

Predictors of Quality of Life and Depression among Korean American Cancer Patients
and Their Family Caregivers

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Abstract

Objective: This study examined social, cultural, and appraisal factors associated with Korean American cancer patients' and their family caregivers' quality of life (QOL) and depression.

Methods: Data were from Korean American cancer patients and their family caregivers ($N=60$ dyads) living in the U.S. Study aims were examined using descriptive statistics and multiple regression.

Results: For patients, higher social support and lower negative appraisal of illness predicted higher patient QOL; negative appraisal of illness also predicted higher patient depression. For caregivers, older age, having fewer traditional Korean values, and more modern (individualistic) values predicted higher caregiver QOL. Caregivers who held more modern values also had less depression.

Conclusions: Higher support and less negative appraisal predicted better quality of life in patients. For caregivers however, the type of cultural values they held (tradition or modern)

was a key factor that predicted level of QOL and depression. Assessment of support and appraisal as well as attention to cultural values may enhance their QOL and reduce depression.

Key words: Appraisal, Cancer, Depression, Korean American, Oncology, Quality of life, Acculturation, Caregiving, Social support, Communication

Background

Cancer is the leading cause of death among Asian Americans.¹ By 2030, cancer incidence rates are expected to increase for ethnic minority groups by 99% versus 31% for non-Hispanic whites.² Korean Americans have the lowest cancer screening rates, are least likely to have health insurance^{3,4} and report the lowest quality of life (QOL) compared to other Asian American groups.⁵ Korean American immigrants are also four times more likely to have depression than Whites or African Americans.⁶

The current study uses the socio-cultural stress and coping framework⁷ to examine social, cultural, and appraisal factors associated with QOL and depression in Korean American cancer patients and family caregivers. This framework asserts that individuals respond to

stressful events (e.g., illness) by constructing cognitive appraisals (e.g., illness perceptions) that activate resources and coping strategies (e.g., social support) which can affect specific outcomes (e.g., depression, QOL).⁷ Individuals also possess personal (e.g., age, gender, education) and cultural characteristics (e.g., values, beliefs, norms) that affect the stress and coping process and influence QOL and depression.

Ethnic values influence cultural norms and expectations⁸ that affect perceptions of health and/or illness.⁹ Confucian philosophy shapes Korean traditional values emphasizing obedience and respect for authority⁸ that subsequently influences patients' and caregivers' cancer experiences, depression and perceptions of QOL. In contrast, modern or western values emphasize autonomy and assertiveness. Unfortunately, little is known about *appraisals* of illness and caregiving and their association with QOL and depression among Korean American cancer patients and their family caregivers. Patients' perceptions of illness are influenced by social class, culture, and religion.¹⁰ Furthermore, for Korean Americans, perceptions of caregiving are embedded within a cultural value of filial piety, that defines caregiving as an obligation rather than a voluntary choice.¹¹

Ethnic minority groups also experience concomitant stressors and resources that affect stress and coping processes and outcomes. *Acculturative stress*, representing the myriad cultural and psychological adjustments (i.e., language acquisition) in adapting to a new culture,¹² is associated with poorer mental health, higher psychosomatic symptoms, and

identity confusion.¹² We hypothesize that acculturative stress will be associated with lower levels of QOL and higher reports of depression.⁹ *Social support* representing assistance provided by family, friends, and others, is positively associated with both better physical and mental QOL among Korean Americans.^{10,13} *Communication* and communication style also influence cancer patients' and caregivers' QOL¹⁴ and shaped by culture and ethnicity.¹⁵ Koreans use high-context communication style which is derived from Confucianism and emphasizes non-verbal, indirect exchange of information.¹⁵ In Western cultures, low-context communication style, emphasizing verbal methods for exchanging information and meaning, is more common and regarded as clearer and more precise and effective for clinical care.¹⁵ Accordingly, we examined the use of high-context communication style and its relationship to QOL and depression.

