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Leisure Engagement, Residential Context, and Life Satisfaction Among Older Adults in South Korea: A Cross-Sectional Cohort Comparison, 2012 and 2022

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Abstract

Leisure participation is considered a contributor to sustainable well-being in later life, but its influence may differ across regions and between cohorts of older adults. This study examines how leisure activity relates to life satisfaction among older adults in South Korea and whether these associations vary by residential area over a 10-year period. This study analyzed leisure patterns using nationally representative data from the 2012 ($n = 3191$) and 2022 ($n = 3227$) waves of the Korean Longitudinal Study of Aging. An ANCOVA was conducted to examine the main and interaction effects of leisure participation and residential area on life satisfaction, adjusting for demographic, socioeconomic, and health-related covariates. The positive association between leisure participation and life satisfaction was weak and mostly non-significant in the 2022 cohort compared to the 2012 cohort. The 2022 cohort also showed higher life satisfaction and better self-rated health, suggesting a more central role of health in shaping well-being. Social and friendship activities, along with alumni and hometown associations, remained the only leisure types consistently linked to higher life satisfaction across both cohorts. Policies should prioritize health promotion and financial security as primary determinants of life satisfaction among older adults. Although leisure participation showed minimal overall effects, targeted support for socially embedded activities (e.g., social gatherings, community associations) may provide supplementary benefits.

Keywords: sustainable well-being; leisure participation; older adults; residential area; life satisfaction; Republic of Korea



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1. Introduction

Population aging in South Korea has progressed rapidly, reshaping social and policy agendas related to later life [1]. Older adults now constitute a growing share of the population, and concerns about their well-being have become central to debates on sustainable development [2,3]. Leisure engagement is increasingly recognized as a key component of active and successful aging because it supports health, social integration, and subjective well-being [4,5]. However, leisure engagement differs across residential areas and across cohorts. This reflects differences in local opportunities as well as generational variation in older adults' resources and leisure orientations [6,7].

Leisure participation plays multifaceted roles in promoting sustainable well-being by enhancing physical, psychological, and social functioning in later life [8,9]. From a physical standpoint, activities such as walking, gardening, and swimming contribute significantly to

preserving muscle strength, mobility, and cardiovascular health, all of which are essential for maintaining functional independence in older adults [4]. Psychologically, participation in leisure pursuits fosters a sense of purpose, joy, and resilience against depression and loneliness, which are common challenges in later life [10,11]. The social role of leisure activities is particularly important for older adults, as group-based or community activities encourage interaction, provide social support, and nurture a sense of belonging, combating social isolation [12,13]. Cognitively, engaging in activities like reading, playing games, and pursuing creative hobbies helps stimulate mental processes and maintain memory function, potentially slowing cognitive decline associated with aging [4]. Additionally, leisure activities can serve as a means of self-expression and personal growth, allowing older adults to explore new interests or rediscover past passions [9,11,14]. Previous studies suggest that leisure participation may contribute to successful aging, but findings remain inconsistent.

Gerontological theories offer a conceptual foundation for understanding these patterns. Activity theory posits that continued engagement in meaningful activities supports life satisfaction [15]. Continuity theory highlights the importance of maintaining stable behavioral patterns and social roles over time [16]. These perspectives suggest that leisure participation helps older adults preserve autonomy, purpose, and psychological stability, thereby promoting well-being in later life [17–20].

These ideas align with broader frameworks of sustainable well-being and social inclusion. Sustainable well-being recognizes that long-term quality of life depends primarily on health, economic, and environmental aspects [21], while leisure serves a supplementary role by supporting social and psychological dimensions of aging [22,23]. Social inclusion emphasizes older adults' ability to participate in community life and maintain meaningful social roles [24,25]. Within this framework, leisure participation contributes by strengthening social ties, reducing isolation, and fostering engagement in community activities. Community-based leisure pursuits also allow older adults to share their experience and knowledge, promoting intergenerational connections, cultural continuity, and social cohesion [26,27]. Participation in group activities, such as physical activity or joining clubs, enables older adults to remain active contributors to their communities, enhancing social capital and community resilience [24,28]. Such involvement supports personal resilience and functional independence among older adults. It also reinforces community sustainability by increasing social resources and potentially reducing healthcare burdens [29].

Residential context further shapes these experiences. Metropolitan, mid-sized, and rural areas offer different opportunities for leisure due to variations in infrastructure, service availability, transportation and community resources [30–33]. These differences influence both leisure participation and life satisfaction [34]. In metropolitan areas, older adults generally have access to a wider variety of leisure activities, including cultural events, sports facilities, and social clubs, due to better infrastructure and more diverse offerings [35]. Older adults in rural areas often have limited resources for leisure-time physical activity and fewer organized social activities, which can lead to increased isolation [36,37]. Mid-size urban areas fall somewhere in between, often offering a balance of opportunities but still facing challenges in providing comprehensive leisure options for older adults [38]. These contextual differences also shape how older adults engage in activities and whether they are able to maintain consistent participation over time. Ensuring equitable access to meaningful leisure opportunities across geographic settings therefore requires targeted, region-specific interventions and policies [39,40].

Since leisure engagement occurs within these environmental contexts, its association with life satisfaction may differ by region [41]. Understanding the impact of different types of leisure activities in later life on life satisfaction, along with regional differences, is crucial for establishing strategic directions that promote sustainable well-being through equitable

and inclusive leisure participation. It is also essential for policymakers and community leaders to develop targeted interventions that address specific regional needs and leverage local strengths [42]. By recognizing the impacts of leisure activities and regional variations, stakeholders can create more effective, inclusive, and sustainable leisure programs that cater to the unique needs of older adults in different settings [42]. This evidence-based approach is essential for ensuring equitable access to leisure opportunities, which in turn enhances life satisfaction and supports the development of age-friendly, sustainable communities across diverse regions [43]. However, empirical research on these interaction effects remains limited.

