

## Article

# Life Satisfaction in Later Life: The Interplay of Marital Condition and Income among Elderly Koreans

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**Abstract:** Although both marital status and economic conditions significantly contribute to life satisfaction in later life, the effect of their interaction (or moderating) on life satisfaction has been understudied. Our goal was to examine whether marriage buffers the negative consequences of low income among elderly people. Using two large national survey datasets, the Korean Community Health Survey (n = 126,936) and the Korean Longitudinal Study of Aging (KLoSA) (n = 5687), we examined the relationship between household income, marital condition (marital status and marital satisfaction), and life satisfaction in Korean adults over 50. We found that increases in life satisfaction among individuals aged 50 and over were associated with higher income, marital status, and spousal satisfaction. We also determined that the beneficial effects of marriage, as well as marital quality, on life satisfaction are stronger in men. Moreover, separated/divorced status, but not bereavement or single status, moderated the effects of household income, such that the adverse effects of poverty were particularly pronounced among those who were separated/divorced. Furthermore, spousal satisfaction also moderated the effect of household income on life satisfaction among married men, indicating that marital satisfaction amplifies the effect of favorable economic conditions on life satisfaction. Because economic condition and relationship status are two key determinants of life satisfaction, understanding their interactions can improve overall predictions of life satisfaction.

**Keywords:** Korean elderly; household income; life satisfaction; marital status; spousal satisfaction; interaction effect

## 1. Introduction

Life satisfaction, the overall subjective assessment of one's own life, reflects a relatively long-term cognitive evaluation of one's overall life situation [1,2]. As a key ingredient of subjective well-being, life satisfaction has long been recognized as a protective factor against poor health and as a reliable predictor of longevity, especially in older populations [3,4]. In fact, poor life satisfaction is a significant predictor of the onset of disability in later life [5] and all causes of mortality in old age [6]. Given the ample evidence that higher life satisfaction buffers the detrimental effects of aging, maintaining high levels of life satisfaction can be considered a key to successful aging.

Economic status, largely determined by income, is one of the most robust contributors to high life satisfaction. Numerous studies have repeatedly shown an association between income and life satisfaction [7,8]. Low household income not only significantly decreases life satisfaction, but also exacerbates various adverse situations, such as divorce and living alone [8,9]. In addition, lower economic status has been linked to higher disease rates and accelerated physical and cognitive aging [10,11]. In general, economic condition is one of the primary determinants of the physical and psychological well-being of older adults.

What, then, can buffer the detrimental effect of low income in general? Here, we examine the role of marriage (marital status and marital quality) as a potential buffer against low income. Studies from Western cultures have revealed that marriage is significantly related to increased happiness [12,13]. Living with a spouse not only increases one's life satisfaction [14], but also decreases one's mortality rate by 5–15% [15], especially among elderly individuals. In addition to marital status, marital relationship quality also matters since it is the most significant correlate of life satisfaction and psychological well-being among married couples [16]. Some research has even suggested that marital quality is a stronger predictor of life satisfaction than marital status itself [1].

Interestingly, some studies from Asian cultures have also reported the beneficial effect of marriage, but with significant gender differences [17–19]. For example, the prevalence of depressive symptoms is about 2.5 times higher in non-married men than married ones, but this pattern was not observed in Chinese women [19]. Similarly, among elderly Koreans, divorced and widowed status is associated with an increased risk of major depression only for elderly men, not women [18]. Moreover, divorce and bereavement are significantly associated with all causes of mortality among Japanese men, but not women [20]. Hence, more studies on the gender difference in the positive effects of marriage need to be conducted to establish an unequivocal relationship between household income, marriage, and gender influencing life satisfaction in Asian populations.

Marital status has been established as a robust predictor of life satisfaction in Western cultures, but relatively few studies have been performed in non-Western cultures, including Asia. For example, one of the largest cross-national studies, involving 27 countries, on marriage and well-being included only two Asian countries, the Philippines and Taiwan [21]. Moreover, though marital and economic conditions are both significant predictors of life satisfaction, whether these two factors interact to predict the degree of life satisfaction has not been examined. Specifically, whether marital condition moderates the effect of adverse economic conditions on well-being among elderly Asian people remains unresolved.

This study aimed to examine if a good marriage can buffer the negative consequences of lower-income in older adults. To this end, we used two sets of large national survey samples representing elderly Korean adults (above age 50) to examine (1) whether different marital status moderates the effect of household income on life satisfaction, and (2) whether marriage quality, measured by satisfaction with one's spouse, also moderates the effect of household income on life satisfaction.

