Original Article

Treatment-related Decisional Conflict, Quality of Life, and Comorbidity in Older Adults with Cancer

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ABSTRACT

Objective: The present study aims to examine the relationships between and among cancer treatment-related decisional conflict, quality of life, and comorbidity in older adults with cancer. **Methods:** A convenience sample of 200 older adults was recruited from outpatient medical oncology and radiation oncology practices in the northeastern United States. A cross-sectional, descriptive, correlational study design was used employing a survey method. Survey instruments included the Decisional Conflict scale (DCS) (with five subscales, including informed, values clarity, support, uncertainty, and effective decision); Self-administered comorbidity questionnaire (SCQ); European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (including five function scales, three symptom scales, a global health/quality of life scale, and six single items); and an investigator-developed demographic form. **Results:** The mean total DCS score was 22.1 (±12.5). The uncertainty subscale had the highest mean of the subscales (29.2 ± 18.2). The mean score for global health status/quality of life was 44.2 (±20.7). The mean score of the SCQ was low (9.6 ± 4.1). Significant positive relationships were identified between decisional conflict and quality of life ($P = 0.009$) and quality of life and comorbidity ($P = 0.001$). Multiple linear regression analysis found statistically significant relationships for total decisional conflict score and the five decisional conflict scale subscales. **Conclusions:** Results may suggest a relationship between decisional conflict and quality of life, as well as the quality of life and comorbidity. In addition, there are several physical, emotional, and spiritual factors that may positively or negatively impact decisional conflict.

Key words: Cancer, comorbidity, decisional conflict, older adults, quality of life

Introduction

It is widely accepted that the single greatest risk factor for cancer is age. Greater than 50% of new cancer cases and nearly 70% of cancer deaths occur in people 65 years of age and older in the United States.[1] As the population

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ages, this proportion will markedly increase. The incidence of comorbid illness also increases with age. On an average, people 65 years of age and over, with cancer, suffer from three additional diseases.[2,3] Comorbidity is associated with reduced life expectancy and increased risk for treatment complications, while also having the potential to negatively affect the natural history of cancer.[4-7]

Regardless of age, cancer treatment-related decisions can be exceedingly complex. There is variability in patients' desire to participate in decision making, which may be influenced by their age and disease progression.[8-10] In addition, there is a variety of psychological, physical, functional, and social factors that influence decision-making.[11-14] Quality of life is a concept that is central to the care of cancer patients. Quality of life is generally described as a subjective and multidimensional concept that encompasses many of the components that influence decision making.[15] The concept of quality of life refers to a broad range of content, including physical functioning or well-being, psychological well-being, social role functioning or well-being, disease- and treatment-related symptoms, and spiritual well-being.[15] According to O'Connor,[16] patients' health status (including physical, emotional, cognitive, and social) is an essential component in determining their decisional needs. Measurement of comorbid illness and quality of life are just two ways in which to gain some insight into a patient's health status and ultimately, decisional needs.

With an increasing number of cancer treatments available, patients are presented with increasingly difficult decisions. These decisions can lead to decisional conflict, which can be described as "a state of uncertainty about which course of action to take when choices among competing actions involve risk, loss, regret, or challenge to personal life values."[17] Physiologic and psychologic factors can be the basis for patients' decision-making. For older adults, decisions regarding treatment may be considered in the context of their physical function. Sometimes, patients will choose to forego cancer treatment explicitly within the context of their age and comorbidities.[18] Decision-making is preceded by careful thought, which is influenced by a broad perspective of older adults' values and their perceptions of their whole life situation.[19,20]

As the proportion of older adults in the world increases, so too will the prevalence of cancer. Cancer will be just one of the chronic illnesses that older adults will endure. Older adults are at risk for physical, psychological, and functional decline as a result of these chronic illnesses, which may be exacerbated by cancer and cancer treatment. Cancer treatment-related decisions are multifactorial and complex for health-care providers, patients, and families. Although physicians utilize clinical tools in making decisions regarding cancer treatment, little is known about how older adults make their own decisions regarding treatment and whether they experience decisional conflict regarding those decisions.

The purpose of this study was to examine the relationships between and among treatment-related decisional conflict, comorbid illness, and quality of life in older adults with cancer. The following research questions guided this inquiry:

1. What is the relationship between and among treatment-related decisional conflict, quality of life, and comorbidity in older adults with cancer
2. To what degree does the variability in the quality of life and level of comorbidity predict decisional conflict?

Methods

Sample and design

This study utilized a cross-sectional, descriptive, correlational study design using a survey method. A sample of 200 older adults with cancer was recruited from two medical oncology practices and one radiation oncology practice in the northeastern United States.