Little is known about the differences in the leisure–life satisfaction relationship between older adult cohorts. Shifts in digitalization and community infrastructure may alter leisure patterns and their effects on well-being. Understanding these changes is critical for designing sustainable and equitable policies that effectively support older adults [43]. However, previous research has given limited attention to cohort-to-cohort differences in the leisure–life satisfaction relationship [44,45]. Furthermore, few studies explore how geographic context, cohort-specific patterns, and personal characteristics collectively influence leisure engagement and related well-being outcomes [46]. These gaps highlight opportunities to advance knowledge through studies that compare multiple cohorts and examine regional differences while adjusting for key sociodemographic and health variables.

Activity theory suggests that religious and social activities provide stable and recurring social roles [47]. These roles are expected to produce stronger associations with life satisfaction than sports or cultural activities, which are often more episodic. Continuity theory adds that activities maintained from mid-life may offer the greatest benefits in later life [16]. Based on this perspective, the current study examines how residential area and different types of leisure activities relate to life satisfaction among older adults in South Korea. The study also assesses whether these associations—and their interaction patterns—differ between the 2012 and 2022 cohorts. Finally, the analysis explores whether residential context moderates leisure–life satisfaction relationships through differences in infrastructure [48] or through variations in social capital and community integration [49]. The research questions are as follows:

- R1.** *Do levels of life satisfaction differ by the residential area?*
- R2.** *Does life satisfaction differ according to the type of leisure activities in which older adults engage?*
- R3.** *Is there an interaction effect between residential area and leisure activity on life satisfaction?*
- R4.** *Do these patterns differ between the 2012 and 2022 cohorts of older adults?*

2. Materials and Methods

2.1. Materials

2.1.1. Data

This study utilized data from the Korean Longitudinal Study of Aging (KLoSA), a nationally representative panel survey that provides comprehensive information on the aging process of adults aged 45 and older in South Korea. Initiated in 2006, KLoSA is conducted biennially and collects extensive data on various aspects of aging, including health status, cognitive function, economic conditions, social relationships, and lifestyle factors [50]. Because the 2022 wave includes a refreshed sample that adds new participants, the present analysis compares two cross-sectional cohorts rather than tracking the same individuals. Thus, differences between 2012 and 2022 represent population-level cohort differences rather than within-person changes.

Data were obtained from the KLoSA website <https://survey.keis.or.kr/eng/klosa/klosa01.jsp> (accessed on 10 July 2025). The 2012 (4th wave) and 2022 (9th wave) datasets were used to compare patterns of leisure activity participation and life satisfaction between the two cohorts of older adults. All analyses applied sampling weights provided by KLoSA to adjust for unequal selection probabilities and nonresponse, ensuring population-level representativeness.

2.1.2. Sample Population

The analytic sample consisted of individuals aged 65 years and older from the 2012 (4th wave) and 2022 (9th wave) KLoSA cohorts. The 2012 cohort included 4134 respondents aged 65 and above, while the 2022 cohort included 4491 respondents. Differences in sample size reflect panel aging, attrition, and the addition of refreshed participants to maintain representativeness. This sampling structure supports a cohort-comparative examination of the associations between leisure activity participation and life satisfaction among older adults in South Korea. The large sample sizes in both cohorts provide robust statistical power and enhance the generalizability of the findings.

2.2. Methods

2.2.1. Variables

- Dependent variable: life satisfaction (0–100)

Life satisfaction was the dependent variable and was measured on a continuous scale from 0 to 100 points.

- Independent variable: frequency of leisure activity participation (0–10)

The independent variable was the frequency of participation in leisure activities, assessed across four types: religious meetings, social/friendship gatherings, alumni/hometown/kinship associations, and sports/cultural activities. Participation frequency was originally measured on a 10-point ordinal scale, ranging from 1 = almost daily (four or more times per week) to 10 = not at all, with intermediate points such as 2 = once per week, 3 = two to three times per week, 4 = once per month, and so forth. For analysis, this scale was reverse coded so that higher values indicate higher levels of participation. This approach is commonly applied in social science and aging research. Ordinal variables with four or more categories can be treated as continuous. This is especially appropriate when the variable's distribution is not severely skewed. Continuous treatment allows clearer interpretation of effect estimates. Simulation studies and methodological discussions support this practice as defensible and practical for variables with approximate linear relations and multiple categories [51–53]. However, researchers should be aware of the underlying assumptions and potential limitations.

- Moderate variable: region

To address possible regional differences in leisure activity participation and life satisfaction, separate regression analyses were performed for metropolitan, mid-sized city, and rural areas.

- Covariate

Based on previous findings [42,43], several demographic and health-related factors were incorporated as covariates to account for their impact on the relationship between leisure participation and life satisfaction. These covariates were sex, age, educational attainment, household size, assets, self-rated health, and instrumental activities of daily living (IADL). Age and household size were treated as continuous variables. Educational attainment was categorized into four groups: elementary school or below, middle school graduate, high

school graduate, and college graduate or higher. Household size was defined as the number of individuals currently living together in the respondent's household. Assets were measured as personal net assets, calculated by subtracting an individual's total liabilities from their total assets, reflecting respondents' overall financial standing. Self-rated health was measured on a 0–100 scale, with higher scores indicating better perceived health status. IADL was assessed using nine items reflecting functional ability in daily tasks (housework, meal preparation, laundry, short-distance outings, using transportation, shopping, managing finances, using the telephone, and taking prescribed medication on time). Each item was coded 1 = needs partial or full assistance and 0 = no assistance needed, and scores were summed to create a composite measure, with higher values representing greater functional limitations.

