantly by age, education level, disease status, number of children, length of time spent living alone, income satisfaction, and leisure-activity participation (Lee, 2005). Self-esteem among the elderly living alone also differed by employment status (Yoon et al., 2016).

The mean life-satisfaction score of the elderly living alone was 3.29, indicating a moderate level of satisfaction. This result is similar to the previously reported score (3.33), but lower than that reported among non-single-person households (3.52). The general characteristics that influence life satisfaction were marital status, education level, annual income, and culture and entertainment expenses. Widowed elderly living alone had more life satisfaction than their single counterparts; middle-school graduates had more life satisfaction than people who completed or dropped out of elementary school. Older people with jobs, higher incomes, and higher culture and entertainment expenses also had more life satisfaction. This result partially reflects previous findings, which have shown that religion, employment status, leisure-activity involvement, and self-rated health affect life satisfaction among older adults living alone (Ryu et al., 2005). Although life-satisfaction results differ across studies, based on participant-inclusion criteria and operational definitions, employed elderly who are economically stable and can thus participate in social activities, such as religious or leisure activities, demonstrate greater life satisfaction, as do those who consider themselves in good health. This appears to contribute to reducing depression.

To examine the effects of self-esteem and life satisfaction on the depression of the elderly living alone, we conducted multiple regression analysis, based on self-esteem, life satisfaction, and other significant general characteristics. The results confirm that self-esteem and life satisfaction are significant predictors of depression among elderly living alone, accounting for 34.3% of the variance. This is consistent

with previous research, which has shown that self-esteem predicts depression among the elderly living alone (Kim, 2021). In other words, self-esteem and life satisfaction are major interpersonal coping resources that may alleviate depression. Developing high self-esteem, perceiving oneself to be useful, and gaining high levels of life satisfaction by engaging in various social and leisure activities can prevent or mitigate depression, even when older people have diminished physical functioning and reduced economic and social activities. Recently, the government's welfare policy support for the elderly is increasing a lot, but leisure and cultural opportunities are still lacking for the elderly living alone in blind spots. The low self-esteem of the elderly living alone can reduce the level of depression, and it is required to develop an intervention program to improve self-esteem to prevent and alleviate depression so that the elderly living alone do not develop depression. Government support is needed to improve their self-esteem and life satisfaction. This is expected to improve the quality of life of the elderly by acting as a psycho-emotional protective factor that can prevent or alleviate depression.

6. Conclusion

This study was to investigate the effects of self-esteem and life satisfaction on depression of the elderly living alone, while providing basic data to reduce depression among the elderly living alone and promote health among the elderly population. The subjects of this study had a slightly lower depression score. The results show that levels of depression differ significantly by age, education level, health status, employment type, and culture and entertainment expenses and are negatively correlated with self-esteem and life satisfaction. Self-esteem and life satisfaction account for 34.3% of the variance in depression among elderly living alone. The results of this study confirm that self-esteem and life satisfaction are significant predictors of depression of the elderly living alone. It is clear that efforts to enhance life satisfaction, including health-status satisfaction and self-esteem can effectively prevent and manage depression in the aging adult population. We hope that the findings of this study will serve as valuable foundational data to develop intervention programs that promote health among the elderly living alone. The present study is significant because it uses KOWEPS nationally representative elderly-population data. It does have limitations because it analyzes only self-esteem and life satisfaction, among other psychosocial protective factors reported to reduce depression. Subsequent studies should examine more diverse predictors.

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