## 2. Materials and Methods

### 2.1. Data Source

#### 2.1.1. Study 1. Marital Status, Household Income, and Life Satisfaction

We used data from the Community Health Survey conducted by the Korean Centers for Disease Control and Prevention. The survey targets Korean adults older than 20 years who have completed one-on-one interviews. Among 228,558 participants, we selected those who were older than 50 and responded to the life satisfaction question, “All things considered, how satisfied are you with your life as a whole these days?” (rating satisfaction on a 10-point scale, with 1 being most dissatisfied and 10 being most satisfied). To enroll in the survey, participants were also required to disclose their marital status, educational level, and monthly household income ( $n = 126,936$ ).

Marital status was categorized into four dummy variables: one for married, one for divorced or separated, one for bereaved (widowed), and one for never married (single). Married was used as a reference category in regression analysis. Education was likewise divided into four categories: less than elementary education (fewer than six years), middle school education (six to nine years), high school education (10–12 years), and college and higher education (13 years or more). Monthly household income was indexed by eight dummy variables: 1. less than 500K KRW (1K KRW is approximately

0.9 USD); 2. 500K to 1000K KRW; 3. 1000K to 2000K KRW; 4. 2000K to 3000K KRW; 5. 3000K to 4000K KRW; 6. 4000K to 5000K KRW; 7. 5000K to 6000K KRW; and 8. more than 6000K KRW.

### 2.1.2. Study 2. Satisfaction with Spousal Relationship, Household Income, and Life Satisfaction

Study 2 used data from wave 6 of the Korean Longitudinal Study of Aging (KLoSA) conducted by the Korea Labor Institute in 2016. The design and data collection procedures of the KLoSA study are described elsewhere [13,22]. Among the participants, we selected 5687 who reported their marital status as ‘married’ and who provided information on our variables of interest (life satisfaction, spousal satisfaction, monthly household income, education, and age). Perceived overall spousal satisfaction with the relationship was measured by individual participants’ answers to the question, “How satisfied are you with the relationship with your spouse?”, and life satisfaction was measured with the question, “How satisfied are you with your life overall?”, respectively. Both life and spousal satisfaction were measured with an 11-point scale, in 10-point increments, with 0 being most dissatisfied and 100 being most satisfied. Monthly household income was indexed by eight categories, consistent with Study 1. Additionally, education was categorized into four groups, as in Study 1: (1) less than elementary education, (2) middle school education, (3) high school education, and (4) more than college education (13 years or more).

### 2.2. Ethics Statement

All the analytical procedures for the current study were approved by the Institutional Review Board of Seoul National University.

### 2.3. Statistical Analysis

All the analytical procedures for the current study were approved by the Institutional Review Board of Seoul National University. All the statistical analyses were performed using R and  $p$ -values < 0.05 were considered statistically significant. To describe the basic characteristics of the variables used in the analysis, we calculated the means (standard deviations) of the variables and performed a t-test or chi-square test to examine the group differences by gender. Age and education level were used as covariates in regression testing the two-way and three-way interactions. For gender, men were coded as 0, while women were coded as 1.

## 3. Results

### 3.1. Study 1. Marital Status, Household Income, and Life Satisfaction

The descriptive characteristics of the participants are shown in Table 1. The mean age of the participants was 64.4 years and 63.3 years for men and women, respectively. Most male participants were married (87%), whereas only 62% of women participants were married. About six times as many female participants (32%) were bereaved compared to males (5%). Male participants were significantly more highly educated compared to women ( $\chi^2$  (3,  $N = 126,936$ ) = 14457,  $p < 0.001$ ), as more than half of the women reported that their educational attainment was less than six years. Monthly household income was significantly higher for men than women ( $\chi^2$  (7,  $N = 126,936$ ) = 2312.6,  $p < 0.001$ ); about 40% of women participants reported a monthly household income of less than 1,000K KRW (about \$900 US dollars), whereas less than 30% of the male participants fell into that category. The level of household income and marital status were significantly associated with life satisfaction among the elderly Korean population (the main effect of household income:  $F$  (1,126,918) = 138.55,  $p < 0.001$ ; marital status:  $F$  (3, 126,918) = 312.05,  $p < 0.001$ , respectively).

