

A Structural Equation Model for Quality of Life of Super-Aged Women

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[Abstract]

This study aims to investigate the relationship between quality of life, activities of daily living, and depression among Korean super-aged women. In this study, the 7th (2018) data of the Korean Longitudinal Study of Aging (KLoSA) were used. The participants in this study were 363 super-aged women. The mean age was 88.67 years old. Quality of life was significantly related with Activities of daily living (ADL) ($r = .34, p < .001$), and depression ($r = -.47, p < .001$). The analysis of the hypothesized model showed a good fit to the data except for the χ^2 value ($\chi^2 = 38.8, df = 11, p < .001, CFI = .98, TLI = .96, RMSEA = 0.08$). The hypothesized model explained 34% of the variance in super-aged women. The activities of daily living of elderly women had an indirect effect on quality of life via depression. Very old women with a high level of ADL were more likely to be feeling less depression, and elderly people who had less depression were likely to have a better quality of life. The findings thus highlight prevailing depression and activities of daily living as critical foci for clinical management strategies in super-aged women.

Key Words: activities of daily living, depression, quality of life, super-aged women

I. INTRODUCTION

According to the Korean Statistical Information Service (KOSIS), the number of super-aged is expected to increase from 1.4 million in 2030, accounting for 2.7% of the total population, to about 2.3 million in 2040, which is 4.4% of the total population [1]. The super-aged period usually refers to the elderly over 85 years of age, and this period is sometimes referred to as the unknown period [2,3]. In general, in the early aging period, most of the elderly are living healthy lives, whereas in the latter period, the risk of various chronic diseases or injuries increases along with natural aging. As the aging of the elderly in Korea rapidly progresses, various problems of elderly women arise.

Moreover, physical and mental functions are considerably weakened [4-6]. Due to various chronic diseases and senescence, super-aged women experience significant changes in their residence and daily life [6,7]. To maintain a happier life for super-aged women who are in the last stage of their life, it is necessary to identify the health status and social psychological factors that may affect their quality of life. As the life expectancy of the elderly increases, so super-aged women need attention paid to quality of life [8,9].

Quality of life (QOL) is a core aspect of an individual's wellbeing and describes the subjective assessment of their life satisfaction. As factors affecting QOL in the 60s and 90s can appear differently even for the same elderly women: interest in the QOL of super-aged women has been

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increasing in recent years [10]. A secondary data analysis study (N = 1,022) in South Korea emphasized the role of mental health on QOL, improving mental health through physical function, Activities of daily living (ADL), and participation in social activities [11].

Depression is a major public health issue connected with several poor health outcomes and disabilities among old people [12]. Depression is a mental health problem that can last over time, and seriously affect the lives of the people who suffer from it, diminishing their QOL, reducing their motor capacity, and incapacitating them in their daily lives. Living a meaningful life has been found to be related to subsequently reducing risks of depression, loneliness, and limitations in the ADL [3,10]. Furthermore, previous experience of depression, loneliness, and limited ADL has been found to be related to a subsequent decreased sense of meaningful QOL [3]. In India, one study found that depression remains undiagnosed and strongly linked with poor health and wellbeing outcomes in the middle-aged and older adults [13]. According to a longitudinal aging study, 7.3% of older males and 9.3% of older females had depressive symptoms. The study suggested that depression has emerged as a major public health problem that places females at a greater disadvantage; it is therefore important to focus on gender-specific policies to mitigate this problem [14].

Activity limitations can reduce life satisfaction. One study explored the role of optimism on the relationship between changes in ADL limitations and life satisfaction over time among older adults. Increasing optimism was found to reduce the negative consequences of ADL limitations on life satisfaction among middle-aged to older adults [15]. According to a Portuguese study, elderly Portuguese were more likely to report a high level of life satisfaction although their health status was low [16]. The results showed that life satisfaction level was decreasing among elderly people. However, at a certain point, the level started to increase again displaying a U-shape among people between 70 and 74 years old [16].

