

# Mutual Effects of Depression on Quality of Life in Patients and Family Caregivers

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**OBJECTIVES:** To elucidate the importance of mutual effects within dyads by examining the contribution of depression on quality of life (QOL) in patients with advanced cancer and their family caregivers (FCs).

**SAMPLE & SETTING:** 716 patients with advanced cancer paired with their FCs at two large, private not-for-profit hospices.

**METHODS & VARIABLES:** A descriptive, cross-sectional design with the baseline data of a randomized hospice clinical trial was used. Structural equation modeling helped examine four hypotheses by integrating the features of the Actor-Partner Interdependence Model. Variables included QOL and depression.

**RESULTS:** Depression in patients with cancer and their FCs exhibited significant actor effects on an individual's QOL after controlling for the partner effects. Among the spousal pairs, depression in FCs exhibited a positive partner effect on the functional well-being of patients with cancer, indicating that depressive symptoms occurring in FCs may increase patients' functional well-being.

**IMPLICATIONS FOR NURSING:** This study suggests the importance of consistent assessment in emotional well-being for dyads with cancer because their concerns may be transmitted to each other.

**KEYWORDS** family caregivers; advanced cancer; depression; palliative care; quality of life

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Patients with advanced cancer need their family caregivers (FCs) to respond to challenges from diagnosis through various transitional stages. These dyads will face some uncertainties, such as fear of symptoms from disease recurrence, effects of treatment, or impending death, which not only cause a dyad's perceived interpersonal resources to be challenged, but also cause difficulties in coping with the illness (Song, Rini, Ellis, & Northouse, 2016). Without proper and constant examination, FCs may not be seen as needing care until late in the disease, resulting in limited assistance from healthcare professionals for the dyads during these transitions, and the dyad's quality of life (QOL) may deteriorate, particularly in psychological well-being (Applebaum et al., 2014; Krebber et al., 2014; Lund, Ross, Petersen, & Groenvold, 2015).

One particularly difficult transition for FCs may occur when patients need end-of-life care. Caregiving during this time may prompt FCs to change their coping strategies toward illness and also their perceptions of their own death (Holdsworth, 2015). Therefore, healthcare providers, who view both the patient and family as the focus of care, have attempted to support dyads by providing care from diverse perspectives to maintain optimal QOL of patients and FCs (National Hospice and Palliative Care Organization, 2017). However, current evidence identified that at least 25% of patients with cancer experience depression at some point, suggesting that such a detrimental problem may not be the primary focus of treatment (American Cancer Society, 2015). A meta-analysis also revealed that 13% of patients with cancer met the diagnostic criteria for major depression, and other previous studies indicated that 16%–67% of FCs may experience depressive symptoms (Fasse, Flahault, Bredart, Dolbeault, & Sultan, 2015; Jacobs et al., 2017; Krebber et al., 2014; Ullrich et al., 2017). Results of these studies may imply that healthcare providers are still underdiagnosing

depression and overlooking the need to evaluate overall psychological well-being in both patients and caregivers, particularly in patients who are relatively older with chronic comorbidities (Centers for Disease Control and Prevention, 2017).

Caregivers are not immune to depression while caring for loved ones with advanced cancer, particularly when FCs overlook their own needs (Hansen, Rosenkranz, Wherity, & Sasaki, 2017; Matzo & Sherman, 2015; Nik Jaafar et al., 2014). Patients with cancer nearing the end of life have multiple problems that FCs must learn to manage, including their own fear of loss and symptom management for patients; therefore, FCs may not feel able to vent their own feelings while taking care of their family member, which can have a negative effect on their overall QOL (Lund, Ross, Petersen, & Groenvold, 2014; Stenberg, Ruland, & Miaskowski, 2010; Ullrich et al., 2017). Despite these issues, researchers suggest that the attachment within the dyads may gradually increase and, therefore, create a stronger bond during this time of intense symptom management and support during the patient's final stage of life (Hansen et al., 2017). An outcome of these intertwined relationships within the dyad may be that each individual's QOL is compromised as both not only witness their partner's struggles with cancer or with being a caregiver, but also simultaneously have symptoms of depression themselves (Johansen, Cvancarova, & Ruland, 2017; Kim et al., 2015).