In summary, our focus on social, cultural, and appraisal factors (e.g., illness and caregiving appraisals, ethnic values, acculturative stress, social support, communication styles) and their relationship to quality of life (QOL) and depression, addresses significant gaps in the research literature concerning Korean American cancer patients and their family caregivers.

Methods

Design and sample

Prior to recruitment, this study was approved by the Institutional Review Board (IRB) at the University of Michigan (ethical approval #HUM00082249). Participants were recruited from

Korean American community health agencies, ethnic churches and temples, senior apartments, ads in local Korean American newspapers, and referrals from Korean American primary care physicians in Illinois (urban and suburban areas) and Michigan. Interested participants were contacted by telephone, informed about the study, and screened to determine their eligibility. Participants could complete questionnaires in person with the researcher or by mail, and in either English or Korean. Participants who completed questionnaires in-person signed an IRB-approved consent form prior to completing questionnaires. Participants completing mail questionnaires received packets that included written consent forms, questionnaires, and return envelopes. All participants' written consent was obtained. Patients and caregivers were instructed to complete instrument packets separately; each received \$15 after returning completed questionnaires.

Patient eligibility criteria included: 1) self-identified as Korean American, 2) confirmed cancer diagnosis within the past 5 years, 3) age 18 years or older at diagnosis, 4) speaks English or Korean, and 5) had a family caregiver willing to participate. *Family caregiver eligibility* included: 1) identified by patient as her/his primary source of emotional and/or physical support, 2) self-identified as a Korean American, 3) age 18 or older, and 4) speaks English or Korean.

Measures

A rigorous translation and back-translation process was used to translate English

versions of two questionnaires (Ethnic Values and Communication Style) to Korean. Any discrepancies between the translated and original version were reviewed by three Korean-English bilingual experts and revised as needed to improve item clarity and meaning. Other instruments had been translated to Korean previously.

Quality of life. Functional Assessment of Cancer Therapy-General (FACT-G, version 4) was used to measure patients' QOL; a slightly modified version was used with family caregivers (with permission from FACIT.org).¹⁶ The FACT-G consists of 27 items; higher scores indicated higher QOL. Reliability and validity assessments were reported previously.^{17,18} In this study, the α reliability coefficient was 0.93 for patients and 0.94 for caregivers.

Depression. The Kim Depression Scale for Korean Americans (KDSKA) was used to measure participants' level of depression and had α reliability coefficient of 0.97 in previous studies.^{19,20} This 21-item scale has four subscales measuring affective, cognitive, behavioral, and somatic depression and uses a 4-point Likert-type scale (scores ranging from 0 to 63). The item "I thought about suicide" was removed on the recommendation of the UM-IRB because the sample was recruited from community settings rather than affiliated with a health clinic. No cut-off point has been established for clinical use. In this study, α reliability coefficient was 0.95 for patients and 0.94 for caregivers.

Ethnic values. Aldwin and Greenberger⁹ adapted a scale that measure ethnic values and their subscales are called as Korean Traditionalism Value Scale and Modern Value Scale. The 7-

item traditional value scale measures obedience, respect for authority, and maintenance of social ties with family members. Higher scores indicate greater endorsement of Korean traditional values. In this study, the α reliability coefficient was 0.82 for patients and 0.73 for caregivers. The 4-item Modern Value Scale measures self-reliance, autonomy, and assertiveness. Higher scores indicate greater endorsement of modern or individualistic values. The reliability coefficient was 0.68 for patients 0.71 for caregivers.

Acculturative stress. The Acculturative Stress Scale (ASS)²¹ measures stress-related language difficulties, economic and social conflicts due to immigration, cultural values, and role conflicts resulting from the acculturation process. ASS has 12 items, each with a 4-point Likert-type scale; higher scores indicate greater acculturative stress. In the current study, 3 items (“Not having enough money to pay debts”, “To think of the welfare of family and friends left in Korea”, and “To understand the values and culture in the U.S.”) were deleted to increase scale reliability, yielding a 9-item scale. The α reliability coefficient was 0.70 for patients and 0.72 for caregivers.