With the permission of the practices, flyers advertising the study were developed by the investigator and placed in waiting rooms and examination rooms. Interested patients were directed to contact any nurse in the practice. If patients who met the inclusion criteria were identified by nurses, a survey packet was offered to them. Once completed, the survey packet was returned to the nurse and the patient received a $10 gift card.

The criteria for inclusion in this study were as follows: being 65 years of age or older, English-speaking, having the ability to read English at an eighth-grade level, having a current cancer diagnosis, and receiving cancer treatment. A power analysis was conducted to determine the appropriate sample size to conduct correlational statistics and regression analysis. Using the effect size as a guideline, a sample size range of 193 ($d = 0.40$) to 346 ($d = 0.30$) was calculated. Thus, a sample size of 193 was needed to achieve the power of 0.80 using a two-tailed test of significance at 0.05.

Data collection instruments

Participants were asked to complete four instruments including Decisional Conflict Scale (DCS), Self-Administered Comorbidity Questionnaire (SCQ), European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), and an investigator-developed Demographic Information Form (DIF).

The DCS was developed to elicit "healthcare consumers' uncertainty in making a health-related decision, the factors contributing to the uncertainty, and health-care consumers' perceived effective decision-making."[21] There are four versions of the DCS; however, the traditional DCS was used in this study because it has been used in >30 studies and sufficient psychometric data exist.[22] The traditional DCS is a 16-item instrument that consists of five subscales: informed (items 1–3); values clarity (items 4–6); support (items 7–9); uncertainty (items 10–12); and effective decision (items 13–16). Items in each subscale are scored on a 5-point Likert scale (0 = strongly agree, 1 = agree, 2 = neither agree nor disagree, 3 = disagree, and 5 = strongly disagree). DCS scores range from 0 (no decisional conflict) to 100 (extremely high-decisional conflict). According to O'Connor,[22] investigators using the DCS should "set the stage" for participants by asking them to focus on their opinions regarding a treatment decision specific to the area of inquiry. To this end, the investigator developed an opening paragraph to the DCS that focused respondents to cancer treatment-related decisions, an open-ended question to determine the decision that was made, and a multiple choice question to determine when the decision was made. The paragraph and questions were pilot-tested with a sample (n = 10) that met the inclusion criteria for the current study. Minor logistical revisions were made based on the pilot study. In this study, reliability analyses indicated acceptable reliability with Cronbach's $\alpha > 0.70$ for the DCS total score and each of the subscales.

The SCQ allows participants to note the severity of each comorbid disease and their perception of its impact on their function. It is a 13-item instrument with the option of adding three additional conditions in an open-ended format. Thirteen medical conditions are listed for which participants are asked to indicate if they have the condition, if they receive treatment for the condition, and if the condition limits their activities. For each item, participants record a dichotomous yes or no response. A maximum of three points can be scored for each medical condition: one point for the presence of the medical condition, one point if treatment is received for the medical condition, and one point if the medical condition causes a limitation in functioning. The total number of points depends on whether or not the optional open-ended items are completed by the participant (scale range 0–48). The SCQ has been shown to have good reliability and validity in previous studies of older adults;[23] however, in this study, the SCQ was not found to have an acceptable level of reliability (Cronbach's $\alpha = 0.36$).

The EORTC QLQ-C30 (Version 3) is a 30-item instrument that consists of multi-item scales and single-item measures including five function scales (physical, role, cognitive, emotional, and social); three symptom scales (fatigue, pain, and nausea/vomiting); a global health status/quality of life scale; and six single items (dyspnea, appetite, sleep, constipation, diarrhea, and financial). The two global health status/quality of life items are scored on a 7-point Likert scale (1 = very poor to 7 = excellent); the remaining 28 items are scored on a 4-point Likert scale (1 = not at all, 2 = a little, 3 = quite a bit, and 4 = very much). All of the scales and single-item measures range in score from 0 to 100. A high score for global health status/quality of life represents a high quality of life, a high score for a functional scale indicates a high/healthy level of functioning, and high score for a symptom scale/item represents a high level of symptoms/problems.[24] The EORTC QLQ-C30 has been shown to have good reliability and validity in numerous international oncology studies. In this study, the EORTC QLQ-C30 was found to have an acceptable level of reliability with a Cronbach's α of 0.88.

The DIF included 17 items to describe the population under study. In addition to marital status, race, religion, and education, participants were asked to specify the type of cancer, types of cancer treatments received, and types of decision support received.

Statistical analysis

Data were analyzed using IBM SPSS Statistics Version 21 (IBM Corp., Armonk, NY, USA). Initially, a series of descriptive statistics were conducted on the demographic data and on the dependent variable, decisional conflict, and independent variables, quality of life, and comorbidity. Next, a series of correlations were conducted to determine the relationship between the variables. Histograms as well as additional descriptive analyses conducted indicated that these measures were not normally distributed; therefore, the assumptions of parametric testing were not met. Thus, Spearman's rho (r_s), the nonparametric equivalent of Pearson's r, was used for the correlational analyses. Scatterplots were used to test for the assumptions of multiple regression. Since the scatterplots revealed linearity, multivariate normality, homoscedasticity, and no multicollinearity, multiple linear regression analyses were conducted to determine whether the predictors of quality of life and comorbidity significantly impact decisional conflict.

