

Changes in the Health-related Quality of Life among Korean Adults: Data Comparison between 2007 and 2017

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Abstract

Background/Objectives: The purpose of this study was to analyze and compare changes in Koreans' health-related quality of life between 2007 and 2017.

Method/Statistical Analysis: A secondary analysis was conducted using raw data from 3,854 adults over 20 years old using the Korean National Health and Nutritional Examination Survey (KNHANES) statistics for 2007 and 2017.

Findings: In 2007 the health-related quality of life (EQ-5D) among respondents was 0.97 and it was 0.98 in 2017, which indicated that there were not significant changes in this area. However, among other EQ-5D items, particularly with regard to anxiety and depression, there was a significant decrease noted in 2017 compared to 2007. In addition, socio-economic factors such as level of education and marital status affected health-related quality of life.

Improvements/Applications: It is necessary to develop and manage policies that take into consideration factors affecting people's health-related quality of life.

Keywords: *Quality of life, HR-QoL, EQ-5D, Korean, KNHANE.*

Introduction

As medicine and technology have developed, the world's elderly population has also grown dramatically. This growth in the elderly population has also tended to increase morbidity rates through chronic illness and medical costs. Promoting health-related quality of life (below HR-QoL) is one of the most important tasks of the government, as health and happiness in life is more important than living longer. The Korean government has also tried to establish a fundamental model for various public health and well-being services to improve people's health-related quality of life. HR-QOL is an

individual's or a group's perceived physical and mental health over time. The Korea Centers for Disease Control and Prevention website provides general information about health-related quality of life, such as HR-QOL surveillance and its role in public health practice. The site also lists HR-QOL trend data by state and demographics using our online HR-QOL data application^[1].

HR-QOL is an individual's perceived physical, mental and social health based on their individual's experiences, faith, expectations and level of awareness. The importance of the HR-QoL has gradually increased because it is an independent factor that affects various medical situations such as death and hospitalizations^[2,3].

The survey used the HR-QoL questionnaire from the Korean National Health and Nutritional Examination Survey (KNHANES) and it contained 5 sections, so called Euro QoL-5 dimensions (EQ-5D) asking about current health conditions^[4]. Past research indicated that health related quality of life was closely related to

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socio-economic factors including education and income. This study focused on Koreans' HR-QoL from 2007 to 2017 with the goal of examining and investigating demographic factors that affect HR-QoL over time and to examine factors that need to be considered when implementing public health and well-being service models.

Method

This study performed a secondary analysis of the Korean National Health and Nutritional Examination Survey (KNHANES) data for 2007 to 2017.

The total number of subjects who participated in the Korean National Health and Nutritional Examination Survey (KNHANES) for 2007 were 4,594 and 8,127 in 2017. Of those subjects, 3,854 were included in the study because they were over 20 year old (1,286 in 2007 and 2,568 in 2017), answered all of the study variables and denied having an illness.

This study used the health related survey questionnaire from the Korean National Health and Nutritional Examination Survey (KNHANES). Demographic variables included sex, age, residential area, education level, marital status, household composition, household income level and occupation. Variables associated with physical and mental health included subjectively perceived health condition, activity confinement, perceived usual stress level, depression (in the past 2 weeks), suicidal ideation (in the past year) and body mass index(BMI).

The EQ-5D was used to measure HR-QoL. The EQ-5D is a standardized instrument that measures HR-

QoL and it is composed of 5 items/areas. The EQ-5D index was obtained by applying a weighted value to the measured score of each question. The score variation was 0 through 1 and higher scores indicated a better quality of life [5].

The study analysis was conducted by following usage guidelines of the Korean National Health and Nutritional Examination Survey (KNHANES) suggested by KNHANES. The raw materials of KNHANES were used for complex sample design.

The differences of EQ-5D index score of Korean adults between 2007 and 2017 were determined by using the complex sample Chi-square test. The socio-economic factors affecting the health-related quality of life of Korean adults in 2007 and 2017 were determined by using the complex sample general linear model (CSGLM) respectively. SPSS version 19.0 (SPSS Inc. Chicago, IL, USA) was used to measure the data and significance level was below 0.05.