Social support. The 15-item Personal Resource Questionnaire 2000 (PRQ 2000) measured perceived social support from others, with higher scores indicating more support.²² The Korean version of PRQ 2000 reported strong internal consistency²³ and the α reliability coefficient for the current study was 0.93 for both patients and caregivers.

Communication style. Two styles, *inferring meaning* and *interpersonal sensitivity*, were

used from the Survey of Asian American Communication (SAAC)¹⁵ to measure high-context communication style. Each scale has 5 items using a 7-point Likert-type scale; higher scores reflect greater use of high-context communication style. The alpha reliability coefficient for the current study was 0.85 for patients and 0.88 for caregivers.

Illness appraisal. The 4-item Health-Self Rating scale in the Health and Activity Survey measured patients' perception of their own health status.²⁴ The scale has a three-point Likert-type format; higher scores indicate less negative appraisal of health status. Internal consistency reliability was 0.77 for the current study.

Caregiving appraisal. The Caregiver Reaction Assessment (CRA)²⁵ measured negative perceptions of caregiving. Subscales measuring negative perceptions (*disrupted schedule, financial problems, lack of family support, and health problems*) were used in this study; higher scores indicated higher caregiver burden. The α reliability coefficient was 0.83 in the current study.

Socio-demographic Characteristics

A researcher-designed questionnaire assessed socio-demographic characteristics (age, education, employment status) and acculturation characteristics (years in the U.S., country of birth, mothers' language, and language used by primary physician). Patients reported cancer type and stage at time of diagnosis, year of diagnosis, current treatment, and comorbidities. Caregivers reported number of hours they provided care per week, and relationship with the

patient.

Statistical Analysis

Descriptive statistics were used to examine major study variables. Multiple regressions examined demographic (age, income, education, employment status, and relationship), sociocultural (ethnic values, acculturative stress, social support, communication style) appraisal, and medical (cancer stage, currently receiving treatment, and comorbidity) predictors of QOL and depression for patients and caregivers separately. Prior to multiple regression, descriptive analyses indicated that the data had normal distribution. All analyses were conducted using SPSS 22.0.²⁶

Results

Sample Characteristics

Seventy-one eligible Korean-American, cancer patient-caregiver dyads (i.e., pairs) were recruited for the study. Eleven dyads either refused or initially agreed to participate, but then did not complete questionnaires. In total, 60 dyads enrolled and completed questionnaires (84.5%). Even though our sample size was smaller than planned, we had sufficient power ($1-\beta=.80$, $\alpha=.05$, $f^2=.18$; medium effect size) to detect relationships among major study variables. Most participants (95.8%) completed instruments in Korean. Patients' average age was 62 and caregivers' was 56 years. Most participants were female and married (see Table 1). About 30% of patients had breast cancer, followed by colorectal and stomach cancers. Mean time since

diagnosis was 2.23 years. Most participants were born in South Korea, lived in the U.S. an average of 25 years, spoke Korean at home and indicated their physician spoke Korean.

Description of Major Variables

The mean scores for study variables and alphas reliability coefficients for each scale are in Table 2. Patients' mean scores on variables did not differ significantly from family caregivers' (See Table 2).

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Patients. Higher levels of social support ($\beta = 0.42, p < .03$) and lower negative illness appraisals ($\beta = 3.26, p < .0001$) were significantly associated with higher QOL (Table 3); the model explained about 56% of the variance in patients' QOL ($F = 6.04, p = 0.0001$). Only negative appraisal of illness ($\beta = -1.82, p < .02$) was related to patients' depression (Table 3), but was only marginally significant ($F = 9.17, p = 0.06$).