On the other hand, another study reported whether gender can be a moderator of the relationship between physical and psychological health and the level of life satisfaction [4]. With regard to gender, first of all, elderly men are less

likely to be depressed than women by and large. Judging from the score gap between satisfaction with life, health condition, and cognition function, which is fairly high, super-aged women need considerable attention paid to their life and health. Judging from the fact that depression is higher among women than men, psychological factors such as relative vulnerability in super-aged women can also be found. Therefore, it is necessary to examine the relationship between ADL, depression, and QOL of elderly women aged 85 or older.

In Korea, the elderly aged 85 years or older were included within the entire group of the elderly 65 years and older. This has made it difficult to grasp accurate information about super-aged people because the prior study overlooked the experience that could appear differently according to age. Thus, this study aims to investigate the relationship between QOL, ADL, and depression among Korean super-aged women.

II. Materials and Methods

A. Participants

In this study, the 7th (2018) panel data of the Korean Longitudinal Study of Aging (KLoSA) was used. KLoSA was conducted to identify and prepare for Korea's aging process as basic data produced for policy establishment and academic research. The 7th KLoSA selected 6925 participants aged ≥ 55 years to be part of the panel data. The participants in this study were 363 super-aged women among 6925 participants.

B. Variables

1) Quality of life (QOL)

QOL was analyzed based on the questions of the KLoSA regarding satisfaction in elderly life [4,9]. Five questions were used for QOL pertaining to health status, relationship with family, economic status and overall happiness. Each question had a scale of 0 to 100 points, and the higher the score, the higher the QOL; the reliability of Cronbach's alpha was .76.

2) Activities of daily living (ADL)

Activities of daily living (ADL) were analyzed based on the questions of the KLoSA regarding the performance of daily activities [8]. The ADL consisted of seven questions: getting dressed, washing the face/brushing the teeth/washing the hair, taking a bath or shower, having a meal, leaving the room, using the bathroom, and control of toileting. Each question has a scale of 1 to 3 points. The higher the score, the better the condition of ADL; the reliability of Cronbach's alpha was .97.

3) Depression

The depression scale used was a short-form version of the Center for Epidemiological Studies-Depression Scale (CES-D10) at baseline [12]. Ten questions were used for "Depression" about depression-related feelings over the past week. The items were questions about the degree of depression felt within a week (e.g., "I had no energy. I felt unhappy, sad and depressed."). Each question has a scale of 1 to 4 points. The higher the score, the higher the depression; the reliability of Cronbach's alpha was .86.

C. Data analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) (version 17.0) and the Analysis of Moment Structures (AMOS) statistical software programs (version 17.0). To examine the relationship between QOL, ADL, depression among Korean super-aged women, structural equation modeling (SEM) was used. The hypothesized model in this study was analyzed using structural equation modeling (SEM) techniques (Fig. 1). The

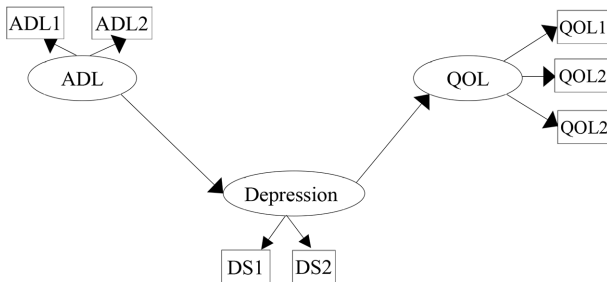


Fig. 1. Hypothesized model of the antecedents of Quality of life.

chi-square (χ^2) goodness of fit statistic was used to assess the degree of model fit and the incremental fit indices, such as the Comparative Fit Index (CFI), Normed fit index (NFI), and Root Mean Square Error of Approximation (RMSEA). The generally agreed-upon critical value for the CFI and TLI is 0.90 or higher [17].