Result and Discussion

Changes in Korean Adults' HR-QoL: [Table 1] presents changes in Korean adults' HR-QoL. In the past ten years, there were no significant differences in Korean adults' HR-QoL as the EQ-5D index indicated 0.97 for 2007 and 0.98 for 2017 (Wald F=2.39, p=0.123).

In EQ-5D, the only category to show a significant difference between 2007 and 2017 was anxiety/depression. This data indicates that the category of anxiety and depression had improved in 2017 compared to 2007 ($\chi^2=19.18$, p<0.001).

Table 1. EQ-5D index score of Korean adults

Categories	2007 (n=1286)		2017 (n=2568)		χ^2	p
	Value (%) ^a	SE (%) ^a	Value (%) ^a	SE (%) ^a		
EQ-5D: mobility						
1	96.4	0.50	96.1	0.40	0.74	0.473
2	3.6	0.50	3.8	0.40		
3	-	-	0.1	0.10		
EQ-5D: self-care						
1	99.3	0.20	98.9	0.20	1.24	0.288
2	0.7	0.20	1.1	0.20		
3	-	-	-	-		

Categories	2007 (n=1286)		2017 (n=2568)		χ^2	p
	Value (%) ^a	SE (%) ^a	Value (%) ^a	SE (%) ^a		
EQ-5D: usual activities						
1	98.2	0.30	98.0	0.40	0.79	0.450
2	1.8	0.30	1.8	0.40		
3	-	-	0.1	0.10		
EQ-5D: pain/discomfort						
1	85.5	1.10	85.7	0.70	0.34	0.699
2	14.0	1.10	13.9	0.70		
3	0.5	0.20	0.4	0.10		
EQ-5D: anxiety/depression						
1	90.8	0.90	95.8	0.40	19.18	<0.001
2	9.0	0.90	4.1	0.40		
3	0.2	0.10	0.1	0.10		
EQ-5D index (M±SE)	0.97±0.002		0.98±0.001		Wald F=2.39	0.123

Value= Estimated value, SE= Standard error, a=Weighted value, EQ-5D: European quality of life-5 dimensions used as a measure of health-related quality of life (HR-QoL)., 1=Performed well, 2=Performed with a few difficulties, 3=Performed badly

HR-QoL comparison in socio-demographic characteristics between 2007 and 2017: According to the study’s results regarding the HR-QoL related to socio-demographic characteristics, females, subjects in their 40s and those subjects who lived in urban and countryside areas showed significant differences.

Among women, the HR-QoL was significantly different for females in 2007 and women in 2017 (F=8.27, p=0.004). Significant differences were also noted among subjects in their 40s, where 95% CI of the HR-QoL was 0.97~0.98 in 2007 and 0.98~0.99 in 2017 (F=8.11, p=0.005). Among study subjects who lived in urban areas, 95% CI of their HR-QoL was 0.96~0.98 in 2007 and 0.98~0.98 in 2017, thus indicating that there was a significant difference (F=4.17, p=0.042). That is, compared to 2007, in 2017 the HR-QoL of women in their 40s and who lived in an urban areas had improved.

Factors affecting Korean adults’ HR-QoL in 2007:

[Table 2] presents the factors affecting Korean adults’ HR-QoL in 2007.

As the subject’s age range for 2007 was converted into covariates, sex was the main factor that affected the HR-QoL for Korean adults in 2007. The EQ-5D

index score for Korean men in 2007 was higher than women and this indicated that the HR-QoL of Korean men in 2007 was also higher than that of women (Wald F=17.38, p<0.001). By exploring the HR-QoL according to subjects’ educational level, scores for those with an elementary school or below education level were lower than for the subjects who were college students or graduates (95% CI= -0.055~-0.004, p=0.023).

As the study subjects aged, their HR-QoL lowered by 0.001 each year (Wald F =12.09, p=0.001).

