

Women's Quality of Life and Their Health Awareness by Age at the First Childbirth and Age at the Last Childbirth

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ABSTRACT

Background/Objectives: The aim of this study was to prove how factors associated with childbirth related variables affect women's quality of life (QoL) and their health awareness.

Method/Statistical Analysis: This study is a secondary analysis that uses the raw data collected through the KNHANES between 2013 and 2015. A total of 5,698 subjects were selected for this study among 22,948 participants who completed the KNHANES between 2013 and 2015. This study used the SPSS win 19 program to analyze data and a complex sample- general linear model was used to analyze quality of life by examining childbirth related variables.

Findings: While childbirth affected women's QoL and their health awareness when their first childbirth occurred prior to 20 years of age, it did not affect women's QoL and their perceived health conditions when the first childbirth occurred after age 20.

Improvements/Applications: Study results can be used to alter women's perceptions of childbirth if they avoiding giving birth due to an assumption that it will have a negative influence on their QoL and health.

Keywords: *Quality of life (QoL), Subjective health status, Childbirth age, Birth interval, KNHANES.*

Introduction

Continuing low birth rates and delays in the parturition of the first child due to women's avoidance of childbirth have resulted in numerous demographically issues^[1-3].

Korea's total fertility rate has been decreasing since 1983 and it dropped below 1.5 in 2000^[4]. The total fertility rate in 2013 was 1.19, which was too low to even maintain the current demographic structure and accordingly, population policy interventions are required to prevent destabilization of the demographic structure.

Society's stress for higher education is one of factors that has affected women's desire to start a family. Women have obtained more roles in labor market by participating

as an economic population. Additionally, birth culture has been changed due to changes in values such as gender equality and marriage. In modern society generally, women are expected to be juggle work with family life, and the tension between these roles plays a primary factor in women's avoidance of child birth. This is because modern women consider their individual QoL, pursuing their personal satisfaction and meeting their desires as more important than participating in childbirth^[5-9].

An individual's QoL is a multi-dimensional concept that is related to physical, mental, social, emotional, and individual functioning^[10]. Women in modern society view taking a break in their career to give birth and rear their children as decreasing their quality of life. This causes an increase of married couples who give up having a child and Korea's demographic structure has been jeopardized due to the decrease in fertility rate. Thus women's efforts to keep up their QoL and increase their social roles have brought about the avoidance of childbirth.

Therefore, it is necessary to positively change perceptions of childbirth by implementing policies that can make it easier for women to carry out their work and

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rear their children instead of encouraging them avoid childbirth. The study seeks to investigate how factors associated with childbirth such as the age at first birthing, number of children, age at last birth, and birth interval affect women's QoL and their health awareness stste.

Method

Study Design: This paper is a secondary analysis examining raw data from the Korean National Health and Nutrition Examination Survey VI (KNHANES VI) prosecuted between 2013 and 2015.

Study Population: A total of 5698 women were finally selected as this study subjects from a total of 22,948 participants who completed the Korean National Health and Nutritional Examination Survey between 2013 and 2015. The subjects were married, lived with their partners, had no ongoing illness, and answered in the survey about their age at first and last birth.

Study Variables: This paper used health survey data including demographic characteristics, socio-economic characteristics, disease incidence and prevalence, age of the first birth, age of the last birth, recognition of stress, and perceived health condition in the KNHANES raw data.

The participants' age at the first birth was divided into the following groups: below 20s, between 20 and 29, between 30 and 39, and over 40s. Subjects who had the same age of the first and last birth were indicated as "1" and subjects who reported that they had a different age between the first and last birth were indicated as "2." The birth interval was specified as follows; 1 child when subjects had the same age of the first and last birth and gaps in the mother's age ranging from 1 year ~5 years, 6 years ~10 years, 11 years ~15 years, and over 16 years.

Awareness of level of stress was interpreted as follows; 1 point- hardly/never, 2 points- a little, 3 points- high, and 4 points- extremely high, with higher point values being indicative of higher levels of stress. A subjective health condition was specified as follows; 1 point (very bad), 2 points (bad), 3 points (mediocre), 4 points (good), and 5 points (very good), with higher point values showing better health.

EQ-5D materials were employed to study QoL. EQ-5D is a standard instrument that assesses the QoL related to health conditions which is composed of five areas including mobility, self-care, usual activities, pain/

discomfort, and anxiety/depression. It uses a three-point scale wherein 1 point-no problem, 2 points- some problems, 3 points- serious problems. Subject's quality of life was determined by converting each question into weight values ranging between 1 (excellent) and -1 (worst; worse than dying).

