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# Health-Related Quality of Life in Women With Breast Cancer in Korea: Do Sociodemographic Characteristics and Time Since Diagnosis Make a Difference?

Young Ran Chae, PhD, RN, and Kumin Seo, MS, RN

**B**reast cancer is the most common cancer among women worldwide. Breast cancer accounts for 23% of all cancers in women, with an estimated 1.15 million new cases each year (Centers for Disease Control and Prevention, 2010; Parkin, Bray, Ferlay, & Pisani, 2005). In the Republic of Korea, breast cancer also is the most frequently occurring cancer in women. The incidence rate has increased continuously since the late 1990s (Lee et al., 2007; Ministry of Health and Welfare, 2007). Although breast cancer remains one of the leading causes of cancer death worldwide in women, favorable long-term survival rates are increasing in Korea and other developed countries, including the United States (Jemal et al., 2006; Lee et al., 2007; Parkin et al., 2005).

## Quality of Life—Global Change

Research reveals that quality of life is a prognostic predictor of survival in patients with breast cancer (Efficace et al., 2004; Gupta, Granick, Grutsch, & Lis, 2007). Given the increasing prevalence of breast cancer and the number of breast cancer survivors, quality of life can be considered an essential variable (King, 2006). In general, quality of life can be considered one's sense of well-being in multiple aspects of life (Ferrans & Powers, 1992; Haas, 1999; Padilla, Ferrell, Grant, & Rhiner, 1990). The definition of quality of life given by the World Health Organization Quality of Life Group (1998) stated that quality of life is a subjective judgment embedded in a cultural and social background. The meaning and domains of quality of life in patients with cancer differ across cultures and ethnicities (Ashing-Giwa, Tejero, Kim, Padilla, & Hellemann, 2007; Kim, Ashing-Giwa, Kagawa Singer, & Tejero, 2006; Meyerowitz, Richardson, Hudson, & Leedham, 1998). For example, Koreans with

**Purpose/Objectives:** To describe whether levels of health-related quality of life (HRQOL) differ by sociodemographic characteristics and time since breast cancer diagnosis in women in Korea.

**Design:** A descriptive, cross-sectional study of women with breast cancer.

**Setting:** An outpatient clinic of one large hospital in Seoul, Republic of Korea.

**Sample:** A convenience sample of 244 women with breast cancer after mastectomy.

**Methods:** Study participants completed sociodemographic characteristics and HRQOL questionnaires. Medical charts were reviewed to determine time since breast cancer diagnosis.

**Main Research Variables:** Sociodemographic characteristics (age, marital status, employment status, education, monthly household income, and religion), time since diagnosis, and HRQOL.

**Findings:** The psychological well-being domain scored the lowest among domains of HRQOL. Women who are younger, married, unemployed, highly educated, or religious, with higher monthly household income or with greater than one year elapsed time since diagnosis, had higher HRQOL.

**Conclusions:** Study findings will be useful to establish priorities in planning nursing interventions to enhance HRQOL in care of women with breast cancer.

**Implications for Nursing:** Nursing interventions can be provided to Korean women with breast cancer who are not religious, who are older, single or widowed, or employed, with lower education level, with lower monthly household income, or with one year or less elapsed time since breast cancer diagnosis.

breast cancer showed lower quality-of-life scores across various dimensions than Europeans or other Asians with breast cancer (Shim et al., 2006). In a qualitative study on the experience of women with breast cancer

### Quick Facts: Republic of Korea

**Geography and population:** The Republic of Korea (also known as South Korea) is located in Northeast Asia near Japan, the Russian Far East, and China. Korea encompasses a total of 223,098 km<sup>2</sup>. The Korean Peninsula is divided into two separate states: North and South Korea. Seoul is South Korea's capital city. South Korea's total population is estimated to be 48.6 million.

**Development:** South Korea has developed rapidly since the 1960s, fueled by high savings and investment rates and a strong emphasis on education. The nation became the 29th member of the Organization for Economic Cooperation and Development in 1996.