III. Results

A. General characteristics

The baseline characteristics of the participants are shown in Table 1. The participants in this study were 363 super-aged women. The mean age was 88.67 years old. Most participants had graduated only from elementary school. According to subjective health status, most of the participants were in good health.

B. Descriptive statistics for variables

Descriptive statistics for participants' QOL, ADL, and depression are shown in Table 2. The level of QOL, ADL, and depression were 55.05±13.34, 2.61±.58, and 1.82±.73 points, respectively.

Table 1. General characteristics (N = 363)

Variable	Category	Means±SD / n(%)
Age	-	88.67±3.33
Educational background	Elementary school graduation and below	333(93.0)
	Junior high school graduation	15(4.2)
	Senior high school graduation	9(2.5)
	College graduation	1(0.3)
Religion	Christian	66(18.2)
	Catholic	25(6.9)
	Buddism	44(12.1)
	None	228(62.8)
Subjective health status	Very good	75(20.7)
	Good	157(43.3)
	So so	102(28.1)
	Bad	28(7.7)
	Very bad	1(0.3)

Table 2. Descriptive statistics for variables (N = 363)

Variable	Means±SD
Quality of life	55.05±13.34
Activities of daily living	2.61±.58
Depression	1.82±.73

C. Correlation among main variables

Correlations among main variables are shown in Table 3. QOL was significantly positively related to ADL ($r = .34, p < .001$). However, quality of life was significantly negatively related with depression ($r = -.47, p < .001$). ADL was also significantly negatively related with depression ($r = -.27, p < .001$).

D. Model fit

The hypothesized model assumed relationships among ADL, depression, and QOL of super-aged women. The summarized results of the hypothesized model are shown in Table 4. The analysis of the model showed a good fit to

Table 3. Correlation among main variables

Variable	Quality of life	ADL	Depression
Quality of life	1		
ADL	.34***	1	
Depression	-.47***	-.27***	1

*** $p < .001$

the data except for the χ^2 value ($\chi^2 = 38.8, df = 11, p < .001$, CFI = .98, TLI = .96, RMSEA = 0.08). The correlation between ADL and depression was significant (see Table 3). The correlation between depression and QOL was also significant. Those results partially support the hypothesized model, which explained 34% of the variance in super-aged women (see Fig. 2).

E. Standardized indirect effect

The estimates of the indirect effects of ADL on QOL of elderly via depression are shown in Table 5. When bootstrapping CI does not include zero, the indirect effect is considered significant [17]. The ADL of elderly women had an indirect effect on QOL via depression. Elderly women with high levels of QOL were more likely to feel less depression, and those who had less depression were likely to have a better QOL. This finding highlights the importance of elderly depression in promoting their QOL.

Table 4. Regression weights of hypothesized model

Variable	Estimate (Unstandardized)	Estimate (Standardized)	SE	CR
ADL → Depression	-.43	-.30***	.09	-5.02
Depression → QOL	-9.07	-.46	1.23	-7.38
ADL → QOL	7.23	.25***	1.65	4.39

