Health-Related Quality of Life and Psychological Wellbeing Among Residents in a Rural Area - 2019 Community Health Survey

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ABSTRACT

Objectives: This research attempted to analyze the health-related behavior of rural residents, life satisfaction, symptoms of melancholy, and Health-related quality of life with respect to characteristics of social capital.

Methods: A secondary analysis of the raw data from the 2019 Community Health Survey was conducted, which examined the health behavior, social capital, symptoms of melancholy, life satisfaction, and Health affecting life of residents in a city in Korea.

Results: The effect of education level, marital status, and average income on life satisfaction was explored. Melancholy was higher in female subjects aged 75 or older, with low education and income, and without a spouse. A positive effect on Health-related quality of life was found in subjects with high subjective health levels and no chronic diseases. Religion, friendship, and leisure activities influenced life satisfaction. The higher the social capital, the lesser the Melancholic symptoms level, and the higher the life satisfaction index.

Conclusions: There is a need to develop social welfare programs that can help form social networks and social programs involving economic activities to improve the quality of life of the elderly.

Keywords: Health-related Quality of life, General health status, Social capital, Life satisfaction, Melancholy.

1. INTRODUCTION

In an aging society with a low birth rate, the average life expectancy has recently increased due to an increase in income and advances in medical technology. This puts the awareness of health on living a heal their life even with chronic diseases rather than treating the disease (Lee & Bin, 2011). Hence, this was viewed as a Health-related quality of life referring to maintaining social health, body, mind not simply disease-free (Park et al., 2016). In addition, there is a common concept in the local community that the health of residents commonly refers to life in old age (Lee & Bin, 2011), and a trend exists that places more importance on the health-related quality of life. Among the factors that determine the health-related quality of life, it can be explained that the health level of the local environment is generally affected by individual characteristics of local population members and environmental factors such as the physical environment and socio-economic environment of the region (Lee, 2004). Recently, many health institutions have been conducting projects to explore disease prevention in the region to improve the community's health. To perform effective projects that promote community health, it is necessary to accurately determine the community's health level and establish a strategy based on the results (Ko et al., 2019; Zhang, 2020).

In Korea, a Community Health Survey (CHS) is a representative of health statistics for establishing a regional health business plan. The CHS refers to the Health Statistics Act, which directly surveys about 900 citizens based on questions on the health behaviors of residents aged 19 years or older. Using this in the process of establishing policies to address health disparities is improving the efforts to find causes and alternatives to health disparities in subregional units of living areas beyond cities (An et al., 2015). The quality of life in a community is a pluralistic yet comprehensive concept that varies depending on the individual researcher's unique

perspective and purpose. Johnson, McCauley, and Copley (1982) and Lee et al. (2007) referred to this as a state of subjective satisfaction and well-being expressed or experienced by individuals in physical, social, and economic situations (Cameron et al., 2000; Lee et al., 2007). According to Homes and Dickerson (1987), It is a compound word that refers to the influence of mental, social, and physical factors. (Holmes & Dickerson, 2003). In the previous studies that analyzed factors related to the quality of life, it was found that economic level (Chung, 2004; Lee and Cho 2019), self-esteem and family support (Hwang, 2002), physical function (Jiang, 2004), and melancholy (Kim et al., 2006) affect the quality of life. Health-related quality of life at the individual level has been shown to improve the efficiency of individuals and society in terms of social support, capital, health, and socioeconomic status (Kim et al., 2015). Social capital, which individuals develop through social relationships, positively affects the quality of life by reducing stress and enhancing coping skills through networking, trust, and social participation (Hur & Cho, 2017). In addition, exchanges and relationships pertaining to social capital in rural areas are more important than in urban areas; this factor has a greater impact on Health-related quality of life (Castle, 2002). EQ-5D can identify Health affecting problems of residents at the community level and help establish health promotion plans such as necessary resources and their distribution and the community intervention methods (Jeong et al., 2015). EQ-5D calculates the EQ-5D index, which is a Health-related quality of life score, by giving weightage to each of the measurement values of the five items. Although many studies have found related factors in the individual unit analysis, EQ-5D at the regional level literature identifies the regional variation in the 5D index, and the related factors have not been adequately explored.

Therefore, to understand the factors influencing the quality of life, this research uses the raw data of the 2019 CHS conducted in Korea to analyze the health behaviors of residents and their life satisfaction, considering social capital, symptoms of melancholy, and Health-related quality of life of rural residents. Hence, I/we intend to provide basic data for developing effective intervention programs to improve the health-related quality of life of the residents.

2. OBJECTIVES

The specific purpose of this research was as follows:

- First, to identify the general characteristics, health behavior, and social capital of residents.
- Second, to identify the general characteristics of residents, health behaviors, and differences in symptoms of melancholy, life satisfaction, and Health-related quality of life (EQ-5D index) according to the social capital.
- Third, to identify the relationship between symptoms of melancholy, life satisfaction, and health-related quality of life of the local residents.
- Fourth, to identify factors that affect the health-related quality of life of the residents.

3. METHODS

3.1. Investigation Design

This research was a secondary analysis of the raw data from the 2019 Community Health Survey (Community Health Survey, 2019), which examined the health behavior, social capital, symptoms of melancholy, life satisfaction, and health affecting life of residents in a city in Korea. This cross-sectional descriptive research identified the quality characteristics and analyzed the major factors affecting the health-related quality of life.

3.2. Subjects of Investigation

The raw data of the 2019 Community Health Survey (CHS) presented the data of the subjects surveyed at a public health center in a city in Korea.

In This research, the subjects were selected according to the sample design of the community health survey. First, adults aged 19 years or older were selected as the population. Second, they were divided by housing type in the region. Third, a sampling frame was created by linking the population data and the housing data of the Ministry of Land, Infrastructure, and Transport. Finally, after sampling points were extracted by the first-order probability proportional phylogenetic extraction, the final sample was extracted using the second-order systematic sampling (Sohn, 2006). Therefore, 892 people living in a city in Korea who participated in the 2017 Community Health Survey were selected as the final investigation subjects.