Some potentially relevant factors—such as marital status, living arrangements, chronic disease burden, and social network characteristics—were not included as covariates. Marital status and living arrangements overlap conceptually with household size and raise concerns about multicollinearity. Chronic disease measures also show conceptual and statistical overlap with IADL limitations. Social network indicators were not available in the KLoSA dataset. These omissions may produce residual confounding. Future studies should incorporate these variables when possible to strengthen causal inference.

2.2.2. Analysis Methods

Descriptive statistics, chi-square tests, independent samples *t*-tests, one-way ANOVA, and linear regression analyses were conducted to examine the general characteristics of the participants and to explore differences in leisure activity participation across key variables. For comparisons of leisure activity frequency by education level and residential area, Bonferroni-adjusted post hoc tests were applied following significant omnibus tests. To assess the main and interaction effects of leisure activity participation and residential area on older adults' life satisfaction, two-way analyses of covariance (ANCOVA) were performed, controlling for relevant demographic, socioeconomic, and health-related covariates. Prior to estimating the ANCOVA models, assumption checks were performed. Scatterplots of residuals confirmed linear relationships between leisure participation and life satisfaction across all activity types, supporting the treatment of leisure activity measures as continuous predictors. All analyses were conducted using IBM SPSS Statistics version 28.0. Perplexity Pro (Perplexity AI, San Francisco, CA, USA; accessed 2025) was additionally used to assist with information retrieval and analytical interpretation, and all outputs were reviewed and edited by the author.

3. Results

3.1. Participation Rates in Leisure Activity Type

Table 1 shows the participation rates in four leisure activity types among South Korean older adults in 2012 and 2022. Volunteer activities and political participation were excluded from analysis due to extremely low participation rates (volunteering: 0.05% in 2012, 0.04% in 2022; political activities: 0.12% in 2012, 0.76% in 2022). Chi-square tests were conducted to examine whether participation rates differed significantly between the two survey years. Religious activities significantly declined from 21.0% in 2012 to 15.2% in 2022 ($\chi^2 = 10.24$, $p < 0.001$). Social/friendship activities showed a slight increase from 49.2% to 51.6%, but this difference was not statistically significant ($\chi^2 = 3.06$, $p > 0.05$). Participation in alumni/hometown/family associations (9.4% in 2012; 12.4% in 2022) increased significantly ($\chi^2 = 4.09$, $p < 0.05$). Sports/cultural activities showed the increase, rising from 3.4% to 6.6%, although the difference did not reach statistical significance ($\chi^2 = 0.47$, $p > 0.05$). Overall, participation shifted away from religious activities while engagement in alumni/hometown/family associations grew, and social/friendship and sports/cultural activities remained relatively stable.

Table 1. Participation rate in leisure activity types during the past year by survey year.

Variables	2012 (<i>n</i> = 4134)	2022 (<i>n</i> = 4491)	χ^2
Religious activities, %	21.04	15.19	10.24 ***
Social/friendship activities, %	49.15	51.57	3.06
Alumni/hometown/family associations, %	9.41	12.45	4.09 *
Sports/cultural activities, %	3.39	6.57	0.47

* $p < 0.05$, *** $p < 0.001$.

3.2. General Characteristics of Participants by Leisure Activity

Tables 2 and 3 present the descriptive characteristics of older adults according to the frequency of participation in four types of leisure activities in 2012 and 2022. Several consistent patterns emerged across the two time points. In both years, women participated more frequently in religious activities (2012: $t = -7.17$, $p < 0.001$; 2022: $t = -6.10$, $p < 0.001$). Men consistently showed higher engagement in social/friendship activities (2012: $t = 4.64$, $p < 0.001$; 2022: $t = 2.43$, $p < 0.001$) and sports/cultural activities (2012: $t = 14.91$, $p < 0.001$; 2022: $t = 8.95$, $p < 0.001$). In 2022, men participated significantly more in alumni, hometown, and family associations compared to other groups ($t = 2.78$, $p < 0.01$).

A pronounced educational gradient was evident across leisure types. For social/friendship activities (2012: $X^2 = 8.45$, $p < 0.001$; 2022: $X^2 = 19.09$, $p < 0.001$), alumni/hometown/family association (2012: $X^2 = 8.16$, $p < 0.001$; 2022: $X^2 = 28.56$, $p < 0.001$), and sports/cultural activities (2012: $X^2 = 189.39$, $p < 0.001$; 2022: $X^2 = 80.58$, $p < 0.001$) participation increased stepwise from the lowest ($\leq$ elementary school) to the highest ($\geq$ college) educational level. In contrast, religious activity participation was highest among the least educated ($\leq$ elementary school) in both 2012 and 2022 (2012: $X^2 = 14.74$, $p < 0.001$; 2022: $X^2 = 2.43$, $p < 0.001$). Educational disparities were especially large for sports/cultural activities, and widened further in 2022, reflecting increasing inequality in active leisure engagement.

Self-rated health was positively associated with all leisure activity types in both years. Younger age, fewer IADL limitations, and greater personal assets were also related to more frequent leisure participation, although assets were not associated with religious activity. These demographic, socioeconomic, and health factors showed consistent associations with all four leisure types; however, the explanatory power of these models was very low ($R^2 = 0.001$ – 0.052). Although several associations reached statistical significance due to the large sample size, the small R^2 values indicate minimal practical relevance, as each factor explained less than 5% of variance in leisure participation. Therefore, multivariate models controlling for multiple predictors simultaneously are necessary to evaluate independent effects.