**Healthcare system:** Health care in the form of medical insurance and medical assistance was first introduced in 1977. As of December 2005, 96.4% of the population had access to health insurance, with the remaining 3.6% able to receive direct medical assistance.

**Cancer incidence:** Cancer has been the leading cause of death in South Korea since 1983. To date, cancer deaths account for 26.7% of all deaths annually. Stomach, lung, liver, and colorectal cancer are the four most common cancers in Korean men. Breast, stomach, colorectal, cervical, lung, and liver cancer constitute 66.7% of cancers in Korean women.

**Cancer research:** The National Cancer Center was founded in 2000 as a government-funded institution devoted to research, patient care, education, and training in cancer.

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in the United States., similar themes on breast cancer were revealed through various cultural manifestations (Ashing-Giwa et al., 2004). Asian or Hispanic American women relied more on their family responsibilities, whereas Caucasian American women focused more on personal responsibility. Factors influencing quality of life were different, including languages, legal status, information-seeking behaviors, and healthcare systems across different ethnicities. However, sociodemographic characteristics were manifested as influencing factors by all these American women groups as a type of education, financial level, or insurance types.

As such, sociodemographic characteristics greatly influence quality of life in patients with breast cancer (Ashing-Giwa et al., 2007; Awadalla et al., 2007; Guner et al., 2006; Hartl et al., 2003; Janz et al., 2005). However, little is known about the relationship between quality of life and sociodemographic characteristics in women with breast cancer in Korea (Shim & Park, 2004). In addition, research on quality of life and sociodemographic characteristics in Korea showed inconsistent findings from studies (Shim & Park, 2004; Suh, 2007). In Suh's

(2007) study, education, income, employment status, and stage of disease had impacts on levels of quality of life, whereas age, religion, spousal status, and types of adjunctive therapies did not. However, Shim and Park (2004) reported that only "being religious" influenced quality of life among sociodemographic characteristics, including age, education, employment status, income, duration after operation, and numbers of chemotherapy.

Time since diagnosis is another important factor affecting quality of life in women with breast cancer (Awadalla et al., 2007; Hartl et al., 2003). Quality of life in patients with breast cancer has been explored in diverse populations, ranging from newly diagnosed patients to 5–10 year long-term survivors, in terms of time since diagnosis in the Western culture (Dorval, Maunsell, Deschenes, Brisson, & Masse, 1998; Ganz et al., 2002; Rustoen, Moum, Wiklund, & Hanestad, 1999). The results of these studies indicate that women with breast cancer still are challenged by diverse physical, psychological, and social issues even more than four years after diagnosis and treatment (Ashing-Giwa et al., 2004; Bloom, Petersen, & Kang, 2007; Carter, 1997; Dorval et al., 1998; Hartl et al., 2003).

Studies in Korea on the relationships between quality of life and time since diagnosis have focused primarily on newly diagnosed patients or women with relatively less than two years' elapsed time since diagnosis or treatment of breast cancer (Jun, Kim, & Kim, 1996; Kim & Kwon, 2006; Shim & Park, 2004; So, Min, & Park, 2006). Therefore, little information exists on the association between quality of life and longer time since diagnosis (i.e., more than two years) in women with breast cancer in Korea.

This study explored whether levels of health-related quality of life (HRQOL) differ by sociodemographic characteristics and time since diagnosis in women with breast cancer. The specific objectives of this study are to describe the levels of HRQOL in Korean women with breast cancer and to examine whether sociodemographic characteristics or time since diagnosis makes a difference in their levels of HRQOL.

## Methods

### Research Design and Sample

A descriptive, cross-sectional study was used to investigate HRQOL in Korean women with breast cancer. Women receiving mastectomy and follow-up checks after breast cancer diagnoses were recruited at an outpatient clinic of a large urban hospital that is well-known for treating cancer. Two hundred and sixty participants from a convenience sample initially agreed to take part in this study. Among them, nine women older than 61 years or younger than 30 years were

excluded because enough sample couldn't be obtained as compared to the other age groups. In Korea, incidence rates of breast cancer are increasing dramatically for women aged 41–50, whereas the rates are very low among women older than 60 or younger than 30 (Lee et al., 2007). Seven women were excluded from the data analysis because of significant missing data. Finally, the participants for the current study were 244 women, aged 31–60 years, who had undergone mastectomy after a breast cancer diagnosis. Most participants completed treatments of their cancer except for hormonal therapy. A minimum of 126 participants were required for the analysis of covariance (ANCOVA) at a significance level of  $\alpha = 0.05$  and a power of  $1-\beta = 0.8$  based on the calculation by Borm, Fransen, and Lemmens (2007). Therefore, the final sample size was adequate for a descriptive study.