3.3.RESEARCH TOOLS

3.3.1.   Characteristics: General, Health to Related, and Social Capital

Based on the literature review, some of the items of the health questionnaire of the 2019 Community Health Survey were selected for This research. Age, gender, education, marital, earnings per month, and the number of family members were selected as general characteristics of the subjects. The Education level was classified into elementary school and below, middle school, high school, and university or higher based on their graduation status.

The health affecting characteristics of the subjects were selected based on smoking, drinking, exercise, subjective health status, and diagnosis of hypertension and diabetes. Smoking was classified into lifetime smoking amount, current smoking amount, and age at which smoking started. Information pertaining to drinking lifelong drinking status, age at which the individual started drinking, drinking status in the last year, frequency of drinking, and amount of alcohol consumed at one time was considered. With respect to exercise, the number of days of moderate physical activity and the number of days of walking in the last week were selected. Social capital characteristics of the subjects included "religious activities," "social activities," "leisure activities," "charity activities," "frequency of contact with comparatives including family," "frequency of contact with neighbors," and "frequency of contact with friends." "Contact frequency" was categorized into: "less than once a month," "once a month," "2-3 times a month," "once a week," "2-3 times a week," and "every week." It was measured by classifying it as "more than 4 times." The higher the score, the higher the social capital.

3.3.2.   Symptoms of Melancholy

Symptoms of melancholy were determined by analyzing the response to the question, "In the past 2 weeks, how often have you had these nine symptoms: interest, melancholy, sleep disturbance, fatigue, appetite, unhappiness, difficulty concentrating, anxious behavior, and self-abasement, that interfere with your daily life? The responses were marked on a 4-point scale: "not at all," "for several days," "more than a week," and "almost every day," and the score ranged from 9 to 36; the higher the score, the higher was the degree of melancholy.

3.3.3.   Life Satisfaction

In response to the question "How satisfied are you with your recent life?" the items sought responses on a 10-point scale: ranging from "very unsatisfactory" to "very satisfied." The score ranged from 0 to 10, with higher scores indicating higher life satisfaction.

3.3.4.   Health-Related Quality of Life.

For exploring the health -related quality of life, the raw data from the CHS measured by the Korean version of the Euro-QoL 5-dimension 3 level (EQ-5D-3L) tool of EQ-5D-3L developed by the Euro QoL group was used. The EQ-5D-3L tool is configured to evaluate the health -related quality of life through the five dimensions: motor skills, self-care, daily activities, pain or discomfort, and anxiety or melancholy in. The five dimensions are measured on a scale of 1 for "no problem," 2 for "some problems," and 3 for "severe problems." The EQ-5D-3L index scores were calculated by applying the weightage recommended in the raw data of the CHS. In the formula below, M refers to the motor ability, SC to self-care, UA to daily activity, PD to pain or discomfort, and AD to anxiety or melancholy.

The number 2 or 3 after each letter represents the response level for each domain. If there was at least one level, the values were substituted as follows: 1 for 2 or 3, 0 for other cases, and 1 for N 3 and 0 for the rest of the values. The score with respect to the five domains (exercise ability, self-care, daily activities, pain or discomfort, and anxiety or melancholy) was calculated; the closer the score was to 1, the better an individual's state of health. The reliability values of Lee's (2011) investigation, which evaluated the reliability and validity of the Korean version of the EQ-5D-3L tool for the general public, were OPA (overall percent agreement) 79-97%, Kappa value 0.32-0.64, continuous variable EQ- The ICC values of the 5D-3L index were 0.65 and 0.61.EQ-5D 3L index=1 - (0.050 + 0.096*M2 + 0.418*M3 + 0.046*SC2 + 0.136*SC3 + 0.051*UA2 + 0.208*UA3 + 0.037*PD2 + 0.151*PD3 + 0.043*AD2 + 0.158*AD3 + 0.050*N3).

3.4. Data Collection

The 2019 CHS used in This research is a national sample survey conducted annually in 17 cities and provinces with the target population of all adults aged 19 and older (Sohn, 2006). The community health survey has a standardized survey implementation system to establish and evaluate the community health care plan by assessing the health status of the residents. For data collection, a household selection notice was sent to the selected households, and then trained surveyors visited the households. The purpose of the investigation and the community health survey was explained to the subjects, and an electronic survey installed on a laptop computer was used. Data were collected using the face-to-face survey method, through individual survey questionnaires for the household members and a household survey to which only one representative of the household had to respond.

3.5. Data Analysis

The data collected in This research were analyzed using the SPSS/WIN 28.0 program.

First, descriptive statistical analysis was carried out using the data pertaining to the general, health to related, social capital characteristics, symptoms of melancholy, life satisfaction, and Health-related quality of life of the subjects.

Second, the difference between the subject's general characteristics, Health-related characteristics, and Health-related quality of life according to social capital characteristics was analyzed through an independent t-test and one-way analysis of variance (ANOVA) using a composite sample.

Third, the correlations between the symptoms of melancholy, life satisfaction, and Health-related quality of life were determined by Pearson's method.

Fourth, the factors affecting Health-related quality of life were analyzed through Multiple Linear Regression Analysis.

3.6. Ethical Considerations for Research

According to the regulations pertaining to the raw data disclosure procedures of the Korea Centers for Disease Control and Prevention, a written oath related to the use of raw data was prepared, and a data use plan was prepared to procure the raw data. The CHS complies with the Personal Information Protection Act and the Statistical Act, and the public data were provided to the researchers after deleting the private information pertaining to the subjects, and the data could be downloaded in a de-identified state.

4. RESULTS

4.1. Differences in life satisfaction, melancholy, and Health-related quality of life according to the general characteristics of the subjects.

The average age of the subjects was 53.04 years, and the average life satisfaction index was 7.10 (SD±1.68) points. Subjects aged 19-44 years had the highest score of 7.24 (SD±1.50) points, which was statistically insignificant. (F = 1.63, ρ = .180). Subjects with "graduation degree or higher" were more likely higher than subjects with "no education" and subjects with "no elementary school education" (F = 6.03, ρ < .001), and subjects who were "married" were more higher than subjects who were "widowed" (F = 4.78, ρ = 4.78) in life satisfaction level. The subjects with the income "5,000,000-7.99 million won" and "8,000-9,990,000 won" were statistically significantly higher than those with "0-990,000 won" and "1,000-2.99 million won" in average earnings per month (F = 6.54, ρ < .001) in life satisfaction level. With respect to the number of family members, "4" subjects were statistically significantly higher than "1" and "3" subjects (F=3.61, ρ=.003) in life satisfaction level (Table 1).