Considering the bond growing over time within the dyads, current research seems to fail to include their attachment as one of the potential effects, leading to depression for both the individual with cancer and FC and, subsequently, creating a negative effect on the QOL of each member of the dyad. Only a few studies have investigated patients with cancer and FCs as dyads. Because of the dearth of literature reporting mutual effects in this population, the purpose of the current study was to apply the Actor-Partner Interdependence Model (APIM) to elucidate the importance of mutual effects within dyads with advanced cancer by examining the contribution of depression on their individual QOL and their FC's QOL.

## Methods

Because of the intense and dynamic relationship that grows during the cancer experience for the dyads, hospice care should focus on the dyads as a unit rather than as separate individuals. Therefore, it is critical that the interdependence between dyads be

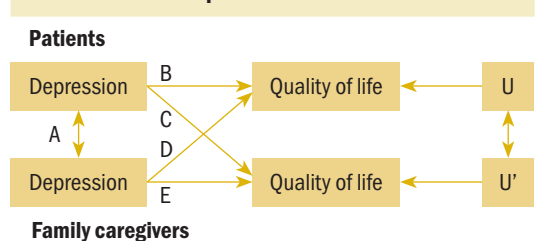
examined when mutual effects are investigated. The APIM was the conceptual and analytic framework used in this study to evaluate actor effects and partner effects (Cook & Kenny, 2005). Specifically, the APIM embodies the focus of end-of-life care by considering individual and dyadic factors. According to Cook and Kenny (2005), the actor effect in this study indicates the effect of individual depression on individual QOL, and the partner effect denotes the effect of personal experience of depression on his or her partner's QOL. Combining the features of the APIM, the focus of the current study was to examine the following hypotheses (see Figure 1):

- Hypothesis 1: Depression in patients with advanced cancer has a significantly negative effect on their own QOL (actor effect, path B).
- Hypothesis 2: Depression in FCs has a significantly negative effect on their own QOL (actor effect, path E).
- Hypothesis 3: Depression in patients with advanced cancer has a significantly negative effect on their FC's QOL (partner effect, path C).
- Hypothesis 4: Depression in FCs has a significantly negative effect on the QOL of individuals with advanced cancer (partner effect, path D).

## Setting and Subjects

The study used a cross-sectional design and was a secondary analysis of data from an earlier clinical trial investigating the effectiveness of combining usual care with systematic longitudinal assessments

**FIGURE 1. Conceptual Framework**



**Note.** The A pathway indicates that depression in patients and family caregivers is correlated; the B and E pathways show a connection between the person's depression and his or her quality of life; the C and D pathways show the influence of one person's depression on another person's quality of life; and U and U' represent unexplained aspects of quality of life in patients and caregivers, respectively.

**Note.** From "Analyzing Mixed Independent Variables: The Actor-Partner Interdependence Model" (p. 145), by D.A. Kenny, D.A. Kashy, and W.L. Cook (Eds.), *Dyadic Data Analysis*, 2006, New York, NY: Guilford Press. Copyright 2006 by Guilford Press. Adapted with permission.

(intervention group) compared to usual care alone (control group). The data were collected from patients receiving care in not-for-profit hospices in southeastern Florida (Hernando-Pasco Hospice in Brooksville and Tidewell Hospice in Sarasota). Inclusion criteria for eligible patients included being an adult (aged 18 years or older), having a diagnosis of cancer, having a primary FC who assisted the patient more than four hours per day, being able to understand English, and passing a mental status screening test. Eligible FCs had to be adults (aged 18 years or older). Caregivers who were receiving cancer treatment during the study period were excluded. If patients were confused or actively dying, they were excluded.