The explanation power for socio-demographic variables among the HR-QoL of Korean adults in 2007 was 11.2% (Wald F=4.34, p<0.001).

The Oh’s study^[6] about factors affecting the HR-QoL by age group (such as young age group, middle age group and elderly age group,) noted that the women’s HR-QoL was low and both genders showed more differences in elderly age group. This study also noted that walking was one of the factors that affected the HR-QoL, thus emphasizing its importance. Factors affecting the HR-QoL played a more influential role for the middle and elderly age groups than young age group. Consequently, it is important to study factors negatively affecting the HR-QoL beginning at a young age.

Table 2. HR-QoL by the socio-demographic characteristics of Koreans in 2007 (N=1286)

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
(constant)	0.979	1.025	<0.001	7153.18	<0.001
Sex					
Male	0.008	0.022	<0.001	17.38	<0.001
Female ^a	.	.	.	.	.
Residential area					
Seoul	-0.011	0.006	0.618		
Urban area	-0.012	0.004	0.307	0.54	0.583
Provincial area ^a	.	.	.	.	.
Education					
≤Elementary	-0.055	-0.004	0.023		
Middle	-0.029	0.005	0.173	1.98	0.118
High	-0.009	0.006	0.685		
≥University ^a	.	.	.	.	.
Marital status					
Married	-0.008	0.011	0.725	0.12	0.725
Others ^a	.	.	.	.	.
Household composition					
1	-0.020	0.019	0.989		
2~3	-0.017	0.018	0.977	0.02	0.994
4~5	-0.015	0.017	0.882		
≥6 ^a	.	.	.	.	.
Household income level					
Lower class	-0.026	0.001	0.062		
Lower-Middle	-0.009	0.006	0.722	1.28	0.282
Upper-Middle	-0.010	0.005	0.505		
Upper class ^a	.	.	.	.	.
Occupation*					
A	-0.005	0.012	0.441		
B	-0.017	0.008	0.501		
C	-0.004	0.019	0.212		
D	-0.020	0.023	0.892	1.08	0.371
E	-0.011	0.018	0.653		
F	-0.001	0.025	0.061		
G ^a	.	.	.	.	.
Age	-0.001	<0.001	0.001	12.09	0.001

Model summary: $R^2=0.112$, Wald $F=4.34$, $p<0.001$, 95% CI=95% Confidence Interval, a =Reference category, Occupation*: A=Managers, B=Clerical workers, C=Service and sales workers, D=Farm and fishery skilled workers, E=Technicians, machine operations and assembly line workers, F=Simple labor workers, G=Unemployed

Factors affecting Korean adults' HRQoL in 2017:

[Table 3] presents the factors affecting Korean adults' HR-QoL in 2017.

As subject's age among Korean adults in 2017 was converted into covariates, educational level (Wald $F=3.02$, $p=0.030$) and marital status (Wald $F=4.82$, $p=0.029$) were the main factors that affected the HR-QoL for Korean adults in 2017.

Those with an elementary school education level had lower quality of life compared to college graduates or those with a higher education level (95% CI= -0.037 ~-0.006, $p=0.007$). Related to marital status, the study subjects who were married indicated having a higher quality of life compared to the group of others (95% CI= 0.001 ~0.016, $p=0.029$).

Household income was not a significant factor affecting the total HR-QoL (Wald $F=2.47$, $p=0.062$),

but it indicated partially significant differences. The study subjects in the low income household group had a lower HR-QoL compared to those in the higher income household group (95% CI= -0.043 ~-0.007, p=0.008). This matched Kraus and Tan’s study results [7], which indicated that socio-economic status influences not only physical and mental health, but also social mobility.

Like the 2007 results, as the study subjects got one year older, their HR-QoL lowered by 0.001 in 2017 (Wald F =14.96, p<0.001).

The explanation power for the socio-demographic variables in the HR-QoL among Korean adults in 2017 was 6.7% (Wald F=3.69, p<0.001).