Regional patterns varied substantially by leisure type. Religious participation was consistently highest in rural areas (2012: $\chi^2 = 38.84$, $p < 0.001$; 2022: $\chi^2 = 19.72$, $p < 0.001$). Social/friendship activities also showed significant regional differences in both 2012 ($\chi^2 = 16.67$, $p < 0.001$) and 2022 ($\chi^2 = 5.77$, $p < 0.01$); however, post hoc tests indicated meaningful differences only in 2012, when rural residents participated more frequently than those in metropolitan and mid-sized cities. For alumni/hometown/family associations, regional differences were significant in both 2012 ($\chi^2 = 16.67$, $p < 0.001$) and 2022 ($\chi^2 = 13.09$, $p < 0.001$), but the pattern reversed over time: participation was highest in mid-sized cities in 2012, whereas metropolitan residents showed the highest involvement in 2022. Sports/cultural activities differed significantly across regions in both years (2012: $\chi^2 = 6.17$, $p < 0.001$; 2022: $\chi^2 = 16.99$, $p < 0.001$). The data from 2012 and 2022 indicate that mid-sized city residents among older adults maintain a consistent lead in participation rates for socially and physically engaging leisure activities compared to metropolitan and rural dwellers.

Table 2. General characteristics of participants by frequency of leisure activity participation in 2012 ($n = 4134$).

Predictor [Range]		All	Religious Activities		Social/Friends-Hip Activities		Alumni/Home-town/ Family Associations		Sports/Cultural Activities	
		M (SD), %	M (SD),	t, X^2, β (SE)	M (SD),	t, X^2, β (SE)	M (SD),	t, X^2, β (SE)	M (SD)	t, X^2, β (SE)
Covariate										
Sex	Man	42.50	1.22 (2.85)	−7.17 ***	3.80 (3.59)	4.64 ***	0.28	−0.01	0.93 (2.07)	14.91 ***
	Woman	57.50	1.92 (3.42)		3.26 (3.83)		0.28		0.14 (0.88)	
Education	≤Elementary school ^a	65.10	1.38 (3.01)	14.74 *** a < b < c = d	3.27 (3.82)	8.45 *** a < b < c = d	0.20 (1.29)	8.16 *** a < b < c = d	1.38 (0.94)	189.39 *** a < b < c < d
	Middle school ^b	13.10	1.80 (3.38)		3.84 (3.60)		0.34 (1.72)		0.59 (1.71)	
	High school ^c	15.40	2.14 (3.62)		3.82 (3.50)		0.38 (1.75)		1.22 (2.29)	
	≥College ^d	6.50	2.28 (3.62)		4.09 (3.74)		0.62 (2.15)		1.90 (2.72)	
Age [65–103 years old]		74.48(6.63)		−0.03 (0.01) *		−0.10 (0.01) ***		−0.06 (0.00) ***		−0.14 (0.00) ***
Household size [1–10 persons] ¹		2.48(1.32)		0.00 (0.00)		−0.02 (0.04)		−0.03 (0.02)		0.04 (0.02)
Assets [−38,000 K–251,000 K won]		12,799,420 (20,229,290)		0.01 (0.00)		0.06 (0.00) ***		0.06 (0.00) ***		0.02 (0.00) ***
Self-rated health [0–100 points]		49.84 (21.18)		0.08 (0.00) ***		0.20 (0.00) ***		0.06 (0.00) ***		0.19 (0.00) ***
IADL [0 to 10]		0.96 (2.49)		−0.08 (0.02) ***		−0.20 (0.02) ***		−0.06 (0.01) ***		−0.08 (0.01) ***
Moderator variable										
Region	Metropolitan ^e	40.00	2.01 (3.47)	38.84 *** e < f < g	3.31 (3.75)	16.67 *** e = f < g	0.43 (1.63)	16.67 *** (e = g < f)	0.50 (1.59)	6.17 *** (e = g < f)
	Mid-sized city ^f	29.60	1.74 (3.26)		3.21 (3.61)		0.33 (1.65)		0.57 (1.67)	
	Rural ^g	30.40	0.98 (2.64)		3.99 (3.81)		0.15 (1.10)		0.35 (1.37)	

Table 2. Cont.

Predictor [Range]	All	Religious Activities		Social/Friends-Hip Activities		Alumni/Home-town/Family Associations		Sports/Cultural Activities	
	M (SD), %	M (SD),	t, X^2, β (SE)	M (SD),	t, X^2, β (SE)	M (SD),	t, X^2, β (SE)	M (SD)	t, X^2, β (SE)
Dependent variable									
Life satisfaction [0–100 points]	56.29 (18.30)		0.07 (0.00) ***		0.19 (0.00) ***		0.06 (0.00) ***		0.18 (0.00) ***

M: mean, SD: standard deviation, SE: standardized error, * $p < 0.05$, *** $p < 0.001$. ¹: The valid sample size for the assets variable was 3119. Note: IADL [0–10] indicates the number of IADL limitations, ranging from 0 to 10. β values represent standardized regression coefficients from bivariate models regressing each leisure activity type on each predictor separately (not controlling for other variables). Letters (a–g) indicate the ordering of groups according to the post-hoc tests. R^2 values indicate the proportion of variance in leisure participation explained by each predictor alone.

Table 3. General characteristics of participants by frequency of leisure activity participation in 2022 ($n = 4491$).