The average score on the melancholy index was 11.81 (SD = 3.76); the average score of females was 12.44 (SD±4.07), and that of males was 11.10 (SD±1.07); the average score of females (t = -5.45, ρ = < .001) was significantly higher than males. With respect to age, "75 years old or older" subjects had a statistically significantly higher level of melancholy than "45-64 years old" subjects (F=3.18, ρ=.023). In the education level, "no education" subjects had a statistically significantly higher level of melancholy than "middle school graduate," "high school graduate," "university graduate," and "graduate school" and subjects who had graduated from elementary school had a statistically significantly higher level of melancholy than subjects who graduated from graduate school (F=4.19, ρ<.001). Subjects who were "divorced" or "widowed" were more likely higher than subjects who were "married" in the level of melancholy (F=4.52, ρ<.001). Subjects with "0-990,000 won" average

household income per month had a statistically significantly higher level of melancholy than subjects with "5,000-7.99 million won" and "8,000-9.99 million won" (F = 3.60, ρ = .003). However, there was no statistically significant difference between the groups with respect to the number of family members (F = 1.75, ρ = .121) (Table 1).

The average Health related quality of life score of the subjects was 0.89 (SD ± 0.13), and males scored 0.91 (SD ± 0.07) and females 0.87 (SD ± 0.13), which score of males being significantly higher than females (t = 5.73, ρ = <.001). Health related quality of life score of the subjects was statistically significantly higher in the order of "19-44 years old" subjects, "45-64 years old" subjects, "65-74 years old" subjects, and "75 years old or older" subjects (F=57.67, ρ<.001). As for education level, Health related quality of life score of the "middle school graduate," "high school graduate," "university graduate," "junior college graduate," and "graduate school graduate" subjects had a statistically significantly higher than "elementary school graduate" and "no school."

Table 1: General Characteristics of Community Participants (N = 892)

Characteristics	Categories	n	%	Satisfaction of Life M±SD	Satisfaction of Life t or F (ρ)	Melancholy M±SD	Melancholy t or F (ρ)	Health-related Quality of Life M±SD	Health-related Quality of Life t or F (ρ)
Gender	Male	416	46.6	7.14±1.69	0.65 (.051)	11.10±1.07	-5.45 (<.001)	0.91±0.07	5.73 (<.001)
	Female	476	53.4	7.07±1.68		12.44±4.07		0.87±0.13	
	Total	892	100.0	7.10±1.68		11.81±3.76		0.89±0.11	
Age (Years)	19-44[a]	269	30.2	7.24±1.50	1.63 (.180)	11.92±3.82	3.18 (.023) b<d†	0.93±0.04	57.67 (<.001) d<c<b<a
	45-64[b]	396	44.4	7.11±1.71		11.56±3.42		0.91±0.09	
	65-74[c]	115	12.9	6.86±1.76		11.56±3.70		0.87±0.14	
	>=75[d]	111	12.5	6.96±1.87		12.76±4.67		0.78±0.18	
	M±SD	53.04±17.03							
Education	Never attended school[a]	35	3.9	6.63±1.96	6.03 (<.001) a,b<g	14.41±5.14	4.19 (<.001) a<c,d,f,g b<g	0.74±0.22	30.19 (<.001) a<b<c,d,e,f,g c<f
	Elementary school[b]	120	13.5	6.79±1.83		12.78±4.70		0.83±0.16	
	Middle school[c]	95	10.7	6.92±1.69		11.71±3.14		0.88±0.10	
	High School[d]	288	32.3	7.10±1.74		11.66±3.52		0.91±0.10	

	College[e]	89	10.0	6.92±1.63		11.78±3.27		0.93±0.04	
	University[f]	226	25.3	7.32±1.47		11.50±3.65		0.93±0.06	
	Graduate School[g]	39	4.4	8.03±1.31		10.03±2.33		0.94±0.03	
Marital Status	Married[a]	612	68.6	7.25±1.60	4.78 (.001) d<a	11.49±3.36	4.52 (.001) a<b,c	0.90±0.10	19.58 (<.001) c<a,b,e
	Divorced[b]	40	4.5	6.60±2.02		13.35±4.55		0.88±0.10	
	Bereaved[c]	92	10.3	6.73±1.92		12.78±4.80		0.81±0.18	
	Separated[d]	17	1.9	6.47±1.37		11.47±3.00		0.88±0.12	
	Single[e]	131	14.7	6.88±1.69		12.22±4.34		0.93±0.04	
Average monthly income of households (Ten thousand won)	0-99[a]	94	10.5	6.72±2.01	6.54 (<.001) a,b<d,f	12.88±4.90	3.60 (.003) d,e<a	0.84±0.14	17.01 (<.001) a<c,d,e,f b<c,d
	100-299[b]	313	35.1	6.81±1.73		12.10±3.91		0.87±0.15	
	300-499[c]	228	25.6	7.19±1.58		11.63±3.74		0.91±0.07	
	500-799[d]	195	21.9	7.45±1.47		11.44±3.04		0.93±0.04	
	800-999[e]	27	3.0	7.33±1.69		10.26±2.09		0.93±0.03	
	Over 1000[f]	35	3.9	7.91±1.29		11.06±3.13		0.94±0.01	
	M±SD	358.8±252.1							
	Number of basic livelihood recipients	20	2.2						
Number of family members	1[a]	169	18.9	6.96±1.92	3.61 (.003) a,c<d	11.92±3.71	1.75 (.121)	0.88±0.11	4.83 (<.001) a,b<d
	2[b]	333	37.3	7.05±1.66		11.85±3.99		0.88±0.13	