Statistical Analysis

SPSS win 19 was used for analysis, and statistical errors were below 0.05. Statistical analysis was conducted by using complex standard design through applying weight values. Subjects' general characteristics were calculated through frequency and percentage. Differences in the age at the first birthing, number of children, age at the last birth, QoL based on birth interval, recognition of stress, and subjective level of health were analyzed by using a complex sample general linear model (CSGLM).

Ethical Considerations: The Korea National Health and Nutrition Examination Survey was conducted with the approval of the institutional review board of the KCDC and the raw data can be downloaded from the website of the KNHANES for academic research use.

Results and Discussion

The Socioeconomic Related Characteristics of Subjects

Table 1 presents the socioeconomic related characteristics of subjects.

Subjects' age was investigated as follows; 20~29 (3.8%), 30~39 (22.5%), 40~49 (27.7%), 50~59 (25.8%), 60~69 (13.2%), and over 70 (6.9%).

18.8% of subjects had one child and 81.2% had two or more children. 95% of subjects' age at first birth was between 25.74~26.01 and 0.4% of subjects first gave birth when they were over 40. 95% of subjects' age at last birth was between 29.47~29.73 and this indicated that subjects stopped giving birth at a relatively young age. 95% of subjects' birth interval was 3.61~3.83 years and 58.80% of subjects had the birth interval of 1 to 5 years. Regarding subjects' recognition of stress level, 95% CI was 2.14~2.18 points, indicating that majority of subjects experience a low level of stress. In regard to subjects' perceived health, 95% CI was 3.07~3.12 points which indicates subjects feel they have mediocre health.

Table 1: Socioeconomic related characteristics of study participants (N = 5698)

Characteristics	Categories	N ^a	Estimated value (%) ^b	SE (%) ^b
Age (years)	20~29	138	3.80	0.40
	30~39	1115	22.50	0.80
	40~49	1369	27.70	0.80
	50~59	1459	25.80	0.70
	60~69	1046	13.20	0.50
	≥70	571	6.90	0.30
Residential area	Capital (Seoul)	1075	19.60	0.60
	Urban, Metropolitan area	1498	26.30	1.10
	Province	3125	54.20	1.20
Personal income level	Lower class (1st quartile)	1196	21.70	0.70
	Lower-middle class (2nd quartile)	1415	25.40	0.80
	Upper-middle class (3rd quartile)	1567	26.90	0.80
	Upper class (4th quartile)	1499	26.00	1.00
Household income level	Lower class (1st quartile)	829	11.70	0.60
	Lower-middle class (2nd quartile)	1441	25.50	0.80
	Upper-middle class (3rd quartile)	1666	31.00	0.90
	Upper class (4th quartile)	1741	31.80	1.10
Education	≤Elementary school	1378	19.10	0.70
	Middle school	675	11.30	0.50
	High school	1974	37.80	0.80
	≥College	1666	31.80	0.90
Occupation	Professional occupations	578	10.80	0.50
	Other occupations	2179	38.10	0.80
	Unemployed (housewives and students)	2937	51.20	0.80
Basic living allowance (n=5695)	Yes, received	256	4.30	0.30
	No, never received	5439	95.70	0.30
Home ownership (n=5697)	No home ownership	1560	30.00	1.00
	1 household	3312	56.80	0.90
	2 or more household	825	13.20	0.60
Number of children	One person	954	18.80	0.60
	More than two	4744	81.20	0.60
Age of first birth	95% CI: 25.74~26.01 Min.~ Max.: 15~50	5698	25.88	0.069
	Below 19	244	3.80	0.30
	20~29	4618	80.20	0.70
	30~39	814	15.60	0.60
	Over 40	22	0.40	0.10
Age of last birth	95% CI: 29.47~29.73 Min.~ Max.: 16~50	5698	29.60	0.065
	Below 19	13	0.30	0.10
	20~29	2947	51.60	0.80
	30~39	2639	46.60	0.80
	Over 40	99	1.60	0.20

Conted...