Caregivers. Older age ($\beta = 0.47, p < .05$), having lower Korean traditional values ($\beta = -1.48, p < 0.02$) and higher modern individualistic values ($\beta = 1.84, p < 0.04$) were significant predictors of higher caregiver QOL (Table 4). The model explained about 23% of the variance in caregivers' QOL ($F = 2.40, p = 0.01$). Lower modern individualistic values ($\beta = -1.01, p < .05$) was associated with higher caregiver depression (Table 4). The model explained about 21% of the variance of caregivers' depression ($F = 2.22, p = 0.02$).

Discussion

Consistent with other studies with Korean American cancer patients¹⁰ and Western cancer patients,¹⁶ patient's enhanced quality of life was predicted by higher social support and lower negative appraisal of illness. Social support from family is a major resource for coping with stress among Korean Americans. Many Korean Americans also rely on their religious communities to extend their social networks, gain helpful information, and transition to a new environment.¹⁴ Consistent with stress coping theory,⁷ illness appraisals also predicted patient's QOL; those with fewer negative perceptions about their cancer had better QOL. Further, more negative illness appraisals were associated with higher patient depression. In contrast to findings from a prior study with Korean Americans,¹¹ social support was not significantly related to patient depression which may be due to differences in the social support measures used or sample characteristics; patients in the current study were older (mean age 61.6) and included more male patients (31.7%).

Ethnic values emerged as major predictors of caregiver quality of life and depression. Caregivers who reported lower Korean traditional values (reflecting a de-emphasis on obedience, respect for authority, and maintenance of social ties) had higher quality of life, while those endorsing more modern individualistic values (self-reliance, autonomy, and assertiveness) had both higher QOL and less depression. Caregivers who held more traditional Korean values, viewed caregiving as an obligation, and adhered to collectivistic values rather than individualistic values. Similar to studies of Asian American caregivers,^{27,28} we found that

collectivistic values of caregiving, such as a strong emphasis on familism, parental authority, and hierarchy within the family, did not protect caregivers from burden or emotional distress. Furthermore, other research suggests that familism in Korean culture is not associated with a strong tradition of mutual support.²⁹ Modern individualistic values, on the other hand, were associated with more positive caregiver outcomes. Caregivers with more modern values may be more assertive in interacting with others in meeting their own needs which, in turn, enhances their QOL and lowers their risk for depression.

Social support was not significantly related to caregiver QOL or depression. Almost half of caregivers (48.3%) worked outside the home while over a third provided between 21 and 50 hours of caregiving. With work and caregiving demands, caregivers may have had little time to obtain support from others. Furthermore, most caregivers spoke Korean at home (78%) and were born in Korea (87%) suggesting possible difficulties in accessing formal social support services that are typically available in English.

Caregiving appraisals (i.e., caregiver burden) were not significantly related to caregivers' QOL or depression, in contrast to findings in Western studies.¹⁶ Although over a third of the caregivers provided 20 to 50 hours of care per week, hours of caregiving did not predict caregiver depression. A qualitative study¹¹ of Korean American caregivers found that caregiving is viewed as an expected familial responsibility rather than a burden. A study of Taiwanese cancer caregivers (who follow Confucian values) similarly found that hours of care were

unrelated to depression.²⁸ Rather, caregivers' degree of confidence in providing care predicted less depression.²⁸ This is similar to our findings that endorsement of western values (assertiveness, self-reliance, and autonomy) predicted less depression.

Consistent with age findings from western studies,^{30,31} younger caregivers had lower QOL than older caregivers. However, age was unrelated to caregivers' depression, which is inconsistent with findings for other minority caregivers in which older age predicts less depression.³²

Acculturative stress was not significantly related to patients' or caregivers' QOL and depression which is inconsistent with Han et al.'s findings that acculturative stress was associated with depression among Korean American immigrants.²⁰ Patients and caregivers in the Han study²⁰ had lived in the U.S. about 16 years, as compared to roughly 25 years in the current study. Living in the U.S. for a shorter duration may result in higher levels of acculturative stress, a finding documented among other ethnic immigrants,³³ that may account for this difference.