## Procedures

The descriptive research policy of the hospital did not require formal institutional review board approval. Instead, according to the hospital's internal regulation and policy on research, approval was sought from the committee of small group members, which consisted of the surgeon of the outpatient clinic, the director of nursing education, and the director of the nursing department of the hospital. Then, visits were made to all participants at the outpatient clinic to obtain informed consent.

A set of self-administrated questionnaires was distributed to the participants by a trained research assistant. The participants were asked to return the questionnaires to the research assistant after completing them in a private room in the outpatient clinic. The research assistant stayed in the room to answer any questions or concerns from the participants. However, the research assistant sat separate from the participant, keeping enough space between the two so as to not give any impression of pressure and to not look at the participants' responses to the questionnaires. Participants took about 15–20 minutes to answer the questionnaires.

## Instruments

The first set of questions asked about sociodemographic characteristics. The questionnaire consisted of six items regarding participants' age, education, marital status, employment status, income, and religion. Next, HRQOL was assessed using the Quality of Life Scale for Patients with Breast Cancer in Korea (Chae & Choe, 2001). This scale was originally developed to measure HRQOL of patients with breast cancer in Korean culture and context (Chae & Choe, 2001), and is comprised of 27 items with six domains, including responses to breast cancer diagnosis and treatment (eight items), family well-being (five items), physical

well-being (five items), psychological well-being (five items), spiritual well-being (two items), and economic well-being (two items). The score for each item ranged from 0 (not at all) to 10 (always). The item score was calculated by averaging responses for each item. A total score and each dimension score were calculated by averaging responses for all items and items in each domain, respectively. Because of different item numbers for each domain, the average of the mean score for each domain was obtained instead of summing up the scores of each item. Therefore, comparisons of scores across domains were made possible. Higher scores indicate higher levels of HRQOL. A support for construct validity was demonstrated in the previous study (Chae & Choe, 2001). Reliability also was demonstrated with Cronbach's  $\alpha$  of 0.91 and Guttman Reliability Coefficient of 0.81 in the previous study. Cronbach's  $\alpha$  was 0.88 in this study. Time in months since breast cancer diagnosis was extracted from the participants' medical charts by the researcher after obtaining consent from each participant.

## Data Analysis

SPSS® 15.0 for Microsoft® Windows® was used for data analysis. Descriptive statistics, including means, standard deviations, and frequencies, were calculated for study variables. To examine the levels of HRQOL by sociodemographic characteristics, independent sample t-test analysis and analysis of variance (ANOVA) were used. ANCOVA analyses were used to examine the levels of HRQOL by time since diagnosis. Age, marital status, education, income, and number of treatments (treatment options) were controlled as covariates in the ANCOVA analyses. Marital status was operationalized as a continuous variable by coding not married (single or widowed) as "0" and married as "1" because of the characteristics of covariates in the ANCOVA analysis.

## Results

### Sample Characteristics

Descriptions of the sample are shown in Table 1. The majority of the participants were aged 41–50 years, with a mean of 46.1 years ( $SD = 7.28$ ). Most of the participants were married, unemployed, high school graduates, had less than \$4,000 monthly household income, and were religious. The average time since diagnosis was 3.3 years ( $SD = 2.42$ ). Eighty-seven participants were diagnosed with breast cancer within two to three years, followed by three to five years, five years or more, and one year or less.