5 EQ: mobility							17.00	<0.001
	<20	3.80	1.28	0.03	Ref			
	20~29	80.20	1.13	0.01	-0.15	0.03	20.54	<0.001
	30~39	15.60	1.06	0.01	-0.21	0.03	37.55	<0.001
	>40	0.40	1.19	8.79	-0.09	0.09	1.00	0.316
5 EQ: self-care							11.17	<0.001
	<20	3.80	1.05	0.01	Ref			
	20~29	80.20	1.02	0.01	-0.02	0.01	2.89	0.089
	30~39	15.60	1.00	0.31	-0.04	0.01	10.38	0.001
	>40	0.40	1.09	6.76	0.04	0.06	0.43	0.508
5 EQ: usual activities							9.70	<0.001
	<20	3.80	1.21	0.02	Ref			
	20~29	80.20	1.08	0.01	-0.13	0.03	20.19	<0.001
	30~39	15.60	1.04	0.01	-0.16	0.03	27.00	<0.001
	>40	0.40	1.09	0.06	-0.11	0.07	2.42	0.120
5 EQ: pain/discomfort							3.46	0.016
	<20	3.80	1.34	0.03	Ref			
	20~29	80.20	1.28	0.01	-0.06	0.03	2.91	0.088
	30~39	15.60	1.22	0.01	-0.11	0.04	7.74	0.006
	≥ 40	0.40	1.26	0.11	-0.07	0.11	0.42	0.513
5 EQ: anxiety/depression							1.98	0.116
	<20	3.80	1.17	0.03	Ref			
	20~29	80.20	1.12	0.01	-0.04	0.03	1.74	0.187
	30~39	15.60	1.11	0.01	-0.06	0.03	3.35	0.068
	≥40	0.40	1.27	0.10	0.09	0.11	0.76	0.381
Recognition of stress (n=5656)							2.48	0.060
	<20	3.80	2.20	0.05	Ref			
	20~29	80.20	2.15	0.01	-0.04	0.05	0.62	0.429
	30~39	15.70	2.20	0.02	0.01	0.06	0.01	0.890
	≥40	0.30	2.51	0.18	0.31	0.19	2.63	0.105
Perceived health status (n=5696)							8.58	<0.001
	<20	3.80	2.82	0.06				
	20~29	80.20	3.08	0.01	0.26	0.06	14.10	<0.001
	30~39	15.60	3.20	0.03	0.37	0.07	23.79	<0.001
	≥40	0.40	3.00	0.16	0.17	0.18	0.89	0.345

a: Weighted value

Women’s QoL and their health awareness state by number of children.

Korean women’s quality of life and their health awareness state by number of children was indicated in table 3.

There was significant differences in women’s QoL by number of children (Wald F=23.28, p<0.001) and in

the sub-categories of quality of life including mobility (Wald F=33.04, p<0.001), self-care (Wald F=14.41, p<0.001), and usual activities (Wald F=7.52, p<0.001).

5EQ point (quality of life) appeared higher among women who had two or more children compared to who had one child (Wald F=23.28, p<0.001). Women who had two or more children showed higher quality of life rather

than women who had one child in the sub-categories of QoL including 5EQ-mobility, 5EQ-self-care, and 5EQ-usual activities which displayed significant differences.

Subjects' number of children did not affect women's health awareness state as it did not show any significant difference. This finding is contradicting to findings

in Payne's research [11], that is, women perceived their health bad and men perceived their health good in case of having higher number of children. It is analyzed that the subjects of this study had one or two children and consequently the number of children did not affect participants' perceived health status.

Table 3: EQ-5D and their health awareness state according to number of children in Korean women (N = 5698)

Categories	Number of children	% ^a	Mean	SE	Estimated value	SE	Wald F	p
5 EQ-Total	One child	18.80	0.96	0.01	Ref			
	More than two children	81.20	0.94	0.01	-0.01	0.01	23.28	<0.001
5 EQ: mobility	One child	18.80	1.07	0.01	Ref			
	More than two children	81.20	1.14	0.01	0.06	0.01	33.04	<0.001
5 EQ: self-care	One child	18.80	1.01	0.01	Ref			
	More than two children	81.20	1.03	0.01	0.01	0.01	14.41	<0.001
5 EQ: usual activities	One child	18.80	1.05	0.01	Ref			
	More than two children	81.20	1.08	0.01	0.02	0.01	7.52	0.006
5 EQ: pain/discomfort	One child	18.80	1.25	0.01	Ref			
	More than two children	81.20	1.28	0.01	0.02	0.01	2.69	0.101
5 EQ: anxiety/depression	One child	18.80	1.12	0.01	Ref			
	More than two children	81.20	1.13	0.01	0.01	0.01	0.66	0.417
Recognition of stress (n=5656)	One child	18.80	2.19	0.02	Ref			
	More than two children	81.20	2.16	0.01	-0.03	0.02	1.41	0.235
Perceived health status (n=5696)	One child	18.80	3.12	0.02	Ref			
	More than two children	81.20	3.08	0.01	-0.04	0.03	1.59	0.208

a: Weighted value

Women's QoL and their health awareness state by age of the last birth.

Korean women's QoL and their health awareness state by age of the last birth is shown in table 4.