High-context communication style was not significantly related to QOL and depression for both cancer patients and caregivers. This insignificant finding may indicate that both groups use high-context communication style and thus are congruent in the ways they communicate about cancer. Further, despite its association with non-verbal and less explicit use of spoken language,³⁴ using high-context style within patient-caregiver dyads may not be problematic in

Korean American culture.³⁴ Accordingly, clinicians should be aware of cultural differences in communication and adapt their practice to accommodate the use of different communication styles as needed.

Study Limitations

With a small convenience sample (60 dyads), we had limited power to assess all possible relationships within the theoretical framework at a statistically significant level. However, we had sufficient power to detect significant relationships among 6 predictors and 2 outcomes in multiple regression models. Study participants also had access to Korean American community centers in their geographical areas which may have influenced their levels of support, potentially limiting the generalizability of study findings. Although patients and caregivers were instructed to complete questionnaires separately, we cannot state with certainty that dyads who completed them at home did so independently. The cross-sectional survey design prevented establishing causal connections between predictor and outcome variables.

Clinical Implications

Clinical implications from the findings provide ways to improve quality of life and depression among Korean American cancer patients and their family caregivers. First, expanding and improving the quality and number of formal services for Korean Americans may help to improve cancer patients' quality of life. Although participants lived in the U.S. on average 25 years, their primary language was Korean suggesting that English-only formal

services may not be utilized by Korean American cancer patients and caregivers. The development and expansion of programs and interventions that are provided in Korean and through local community centers and ethnic organizations are needed. Agencies serving ethnic communities are effective because they can provide bilingual services and expand participants' access to community social networks.

Second, study findings indicated that modern, individualistic values were associated with higher QOL and lower depression among caregivers. Caregiving and work-related responsibilities, place heavy demands on family caregivers. Interventions that enhance caregivers' autonomy, self-reliance, and confidence may improve caregivers' QOL and reduce depression. Caregivers may further benefit from assistance in managing their own health and having opportunities for caregiver respite. Finally, study findings confirmed that depression among Korean American cancer patients was associated with illness appraisals. Korean Americans may be more likely to manifest depression through somatic complaints such as, back pain, headache, and indigestion.³⁵ Given this cultural expression of depression, future studies that measure symptom distress could potentially provide a better understanding of patients' depression.

Increasing rates of cancer incidence and its position as the leading cause of death among Asian Americans, distinguishes cancer as an important area for research and intervention. Study findings indicate that patient interventions that improve positive appraisals

of illness are important for depression and QOL, while enhancing social support is important for QOL. For family caregivers, interventions that enhance self-reliance, autonomy, and confidence in performing caregiving role are indicated for improving assessments of quality of life and decreasing depression.

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Conflict of Interest: The authors have declared that there is no conflict of interest.

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Table 1. Demographic and Medical Characteristics of Sample

Demographic Characteristics	Patients n=60	Caregivers n=60
Age, Mean (SD)	61.6 (13.3)	56.2 (17.5)
Range	31-85	22-85
Gender, N (%)		
Male	19 (31.7)	28 (46.7)
Female	41 (68.3)	32 (53.3)
Education, N (%)		
Less Than high school	6 (10.0)	5 (8.3)
Graduated high school	17(28.3)	13 (21.7)
College and higher	37(61.7)	41 (68.3)
Missing	-	1(1.7)
Income, N (%)		
< \$15,000	22 (36.7)	20 (33.3)
\$15,001-30,000	10 (16.7)	12 (20.0)
\$30,001-50,000	9 (15.0)	8 (13.3)
\$50,001 or more	12 (20.0)	17 (28.3)
Missing	7 (11.7)	3 (5.0)
Dyad relationship, N (%)		
Patient-Spouse/Partner		43 (71.7)
Patient-Adult Children		10 (16.7)
Patient- Other		5 (8.4)
Missing		2 (3.3)
Hours of Caregiving per Week, N (%)		
0-10	-	20 (33.2)
11-20	-	10 (16.7)
21- 40	-	8 (13.4)
Over 50	-	14 (21.7)
Missing	-	9 (15.0)
Primary Care Physician's Language, N (%)		
Speaks Korean	37 (61.7)	49 (81.6)
Speaks only English	19 (31.7)	10 (16.7)
Missing	4 (6.6)	1 (1.7)
Language at Home, N (%)		
Korean	46 (76.7))	47 (78.3)
English	2 (3.3)	3 (5.0)