All participants underwent mastectomy as treatment for breast cancer. Forty-seven percent of the participants ( $n = 115$ ) took two adjunctive therapies in addition to

**Table 1. Sociodemographic and Illness-Related Characteristics of Participants**

Characteristic	n	%
<b>Age (years)</b>		
31–40	63	26
41–50	113	46
51–60	68	28
<b>Marital status</b>		
Single or widowed	16	7
Married	228	93
<b>Employment status</b>		
Unemployed	205	84
Employed	39	16
<b>Education</b>		
Middle school or below (grades 1–9)	32	13
High school (grades 10–12)	140	57
Undergraduate or higher	72	30
<b>Monthly household income (\$)ª</b>		
2,000 or less	106	43
2,001–4,000	104	43
4,001 or more	34	14
<b>Religion</b>		
Yes	206	84
No	38	16
<b>Time since diagnosis (months)</b>		
1–12	43	17
13–36	87	36
37–60	63	26
More than 61	51	21
<b>Treatment options</b>		
Mastectomy	6	2
Mastectomy + CT	41	17
Mastectomy + RT	46	19
Mastectomy + HT	3	1
Mastectomy + CT + RT	56	23
Mastectomy + CT + HT	13	5
Mastectomy + RT + HT	46	19
Mastectomy + CT + RT + HT	33	14

N = 244

ª Korean wons were converted to U.S. dollars based on the currency exchange rate in early 2008.

CT—chemotherapy; HT—hormonal therapy; RT—radiation therapy

mastectomy. Six participants experienced mastectomy only, whereas 33 participants received three adjunctive therapies including chemotherapy, radiation therapy, and hormonal therapy.

### Levels of Health-Related Quality of Life

On average, the women reported an overall HRQOL score of 7.39 (SD = 1.29). The domain of responses to breast cancer diagnosis and treatment had the highest average score ( $\bar{X}$  = 8.39, SD = 1.65) relative to the other domains, whereas the psychological well-being domain scored the lowest ( $\bar{X}$  = 5.75, SD = 1.87). The family well-being domain was the domain with the second highest scores ( $\bar{X}$  = 8.31, SD = 1.86), followed by spiritual ( $\bar{X}$  = 8.07, SD = 2.63), economic ( $\bar{X}$  = 8.06, SD = 2.24), and physical well-being ( $\bar{X}$  = 5.81, SD = 1.69).

### Levels of Health-Related Quality of Life by Sociodemographic Characteristics

The levels of HRQOL by sociodemographic characteristics in Korean women with breast cancer are presented in Table 2. Patients in the aged 31–40 group had significantly higher scores in overall HRQOL and in three domains (i.e., family, physical, and economic well-being), whereas patients in the aged 51–60 group reported lower scores than other age groups.

Regarding marital status, married patients reported higher scores in overall HRQOL than single or widowed patients ( $t$  = -3.74,  $p$  < 0.01) as well as in all domains except for family and physical well-being. For employment status, unemployed patients had significantly higher levels of HRQOL than employed patients in the domain of responses to breast cancer diagnosis and treatment ( $t$  = 3.11,  $p$  < 0.01), spiritual well-being ( $t$  = 2.6,  $p$  < 0.05), and economic well-being ( $t$  = 2,  $p$  < 0.05). However, unemployed patients had significantly lower levels of physical well-being than employed patients ( $t$  = -2.15,  $p$  < 0.05).

Patients with higher education levels showed significantly higher levels of HRQOL than patients with lower education levels in the domain of physical well-being ( $F$  = 4.58,  $p$  < 0.05) and economic well-being ( $F$  = 8.83,  $p$  < 0.01). Patients with monthly household income of \$4,001 or higher scored lower HRQOL in the domain of responses to breast cancer diagnosis and treatment than patients with \$4,000 or less monthly household income ( $F$  = 5.49,  $p$  < 0.01). However, for the economic well-being domain, patients with \$2,000 or less monthly income reported lower HRQOL scores than patients with \$2,001 or higher monthly income ( $F$  = 3.9,  $p$  < 0.05).

In the relationship between HRQOL and religion, patients who were religious scored higher levels of HRQOL in the spiritual well-being ( $t$  = -4.13,  $p$  < 0.01) and economic well-being domain ( $t$  = -2.05,  $p$  < 0.05).