Ethical approval

The investigator received approval to conduct the study from the Institutional Review Board of Duquesne University. Participation in the study was voluntary, and all participants had the right to refuse.

Results

The mean age (± standard deviation) of the participants was 73.1 (±6.98), more than half were female, approximately

half were married, and the majority were married. The most common cancer diagnosis was lung cancer (23.1%), and more than half (51.5%) indicated that cancer had spread. Slightly over 41% of participants indicated they were accompanied by spouses/significant others to appointments with their cancer doctors. The highest grade of school completed was found to be a mean of 13.1 years (±2.1), with a minimum of 8 years and a maximum of 18 years of schooling. The majority (71.5%) were retired. In terms of decision support, almost all reported that their cancer doctor helped them make decisions about their cancer treatment, followed by family, and their cancer nurse. Table 1 shows summary of the demographic characteristics of the sample.

When completing the DCS, the majority of participants (59%) identified their complex decision as related to chemotherapy, and 48% of the participants indicated that they had made their decision within the last 3 months. Approximately 19% of participants had decided over 1 year ago. Table 2 presents the other characteristics of the complex decision reflected on in completing the DCS.

A summary of the descriptive statistics for the DCS, EORTC QLQ-C30, and SCQ is presented in Table 3. Overall, the mean DCS total score (± standard deviation) was low (22.1 ± 12.5) with subscale four (uncertainty) having the highest mean (± standard deviation) of the subscales (29.2 ± 18.2). The mean (± standard deviation) score for the two global health status/quality of life questions was 44.2 (±20.7). Of the function scales, cognitive function had the highest mean score, while role function had the lowest. Fatigue had the highest mean of the symptom scales. With regard to the six single items, dyspnea had the highest mean. The mean score of the SCQ was low, with the most reported comorbid illness being high blood pressure.

The results of correlation analysis showed a significant relationship between decisional conflict and quality of life ($P < 0.01$) and between the quality of life and comorbidity ($P < 0.01$). The correlation conducted between decisional conflict and comorbidity failed to achieve significance. Table 4 shows correlation coefficients for each of the study variables.

Multiple linear regression analysis was conducted to determine whether there were any predictors that significantly impact the DCS total score and the five DCS subscales. All components of the EORTC QLQ-C30 were analyzed as predictors, including five function scales, three symptom scales, global health status/quality of life scale, and six single items. Regression analysis also included total SCQ score and elements of the DIF. All six of the regression models were found to achieve statistical significance ($P < 0.001$). Tables 5-10 summarize the results of the multiple regression analysis conducted on DCS total and each of the DCS subscales.

Table 1: Demographic characteristics of study participants (n=200*)

Characteristics	Data
Age, years, Mean±SD, range	73.1±7.0, 65-92
Gender, *n* (%)	
Female	102 (51.0)
Male	98 (49.0)
Marital status, *n* (%)	
Married	101 (50.5)
Widowed	55 (27.5)
Divorced	32 (16.0)
Single, never married	12 (6.0)
Race, *n* (%)	
White	175 (87.5)
African American	11 (5.5)
Hispanic	9 (4.5)
Native American/Eskimo	1 (0.5)
Asian	1 (0.5)
Missing	3 (1.5)
Religion, *n* (%)	
Catholic	105 (52.5)
Protestant	48 (24.0)
Other Christian	26 (13.0)
Jewish	11 (5.5)
No affiliation	6 (3.0)
Jehovah Witness	1 (0.5)
Missing	3 (1.5)
Employment status, *n* (%)	
Retired	143 (71.5)
Disabled	32 (16.0)
Employed part-time	18 (9.0)
Employed full-time	3 (1.5)
Missing	4 (2.0)
Cancer type, *n* (%)	
Lung	46 (23.0)
Leukemia/myelodysplastic syndrome/lymphoma	32 (16.0)
Breast	24 (12.0)
Colorectal	23 (11.5)
Pancreas/gall bladder	13 (6.5)
Ovarian/uterine	12 (6.0)
Multiple myeloma	12 (6.0)
Head/neck	11 (5.5)
Prostate	9 (4.5)
Liver	6 (3.0)
Melanoma	4 (2.0)
Bladder	4 (2.0)
Kidney	2 (1.0)
Sarcoma	1 (0.5)
Missing	1 (0.5)
Has the cancer spread?, *n* (%)	
No	103 (51.5)
Yes	97 (48.5)
Who primarily goes to cancer appointments with you?, *n* (%)	
Spouse/significant other	81 (40.5)
Child	51 (25.5)
Alone	38 (19.0)
Other family	19 (9.5)

Contd...