There were no significant differences in women's QoL and their health awareness state by age of the last birth. This indicated that age of the first birth affects

women's health while age of the last birth did not significantly impact on women's QoL and their health awareness state. This study indicated that 95% of subjects' last birth age was before 30 years old and the variables of the last birth age did not show any significant differences in their QoL and their health awareness state. Therefore, it is necessary to have a comparison study that examines more diverse age groups according to the age of the last birth such as in 20s, 30s, and 40s.

Table 4: EQ-5D and their health awareness state according to age at the last childbirth in Korean women (N = 5698)

Categories	Age at the last childbirth (years)	% ^a	Mean	SE	Estimated value	SE	Wald F	p
5 EQ-Total							2.13	0.095
	<20	0.30	0.94	0.03	Ref.			
	20~29	51.60	0.94	0.01	0.01	0.03	0.08	0.773
	30~39	46.60	0.95	0.01	0.01	0.03	0.11	0.735
	≥40	1.60	0.91	0.01	-0.02	0.03	0.39	0.529

Conted...

5 EQ: mobility							1.88	0.131
	<20	0.30	1.08	0.06	Ref.			
	20~29	51.60	1.13	0.01	0.04	0.06	0.50	0.478
	30~39	46.60	1.12	0.01	0.03	0.06	0.37	0.541
	≥40	1.60	1.22	0.04	0.13	0.07	3.37	0.067
5 EQ: self-care							0.75	0.522
	<20	0.30	1.08	0.06	Ref.			
	20~29	51.60	1.02	0.01	-0.06	0.06	0.92	0.337
	30~39	46.60	1.02	0.01	-0.06	0.06	0.94	0.331
	≥40	1.60	1.05	0.02	-0.03	0.06	0.23	0.632
5 EQ: usual activities							1.23	0.296
	<20	0.30	1.28	0.18	Ref.			
	20~29	51.60	1.08	0.01	-0.19	0.18	1.13	0.287
	30~39	46.60	1.07	0.01	-0.20	0.18	1.21	0.271
	>40	1.60	1.12	0.03	-0.15	0.19	0.68	0.409
5 EQ: pain/discomfort							2.07	0.103
	<20	0.30	1.19	0.091	Ref.			
	20~29	51.60	1.27	0.01	0.08	0.09	0.77	0.379
	30~39	46.60	1.26	0.01	0.07	0.09	0.55	0.459
	≥40	1.60	1.41	0.061	0.22	0.11	3.60	0.058
5 EQ: anxiety/depression							1.82	0.141
	<20	0.30	1.05	0.05	Ref.			
	20~29	51.60	1.12	0.01	0.07	0.05	1.62	0.203
	30~39	46.60	1.12	0.01	0.07	0.05	1.50	0.220
	≥40	1.60	1.22	0.04	0.16	0.07	5.06	0.025
Recognition of stress (n=5656)							1.91	0.126
	<20	0.30	1.96	0.22	Ref.			
	20~29	51.50	2.15	0.01	0.18	0.22	0.71	0.400
	30~39	46.70	2.17	0.01	0.21	0.22	0.89	0.344
	≥40	1.50	2.32	0.07	0.35	0.23	2.30	0.130
Perceived health status (n=5696)							2.46	0.062
	<20	0.30	3.16	0.30	Ref.			
	20~29	51.60	3.07	0.01	-0.09	0.30	0.09	0.757
	30~39	46.60	3.12	0.01	-0.03	0.30	0.01	0.900
	≥40	1.60	2.97	0.08	-0.19	0.31	0.36	0.544

a: Weighted value

Women’s QoL and their health awareness state by the interval between births.

Korean women’s QoL and their health awareness state by birth interval is shown in table 5.

This study found that there were significant differences in women’s QoL (Wald F=19.71, p<0.001)

and sub-categories of QoL including mobility (Wald F=27.31, p<0.001), self-care (Wald F=6.27, p<0.001), usual activities (Wald F=10.79, p<0.001), and pain/discomfort (Wald F=7.73, p<0.001). And there were significant difference in their health awareness state by the interval between births (Wald F=8.50, p<0.001).

Women who had one child and women who had their second child within 5 years after the first one did not show any significant differences in 5EQ point (quality of life). However, women’s QoL decreased among those who had birth intervals of 6~10,11~15, and over 16 years compared to women who had only one child(Wald F=41.31, p<0.001; Wald F=39.85, p<0.001; Wald F=21.05, p<0.001, respectively).