### Levels of Health-Related Quality of Life by Time Since Breast Cancer Diagnosis

The HRQOL scores by time since diagnosis in Korean women with breast cancer are shown in Table 3 after controlling for sociodemographic characteristics, including age, marital status, education, income, and number of treatments. Patients within one year of breast cancer diagnosis reported lower scores in overall HRQOL and in the domain of responses to breast cancer diagnosis and treatment ( $F$  = 20.74,  $p$  < 0.01), and economic well-being ( $F$  = 7.62,  $p$  < 0.01), compared to patients more than one year from diagnosis ( $F$  = 9.59,  $p$  < 0.01).

An analysis of the levels of HRQOL by time since diagnosis in women within one year is presented in Table 4. The group with four to six months of elapsed time since diagnosis scored lower levels of overall HRQOL

Table 2. Health-Related Quality-of-Life Scores by Sociodemographic Characteristics

Characteristic	Diagnosis and Treatment		Family Well-Being		Physical Well-Being		Psychological Well-Being		Spiritual Well-Being		Economic Well-Being		Total Score	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
<b>Age (years)</b>														
31–40	8.43	1.65	8.58	1.29	6.19	1.69	5.78	2.13	8.23	2.34	8.68	1.7	7.53	1.28
41–50	8.56	1.63	8.46	1.75	5.97	1.58	5.88	1.69	8.16	2.65	7.78	2.48	7.48	1.12
51–60	8.08	1.65	7.83	2.34	5.19	1.74	5.49	1.91	7.75	2.85	7.8	2.17	6.97	1.24
<b>F</b>	1.85		3.35*		6.9**		0.97		0.64		3.36*		4.86**	
<b>Marital status</b>														
Single or widowed	7.25	1.97	7.81	2.41	5.48	1.74	4.68	2.19	5.36	3.86	6.13	2.81	6.29	1.38
Married	8.47	1.59	8.35	1.83	5.48	1.69	5.82	1.83	8.25	2.43	8.2	2.13	7.43	1.17
<b>t</b>	-2.92**		-1.04		-0.83		-2.39*		-2.77*		-2.89		-3.74**	
<b>Employment status</b>														
Unemployed	8.53	1.62	8.33	1.76	5.7	1.61	5.77	1.81	8.33	2.34	8.19	2.16	7.41	1.2
Employed	7.65	1.58	8.21	2.39	6.43	2	5.61	2.19	6.74	3.51	7.41	2.55	7.04	1.29
<b>t</b>	3.11**		0.37		-2.15*		0.51		2.6*		2*		1.74	
<b>Education</b>														
Middle school or below (grades 1–9)	8.15	1.77	8	1.76	5.04	1.72	6.01	2.25	7.22	3.62	6.56	2.92	6.96	1.27
High school (grades 10–12)	8.64	1.5	8.32	1.92	5.84	1.49	5.59	1.74	8.28	2.34	8.26	2.07	7.44	1.18
Undergraduate or above	8.02	1.79	8.45	1.8	6.11	1.95	5.94	1.94	8.02	2.6	8.33	1.96	7.37	1.24
<b>F</b>	1.83		0.64		4.58*		1.17		1.95		8.83**		2.05	
<b>Monthly household income (\$) <sup>a</sup></b>														
2,000 or less	8.67	1.57	8.37	1.97	5.87	1.46	5.52	1.95	8.09	2.74	7.62	2.51	7.38	1.31
2,001–4,000	8.36	1.67	8.3	1.73	5.68	1.67	5.79	1.83	8.24	2.42	8.46	1.84	7.37	1.14
4,001 or more	7.62	1.59	8.17	1.95	6.02	2.33	6.29	1.7	7.5	2.88	8.24	2.25	7.22	1.14
<b>F</b>	5.49		0.15		0.62		2.25		1.01		3.9*		0.24	
<b>Religion</b>														
Yes	8.46	1.58	8.27	1.87	5.8	1.69	5.75	1.84	8.35	2.3	8.19	2.13	7.4	1.17
No	8.04	1.93	8.58	1.84	5.88	1.74	5.72	2.1	4.44	3.74	7.38	2.69	7.1	1.42
<b>t</b>	-1.46		0.95		0.26		-0.09		-4.13**		-2.05*		-1.38	

\*  $p < 0.05$ \*\*  $p < 0.01$ <sup>a</sup> Korean wons were converted to U.S. dollars based on the currency exchange rate in early 2008.