Our first main hypothesis was that being married may be a protective factor against the detrimental effect of low household income on life satisfaction. As hypothesized, the interaction effect between marital status and household income on life satisfaction was significant ( $F$  (3, 126,918) = 21.75,  $p < 0.001$ ). Since we found a three-way interaction effect of marital status  $\times$  gender  $\times$  household

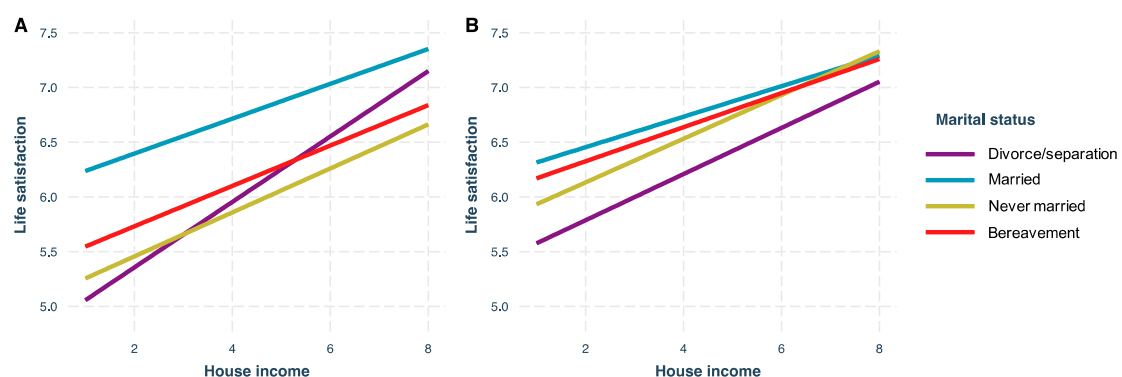
income ( $F(3, 126,918) = 4.10, p < 0.01$ ), we examined the two-way interaction effect for males and females separately.

**Table 1.** Characteristics of Korean Community Health Survey participants.

Variable	Men (n = 55,303)	Women (n = 71,633)	p-Value
<b>Age</b>	Mean (or N)	Mean (or N)	
	64.43	63.29	
<b>SD (or %)</b>	9.63	9.9	
<b>Age</b>			<0.001
<b>Education Level</b>			<0.001
less than elementary	15,468	39,423	55.03%
middle school graduation	10,980	12,221	17.06%
high school graduation	17,447	14,350	20.03%
above college	11,408	5639	7.87%
<b>Marital Status</b>			<0.001
Married	48,100	4,4455	62.06%
Divorced/Separated	3430	3412	4.76%
Bereaved	2750	23,154	32.32%
Never married	1023	612	0.85%
<b>Monthly Household Income</b>			<0.001
1. Less than 500K KRW	5014	12,325	17.21%
2. 500K to 1000K KRW	10,596	15,623	21.81%
3. 1000K to 2000K KRW	12,058	14,772	20.62%
4. 2000K to 3000K KRW	9795	10,806	15.09%
5. 3000K to 4000K KRW	6848	7086	9.89%
6. 4000K to 5000K KRW	4334	4364	6.09%
7. 5000K to 6000K KRW	2562	2531	3.53%
8. Above 6000K KRW	4096	4126	5.76%
<b>Life Satisfaction</b>	6.58	6.44	<0.001
	1.89	1.91	

p-values were calculated from two-sample t-test (age and life satisfaction) or chi-square test (categorical variables; education, marital status, and monthly household income).

For Korean men, lower household income significantly decreased life satisfaction, but marital status moderated this relationship (Figure 1). Interestingly, among the four marital statuses, only the interaction effect of divorced/separated status with household income on life satisfaction was significant ( $B = 0.27, [0.20, 0.35], p < 0.01$ ); specifically, divorced/separated status aggravated life satisfaction among lower-income individuals (Figure 1, purple line). In contrast, bereavement or never being married (single) did not interact with household income in either group (Table S1).



**Figure 1.** Interaction effect of marital status with household income level to predict life satisfaction in men (A) and women (B).

For Korean women, household income was also significantly associated with life satisfaction (Figure 1). The interaction effect of marital status with income was also significant. Consistent with the results for men, only divorce/separation reduced life satisfaction in individuals with low incomes. However, importantly, the interaction effect was much smaller for Korean women ( $B = 0.14$ ,

[0.07, 0.21],  $p < 0.01$ ) than for Korean men, as indicated by the significantly stronger beta coefficient of divorce/separation by income in men.