Predictor [Range]		All	Religious Activities		Social/Friends-Hip Activities		Alumni/Home-Town/Family Associations		Sports/Cultural Activities	
		M (SD), %	M (SD),	t, X^2, β (SE)	M (SD),	t, X^2, β (SE)	M (SD),	t, X^2, β (SE)	M (SD)	t, X^2, β (SE)
Covariate										
Sex	Man	41.70	0.86 (2.44)	−6.10 ***	3.72 (3.54)	2.43 **	0.65 (2.25)	2.78 **	0.86 (1.90)	8.95 ***
	Woman	58.30	1.35 (2.94)		3.45 (3.71)		0.47 (1.93)		0.40 (1.39)	
Education	≤Elementary school ^a	45.80	0.87 (2.43)	13.5 *** a < b < c < d		19.09 *** a < b < c < d		28.56 *** a < b < c < d		80.58 *** a < b < c < d
	Middle school ^b	18.60	1.35 (2.97)							
	High school ^c	26.50	1.33 (2.92)							
	≥College ^d	9.20	1.58 (3.12)							
Age [65–years old]		76.14(7.60)		−0.05 *** (0.01)		−0.16 *** (0.01)		−0.07 *** (0.00)		−0.17 *** (0.00)
Household size [1–7 persons]		2.07(0.91)		0.04 * (0.05)		0.01 (0.06)		0.03 * (0.03)		0.04 ** (0.03)
Assets [−56,800 K–690,100 K won] ¹		25,807,810 (43,754,980)		0.02 (0.00)		0.07 *** (0.00)		0.15 *** (0.00)		0.14 *** (0.00)

Table 3. Cont.

Predictor [Range]		All	Religious Activities		Social/Friends-Hip Activities		Alumni/Home-Town/Family Associations		Sports/Cultural Activities	
		M (SD), %	M (SD),	<i>t</i> , χ^2 , β (SE)	M (SD),	<i>t</i> , χ^2 , β (SE)	M (SD),	<i>t</i> , χ^2 , β (SE)	M (SD)	<i>t</i> , χ^2 , β (SE)
Self-rated health [0–100 points]		57(19.65)		0.04 * (0.00)		0.26 *** (0.00)		0.03 * (0.00)		0.25 *** (0.00)
IADL [0–10]		0.90(2.34)		−0.06 *** (0.02)		−0.21 *** (0.02)		−0.06 *** (0.01)		−0.10 *** (0.01)
Moderator variable										
Region	Metropolitan ^e	39.5	1.36 (2.94)	19.72 *** e, f < g	3.59 (3.5)	5.77 **	0.73 (2.39)	13.09 *** e > f, g	0.76 (1.82)	16.99 *** f > g
	Mid-sized city ^f	32.3	1.24 (2.85)		3.32 (3.46)		0.48 (1.95)		0.56 (1.59)	
	Rural ^g	28.2	0.74 (2.28)		0.73 (2.39)		0.35 (1.67)		0.41 (1.39)	
Dependent variable										
Life satisfaction [0–100 points]		62.62(16.22)		0.03 (0.00)		0.20 *** (0.00)		0.01 (0.00)		0.23 *** (0.00)

M: mean, SD: standard deviation, SE: standardized error, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. ¹: The valid sample size for the assets variable was 3892. Note: IADL [0–10] indicates the number of IADL limitations, ranging from 0 to 10. β values represent standardized regression coefficients from bivariate models regressing each leisure activity type on each predictor separately (not controlling for other variables). Letters (a–g) indicate the ordering of groups according to the post-hoc tests. R^2 values indicate the proportion of variance in leisure participation explained by each predictor alone.

Mean life satisfaction increased from 56.29 (SD = 18.30) in 2012 to 62.62 (SD = 16.22) in 2022. Individuals with greater leisure participation generally reported higher life satisfaction. However, the overall explanatory power of the regression models was small (2012: R^2 ranging from 0.004 to 0.034; 2022: R^2 ranging from 0.001 to 0.052).

3.3. ANCOVA Results for Life Satisfaction by Leisure Frequency and Region

ANCOVA was conducted to examine the associations between residential area, leisure activity types, and life satisfaction in 2012 and 2022, while controlling for sociodemographic and health-related covariates (Table 4). Across both years, self-rated health emerged as the strongest predictor of life satisfaction (2012: $F = 1288.98$, $p < 0.001$, partial $\eta^2 = 0.294$; 2022: $F = 1739.18$, $p < 0.001$, partial $\eta^2 = 0.310$). Assets also showed significant but small effects (2012: $F = 26.84$, $p < 0.001$, partial $\eta^2 = 0.009$; 2022: $F = 34.24$, $p < 0.001$, partial $\eta^2 = 0.009$), along with IADL limitations (2012: $F = 11.22$, $p < 0.001$, partial $\eta^2 = 0.004$; 2022: $F = 14.31$, $p < 0.001$, partial $\eta^2 = 0.004$). Among sociodemographic covariates, education showed statistically significant but negligible effects in both years (2012: $F = 1.00$, $p < 0.05$, partial $\eta^2 = 0.003$; 2022: $F = 5.36$, $p < 0.05$, partial $\eta^2 = 0.001$). Sex was also significant with very small effect sizes (2012: $F = 7.66$, $p < 0.01$, partial $\eta^2 = 0.002$; 2022: $F = 3.53$, $p < 0.05$, partial $\eta^2 = 0.001$). Household size was significant only in 2012 ($F = 9.00$, $p < 0.01$, partial $\eta^2 = 0.003$) and non-significant in 2022 ($F = 3.45$, $p = 0.063$, partial $\eta^2 = 0.001$). Overall, although several covariates reached statistical significance, most showed small or negligible effect sizes, consistent with Cohen's benchmarks for small (0.01), medium (0.06), and large (0.14) effects. In contrast, self-rated health consistently demonstrated large effects (partial $\eta^2 = 0.294$ – 0.310), assets fell within the small range (partial $\eta^2 = 0.031$ – 0.042), and all leisure activity variables showed negligible effects (partial $\eta^2 < 0.005$).