### Instruments

Depressive symptoms were assessed using the short-form version of the Center for Epidemiological Studies–Depression Scale (CES-D), a 10-item self-report instrument. Items were symptoms scored as present or absent, resulting in total scores ranging from 0 to 10. Higher scores indicate more depressive symptoms. The Cronbach alpha coefficient of 0.92 and the correlation coefficient of 0.88 between the original CES-D and the short form of the CES-D indicated the appropriateness of its psychometric properties (Irwin, Artin, & Oxman, 1999).

### Patient Quality of Life

The QOL of patients was assessed using the Hospice Quality of Life Index–14 (HQLI-14), the shorter version of the HQLI-28. The shortened scale also has three subscales compared to the original version: psychophysiological well-being (six items), functional well-being (four items), and social/spiritual well-being (four items) using a summated rating scale. The HQLI-14 scores for each item range from 0 to 10, with total scores that can range from 0 (worst QOL) to 140 (highest QOL). The subscales of the HQLI-28 and the HQLI-14 were significantly correlated: psychophysiological well-being ( $r = 0.9$ ), functional well-being ( $r = 0.96$ ), and social/spiritual well-being ( $r = 0.89$ ); these results support construct validity (Garrison, Overcash, & McMillan, 2011). The Cronbach alpha coefficients for the subscales of psychophysiological well-being, functional well-being, and social/spiritual well-being in this sample were 0.53, 0.6, and 0.59, respectively.

### Family Caregivers Instrument

The Medical Outcomes Study Short Form–12 (SF-12) measures physical and mental health on eight

dimensions: physical functioning, role-physical, bodily pain, general health, vitality, social functioning, role-emotional, and mental health. The SF-12 was included in this study to measure caregivers' perceptions of their own physical health (six items) and mental health (six items) (Ware, 2000). It was used as a proxy measure for QOL. The Cronbach alpha coefficients for the physical and mental subscales in this sample were 0.8 and 0.7, respectively.

### Demographic Data

To describe characteristics of the sample, the following demographic data were collected: relationship between patient and FC, gender, age, race, ethnicity, religious affiliation, and marital status. The primary cancer diagnosis was noted.

### Statistical Analysis

Frequencies, percentages, means, and standard deviations were used to describe the sample and then were used to screen the data for normality, missing values, and outliers using IBM SPSS Statistics, version 22.0. To verify the APIM applied in this sample and the proposed hypotheses, structural equation modeling was conducted using LISREL, version 9.1.

As recommended for model evaluation (Jackson, Gillaspay, & Purc-Stephenson, 2009), the following fit statistics were selected, as each fit index reflected different measurement properties including the chi-square minimum fit function and practical fit indices, such as the goodness of fit index ( $[GFI] \geq 0.9$  are desired), the adjusted goodness of fit index ( $[AGFI] \geq 0.9$  are desired), the comparative fit index ( $[CFI] \geq 0.9$  are desired), the standardized root mean square residual ( $[SRMR] \leq 0.08$  are desired), and the root mean square error of approximation ( $[RMSEA] \leq 0.08$  are desired).

## Results

### Data Preparation

First, all data were screened using univariate descriptive statistics to inspect missing data, out-of-range values, and univariate outliers to control for accuracy of data entry. A total of 716 dyads were enrolled into the parent study, and about 16% of the dyads, when screened, had missing data on the observed variables of QOL and depression. When both members did not have complete data on one of the two critical measures, the dyads were excluded. Therefore, 39 dyads were not included and 677 dyads remained. However, an additional 17 multivariate outliers were then identified and removed, bringing the total number of

dyads to 660. Concerning the level of measurement suitable, two continuous indicators were created by rescaling the original 10 dichotomous observed variables of the CES-D. The new indicators of the CES-D were closely normally distributed with skewness and kurtosis values falling within the criterion of plus or minus 1.