3[c]	188	21.1	6.89±1.65		12.26±4.19	0.91±0.11
4[d]	147	16.5	7.50±1.40		11.13±2.68	0.92±0.06
5[e]	41	4.6	7.37±1.71		11.34±3.37	0.92±0.06
6[f]	14	1.6	8.00±1.41		12.50±3.18	0.94±0.04

Subjects, and "university graduate" subjects had a statistically significantly higher level of the health-related quality of life than "middle school graduate" subjects (F =30.19, ρ<.001). The subjects who were "widowed" in marital status were higher level of the health-related quality of life than those who were "married," "divorced," or "single" (F = 19.58, ρ < .001). The subjects who have "3million-4million won" and "5million - 7.99 million won, "8 million to 9.99 million won," and "10 million won or more" in the average household income per month were statistically significantly higher level of the health-related quality of life than those having an income of "0 to 990 thousand won", and the subjects who have "3 million to 4.99 million won," "5 million to 7.99 million won" in the average household income per month were statistically significantly higher than those having an income of "1,000,000-2,990,000 won" (F = 17.01, ρ = <.001). The subjects who have "4" number of family members were statistically significantly higher than those having "1" or "2" number of family members (F=4.83, ρ=<.001) (Table 1).

4.2. Differences in life satisfaction, melancholy, and Health-related quality of life with respect to Health affecting characteristics.

With respect to smoking, 536 subjects (60.1%) never smoked, 343 (38.5%) smoked 5 packs (100 cigarettes) or more, and 13 (1.5%) smoked less than 5 packs of cigarettes. As for the extent of smoking currently, 185 subjects (52.0%) smoked in the past but had currently quit, 157 subjects (44.1%) smoked daily, and 14 (3.9%) subjects smoked occasionally. The average age at which the subjects' started smoking was 20.2 (SD±4.6) years (Table 2). As for the drinking characteristics of the subjects, 773 subjects (86.7%) drank more than one drink during their lifetime, and 621 subjects (80.3%) drank alcohol during the last year. With respect to the liquor consumption frequency per year, 196 people (31.6%) drank 2-4 times a month, 157 people (25.3%) drank less than once a month, and 132 people consumed 2-3 times a week (21.3%), 83 people (13.4%) drank about once a month, and 53 people (8.5%) consumed it more than 4 times a week. The amount of alcohol consumed per intake was 1-2 cups by 204 people (32.9%), 7-9 cups by 123 people (25.2%), 3-4 cups by 122 people (19.6%), 5-6 cups by 62 (10.0%) (Table 2).

With respect to the motor activities of the subjects, As the number of days of moderate physical activity during the last week, 589(66.0%) subjects practiced 0 days, 64(7.2%) subjects practiced 3 days, 63(7.1%) subjects practiced 2 days, 47(5.3%) subjects practiced 1 days, 41 (4.6%) subjects practiced 0 days, 31(3.5%) subjects practiced 4 days, , 24(2.7%) subjects practiced 6 days, and 33(3.7%) subjects practiced 7 days. As for the number of days that they practiced walking for more than 10 minutes during the last week, 186(20.9%) subjects practiced 7 days, 171(19.2%) subjects practiced 0 days, 137(15.4%) subjects practiced 0 days, 113(12.7%) subjects practiced 2 days. 109(12.2%) subjects practiced 5 days, 85 (9.5%) subjects practiced 4 days, 37(4.1%) subjects practiced 6 days and 54(6.1%) subjects practiced 1 day.(Table 2).

The subjective health level of the subjects was "normal" for 420 (47.1%), "very good" for 61 (6.8%), "good" for 237 (26.6%), and 298 (33.4%) had good or better health; however, 123 people (13.8%) had "bad health" and 51 people (5.7%) had "very bad health," and 174 people (19.5%) had "less than bad health". There were 249 subjects (27.9%) who were diagnosed with hypertension, and 113 subjects (12.7%) were diagnosed with diabetes (Table 2).

The Health affecting characteristics that showed a statistically significant difference in the life satisfaction of the subjects were "subjective health level," "subjects diagnosed with hypertension and diabetes". Life satisfaction was statistically significantly higher in the order of the subjective health level, that is, "very good," "good," "average," "poor," and "very poor" (F = -2.17, ρ = .030). Subjects diagnosed with hypertension had significantly lower life satisfaction than subjects without hypertension (t = -2.17, ρ = .03), and subjects diagnosed with diabetes had significantly lower life satisfaction than subjects without diabetes (t = -2.35, ρ = .019).

Statistically significant difference in the melancholy of the subjects were observed with respect to "lifelong drinking experience," "drinking amount per intake," and "subjective health level." As for the "drinking amount per intake," the number of subjects who drank 1-2 cups were significantly higher than those who drank 7-9 cups (F = 2.45, ρ = .045). The subjective level of depression was statistically significantly higher in the order of subjective health level, that is, "very poor," "bad," "average," "good," and "very good,"(F = -2.17, ρ = .030).

The Health affecting characteristics that showed a statistically significant difference in the Health-related quality of life of the subjects were "lifetime smoking experience," "current smoking level," "lifetime drinking experience," "recent drinking experience in the past year," "Drinking frequency," "drinking amount per serving," "moderate physical activity days," "daily walking days," "subjective health level," "diagnosis of hypertension" and "diagnosis of diabetes." Subjects who "smoked more than 5 packs in their lifetime" had a significantly higher quality of life than those who "non-smoking throughout their lifetime" (t=5.98, ρ=.003). In "current smoking level," subjects who "smoked in the past but currently quit" had a statistically significantly lower Health -related quality of life than subjects who "smoked daily" (F=3.46, ρ=.032). As for "drinking amount per intake," subjects who drank "1-2 cups" had a statistically significantly lower Health Affects Quality of Life than subjects who drank "7-9 cups" or more (F=5.43, ρ=<.001). Subjects who did not practice "moderate physical activity days" had a significantly lower Health Affects Quality of Life than those who did "2 days of practice" (F=4.96, ρ=<.001), and "days of daily walking practice" were significantly lower. The subjects who did not have "practice more than 1 day" had a statistically significantly lower quality of life than those who did "practice for more than 1 day" (F=4.96, ρ<.001). In terms of "subjective health level," Health Affects Quality of Life was statistically significantly lower in the order of "very poor," "poor," "average," "good," and "very good" (F=124.42, ρ=<.001). "Subjects diagnosed with high blood pressure" had a significantly lower Health Affects Quality of Life than "subjects without a diagnosis of hypertension" (t=-5.80, ρ=<.001), and "subjects diagnosed with diabetes" had a significantly lower quality of life than "subjects diagnosed with diabetes." Health Affects Quality of Life was significantly lower than that of "undiagnosed subjects" (t=-4.50, ρ=<.001) (Table 2).