Regarding main effects, residential area had statistically significant but very small associations with life satisfaction in both years (2012: $F = 5.96$, $p < 0.01$, partial $\eta^2 = 0.004$; 2022: $F = 5.39$, $p < 0.01$, partial $\eta^2 = 0.003$). Regarding the main effects of leisure activity types, religious activity was significantly associated with life satisfaction only in 2012 ($F = 6.11$, $p < 0.05$, partial $\eta^2 = 0.002$), while the effect was not significant in 2022 ($F = 1.25$, $p > 0.05$). In contrast, sports/cultural activities did not show statistically significant associations in either year (2012: $F = 0.68$, $p > 0.05$; 2022: $F = 2.69$, $p > 0.05$).

For interaction effects, almost all Region $\times$ Leisure Activity terms were not statistically significant in either year, indicating limited moderation by residential area. However, an exception emerged in 2022, the interaction between residential area and sports/cultural activities reached statistical significance ($F = 3.24$, $p < 0.05$, partial $\eta^2 = 0.002$). This suggests that, for sports/cultural activities in 2022, the association with life satisfaction varied modestly across metropolitan, mid-sized city, and rural areas. Despite this isolated effect, all other interaction terms in 2012 and 2022 were nonsignificant (all $F < 2.1$, partial $\eta^2 \leq 0.001$), indicating that the overall relationship between leisure participation and life satisfaction remained largely consistent across residential contexts over time.

Overall model explanatory power was stable across cohorts ($R^2 = 0.412$ in 2012; $R^2 = 0.419$ in 2022). Self-rated health accounted for most of the explained variance—approximately 71% in 2012 (partial $\eta^2/R^2 = 0.294/0.412$) and 74% in 2022 ($0.310/0.419$). Household assets contributed 7–10%, whereas all leisure activities combined explained less than 2% of the variance. This pattern highlights health status as the dominant determinant of life satisfaction among older Korean adults, with socioeconomic resources contributing modestly and leisure participation exerting minimal independent influence.

Table 4. ANCOVA of life satisfaction by leisure activity types and region (2012 and 2022).

Predictor	2012 (<i>n</i> = 3119)				2022 (<i>n</i> = 3892)			
	Df	SS	<i>F</i>	Partial η^2	df	SS	<i>F</i>	Partial η^2
Covariate								
Sex(ref = man)	1	1385.55	7.66 **	0.002	1	515.04	3.53	0.001
Education	1	1808.73	1.00 **	0.003	1	783.42	5.36 *	0.001
Age	1	39.12	0.22	0.000	1	221.07	1.51	0.000
Assets	1	4857.34	26.84 ***	0.009	1	5002.34	34.24 ***	0.009
Self-rated health	1	233,245.43	1288.98 ***	0.294	1	254,110.70	1739.18 ***	0.310
Household size	1	1628.80	9.00 **	0.003	1	504.66	3.45	0.001
IADL	1	2030.18	11.22 ***	0.004	1	2091.10	14.31 ***	0.004
Main effect								
Region	2	1078.66	5.96 **	0.004	2	787.03	5.39 **	0.003
Religious activity	1	1104.66	6.11 *	0.002	1	183.23	1.25	0.000
Social/friendship activity	1	2266.64	12.53 ***	0.004	1	553.38	3.79	0.001
Sports/cultural activity	1	123.55	0.68	0.000	1	392.60	2.69	0.001
Alumni/hometown/family associations	1	1519.80	8.40 **	0.003	1	2928.12	20.04 ***	0.005
Interaction effect								
Region $\times$ Religious activity	2	333.06	1.84	0.001	2	178.19	1.22	0.001
Region $\times$ Social/friendship activity	2	89.22	0.44	0.000	2	51.11	0.35	0.000
Region $\times$ Sports/cultural activity	2	114.78	0.63	0.000	2	472.64	3.24 *	0.002
Region $\times$ Alumni/hometown/family associations	2	124.25	0.69	0.000	2	99.04	0.68	0.000
Error	3097	180.95			3870	146.11		
Total	3119	11,501,500.00			3892	16,472,281.00		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note. Partial η^2 benchmarks following Cohen (1988) [54]: 0.01 = small effect, 0.06 = medium effect, 0.14 = large effect.

To further clarify the interaction effects, additional analyses were conducted. First, regional stratified regression models were estimated to examine the significant Region $\times$ Sports/Cultural Activity interaction observed in 2022 (Table 5). These models showed that sports/cultural participation was significantly associated with life satisfaction only in metropolitan areas ($\beta = -0.07$, $p < 0.001$), while the associations were nonsignificant in mid-sized cities ($\beta = -0.01$, $p > 0.05$) and rural areas ($\beta = 0.02$, $p > 0.05$). This pattern accounts for the modest but significant interaction identified in the ANCOVA results.

Second, pooled ANCOVA models were estimated using the combined 2012 and 2022 samples to assess cohort differences and Year $\times$ Leisure Activity interactions. Nearly all covariates, with the exception of sex, were significantly associated with life satisfaction. Self-rated health again explained the largest proportion of variance ($F = 3065.44$, $p < 0.001$, partial $\eta^2 = 0.305$), followed by assets, education, household size, and IADL limitations, which contributed small additional effects.

With respect to main effects, both year ($F = 29.70$, $p < 0.001$, partial $\eta^2 = 0.004$) and region ($F = 16.88$, $p < 0.001$, partial $\eta^2 = 0.005$) were significant, indicating differences in life satisfaction across cohorts and residential contexts. Among leisure activity types, religious activity ($F = 6.07$, $p < 0.05$, partial $\eta^2 = 0.001$), social/friendship activity ($F = 15.46$, $p < 0.001$, partial $\eta^2 = 0.002$), and alumni/hometown/family associations ($F = 35.64$, $p < 0.001$, partial $\eta^2 = 0.005$) showed significant positive associations with life satisfaction, whereas sports/cultural activities were not significant ($F = 0.17$, $p > 0.05$).