*** $p < .001$

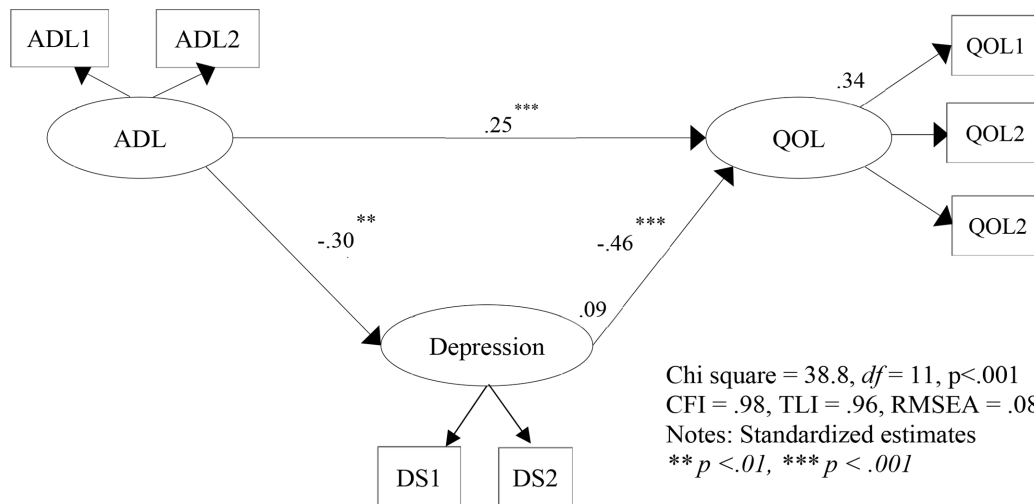


Fig. 2. Final model.

Table 5. Standardized indirect effect

Variable	Direct effect	Indirect effect	Total effect	Lower bounce	Upper bounce
ADL → QOL	.25	.14*	.39	.08	.19

* $p < .05$

IV. Discussion

This study was conducted to identify whether ADL and depression predicted QOL among Korean super-aged women. First, there was a significant relationship between the elderly's ADL and predicted QOL. This finding was consistent with previous studies suggesting a direct relationship between ADL and QOL [5]. In the 5th KLoSA data researched in 2014, physical and psychological condition is a significant predictor of QOL over 85 years old people [4]. The ADL variable was a crucial factor in the QOL among the elderly. ADL is a substantial indicator of the physical health of the elderly and refers to the skills necessary to take care of one's body to enable independent living [4]. The ability to perform daily life activities independently leads to an increase in autonomy and soon acts as a factor contributing to the improvement of QOL.

Second, there was a significant relationship between elderly ADL and depression. This finding was consistent with previous studies suggesting the direct relationship between ADL and depression [4,6]. This suggests that the low level of ADL of the super-aged women has a negative effect on subjective health status perception, which in turn acts as a chronic cause of stress throughout daily life, and ultimately can cause senile depression. In addition, it is difficult for the elderly to actively meet close family and friends because of disabilities in daily life [18]. Depending on others' help to maintain daily life can make the elderly feel worthless, which can lead to depression. When this feeling of depression becomes extremely high, it can lead to extreme choices such as suicide.

Third, there was a significant relationship between elderly depression and QOL. This finding was consistent with previous studies suggesting the direct relationship between the depression and QOL [6,7]. In a study of Swedish elderly subjects, depression significantly affected life satisfaction [19,20]. However, significant sex differences

were identified. In the case of elderly women, depression appeared to have a significant effect on life satisfaction, but in the case of elderly men, this relationship was not found.

Fourth, ADL indirectly influenced QOL via depression as predicted. This finding is partially consistent with studies on old women's QOL [4,7], which emphasized the importance of decreasing their depression to build a safer health system. In addition, this study proved the mediating effects of old women's depression in the relationship between their ADL and QOL. To improve older women's QOL, it is necessary to take a more interest in the depressive mood of older women. Above all, it is important to find out what depressive thinking the super-aged women have; emotional assessment should be included in regular physical examinations.

This finding highlights the importance of elderly women's ADL and depression to improving her QOL. A high level of ADL is associated with reducing elderly depression and negative feelings and increasing the QOL in elderly women. Considering that ADL is a top priority for their QOL and that the most basic principle of super-aged women's healthcare is to maintain their physical and psychological health, they need to meet social supporting system and connect with social networks [21]. Evidence for health practitioners and policymakers on factors that may hamper the development and maintenance of meaningful life for healthy aging was found in this study [3]. Thus, super-aged women's educational program should be considered to be supplied focused on their own quality, different from general old people's [4]. In the age of 100 years of longevity, continuous research is needed to improve the QOL of super-aged people.

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