### 3.2. Study 2. Spousal Satisfaction, Household Income, and Life Satisfaction

In Study 2, we investigated whether marital quality also moderates the effect of household income on life satisfaction among married participants. Table 2 presents the characteristics of the KLoSA participants who met the inclusion criteria. The mean age of the male group was about three years higher than that of the female group. Moreover, men were significantly more highly educated, and reported significantly higher spousal satisfaction. The mean level of life satisfaction scores did not differ by gender.

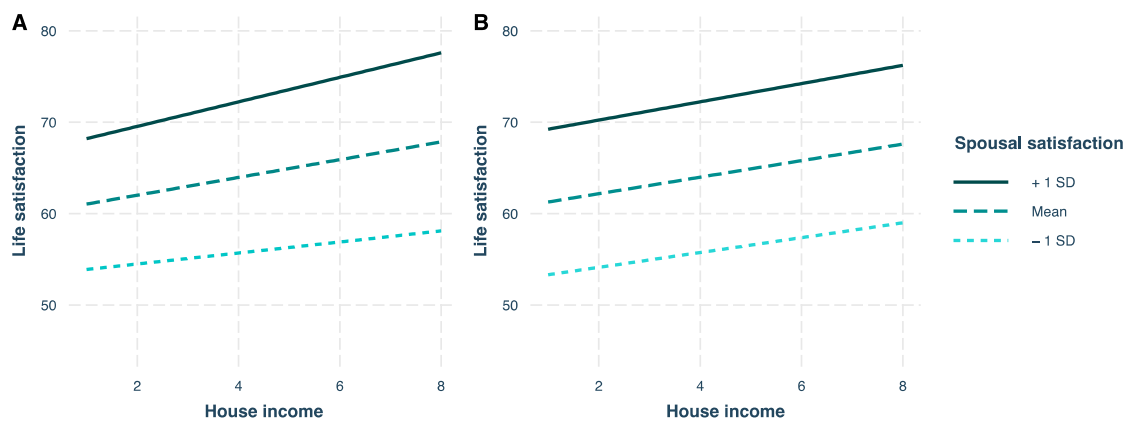
**Table 2.** Characteristics of Korean Longitudinal Study of Aging (KLoSA) participants.

Variable	Men (n = 2887)	Women (n = 2800)	p-Value
<b>Age</b>	Mean (or N)	Mean (or N)	
	68.65	65.48	<0.001
<b>Education Level</b>	SD (or %)	SD (or %)	<0.001
less than elementary	683	1958	69.93%
middle school graduation	463	526	18.79%
high school graduation	1184	1036	37.00%
above college	557	180	6.43%
<b>Monthly Household Income</b>			n.s.
1. less than 500K KRW	133	137	4.90%
2. 500K to 1000K KRW	299	295	10.55%
3. 1000K to 2000K KRW	584	591	21.13%
4. 2000K to 3000K KRW	466	456	16.30%
5. 3000K to 4000K KRW	413	405	14.48%
6. 4000K to 5000K KRW	277	263	9.40%
7. 5000K to 6000K KRW	222	203	7.26%
8. Above 6000K KRW	488	447	15.98%
<b>Spousal Satisfaction</b>	69.5	67.05	<0.001
<b>Life Satisfaction</b>	63.71	64.69	n.s.

Life satisfaction was significantly associated with household income as well as the degree of satisfaction with the spousal relationship ( $B = 1.86$ , [1.61–2.11],  $p < 0.01$  and  $B = 8.86$ , [8.63–9.09],  $p < 0.01$ , respectively). We also found an interaction effect between spousal satisfaction and household income level, suggesting that higher spousal satisfaction strengthens the effect of household income on life satisfaction ( $B = 0.81$ , [0.57–1.05],  $p < 0.01$ ). Since we also found a marginally significant three-way interaction between gender, household income, and spousal satisfaction ( $B = -0.62$ , [−0.95–−0.29],  $p = 0.06$ ), we investigated the two-way interaction between household income and spousal satisfaction for males and females separately.

For elderly men, we found a significant association between household income and life satisfaction (Suppl. Table 2). We also found a significant interaction between spousal satisfaction and household income ( $B = 0.78$ , [0.33, 1.24],  $p < 0.01$ ). As shown in Figure 2, the slope of income was steeper for those with higher spousal satisfaction than for those with lower spousal satisfaction. The results indicate that good marital quality strengthened the positive effects of high income.