**Table 3. Health-Related Quality-of-Life Scores by Time Since Diagnosis Controlling for Sociodemographic Characteristics**

Variable	Diagnosis and Treatment		Family Well-Being		Physical Well-Being		Psychological Well-Being		Spiritual Well-Being		Economic Well-Being		Total Score	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
<b>Years since diagnosis</b>														
1 or less	6.64	2	7.84	2.07	5.48	1.97	5.64	2.01	6.98	3.7	6.7	2.87	6.49	1.28
2–3	8.58	1.46	8.55	1.8	5.85	1.58	5.73	2.7	8.47	2.22	8.34	1.91	7.5	1.15
4–5	8.87	1.28	8.2	2.08	6.04	1.64	5.82	2	8	2.49	8.15	2.11	7.54	1.22
5 or more	8.96	0.9	8.46	1.39	5.75	1.7	5.78	1.94	8.42	2.05	8.63	1.88	7.61	0.96
<b>F</b>	20.74*		1.6		2.69		0.35		1.21		7.62*		9.59*	

\*  $p < 0.01$ 

( $F = 3.95$ ,  $p < 0.05$ ) as well as in the domain of response to breast cancer diagnosis and treatment ( $F = 7.1$ ,  $p < 0.01$ ) compared to other time groups after controlling for age, marital status, education, income, and number of treatments.

## Discussion

The current study described the levels of HRQOL by sociodemographic characteristics and time since diagnosis in 244 Korean women with breast cancer after mastectomy. Overall, Korean women in this study reported higher levels of HRQOL than women in previous HRQOL research in Korea. Korean women with breast cancer reported a score of 4.68 (SD = 1.46) in Shim and Park's (2004) study, which used a 10-point Likert-type Quality of Life Index developed by Ferrans and Powers (1985). The difference may be from the variation in characteristics of the samples. In Shim and Park's (2004) study, all participants were on a chemotherapy regimen after mastectomy and, therefore, the average of time since diagnosis was less than one year. However, this study finding is consistent with the findings from previous studies that measured quality of life ( $\bar{X} = 6.45$ – $7.2$ ) using the European Organisation for Research and Treatment of Cancer's Quality of Life Questionnaire or the Ladder of Life Scale on a 10-point Likert-type scale in survivors of breast cancer in Korea (Ahn et al., 2007) and women with breast cancer in Western cultures (Avis, Crawford, & Manuel, 2005; Osoba et al., 1994).

The psychological well-being domain scored the lowest ( $\bar{X} = 5.75$ ), whereas the domain of responses to breast diagnosis and treatment scored highest ( $\bar{X} = 8.39$ ) among six domains of HRQOL. The findings were supported by previous study results that quality of life scores of the social or psychological domain were lower than those of other domains (Avis et al., 2005; Borghede & Sullivan, 1996; Osoba et al., 1994; Shim & Park, 2004; Suh, 2007). Women with breast cancer experienced psychological comorbidity from moderate to high anxiety,

depression, concerns of recurrence, increased negative feelings, and decreased interpersonal relationships (Lu et al., 2009; Lueboonthavatchai, 2007; Mehnert & Koch, 2008). Patients with their first breast cancer recurrence showed a particularly higher prevalence of psychiatric disorders and helplessness or hopelessness (Okamura, Yamawaki, Akechi, Taniguchi, & Uchitomi, 2005). This may indicate that patients with breast cancer face more psychological than physical issues as time since diagnosis or treatment has elapsed and the survival rate of breast cancer has increased.