### Sample Characteristics

After the missing data and multivariate outliers were identified, 660 distinguishable dyads with cancer were included in the primary analysis. The majority of dyads were spouses (57%,  $n = 375$ ), followed by 11% ( $n = 70$ ) being mother–daughter and other types. Most of the individuals with cancer were White/non-Hispanic ( $n = 640$ , 97%) and male ( $n = 373$ , 57%), with lung cancer ( $n = 223$ , 34%) being the most common diagnosis. In addition, most FCs were White/non-Hispanic ( $n = 633$ , 96%) and female ( $n = 487$ , 74%) (see Table 1). In terms of age, patients tended to be slightly older than FCs, with mean ages of 72.67 years ( $SD = 12.19$ , range = 21–95 years) and 65.49 years ( $SD = 13.81$ , range = 19–97 years), respectively. Patients had been diagnosed with cancer for a mean of 2.21 years ( $SD = 3.89$ ) when they were recruited from the hospices. The average depression score for patients was 4 ( $SD = 1.53$ ) and 3.65 ( $SD = 1.48$ ) for FCs on the original CES-D scale.

### Measurement Model Assessment

The measurement model was assessed before verifying the hypotheses. This procedure was examined via confirmatory factor analysis as a way to understand the factorial validity and reliability of the measures related to the changed structure of the CES-D using parceling method. The concept of simple structure was followed; all of the observed variables measured for depression and QOL only load on their own corresponding factor. In addition, the selected factors (depression and QOL) for each member of the dyads were correlated with every other factor in the model. The method to estimate parameters was maximum likelihood method, as suggested on the correlation matrix of the observed variables. The practical fit statistics and the chi-square minimum fit function test showed that the measurement model fit the data adequately (see Table 2), indicating that the two observed variables generated for the depression factor were reliable. Specifically, the composite reliability of depression for each member of the dyads was greater than the suggested values of 0.6 (patients = 0.69, FCs = 0.71) (Bagozzi & Yi, 1988).

However, the model fit could be improved if following through the modification index generated for the model. The modification index pinpointed the possibility of one of the observed variables—SF-10, contained in the SF-12, “Do you have a lot of energy?”—not only loading on the prespecified factor, mental health, but also on the physical health factor. Given the similar result identified by a previous study (Okonkwo, Roth, Pulley, & Howard, 2010), the observed variable, SF-10, loaded on both physical and mental factors to examine the potential improvement. Indeed, the likelihood ratio test as well as selected fit indices revealed that the modified measurement model fits significantly better than the previous one ( $\Delta\chi^2[\Delta df] = 84.99[1]$ ,  $p < 0.01$ ). Therefore, the modified factor structure, including one additional cross-loading parameter in the SF-12, was used for the following analysis to

**TABLE 1. Sample Characteristics by Group**

Characteristic	Patients (N = 660)		Family Caregivers (N = 660)	
	n	%	n	%
<b>Sex</b>				
Male	373	57	175	27
Female	286	43	485	74
Unknown	1	1	–	–
<b>Marital status</b>				
Currently married	416	63	507	77
Widowed	121	18	50	8
Divorced	79	12	66	10
Never married	34	5	31	5
Separated	8	1	4	1
Unknown	2	1	2	1
<b>Ethnicity</b>				
White/non-Hispanic	640	97	633	96
Black	10	2	9	1
Hispanic	7	1	10	2
Asian/Pacific Islander	1	1	4	1
Other	2	1	4	1
<b>Religion</b>				
Non-Catholic Christians	372	57	372	57
Catholic Christians	187	28	189	29
Agnostic	90	14	83	13
Jewish	7	1	10	2
Other	4	1	6	1

**Note.** Because of rounding, percentages may not total 100.

examine the actor and partner effects in the overall dyads.

### Structural Model Assessment

Structural equation modeling was performed to estimate the mutuality within the dyads and variances in the subscales of QOL explained by the factor of interest. In particular, nonindependence was measured by understanding the strength of the relationship between the factor of depression within the dyads. The practical fit indices, including GFI, CFI, RMSEA, and SRMR, as well as the chi-square minimum fit function, indicated the quality of the proposed structural model. Specifically, the selected fit statistics were either greater or less than the corresponding desired value, indicating the adequacy of the proposed model to the observed data. When examining the structural coefficients to estimate the actor and partner effects, only some of the hypotheses were fulfilled. The actor effects of depression were statistically significant on each subscale of QOL in both members of the dyads, and the partner effects, the primary interest of the study, were not as significant as expected (see Table 3). The strength of the depression scores between the dyads was significantly correlated ( $r = 0.13$ ,  $p < 0.05$ ).