Importantly, however, although the main effects of spousal satisfaction and household income were significant for Korean women, their interaction effect was not significant (Table S2); spousal satisfaction did not change the effect of household income on life satisfaction in elderly women.



**Figure 2.** Interaction effect of spousal satisfaction with household income level to predict life satisfaction in men (A) and women (B).

#### 4. Discussion

Our results indicate that being married increases life satisfaction among the elderly Korean population. Moreover, this positive effect of marriage on life satisfaction was more prominent in men than women. Regarding the combined effects of economic status and marital condition, it is noteworthy that divorced or separated individuals with low incomes, especially men, reported the lowest life satisfaction. Single or bereavement status also decreased life satisfaction; however, its interaction effect with income was not significant. Among married couples, satisfaction with one's spouse significantly increased life satisfaction. When combined with household income, higher spousal satisfaction strengthened the effect of household income on life satisfaction exclusively in men.

Although it was not our main focus, we found a gender difference in that single Korean men reported the lowest life satisfaction, while divorced/separated Korean women reported the lowest life satisfaction (Figure S1). The pattern of results for elderly Korean women is similar to the findings from a meta-study of mortality conducted among 250,000 elderly people from cross-national populations, which showed that divorced/separated women faced an excessive risk of death compared to widowed women or single women [15]. However, elderly Korean men did not follow this pattern: single (never-married) men experienced worse life satisfaction than divorced/separated men did. This result is consistent with the patterns for Japanese men, which show that single status is associated with a higher risk of all causes of mortality compared to other marital conditions [20]. Future studies should address why never-married Asian men experience such a low level of well-being compared to female counterparts.

The most important finding of the present study is that a “good marriage”—being married as well as being satisfied with marriage—has a significant protective effect on life satisfaction, especially combined with low income. One of the explanations for this protective effect is social support. Numerous studies have indicated that one's spouse is often named as the most important source of support in the elderly population, especially for health-related issues [23]. For example, married cancer patients are at a significantly lower risk of metastatic cancer and dying from cancer than unmarried patients [24]. Similarly, our results suggest that marriage plays a beneficial role in life satisfaction under dire economic conditions. Interestingly, we found that this effect was stronger for Korean men than for women. It could be that women, unlike men, also receive social support from other sources; Umberson [25] found that among married individuals, a significantly higher proportion of men, compared to women, named their spouse as being an important source of social support. Future studies should examine whether this is also true for other ethnic groups.

The present study is not without limitations. First, we examined only self-reported levels of life satisfaction with a single question as a dependent variable. Therefore, it is unclear whether marital condition also moderates the effect of low income on other well-being variables such as health. Second,



our sample included only individuals aged 50 and older. Future studies should also examine younger adults, so we can test whether the current findings are unique to older adults. Third, the current study utilized two different datasets to examine the effect of marital status or spousal satisfaction. For future studies, it would be ideal to investigate the two variables in an identical married population. Finally, since the dataset of the current study provided the income range as a categorical variable rather than its actual amount, we were unable to adjust household income by considering the number of family members. Therefore, household income level was not differentiated into one-person (e.g., single, bereaved) or two-person households (married) in the current study.

## 5. Conclusions

In conclusion, despite these limitations, our study is important since it examined the protective role of the marital condition in the relationship between income and life satisfaction among non-Western elderly people. Interestingly, the protective effect of marriage and spousal satisfaction on life satisfaction is stronger in men. Most importantly, separation/divorce and the degree of spousal satisfaction significantly moderate the effects of income on life satisfaction, again, especially in men. Our findings suggest that community-level interventions would be more needed for single, separated, and divorced men. Because economic condition and spousal satisfaction are two key determinants of life satisfaction in the elderly, understanding their interactions can improve overall predictions of life satisfaction.

**Supplementary Materials:** The following are available online at <http://www.mdpi.com/2071-1050/12/8/3483/s1>, Figure S1: Adjusted mean of life satisfaction (Least-squares mean) across different marital statuses in men (blue) and women (red) participants; Table S1: Unstandardized beta estimates for two-way interaction model between house income level and marital status to predict life satisfaction in community health survey; Table S2: House income level and spousal satisfaction to predict life satisfaction in KLoSA samples.

**Author Contributions:** Study conception and design, S.-H.L. and I.C.; statistical analysis and drafting of the manuscript, S.-H.L.; revision of the manuscript, J.L. and I.C.; supervision, I.C. All authors have read and agreed to the published version of the manuscript.

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**Conflicts of Interest:** The authors declare no conflict of interest.

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