Both (Korean & English)	10 (16.7)	10 (16.7)
Missing	2 (3.3)	-
Mother Language, N (%)		
Korean	53 (88.3)	52 (86.7)
English	1 (1.7)	3 (5.0)
Both (Korean & English)	4 (6.7)	5 (8.3)
Missing	2 (3.3)	-
Years Living in USA, N (%)		
Mean (SD)	26.7 (11.4)	25.9 (11.3)
Range	5-50	1-50
< 10	6 (10.0)	10 (16.7)
11-20	17 (28.3)	13 (21.7)
> 21	34 (56.7)	36 (59.9)
Missing	3 (5.0)	1 (1.7)
Type of Cancer, N (%)		
Breast	19 (31.6)	-
Colorectal	10 (16.6)	-
Stomach	7 (11.7)	-
Prostate	5 (8.3)	-
Lymphoma/Leukemia	5 (8.4)	-
Lung/Liver/Kidney	6 (10.0)	-
Oral/Skin/Ovarian/Thyroid	8 (13.4)	-
Stage, N (%)		
Early (0, I, II)	34 (56.7)	-
Advanced (III, IV)	18 (30.0)	-
Unknown or missing	8 (13.3)	-
Years of Cancer Diagnosis, N (%)		
<1	8 (13.3)	-
1	19 (31.7)	-
2	6 (10.0)	-
3	8 (13.3)	-
4	7 (11.7)	-
Current Treatment, N (%)		
Completed treatment	33 (55.0)	-
Chemotherapy	12 (20.0)	-
Hormone Therapy	7 (11.6)	-
Surgery	4 (6.7)	-

Table 2. Internal Consistency Reliability of Scales and Patients' and Caregivers' Scores

Variable	Patient			Family Caregiver			Matched <i>t</i>	<i>p</i> value
	α	Mean	SD	α	Mean	SD		
Quality of life								
Physical	0.91	20.9	6.9	0.93	22.4	6.8	-1.31	0.23
Social	0.84	20.8	5.5	0.83	19.3	5.7	1.81	0.07
Emotional	0.82	18.4	4.6	0.87	18.0	5.8	0.47	0.39
Functional	0.82	20.8	5.0	0.89	19.4	6.4	1.36	0.30
FACT-G total	0.93	80.9	18.1	0.94	79.3	19.6	0.58	0.55
Depression	0.95	14.3	12.3	0.94	12.5	11.5	0.85	0.40
Affective	0.92	4.3	4.6	0.89	3.7	4.1	0.99	0.32
Cognitive	0.85	3.3	2.8	0.79	2.9	2.5	0.81	0.42
Behavioral	0.76	3.4	3.1	0.65	3.2	3.3	0.23	0.82
Somatic	0.73	2.9	2.0	0.67	2.4	2.2	1.20	0.24
Korean Traditional Value	0.82	29.2	4.3	0.73	28.4	4.1	1.23	0.27
Modern Value	0.68	17.0	2.3	0.71	16.5	2.7	1.55	0.14
Acculturative Stress	0.70	18.0	4.8	0.72	17.9	5.8	0.05	0.96
Social Support	0.93	88.3	13.4	0.93	85.5	13.3	1.60	0.27
Communication style	0.85	53.6	8.9	0.88	52.4	10.1	0.96	0.40
Appraisal of Illness	0.77	7.8	2.2	-	-	-	-	-
Appraisal of Caregiving				0.83				
Disrupted schedule		-	-	0.72	2.8	0.82	-	-
Financial problems		-	-	0.68	2.8	1.03	-	-
Lack of family support		-	-	0.59	2.1	0.70	-	-
Health problems		-	-	0.81	2.4	0.94	-	-