Table 2: Health affecting Characteristics of Community Participants (N=892)

Characteristics	Categories	n	%	Satisfaction of Life		Melancholy		Health-related Quality of Life	
				M±SD	t or F	M±SD	t or F	M±SD	t or F
					(ρ)		(ρ)		(ρ)
Smoking									
The extent of smoking over a lifetime	Less than 5 packs (100 cigarettes) [a]	13	1.5	6.77±1.59	0.30 (.745)	12.23±3.77	3.04 (.048)	0.89±0.07	5.98 (.003) c<b
	5 packs (100 cigarettes) or more [b]	343	38.5	7.08±1.73		11.43±3.41		0.91±0.08	
	Never smoked [c]	536	60.1	7.12±1.65		12.06±3.97		0.89±0.13	

		N	%	M±SD	t/F (p)	M±SD	t/F (p)	M±SD	t/F (p)
Currently smoking	Smoke every day[a]	157	44.1	6.94±1.76	1.04 (.354)	11.48±3.58	0.94 (.391)	0.92±0.07	3.46 (.032) c<a
	Occasionally smoke[b]	14	3.9	7.43±1.83		12.64±3.91		0.91±0.10	
	Smoked in the past but not now[c]	185	52.0	7.16±1.68		11.35±3.24		0.90±0.09	
Age at which started smoking	M±SD	20.2±4.6							
Drinking									
Lifetime drinking experience	Yes	773	86.7	7.09±1.68	-0.30 (.763)	11.77±3.74	-0.74 (.456)	0.90±0.10	3.454 (.001)
	No	119	13.3	7.14±1.67		12.06±3.94		0.85±0.12	
Age at which started drinking	M±SD	22.03±8.39							
Drinking experience in the past year	Yes	621	80.3	7.13±1.62	1.19 (.234)	11.77±3.74	-1.07 (.285)	0.90±0.10	4.692 (<.001)
	No	152	19.7	6.95±1.90		12.06±3.94		0.85±0.12	
Frequency of drinking	Less than once a month[a]	157	25.3	7.21±1.67	0.29 (.886)	12.16±3.51	1.04 (.386)	0.90±0.09	3.10 (.015)
	Once a month[b]	83	13.4	7.18±1.53		11.60±3.55		0.90±0.10	
	2-4 times a month[c]	196	31.6	7.04±1.65		11.54±3.92		0.92±0.07	
	2-3 times a week[d]	132	21.3	7.11±1.43		11.39±2.95		0.93±0.06	
	4 or more times a week[e]	53	8.5	7.19±1.97		11.83±3.61		0.92±0.06	
Amount of alcohol consumed at one time	1-2 cups[a]	204	32.9	7.08±1.69	0.68 (.603)	12.07±3.62	2.45 (.045) d<a	0.90±0.09	5.43 (<.001) a<d,e
	3-4 cups[b]	122	19.6	7.12±1.62		11.57±3.23		0.91±0.08	

	5-6 cups[c]	62	10.0	6.95±1.60		11.97±3.81		0.92±0.05	
	7-9 cups[d]	123	25.2	7.12±1.53		10.88±3.29		0.93±0.05	
	More than 10 cups[e]	110	19.8	7.34±1.63		11.90±3.80		0.93±0.04	

Exercise								
Number of days of moderate physical activity in the last week	0[a]	589	66.0	7.03±1.73	1.20 (.298)	12.13±4.12	2.07 (.044)	0.88±0.13	4.12 (<.001) a<c
	1[b]	47	5.3	7.62±1.60		11.19±2.59		0.93±0.05	
	2[c]	63	7.1	7.32±1.59		10.86±2.77		0.93±0.03	
	3[d]	64	7.2	7.14±1.47		11.75±3.67		0.91±0.08	
	4[e]	31	3.5	7.19±1.22		11.32±2.57		0.92±0.06	
	5[f]	41	4.6	6.90±1.89		11.24±2.90		0.92±0.06	
	6[g]	24	2.7	7.00±1.35		10.71±2.01		0.92±0.06	
	7[h]	33	3.7	7.39±1.77		11.06±2.52		0.92±0.05	
Number of days of walking in the last week	0[a]	171	19.2	6.88±1.71	1.17 (.319)	12.46±4.60	0.86 (.538)	0.85±0.18	4.96 (<.001) a<b,c,d,e,f,g,h
	1[b]	54	6.1	7.19±1.39		12.15±3.01		0.91±0.07	
	2[c]	113	12.7	7.10±1.72		11.65±3.58		0.91±0.09	
	3[d]	137	15.4	7.14±1.52		11.42±2.87		0.91±0.07	
	4[e]	85	9.5	7.28±1.37		11.53±3.96		0.90±0.09	
	5[f]	109	12.2	7.06±1.70		11.80±4.66		0.91±0.07	
	6[g]	37	4.1	7.46±1.68		11.41±3.38		0.92±0.07	
	7[h]	18	20.	7.12±1.9		11.74±3.		0.89±0.1	