The levels of HRQOL by sociodemographic characteristics were examined. Age was found to have a significant relationship to HRQOL in that Korean women aged 31–40 showed higher HRQOL than women aged 51–60 in the current study. The finding did not confirm findings of other studies in Korea (Shim & Park, 2004; Suh, 2007). The levels of quality of life were not different across age groups (younger than 40 years, 40–49 years, and 50 or older) in two previous studies. Previous research in Western cultures revealed that an increase in age was related to higher levels of quality of life (Ashing-Giwa et al., 2007; Ganz et al., 2002; Janz et al., 2005). These Western studies found that quality-of-life scores increased as European, African, Latina, or Asian American patients grew older, because older patients were more satisfied with their lives and perceived less vulnerability than younger patients. Additional research is needed to identify the relationship between HRQOL and age in Korean women with breast cancer.

Married Korean women had better HRQOL than single or widowed Korean women with breast cancer in this study. This study result supports previous findings that married patients reported better quality of life (Awadalla et al., 2007; Janz et al., 2005). Social and emotional support from spouses may contribute to better quality of life in married women with breast cancer because perceived social support is significantly related to higher quality of life (Sammarco, 2003).

**Table 4. Health-Related Quality-of-Life Scores by Time Since Diagnosis Within One Year After Breast Cancer Diagnosis**

Variable	Diagnosis and Treatment		Family Well-Being		Physical Well-Being		Psychological Well-Being		Spiritual Well-Being		Economic Well-Being		Total Score	
	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
<b>Years since diagnosis</b>														
0–3	7.2	1.54	8.55	2.12	5.39	2.4	6.24	2.07	6.53	4.36	7.13	3.37	6.89	1.14
4–6	5.04	1.34	7.24	2.21	4.76	1.54	5.57	2.14	6.53	3.18	5.75	2.48	5.64	1.25
7–9	7.57	1.94	8	1.53	6.23	1.5	6	0.87	7.33	4.19	7.29	2.84	7.07	0.96
10–12	7.77	2.52	7.17	1.97	6.53	1.66	3.8	1.72	9.4	0.55	7.08	2.35	6.72	1.3
<b>F</b>	7.1**		1.26		2.26		1.79		0.72		0.98		3.95*	

\*  $p < 0.05$

\*\*  $p < 0.01$

Employed Korean women with breast cancer showed lower levels of HRQOL in domains of physical, economic, and spiritual well-being, as well as responses to breast cancer diagnosis and treatment than unemployed Korean women with breast cancer. This finding is inconsistent with the previous research finding that employment has been a significant factor in explaining better quality of life (Ahn et al., 2007; Awadalla et al., 2007; Guner et al., 2006; Suh, 2007). The finding in the current study may reflect a Korean traditional social norm that a woman's role as a family supporter and a housewife is more important than participating in economic activity in the family system. A previous study supported this assumption. Kim (2003) reported that marriage and childbirth were among the most important barriers preventing Korean women from maintaining their jobs, and dropped the employment rate of Korean women by 8.7% and 11.2%, respectively. The employment rate of Korean women has increased by 1.8% since 2000, but it still is lower than that of other developed countries because of a lack of labor policy to support female employees (Hwang, 2003). HRQOL in unemployed women may be related to a spouse's employment status, support from family members, or, to a lesser degree, pressure to have their own jobs; therefore, unemployed patients reported better HRQOL than employed patients in this study. However, research by Suh (2007) revealed that employed women in Korea had higher levels of quality of life than unemployed women, although employment rate and monthly household income were very similar between the two studies. Because studies have shown inconsistent results, additional research is needed to investigate the relationship between quality of life and employment in women with breast cancer in Korea.

Education and income had significant relationships to HRQOL in this study. Higher levels of education and monthly household income were related to better HRQOL, which is similar to previous findings (Ashing-

Giwa et al., 2007; Awadalla et al., 2007; Guner et al., 2006; Janz et al., 2005; Suh, 2007). This finding may be explained by the fact that patients with higher education and income are better able to cope with breast cancer because of easy access to superior resources and benefits (Guner et al., 2006).