Women who had one child and women who had their second child within 5 years after the first one did not show any significant differences in their health awareness state. However, women’s health awareness state diminished among those who had a birth interval of 6~10,11~15, and over 16 years compared to women who had one child (Wald F=9.20, p=0.003; Wald F=10.34, p=0.001; Wald F=12.57, p<0.001, respectively).

Table 5: EQ-5D and their health awareness state according to birth interval in Korean women (N = 5698)

Categories	Birth interval (years)	% ^a	Mean	SE	Estimated value	SE	Wald F	p
5 EQ-Total							19.71	<0.001
	One child	18.80	0.96	0.01	Ref.			
	1~5	58.80	0.95	0.01	-0.01	0.01	2.98	0.085
	6~10	16.60	0.93	0.01	-0.03	0.01	41.31	<0.001
	11~15	4.20	0.90	0.01	-0.06	0.01	39.85	<0.001
	≥16	1.60	0.87	0.01	-0.08	0.01	21.05	<0.001
5 EQ: mobility							27.31	<0.001
	One child	18.80	1.07	0.01	Ref.			
	1~5	58.80	1.10	0.01	0.02	0.01	6.59	0.010
	6~10	16.60	1.20	0.01	0.12	0.01	51.97	<0.001
	11~15	4.20	1.31	0.03	0.24	0.03	51.12	<0.001
	≥16	1.60	1.38	0.05	0.31	0.05	34.80	<0.001
5 EQ: self-care							6.27	<0.001
	One child	18.80	1.01	0.01	Ref.			
	1~5	58.80	1.02	0.01	0.01	0.01	3.78	0.052
	6~10	16.60	1.04	0.01	0.03	0.01	16.79	<0.001
	11~15	4.20	1.07	0.01	0.05	0.01	11.59	0.001
	≥16	1.60	1.09	0.02	0.08	0.03	7.33	0.007
5 EQ: usual activities							10.79	<0.001
	One child	18.80	1.05	0.01	Ref.			
	1~5	58.80	1.06	0.01	0.01	0.01	0.50	0.478
	6~10	16.60	1.12	0.01	0.06	0.01	18.47	<0.001
	11~15	4.20	1.17	0.02	0.11	0.02	18.40	<0.001
	≥16	1.60	1.21	0.04	0.15	0.04	11.65	0.001
5 EQ: pain/discomfort							7.73	<0.001
	One child	18.80	1.25	0.01	Ref.			
	1~5	58.80	1.25	0.01	0.01	0.01	0.01	0.965
	6~10	16.60	1.32	0.01	0.07	0.02	9.89	0.002
	11~15	4.20	1.40	0.03	0.15	0.04	12.99	<0.001
	≥16	1.60	1.45	0.07	0.19	0.07	7.56	0.006
5 EQ: anxiety/depression							2.04	0.087
	One child	18.80	1.12	0.01	Ref.			
	1~5	58.80	1.12	0.01	0.01	0.01	0.01	0.909
	6~10	16.60	1.15	0.01	0.03	0.01	2.68	0.102
	11~15	4.20	1.15	0.02	0.03	0.02	1.05	0.305
	≥16	1.60	1.22	0.04	0.10	0.05	3.97	0.047

Conted...

Recognition of stress (n=5656)							1.44	0.217
	One child	18.80	2.19	0.02	Ref.			
	1~5	58.90	2.16	0.01	-0.03	0.03	1.10	0.295
	6~10	16.50	2.16	0.02	-0.03	0.03	0.65	0.418
	11~15	4.10	2.07	0.04	-0.12	0.05	4.73	0.030
	≥16	1.60	2.22	0.07	0.03	0.08	0.16	0.684
Perceived health status (n=5696)							8.50	<0.001
	One child	18.80	3.12	0.02	Ref.			
	1~5	58.80	3.13	0.01	0.01	0.03	0.03	0.858
	6~10	16.60	3.00	0.03	-0.12	0.04	9.20	0.003
	11~15	4.20	2.91	0.06	-0.21	0.06	10.34	0.001
	≥16	1.60	2.77	0.09	-0.35	0.10	12.57	<0.001

a: Weighted value

Conclusion

One of the factors for continuing low fertility rates is due to women’s perception that the childbirth process would reduce their quality of life and negatively impact their health. This research sought to examine how childbirth affects women’s quality of life and their perceived health conditions retrospectively and the findings indicate that if the first birth occurred before 20 years of age, childbirth affected women’s quality of life and their perceived health. However, if the first birth occurred after age 20, childbirth did not impact women’s quality of life and their perceived health conditions. Therefore, this study confirmed that childbirth does not necessarily have a negative impact on women’s quality of life and their health and the results of this study should be used to change women’s negative perception on childbirth.

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