### Subgroup Analysis: Married Dyads

Considering the possibility of a difference of mutuality in marital status, a subgroup analysis was conducted. The procedures as detailed in this article were followed. The modification index was reviewed, and it also specified similar findings regarding the same item in the SF-12 that SF-10 should cross-load on both physical health and mental health factors.

The modified measurement model with the additional path pointing from the physical health factor to SF-10 also demonstrated a better quality of the structure with preferred fit statistics and the chi-square minimum function ( $\Delta\chi^2[\Delta df] = 43.01[1]$ ,  $p < 0.01$ ). Another structural equation modeling was performed to examine the proposed model for the spouses (see Table 4). Likewise, the actor effects of depression on individual QOL were negatively significant (depression in married patients: psychophysiological well-being:  $\beta = -0.92$ ,  $p < 0.05$ ; functional well-being:  $\beta = -0.88$ ,  $p < 0.05$ ; social/spiritual well-being:  $\beta = -0.41$ ,  $p < 0.05$ ; depression in FCs: physical health:  $\beta = -0.26$ ,  $p < 0.05$ ; mental health:  $\beta = -0.97$ ,  $p < 0.05$ ). Again, no significant partner effects of depression in patients on their spouses' physical health ( $\beta = 0.09$ ,  $p > 0.05$ ) and mental health ( $\beta = 0.1$ ,  $p > 0.05$ ) were found. On the contrary, depression occurring in FCs had a surprisingly positive partner effect on the functional well-being of patients with cancer ( $\beta = 0.15$ ,  $p < 0.05$ ). The strength of relationship between spousal depression scores was relatively higher ( $r = 0.18$ ,  $p < 0.05$ ).

### Discussion

The mutuality between patients with cancer and FCs has been increasingly of interest, but only a few studies have shown the crossover effects. Including FCs in hospice care has become the standard of care in the United States, and FCs have consistently been included in cancer research; however, potential challenges with recruitment of seriously ill patients and burdened FCs, lack of clear definition of mutuality and theoretical frameworks, and the need for very sophisticated statistical analyses may be limiting the

TABLE 2. Summary of Model Fit Statistics							
Model	$\chi^2$	df	CFI	GFI	AGFI	RMSEA	SRMR
Overall							
Measurement model	1,077.46*	384	0.86	0.9	0.88	0.05	0.05
Modified measurement model	992.47*	383	0.88	0.91	0.89	0.05	0.05
Modified full model	1,029.02*	393	0.87	0.9	0.89	0.05	0.05
Married dyads							
Measurement model	772*	384	0.86	0.88	0.85	0.05	0.06
Modified measurement model	728.99*	383	0.88	0.88	0.86	0.05	0.06
Modified full model	746.56*	393	0.87	0.88	0.86	0.05	0.06
* $p < 0.05$ AGFI—adjusted goodness of fit index; $\chi^2$ —chi-square minimum fit function test; CFI—comparative fit index; df—degree of freedom; GFI—goodness of fit index; RMSEA—root mean square error of approximation; SRMR—standardized root mean square residual							



**TABLE 3. Standardized Structural Coefficients Between Depression and Quality of Life (N = 660)**

Factor	Actor Effects		Partner Effects	
	Depression in Patients		Depression in Family Caregivers	
	β	SE	β	SE
Related to patients				
Functional well-being	-0.84	0.17*	0.04	0.08
Psychophysiological well-being	-0.93	0.14*	-0.05	0.06
Social/spiritual well-being	-0.39	0.06*	0.02	0.05
Factor	Depression in Family Caregivers		Depression in Patients	
	β	SE	β	SE
	Related to family caregivers			
Physical health	-0.33	0.05*	0.08	0.05
Mental health	-0.95	0.07*	0.04	0.03
* p < 0.05				

development of dyadic research (Park & Schumacher, 2014). Therefore, focusing on mutuality within dyads with advanced cancer seems essential and led to the current study. The purpose of the study was to apply the APIM conceptual and analytic model to verify the mutual effects of depression on the QOL of patients with advanced cancer and their FCs.