		6	9	2		15		0	
Subjective health level	Very good[a]	61	6.8	8.31±1.20	30.71 (<.001) a,b>c,d >e	9.87±1.51	52.23 (<.001) a,b<c<d ,e	0.94±0.03	124.42 (<.001) a>d,e b>c>d,e
	Good[b]	237	26.6	7.63±1.36		10.51±2.32		0.94±0.03	
	Moderate[c]	420	47.1	6.96±1.63		11.56±3.13		0.91±0.07	
	Bad[d]	123	13.8	6.54±1.81		14.45±5.02		0.83±0.11	
	Very bad[e]	51	5.7	5.69±1.83		16.02±5.79		0.66±0.26	
Presence of hypertension	Have	249	27.9	6.90±1.79	-2.17 (.030)	11.96±4.14	0.72 (.469)	0.85±0.14	-5.80 (<.001)
	None	643	72.1	7.18±1.62		11.76±3.61		0.91±0.08	
Presence of diabetes mellitus	Have	113	12.7	6.75±1.67	-2.35 (.019)	12.46±4.22	1.94 (.052)	0.83±0.16	-4.50 (<.001)
	None	779	87.3	7.15±1.67		11.72±3.69		0.90±0.09	

4.3. Differences in life satisfaction, melancholy, and Health Affects Quality of Life with respect to the social capital characteristics

Analysis of data revealed that 279 (31.3%) of the subjects engaged in "religious activities" as their social capital, 498 (55.8%) subjects engaged in "social activities," 302 (33.9%) subjects engaged in "leisure activities," 94 people (10.5%) participated in "charitable organization activities." The frequency of meeting comparatives, including family members, for 252 persons (28.3%) was "more than 4 times a week," "2-3 times a week" for 207 people (23.2%), "2-3 times a month" for 162 people (18.2%), "once a week" for 102 (11.4%), "less than once a month" for 94 (10.5%), and "once a month" for 74 (8.3%) people. With respect to frequency of meeting neighbors, 313 people (35.1%) met them "less than once a month," 214 people (24.0%) met them "more than 4 times a week," 112 people (12.6%) met "2-3 times a week," 107 people (12.0%) met "2-3 times a month," 74 people (8.3%) met "once a month," and 72 people (8.1%) met them "once a week." As for the frequency of meeting friends, 214 people (24.0%) met them "more than four times a week," 177 people (19.8%) met them "2-3 times a week," 140 people (15.7%) "less than once a month," 131 people (14.7%) "2-3 times a month," 126 people (14.1%) "once a month," and 104 people (11.7%) met them "once a week" (Table 3).

There was a statistically significant difference in life satisfaction of the subjects in "religious activities," "social activities," "leisure activities," "charitable organization activities," "meetings with comparatives including family," and "meetings with neighbors" among social capital characteristics. With respect to life satisfaction, subjects who participated in "religious activities" were more satisfied with their lives than subjects who "did not" (t = 3.02, ρ = .003), and subjects who participated in "social activities" were better satisfied with their lives than subjects who "did 2not" (t =. 3.17, ρ = .002), subjects who engage in "leisure activities" are more likely to be satisfied their lives than subjects who "do not" (t = 3.08, ρ = .002), subjects who "do" "charity activities" were more satisfied with their lives than subjects "did not"(t = 3.23, ρ = .001). With respect to "frequency of meeting comparatives including family," the life satisfaction of the subjects who met "2-3 times a month," "once a week," and "more than 4 times a week" were significantly higher than those who met "less than once a month" (F=3.15, ρ=.008). With respect to the number of meetings with neighbors, subjects who met them "once a month" had

higher life satisfaction than those who met their neighbors "less than once a month" (F = 3.25, ρ = .006) (Table 3).

As for the social capital characteristics, there was a statistically significant difference in the subject's melancholy ion due to engagement in social activities, leisure activities, charitable activities, the number of times they met their comparatives including family, and the number of times they met their friends. Those subjects who "did not engage in social activities" had a higher Melancholies symptoms level than those who "did" (t = -4.04, ρ = <.001), and subjects who "did not engage in leisure activities" had a higher Melancholies symptoms level" than subjects who "did" (t = -4.04, ρ = <.001). -3.64, ρ = <.001), subjects who "did not participate in charitable activities" had significantly higher Melancholies symptoms level than subjects who "did" (t = -1.99, ρ = .046). In the "frequency of meeting comparatives including family members," subjects who met "less than once a month" were statistically significantly more melancholier than those who met "2-3 times a month," "once a week," and "more than 4 times a week" (F=4.56, ρ=<.001). With respect to "number of times they met friends," subjects who met them "less than once a month" were significantly melancholier than those who met "2-3 times a month" or "2-3 times a week" (F = 3.20, ρ = .007) (Table 3).

There were statistically significant differences in the subjects' Health-related Quality of Life in "social activities," "leisure activities," and "number of times to meet friends" among social capital characteristics. Subjects who "engaged in social activities" were statistically significantly higher than those who "did not" (t = 3.12, ρ = .002), and subjects who "engaged in leisure activities" had a statistically significantly higher than subjects who "did not" in the level of health-related quality of life (t = 7.24, ρ < .001). Regarding the "frequency of meeting their friends," the subjects who met them "once a month" their quality of life was better than those who met their friends "less than once a month" (F = 11.30, ρ = <. 001) (Table 3).

Table 3: Characteristics of Social capital in Community Participants (N=892)

Characteristics	Categories	n	(%)	Satisfaction of Life		Melancholy		Health-related Quality of Life	
				M±SD	t or F (ρ)	M±SD	t or F (ρ)	M±SD	t or F (ρ)
Religious activity	Yes	279	31.3	7.35±1.69	3.02 (.003)	11.58±3.40	-12.4 (.213)	0.89±0.10	-0.68 (.494)
	No	613	68.7	6.99±1.66		11.92±3.91		0.89±0.11	
Social activities	Yes	498	55.8	7.26±1.54	3.17 (.002)	11.34±3.03	-4.04 (<.001)	0.90±0.08	3.12 (.002)
	No	394	44.2	6.90±1.82		12.41±4.46		0.88±0.14	
Leisure Activities	Yes	302	33.9	7.33±1.47	3.08 (.002)	11.23±3.02	-3.64 (<.001)	0.92±0.05	7.24 (<.001)
	No	590	66.1	6.98±1.76		12.11±4.06		0.88±0.12	
Charity work	Yes	94	10.5	7.63±1.45	3.23 (.001)	11.08±2.69	-1.99 (.046)	0.90±0.06	1.76 (.079)
	No	798	89.5	7.04±1.69		11.90±3.86		0.89±0.11	
Frequency of contact with comparatives (including family	less than once a month[a]	94	10.5	6.53±2.09	3.15 (.008) a<c,d,f	13.21±4.88	4.56 (<.001) a<c,d,e	0.88±0.11	0.59 (.708)
	once a month[b]	74	8.3	6.86±1.54		12.04±3.15		0.91±0.08	