Lastly, the levels of HRQOL by time since breast cancer diagnosis were examined. Korean women less than one year since diagnosis reported significantly lower HRQOL scores than Korean women more than one year since diagnosis. Post-hoc analysis revealed that levels of HRQOL more than one year since diagnosis remain the same. This finding may be explained by the fact that the patients with breast cancer experience more physical or psychological distress within one year of diagnosis because of the nature of coping with breast cancer and intensive treatment or therapy. Hartl et al. (2003) consistently showed that the one year or less since diagnosis group reported lower levels of quality of life than groups one to two years and more than six years after diagnosis.

When HRQOL patterns were investigated in the one year or less time group, the four to six month time group had significantly lower levels of HRQOL than the other three groups (0–3, 7–9, and 10–12 months). Longitudinal follow-up studies showed that quality of life at the time of diagnosis or in the pre-operation stage declined over time, began to increase after four to six months after treatment, and then returned to baseline or higher levels by one year (Fairclough, Fetting, Cella, Wonson, & Moinpour, 1999; Parker et al., 2007). Other studies also revealed that one year since diagnosis or treatment is a time point when quality of life returns to initial levels or higher, and no additional improvement exists after one year (Carlsson et al., 2006; Wilkins et al., 2000). This suggests that up to one year after breast cancer diagnosis is the critical time point when greater attention is required for women with breast cancer. However, one previous study in Korea showed inconsistent findings with the current study's results. So et al. (2006) found

that patients with breast cancer in an acute stage (group waiting for surgery to treat breast cancer after diagnosis) reported higher quality of life scores than patients in a stable stage (patient group with an average of 30 months since surgery) in a comparison study with 97 women with breast cancer. Therefore, additional studies are necessary to establish the relationships between quality of life and time since diagnosis because little evidence exists, and the previous study findings were contradictory to the results of this study.

## Implications for Nursing

The current study revealed that the psychological well-being domain was the lowest among six domains of HRQOL in women with breast cancer. Women with breast cancer who were younger, married, unemployed, higher education graduates, or religious, with higher monthly household income or more than one year elapsed time since diagnosis, had higher HRQOL. Women in the four to six months since diagnosis group showed the lowest level of HRQOL. Therefore, nursing interventions for this group should be designed to enhance psychological well-being among Korean women with breast cancer. In addition, nursing priorities should be considered to enhance HRQOL in Korean women with breast cancer who are older, single or widowed, employed, lower education graduates, not religious, with lower monthly household income, and less than one year since diagnosis, particularly women four to six months since diagnosis.

The study had a few limitations. First, the severity of breast cancer, such as stages of breast cancer, was not controlled in assessing the levels of HRQOL by socio-

demographic characteristics and time since diagnosis. Although number of treatment options was controlled in the statistical analysis, it was an indirect indicator of the severity of breast cancer. Also, a cross-sectional study design was used to examine the levels of HRQOL by time since breast cancer diagnosis. Specific subgroups of socio-demographic characteristics were overrepresented, such as married women, unemployed women, and the limited range of the age group being between 31–60 years. To overcome these limitations, additional research can be conducted using a longitudinal study design controlling for the severity of breast cancer in the sample representing a wider range of age groups and an appropriate proportion of unemployed and married women to explore HRQOL by time since diagnosis. Finally, this study showed inconsistent findings with one previous study in Korea in terms of time since breast cancer diagnosis. Additional research is needed to investigate patterns of HRQOL since diagnosis on a long-term basis, including one year or less after diagnosis or treatment, and to establish the relationship between quality of life and time since diagnosis in women with breast cancer in Korea.

Young Ran Chae, PhD, RN, is an associate professor in the Department of Nursing at Kangwon National University in Chuncheon, Republic of Korea, and Kumin Seo, MS, RN, is a doctoral student in the School of Nursing at the University of Washington in Seattle. This research was funded, in part, by the Nursing Care Research Center of Kangwon National University and the Society of Biological Nursing Science in Seoul, both in the Republic of Korea. Seo can be reached at kumin@u.washington.edu, with copy to editor at ONFEditor@ons.org. (Submitted November 2008. Accepted for publication August 4, 2009.)

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