Table 5. Regional Stratified regression results for the association between sports/cultural participation and life satisfaction in 2022.

Predictor	Metropolitan			Mid-Sized City			Rural		
	B	S.E.	β	B	S.E.	β	B	S.E.	β
Constant	33.36	4.48		27.02	4.98		35.67	4.78	
Sex (ref = man)	−1.35	0.72	−0.41	−0.60	0.78	−0.02	−0.92	0.75	−0.03
Education	0.28	0.37	0.02	1.05	0.40	0.07 **	0.63	0.43	0.04
Age	−0.01	0.05	−0.00	0.05	0.06	0.02	0.03	0.05	0.02
Assets	2.911×10^{-5}	0.00	0.09 ***	2.103×10^{-5}	0.000	0.07 **	3.047×10^{-2}	0.00	0.08 **
Self-rated health	0.50	0.02	0.61 ***	0.52	0.02	0.59 ***	0.42	0.02	0.55 ***
Household size	0.31	0.36	0.02	0.08	0.40	0.01	0.59	0.44	0.03
IADL	−0.30	0.18	−0.04	−0.53	0.20	−0.07 **	−0.45	0.17	−0.07 **
Sports/cultural activity	−0.46	0.13	−0.07 ***	−0.06	0.18	−0.01	0.15	0.21	0.02
R ²	0.43			0.42			0.36		
F	136.16 ***			108.55 ***			80.39 ***		

** $p < 0.01$, *** $p < 0.001$.

Two Year $\times$ Leisure Activity interaction terms reached statistical significance: Year $\times$ Religious Activity ($F = 4.08$, $p < 0.05$, partial $\eta^2 = 0.001$) and Year $\times$ Sports/Cultural Activity ($F = 9.69$, $p < 0.01$, partial $\eta^2 = 0.001$). These results indicate cohort differences in the associations of religious and sports/cultural participation with life satisfaction. In contrast, interactions involving social/friendship and alumni/hometown/family activities were not significant, suggesting stability in these relationships across cohorts.

The pooled model showed strong explanatory power ($R^2 = 0.432$), with self-rated health accounting for the majority of explained variance (partial $\eta^2 = 0.305$). Assets, IADL limitations, and education contributed modest shares, whereas all leisure activity variables combined explained less than 2% of variance. This distribution demonstrates that health status is the primary determinant of life satisfaction among older adults, with leisure participation exerting only minimal independent effects (Table 6).

Table 6. ANCOVA of life satisfaction by leisure activity types and year.

Predictor	Df	SS	F	Partial η^2
Covariate				
Sex(ref = man)	1	29.79	0.18	0.000
Education	1	2443.84	15.09 ***	0.002
Age	1	113.31	7.00	0.000
Assets	1	8394.37	51.82 ***	0.007
Self-rated health	1	496,534.84	3065.44 ***	0.305
Household size	1	1999.56	12.35 ***	0.002
IADL	1	4253.05	26.26 ***	0.004
Main effect				
Year	1	4810.84	29.70 ***	0.004
Region	2	2733.49	16.88 ***	0.005
Religious activity	1	982.70	6.07 *	0.001
Social/friendship activity	1	2504.90	15.46 ***	0.002
Sports/cultural activity	1	27.21	0.17	0.000
Alumni/hometown/family associations	1	5772.18	35.64 ***	0.005
Interaction effect				

Table 6. Cont.

Predictor	Df	SS	F	Partial η^2
Year $\times$ Religious activity	1	660.26	4.08 *	0.001
Year $\times$ Social/friendship activity	1	577.37	3.56	0.001
Year $\times$ Sports/cultural activity	1	1570.23	9.69 **	0.001
Year $\times$ Alumni/hometown/family associations	1	56.45	0.35	0.000
Error	6993	1,132,551.18		
Total	7011	27,973,781.00		

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Note. Partial η^2 benchmarks following Cohen (1988) [54]: 0.01 = small effect, 0.06 = medium effect, 0.14 = large effect.

4. Discussion

Comparing the 2012 and 2022 cross-sectional cohorts revealed differences in the strength of leisure–life satisfaction associations. Overall, associations were weaker in the 2022 cohort than in the 2012 cohort, with most leisure activity types showing nonsignificant relationships by 2022. Because the analyses compare partially overlapping cohorts rather than tracking individuals longitudinally, these cohort differences may reflect birth cohort characteristics, period-specific conditions, or changes in sample composition rather than temporal trends within the older adult population.

Despite these cohort differences, socially embedded activities—such as social/friendship activities and alumni/hometown/family associations—maintained small but significant associations with life satisfaction across both cohorts. Socioemotional selectivity theory posits that older adults increasingly prioritize emotionally meaningful relationships. Social capital perspectives likewise emphasize the importance of maintaining supportive social networks, reinforcing social identities, and accessing both emotional and instrumental support. These mechanisms may explain why socially embedded activities persist as small but consistent predictors of well-being, whereas more episodic activities such as sports or cultural participation did not show significant associations in either cohort.

These results align with international evidence demonstrating that the benefits of leisure participation vary by activity type, cultural context, and regional opportunity structures [17,55]. European study, for instance, finds that social and cultural engagement contributes positively to well-being, but the effect size is modest once socioeconomic factors are controlled [56]. Japanese research similarly reports that the association between leisure and subjective well-being is strongest for socially integrative activities, while the impact of general participation frequency is relatively limited [57]. Studies in Canada indicate that access to community resources and transportation infrastructure often explains regional disparities in leisure participation more strongly than individual motivation [58,59]. These international patterns reinforce the conclusion that leisure’s benefits are context-dependent, modest in magnitude, and particularly tied to socially embedded forms of participation.