While numerous studies[8-9] indicated that several factors (younger age, male gender, higher level of education, higher annual household income, status of employment and marital status) affected the HR-QoL individually, this study’s results indicated that education level and socio-economic factors were more closely related to the HR-QoL.

Kim and Park’s research[10] supported this study’s findings that educational attainment was one of variables affecting the subjects’ HR-QoL. Both studies found that higher educational attainment correlated with quality of life and HR-QoL. Socio-economic status and subjective social class affected not only health related quality of life, but also overall quality of life. According to Robert et al.[11], an increased life span and economic growth has improved the HR-QoL in all age groups of subjects, but this change was hidden by an average score among the population and it is therefore important to focus on health differences by economic status for each age group.

Consequently, socio-economic status and level of education are important variables that should be considered when developing a program related to improving the health related quality of life. It is especially important to take into consideration that subjects with a lower socio-economic status might show different results in health related quality of life and overall quality of life.

Table 3.HR-QoLby the socio-demographic characteristics of Korea in 2017 (N=2568)

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
(constant)	0.973	1.022	<0.001	11868.49	<0.001
Sex					
Male	-0.001	0.009	0.123	2.39	0.123
Female ^a	.	.	.		
Residential area					
Seoul	-0.005	0.007	0.754	1.13	0.324
Urban area	-0.001	0.009	0.144		
Provincial area ^a	.	.	.		
Education					
≤Elementary	-0.037	-0.006	0.007	3.02	0.030
Middle	-0.029	0.004	0.138		
High	-0.008	0.003	0.329		
≥University ^a	.	.	.		
Marital status					
Married	0.001	0.016	0.029	4.82	0.029
Others ^a	.	.	.		
Household size					
1	-0.010	0.035	0.277	1.06	0.364
2~3	-0.017	0.024	0.745		
4~5	-0.016	0.026	0.668		
≥6 ^a	.	.	.		

Categories	95% CI Lower limit	95% CI Upper limit	p	Wald F	p
Household income					
Lower class	-0.043	-0.007	0.008	2.47	0.062
Lower-Middle	-0.010	0.003	0.275		
Upper-Middle	-0.006	0.004	0.613		
Upper class ^a	.	.	.		
Occupation*					
A	-0.008	0.005	0.639	0.80	0.565
B	-0.003	0.008	0.300		
C	-0.009	0.007	0.769		
D	-0.011	0.025	0.434		
E	-0.003	0.015	0.193		
F	-0.012	0.014	0.904		
G ^a	.	.	.		
Age	-0.001	<0.001	<0.001	14.96	<0.001

Model summary: $R^2=0.067$, Wald $F=3.69$, $p<0.001$, 95% CI=95% Confidence Interval, a =Reference category, Occupation*: A=Managers, B=Clerical workers, C=Service and sales workers, D=Farm and fishery skilled workers, E=Technicians, machine operations and assembly line workers, F=Simple labor workers, G=Unemployed

Conclusion

In 2007 and 2017, the health related quality of life among Korean adults did not show any significant differences. However, a couple of socio-demographic factors affected the HR-QoL in 2007 and 2017. In 2007, men showed a higher HR-QoL compared to women, but there was no significant difference in 2017 and it indicated that sex did not affect the HR-QoL. In 2007, the level of education had some effect on the HR-QoL. In 2017, the level of education and marital status affected the HR-QoL of Korean adults and household income had some effect on the HR-QoL. In 2017, the study results indicated that educational attainment, marital status and economic factors played more significant roles in determining the HR-QoL.

In spite of the government's promotion of health-related policies, social economic status including income, education and assets continues to affect its citizens overall health and quality of life. It is necessary to understand health-related quality of life by considering socio-economic factors by age group when examining fundamental policies. When developing a program, it is equally important to consider the impact of a person's economic status on their health condition in order to improve their health-related quality of life.

Ethical Clearance: Not required

Source of Funding: This paper was supported by the Semyung University Research Grant of 2019.

Conflict of Interest: Nil

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