		N	%	mean±SD	F(p)	mean±SD	F(p)	mean±SD	F(p)
members)	2-3 times a month[c]	162	18.2	7.19±1.70		11.36±3.40		0.89±0.12	
	once a week[d]	102	11.4	7.16±1.69		11.59±4.01		0.90±0.14	
	2-3 times a week[e]	207	23.2	7.16±1.41		11.23±2.92		0.90±0.11	
	4 or more times a week[f]	252	28.3	7.26±1.70		12.10±4.06		0.89±0.10	
Frequency of contact with neighbors	less than once a month[a]	313	35.1	6.92±1.71	3.25 (.006) a<b	12.04±3.97	2.20 (.053)	0.89±0.13	1.63 (.149)
	once a month[b]	74	8.3	7.43±1.41		10.64±2.59		0.90±0.13	
	2-3 times a month[c]	107	12.0	7.47±1.53		11.49±3.58		0.91±0.07	
	once a week[d]	72	8.1	6.71±1.65		12.15±3.67		0.90±0.10	
	2-3 times a week[e]	112	12.6	7.13±1.84		11.63±3.22		0.91±0.08	
	4 or more times a week[f]	214	24.0	7.18±1.67		12.05±4.12		0.88±0.11	
Frequency of contact with friends	less than once a month[a]	140	15.7	6.86±1.87	0.73 (.601)	12.91±5.00	3.20 (.007) a<c,e	0.83±0.19	11.30 (<.001) a<b,c,d,e,f
	once a month[b]	126	14.1	7.20±1.60		11.74±3.34		0.90±0.09	
	2-3 times a month[c]	131	14.7	7.16±1.59		11.38±2.99		0.91±0.08	
	once a week[d]	104	11.7	7.07±1.69		11.61±3.88		0.91±0.08	
	2-3 times a week[e]	177	19.8	7.16±1.65		11.43±3.29		0.90±0.09	
	4 or more times a week[f]	214	24.0	7.13±1.67		11.84±3.72		0.91±0.08	

4.4. Correlation between subject's Health-related quality of life, life satisfaction index, and melancholy

Health Affects Quality of Life increased significantly with a decrease in melancholy ($r = -.52$, $\rho < .001$), and increased significantly with a increase in the life-satisfaction ($r = .25$, $\rho < .001$). In addition, the melancholy and life satisfaction index showed a statistically significant inverse correlation ($r = -.40$, $\rho < .001$) (Table 4).

Table 4: Correlation between Melancholy and Health Affects Quality of Life of Community Participants

Variables	Life-satisfaction	Melancholy	Health Affects Quality of Life
	r(ρ)	r(ρ)	r(ρ)
Life-satisfaction	1.00		
Melancholy	-.40(<.001)**	1.00	
Health Affects Quality of Life	.25(<.001)**	-.52(<.001)**	1.00

4.5. Factors Affecting the Subject's Health-Related Quality of life.

Table 5 shows the results of stepwise multiple regression analysis to identify factors that affect the subject's Health-related quality of life. The input explanatory variables had significant differences in Health-related quality of life, life satisfaction, and melancholy index among the general characteristics, health characteristics, and social capital characteristics of the subjects. Variables with significant differences, such as gender, age, education level, marital status, lifetime drinking, drinking in the past year, presence of hypertension and diabetes, social activities, leisure life, etc., treated as a dummy variable. The regression model for Health-related Quality of Life was significant ($F = 75.06$, $p = <.001$). Significant variables were identified in the order of melancholy, subjective health level, subjects who drank in the past 1 year, those who did not attend school or elementary school graduates, subjects with hypertension, number of walking days in the last week, earnings per month, bereaved subjects, and lifelong drinking experiences, and the total explanatory power of these variables was 45.0%. Health-related quality of life was found to be higher as subjects who had a drinking experience in the past year, the number of walking days in the recent week, and the higher the earnings per month, and was found to be worse as higher the melancholy, those who did not attend school or elementary school, those who were widowed, those with high blood pressure, and those who had taken more than one drink in their lifetime. With respect to multicollinearity between independent variables, the tolerance limit was 0.1 or higher at .60 to .97, and the variance inflation factor (VIF) was 1.03 to 1.67, which was smaller than the reference value of 10, so multicollinearity could be excluded. The (Durbin-Watson) value was 1.95, which ensured the independence of the residuals (Table 5).

Table 5: Influencing Factors on Health Affects Quality of Life among Community Participants

Variables	B	SE	β	t	ρ
(Constants)	1.08	0.02		64.50	0.000
Melancholy	-0.01	0.00	-0.37	-13.55	0.000
Subjective health level	-0.03	0.00	-0.22	-7.56	0.000
Drinking experience in the past year	0.04	0.01	0.15	4.71	0.000
Education (Never attended school)	-0.07	0.02	-0.12	-4.38	0.000
Presence of hypertension	-0.03	0.01	-0.10	-3.94	0.000
Education (elementary)	-0.03	0.01	-0.09	-3.36	0.001
Number of days of walking in the last week	0.00	0.00	0.07	2.85	0.005
Average monthly income of households	0.01	0.00	0.07	2.44	0.015

Marital status (Bereaved)	-0.03	0.01	-0.07	-2.47	0.014
Lifetime drinking experience	-0.02	0.01	-0.07	-2.24	0.026
$R^2 = .46$, Adjusted $R^2 = .45$, F = 75.06, p = <.001					

B = unstandardized regression coefficient; SE = standard error.

5. DISCUSSION

This research attempted to identify the main factors influencing life satisfaction, symptoms of melancholy, and Health-related quality of life, considering the characteristics of rural residents' social capital and health behavior using the 2019 Community Health Survey.