By 2022, most leisure–life satisfaction associations were nonsignificant, and self-rated health emerged as the most influential predictor, demonstrating the largest effect sizes across all covariates. Personal assets also maintained small but consistent associations across both cohorts. These results indicate that health and economic conditions play a substantially greater role in shaping life satisfaction than leisure participation. Several unmeasured factors may help explain the weaker leisure–life satisfaction associations observed in the 2022 cohort. Improvements in overall health may have reduced the incremental benefit of leisure, and cohort shifts in leisure preferences may also contribute to this pattern. In addition, traditional KLoSA categories may not fully capture newer or more individualized forms of leisure that are increasingly common among recent cohorts. However, such possibilities cannot be tested with the current cross-sectional cohort design.

Future research is needed to examine whether differences in health status, economic circumstances, or emerging leisure forms—such as digital or individualized activities—account for the diminished associations.

The much larger effect of self-rated health (partial $\eta^2 = 0.294$ – 0.310) compared with leisure participation (partial $\eta^2 < 0.005$) suggests that some of the observed leisure–life satisfaction associations may reflect health-related confounding. Individuals with better health are more likely to engage in leisure activities and also report higher life satisfaction. Thus, even with health controlled as a covariate, residual confounding may remain. Individuals with better health may be both more able to participate in leisure activities and more likely to report higher life satisfaction. Longitudinal analyses that examine whether changes in leisure participation predict subsequent changes in life satisfaction—while controlling for baseline health—would help clarify these reciprocal relationships.

Despite overall modest associations, socially oriented activities remained consistently relevant. Social/friendship activities and alumni/hometown/family associations showed significant positive associations with life satisfaction in both years, with the latter increasing in 2022. These findings align with international research indicating that socially embedded leisure activities have the strongest impact on well-being in later life [5,17]. In contrast, religious and sports/cultural activities showed weaker or less consistent associations with life satisfaction. Most leisure $\times$ region interactions were nonsignificant, indicating stability in leisure–well-being relationships across metropolitan, mid-sized, and rural areas. In 2022, sports and cultural activity participation showed a weak negative association with life satisfaction only among metropolitan residents. This localized pattern suggests that, within the metropolitan context, higher frequency of sports and cultural activities may not necessarily translate into greater life satisfaction; however, the effect size is very small, and caution is warranted in generalizing this finding.

Policy implications should align with the empirical results. Health status and household assets were far stronger predictors of life satisfaction than leisure participation [60]. Therefore, policies should prioritize reducing health inequalities and improving economic security for older adults. Leisure activities showed only small effects. Socially embedded activities had consistent but minimal associations, indicating that leisure alone cannot meaningfully raise life satisfaction. Even so, community-based leisure opportunities may support physical, cognitive, and social engagement [10,14–17,19,61]. For this reason, reducing regional gaps in leisure access can still be justified on equity grounds. Such efforts should complement—not replace—health and economic interventions. Leisure policy should support broader healthy aging rather than serve as a primary strategy for improving life satisfaction.

Several limitations should be acknowledged. First, although trained interviewers administered the survey, all variables were self-reported. This reliance on a single source may introduce common method bias. Second, the 2022 wave included a refreshed sample. As a result, the study compares cross-sectional cohorts rather than within-person changes. Sample refreshment may also produce composition differences. New 2022 entrants may differ from continuing panel members in health, socioeconomic stability, or leisure histories. Such differences may bias cohort comparisons even after weighting. True longitudinal tracking of the same individuals would address this limitation. Third, survivor bias may be present because healthier or more socially active respondents are more likely to remain in the panel. Fourth, although sampling weights were applied, no sensitivity analyses assessed the impact of missing data, attrition, or alternative model specifications. Fifth, regional categories (metropolitan, mid-sized city, rural) were based on administrative classifications. Other schemes—such as population density or infrastructure accessibility—could yield different patterns. Future studies should test the robustness of

results using alternative regional definitions. Sixth, the cross-sectional design prevents causal inference. Life satisfaction may influence leisure participation as much as leisure influences satisfaction. Individuals with higher satisfaction may have more energy, motivation, or social resources to engage in activities. Longitudinal analyses assessing how changes in leisure relate to subsequent changes in satisfaction would help clarify these bidirectional relationships. Finally, leisure participation was measured only by frequency within activity types. Qualitative aspects such as enjoyment, meaning, or relationship quality were not captured. Unmeasured factors—such as personality, social networks, or local resources—may also affect both leisure and well-being. Including digital, home-based, and individualized leisure activities in future surveys would better reflect contemporary engagement patterns. Cultural context is another limitation. These findings reflect older adults in South Korea and may not generalize to countries with different social norms, family structures, or policy environments.

5. Conclusions

Mean life satisfaction was higher in the 2022 cohort than in the 2012 cohort, which may reflect improved living conditions, health status, or cohort-specific characteristics rather than within-person changes. Among leisure activity types, only socially embedded activities—such as social or friendship gatherings and alumni or hometown associations—showed small but consistent positive associations with life satisfaction in both cohorts. Other activities, including religious and sports/cultural participation, showed inconsistent or non-significant effects. Residential area did not substantially moderate these associations. Overall, the findings indicate that health promotion and economic security are the primary drivers of life satisfaction among older Korean adults. Leisure plays a modest supplementary role. Policies may selectively support community-based social activities that foster meaningful interpersonal connections, while recognizing that improvements in health and economic conditions remain essential for enhancing well-being.

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