Table 3. Predictors of Quality of Life and Depression for Patients

Predictors	Quality of Life				Depression			
	β	SE	<i>t</i> value	<i>p</i> value	β	SE	<i>t</i> value	<i>p</i> value
Age	.07	.19	.37	.71	-.20	.16	-1.25	.20
Gender (1=female, 0=male)	-5.45	5.79	-.94	.34	-2.04	5.12	-.39	.69
Income	1.73	1.42	1.21	.22	-.90	1.23	-.72	.46
Education	2.70	2.77	.97	.32	.21	2.37	.09	.92
Employment (1=employed, 0=not employed)	-4.36	4.29	-1.01	.31	2.09	3.87	.54	.58
Relationship (1=spouse, 0=adult children)	2.41	5.29	.45	.65	-2.35	4.64	-.50	.61
Cancer stage	-1.46	1.37	-1.06	.28	.62	1.19	.52	.60
Having treatment (1=have treatment, 0=no treatment)	-3.86	3.83	-1.00	.31	4.10	3.32	1.23	.21
Comorbidity (1=have comorbidity, 0=no comorbidity)	-6.86	3.90	-1.75	.07	1.92	3.31	.58	.56
Korean Traditional value	.53	.58	.90	.36	.00	.51	.00	.99
Modern value	.92	1.06	.86	.38	-.49	.90	-.55	.58
Social support	.42	.19	2.23	.03	-.18	.16	-1.16	.24
Communication style	.07	.21	.34	.73	.07	.19	.38	.70
Acculturative stress	-.13	.50	-.26	.79	.44	.45	.97	.32
Appraisal of Illness	3.26	.89	3.66	.00	-1.82	.78	-2.34	.02
	Adjusted R² = .56, F = 6.04, p = .0001				Adjusted R² = .17, F = 9.17, p = .06			

Note. Multiple regression with confounder adjustment was conducted

Table 4. Predictors of Quality of Life and Depression for Caregivers

Predictors	Quality of Life				Depression			
	β	SE	<i>t</i> value	<i>p</i> value	β	SE	<i>t</i> value	<i>p</i> value
Age	.47	.23	2.01	.05	-.20	.13	-1.53	.12
Gender (1=female, 0=male)	6.12	9.23	.65	.51	1.67	4.74	.35	.72
Income	.16	1.71	.09	.92	-.18	.94	-.19	.84
Education	2.01	4.46	.45	.65	1.69	2.57	.65	.51
Employment (1=employed, 0=not employed)	12.62	8.56	1.47	.15	-6.13	4.30	-1.42	.15
Relationship (1=spouse, 0=adult children)	-8.61	11.85	-.72	.46	1.19	6.63	.18	.85
Hours of caregiving	-.50	1.19	-.42	.67	.37	.62	.59	.55
Korean Traditional value	-1.48	.64	-2.31	.02	.55	.36	1.49	.13
Modern value	1.84	.91	2.02	.04	-1.01	.51	-1.97	.05
Social support	.26	.24	1.08	.27	-.06	.13	-.46	.64
Communication style	.22	.26	.85	.39	-.27	.14	-1.84	.06
Acculturative stress	-.14	.47	-.30	.75	.34	.26	1.28	.19
Appraisal of Caregiving Burden	-.48	.26	-1.82	.06	.23	.15	1.49	.13

Adjusted R² = 0.23, F = 2.40, p = 0.01

Adjusted R² = 0.21, F = 2.22, p = 0.02

Note. Multiple regression with confounder adjustment was conducted