The study examined six models, including the subgroup analysis. The fit statistics all suggest that these six models fit the data reasonably well, indicating the appropriateness of the APIM applied in this population. In addition, some of the hypotheses were successfully verified, which indicated a need for considering the mutuality of dyads, particularly in patients with cancer receiving hospice care. After taking account of the partner effects, this study identified the significant actor effects of depression on the patient's own QOL (supporting hypothesis 1), as well as the significant actor effects of depression on the FC's own QOL (supporting hypothesis 2). These findings suggest that greater numbers of depressive symptoms were associated with lower scores of QOL in both patients and FCs.

Looking at the partner effects, the model revealed no significant partner effects of depression on QOL in the overall dyads (challenging hypotheses 3 and 4). Such findings may be related to the weak correlation between the depression scores of patients and FCs in dyads ( $r = 0.13$ ). Although the findings derived from the model did not meet the expectations of the hypotheses, the results of a longitudinal study of dyads with lung and colorectal cancer are similar to

the current study (Kim et al., 2015). According to Kim et al. (2015), the correlation of depression between dyads with lung cancer is weak as well, and only the actor effects were significant to predict the individual's physical and mental health from their depression scores after including partner effects in their model.

In terms of partner effects, the subgroup analysis did reveal a partner effect that was present in the dyads who had a marital relationship in the overall sample, indicating that depressive symptoms appearing in FCs may help improve patients' functional well-being. These results extend current knowledge about dyadic relationships and require investigations to explore the meaning of the finding. It is plausible that use of the HQLI-14, a shortened version of the more widely studied HQLI-28, affected the study's outcomes. There are only four items in the HQLI-14 used to assess functional well-being, which include enjoyable activities, concentration, independence, and eating. The items on the functional subscale do not seem to require that FCs be extensively involved with patients with advanced cancer. More specifically, the level of independence perceived by the person with cancer may reflect how he or she appraises QOL near the end of life (Turner, Tookman, Bristowe, & Maddocks, 2016). Conversely, adverse physical and mental conditions related to depression in FCs could interfere with engagement in care for loved ones. In dyads with heart failure, it has been shown that FCs who experienced greater anxiety reported less self-care management (Buck, Mogle, Riegel, McMillan, & Bakitas, 2015). Dionne-Odom et al. (2016) also

indicated that those with advanced cancer having FC assistance had significantly shorter survival than those without FCs, and it may be related to different prognoses between these two groups. That is, when patients with advanced cancer are in need of hospice care, they have come to the point where their deterioration in QOL and poor prognosis require constant FC care as part of hospice care.

Accordingly, when patients' physical conditions still allow them to perform activities to maintain their sense of independence, gender differences and self-efficacy may play a role in which males with advanced cancer (as the majority of the participants in the study) desired to maintain their QOL and their values to the family (Murray, Kendall, Boyd, Worth, & Benton, 2004). As a result, men would reluctantly become an undue burden on female FCs, particularly when their spouses experience caregiving burden, lower self-esteem, and negative effects on their health (Johansen et al., 2017; Washington et al., 2015). It should be noted that, although expressing emotions and sadness are expected among dyads with cancer, the severity of depression in this sample was in the acceptable range. Only patients' average CES-D scores reached the cutoff score of 4 for depression, implying that the psychological well-being of individuals with advanced cancer was still well-maintained. Such combined interactions within the spousal dyads could contribute to the positive effect of depression on functional well-being in spite of not being fully investigated.