First, the differences in life satisfaction, melancholy, and Health Affects Quality of Life were confirmed with respect to the general characteristics of the subjects. The average age of the subjects was 53.04 years; 53.4% were females, and 68.6% of the subjects were married. There were 10.3% more cases of bereavement than divorce. Life satisfaction with respect to the general characteristics was comparatively higher in males but was not statistically significant (t = 0.65, p = .051). As for age, subjects aged 19-44 years had the highest life satisfaction, but the difference was not statistically significant (F = 1.63, p = .180). In terms of education level, subjects with a graduate degree or higher (F = 6.03, p < .001), married subjects (F = 4.78, p = .001), and subjects with a higher average monthly income per household showed a significantly higher level of life satisfaction (F =6.54, p<.001). It was confirmed that the higher the number of family members, the higher the life satisfaction (F = 3.61, p = .003). The average score on the melancholy index according to the general characteristics of the subjects was 11.81 (SD±1.07), and the average score of females was significantly higher (t = 5.45, p = <.001) than males. The higher the age (F = 3.18, p = .023) and the lower the educational level (F = 4.19, p < .001), the higher the Melancholic symptoms level. Subjects who were divorced or widowed (F = 4.52, p = .001) and subjects with low average income showed a significant increase in melancholy (F = 3.60, p = .003). However, it was confirmed that there was no significant difference between the groups with respect to the number of family members (F = 1.75, p = .121). Considering the general characteristics of the subjects, the average score on the subject's Health-related Quality of Life was 0.89 (SD±0.13), and health-related quality of life scores were significantly higher in younger age groups (F=57.67, p <.001). These results align with the results of the investigation that compared the older adults aged 65 and older as per the type of household (Kim & Lee, 2018). With respect to. The marital status, the number of "widowers," was significantly higher than that of single and married subjects (F = 19.58, p < .001). This contradicts the result of the investigation (Lee & Kim, 2014) that found that older adults with spouses had a higher Health-related quality of life. In addition, it was found that subjects with a high monthly income per household had a statistically significant higher health-related quality of life (F = 17.01, p = <.001) (Sohn, 2006).

Second, differences in life satisfaction, melancholy, and Health-related Quality of Life according to the health-related characteristics of the subjects were confirmed. The characteristics that showed a statistically significant difference in life satisfaction were the subjective health level and the diagnosis of chronic diseases. The higher the subjective health level, the higher the life satisfaction of the subjects (F = -2.17, p = .030), but the subjects diagnosed with hypertension (t = -2.17, p = .03) and diabetes (t = -2.35, p = .019) were significantly lower the satisfaction of life. The Health affecting characteristics that led to significant differences in the melancholy of the subjects was the amount of alcohol consumed (F = 2.45, p = .045), and lower the subjective health level was significantly higher in melancholy (F= -2.17 p=.030). These results aligned with that of a previous investigation dealing with Health Affects Quality of Life (Lee, 2011), but the results pertaining to alcohol consumption need to be clarified in future research. With respect to smoking, subjects who smoked 5 packs or more during their lifetime had a significantly better Health Affects Quality of Life than subjects who had never smoked (t = 5.98, p = .003). Health-related Quality of Life was significantly lower than that of the daily smokers (F = 3.46, p = 0.32). This can be attributed to smoking cessation due to health problems, and further research is needed to explore if quitting smoking affects mental stress to the extent that there is a saying that it is not quitting smoking but enduring it for the rest of your life. The higher the physical activity index, the higher the Health Affects Quality of Life (F = 4.96, p = <.001), and the worse the subjective health level, the lower the Health Affects Quality of Life(F = 124.42, p

= <.001). The results align with the previous studies, when the subjects diagnosed with hypertension (t = -5.80, p = <.001) and diabetes (t = -4.20, p = <.001) showed a significantly lower Health-related quality of life.

Third, the differences in life satisfaction, melancholy, and Health Affects Quality of Life according to the social capital characteristics of the subjects were confirmed. Life satisfaction levels in case of religious activities (t = 3.02, ρ = .003), social activities (t = 3.17, ρ = .002), leisure activities (t = 3.08, ρ = .002), and charity activities (t = 3.23), ρ = <.001) was significantly higher. Health Affects Quality of Life was found to be significantly higher in subjects who engaged in social activities (t = 3.12, ρ = .002) and leisure activities (t = 7.24, ρ < .001) and those who frequently met their friends (F = 11.30, ρ < .001). Melancholy was also higher in those who were less engaged in social activities (t = -4.04, ρ < .001), and the frequency of meeting comparatives (t = 4.56, ρ < .001) and friends (t = 11.30, ρ < .001). showed a significant difference. This aligns with the previous research results (Castle, 2002) that social networking is important.

Fourth, the results of the correlation between the subject's Health-related quality of life, life satisfaction index, and melancholy were confirmed. Health Affects Quality of Life was significantly higher when melancholy was low (r = -.52, p <.001), and the life satisfaction index was also high (r = .25, p <.001). The life satisfaction index showed a statistically significant inverse correlation (r = -.40, p <.001). Previous research results (Kim et al. 2006) have proven that Health Affects Quality of Life is closely related to melancholy.

6. SUGGESTIONS

This research analyzed the 2019 CHS data to identify the factors affecting residents' Health-related quality of life. The factors influencing life satisfaction were education level, marriage, and average income. Melancholy was higher among female subjects aged 75 or older with low educational levels, income, and no spouse. A positive impact on Health Affects Quality of Life was found in subjects with subjective health levels and no chronic disease. Social capital influences life satisfaction. The greater the social connection, such as religion, friendship, and leisure activities, the lesser the Melancholic symptoms level and the higher the life satisfaction index.

Through This research, we would like to suggest the following to improve rural residents' Health-related quality of life. It is necessary to develop social welfare programs that facilitate forming social networks and those involving economic activities. Since these research results were investigated in a single city in Korea, care must be taken while generalizing the effects of the Health Affects Quality of Life of rural residents. Furthermore, after implementing a program to improve residents' Health-related quality of life, we propose a follow-up investigation to explore whether there is an improvement in the Health Affects Quality of Life of residents.

7. ACKNOWLEDGEMENTS

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