**Limitations**

Ideally, in a study such as this, the APIM model should incorporate the same measurement instruments for

**KNOWLEDGE TRANSLATION**

- Emotional well-being of dyads experiencing cancer may continually fluctuate throughout the cancer trajectory.
- The values of family caregivers' involvement in cancer care should be emphasized by nurses and clinicians.
- Assessment of depression for patients and family caregivers should be incorporated into a hospice's usual care.

both people in the dyad when assessing independent and dependent variables. Because the construct of QOL is believed to differ between apparently healthy adults and people with advanced cancer, the outcome variable could not be assessed with the same tool. However, the same scale was used for assessing the independent variable. As a result, correlated residual nonindependence in the outcome measure could not be examined. Despite this limitation, use of the APIM strengthens the study and helps to demonstrate the importance of mutuality, therefore estimating a more accurate model. Another limitation is that this study did not examine the effect of different types of kinship in the sample because of limitations in the available data set, but future studies should include this as a variable because actor and partner effects may vary based on the levels of intimacy and relationships. Regarding the homogeneous sample in the current study, most dyads were predominantly White/non-Hispanic, and such a sample is consistent with the characteristics of the hospice population in Florida and the United States, with 74% and 76% of Whites in 2014, respectively (Florida Department of Elder Affairs, 2016; National Hospice and Palliative

TABLE 4. Structural Coefficients Between Depression and Quality of Life in Married Pairs (N = 660)		
Factor	Actor Effects	Partner Effects
	Depression in Patients	Depression in Family Caregivers
Related to patients		
Functional well-being	-0.88*	0.15*
Psychophysiological well-being	-0.92*	-0.04
Social/spiritual well-being	-0.41*	0.11
Factor	Depression in Family Caregivers	Depression in Patients
Related to family caregivers		
Physical health	-0.26*	0.09
Mental health	-0.97*	0.1
* p < 0.05		

Care Organization, 2017). However, the homogeneous sample in hospice settings signifies the need to decrease racial and ethnic disparities in palliative care because additional factors, such as cultural beliefs, may hinder minorities from using palliative care.

### Implications for Nursing

Psychological well-being is one of the imperative indicators to ensure that dyads obtain optimal quality care (Dy et al., 2015). The results highlight the importance of treating dyads as a unit and the relevance of consistently assessing the emotional concerns of both the patient with cancer and the FC.

Admission to hospice requires these dyads to face new challenges and requires more internal resources to prepare for the impending death of the patient and the grieving process that the FCs will experience. Emotions experienced by the dyads likely are communicated to each other because of mutuality within the two members, with the result that both individuals in the dyad will struggle with similar difficulties and worsening QOL. It is known that the availability of FCs does certainly play a critical role in maintaining QOL for those with advanced cancer, specifically by improving symptoms, both physical and psychological. Therefore, while supporting individuals with cancer, nurses and other interprofessional health-care providers should also proactively enhance FCs' coping skills by educating FCs in relation to treatments, symptom management, and side effects throughout the cancer trajectory. In particular, health practitioners should acknowledge the caregiver's role in caretaking and provide suitable health-related information based on individual characteristics and needs; as a result, FCs' internal resources can be subsequently rejuvenated. Therefore, FCs will not only have more knowledge and abilities to maintain their own QOL, but may also have satisfied interactions with health professionals; in turn, patients with advanced cancer can further benefit from the positive changes, while dyads' physical and psychological aspects of QOL are systematically assessed.

The current study demonstrated the great value of FCs' involvement in hospice settings, and it also suggested that oncology nurses should initiate interventions specifically for newly diagnosed patients who do not have FCs. Although this population of patients without FCs may have less social support from their families, it may elucidate the fact that they may have better prognosis and physical conditions than their counterparts. Therefore, frontline nurses should routinely evaluate each aspect of

QOL for patients with cancer and FCs so that they can provide prompt and optimal patient- and family-centered care.

### Conclusion

This study identified a mutual effect of depression on QOL within married patients with advanced cancer receiving hospice care. Assessment of depression should be routinely incorporated throughout hospice services for both patients and their primary family caregivers.

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McMillan completed the data collection and provided statistical support. Both authors contributed to the conceptualization and design, provided the analysis, and contributed to the manuscript preparation.

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