Table 1: Contd...

Characteristics	Data
Friend	4 (2.0)
Paid caregiver	3 (1.5)
Missing	4 (2.0)
Resources/support/decision aids (list all that apply), *n* (%)	
Cancer doctor	198 (99.0)
Family	160 (80.0)
Cancer nurse	74 (37.0)
Websites	32 (16.0)
Priest/minister/spiritual support	15 (7.5)
Support group	11 (5.5)
Books	8 (4.0)
Other, *n* (%)	
Family doctor	1 (0.5)
Friends	5 (2.5)
Hypnotist	1 (0.5)
Nurse navigator	1 (0.5)
Social worker	1 (0.5)
Therapist	2 (1.0)

*n=200 reflects the total number of participants who initiated the survey. Not all items were answered by all participants. SD: Standard deviation

Table 2: Characteristics of complex decisions (n=200*)

Response	*n* (%)
Type of decision	
Chemotherapy	118 (59.0)
Radiation therapy	51 (25.5)
Surgery	18 (9.0)
Clinical trial	4 (2.0)
Second opinion	4 (2.0)
Cancer doctor/facility	3 (1.5)
Stem cell transplant	1 (0.5)
Missing	1 (0.5)
Length of time since decision was made	
<3 months	94 (47.0)
3-6 months	29 (14.5)
6-9 months	18 (9.0)
9-12 months	17 (8.5)
Over 1 year	38 (19.0)
Missing	4 (2.0)

*n=200 reflects the total number of participants who initiated the survey. Not all items were answered by all participants

Discussion

Descriptive analysis revealed there was no decisional conflict in this sample. A DCS score <25 indicates no decision-making difficulty.[22] The mean DCS total score of 22.1 in this study demonstrated that, overall, the participants in this study did not have difficulty with decision making. Participants demonstrated a higher level of decisional conflict in DCS subscale four which evaluates how informed one is "about options, risks, and benefits, and feeling clear about values and value tradeoffs in the decision."[21] A higher score in this subscale indicates that participants felt less informed about options, risks, and benefits and were unsure of personal values in making cancer treatment-related decisions.[21] It is unclear why there were low levels of decisional conflict in this study. In one study,[25] it was found that DCS scores may decrease considerably up to 6 months posttreatment. Since almost 63% of this sample made the treatment-related decision within the last 6 months, the actual level of decisional conflict may have been higher at the time of the decision. In addition, the majority of this sample had lung cancer, and regardless of cancer type, slightly more than half reported that their cancer had spread. It is unknown whether cancer type or stage may have an impact on decisional conflict, thus further study is needed.

When compared with data from other studies of older adults with cancer, the global health status/quality of life of this sample was generally poorer. In a large study of cancer patients to establish reference values for the EORTC QLQ-C30, the mean global health status/quality was found to be 61.8 (ages 60–69) and 60.6 (ages 70 and older).[26] Although different instruments were used to measure the quality of life, the overall quality of life of this sample is poorer than the quality of life of older adults with cancer or advanced illness in other studies.[27,28] When compared with the EORTC QLQ-C30 reference values for patients 70 years and older,[26] the participants in this study had a poorer physical function, poorer role function, better emotional function, similar cognitive function, and poorer social function. With the exception of insomnia, the participants in this study had higher mean scores on all symptom scales and single items than the EORTC QLQ-C30 reference values. The mean insomnia scores were similar. The fact that participants in this study, overall, had poorer role function and worse symptomatology may account for the poorer global health status/QOL.

The reported level of comorbidity by participants in this study was higher than in other studies of older adults that utilized the SCQ.[29,30] The most reported comorbid illnesses were similar to the most reported illnesses in other studies of older adults, including high blood pressure, back pain, and lung disease.[23,30]

Family members were a source of support for the participants in this study. About 77% of the sample indicated that they were accompanied to appointments with their cancer doctors by a spouse/significant other, child, or other family members. The availability of a caregiver or a family member influences treatment decisions.[31] Family support was also essential in making decisions about cancer treatment. In this sample, participants reported multiple sources of support in making decisions about cancer treatment. The most frequent included cancer

Table 3: Descriptive statistics of study variables (n=200*)

Measure	n	Mean±SD	Range
DCS total	198	22.1 (12.5)	0-70.3
DCS S1	200	21.7 (15.7)	0-100
DCS S2	199	19.9 (13.7)	0-100
DCS S3	200	19.1 (12.0)	0-50
DCS S4	200	29.2 (18.2)	0-100
DCS S5	199	21.0 (13.5)	0-50
EORTC QLQ-C30			
Global health status/QOL	200	44.2 (20.7)	0-100
Physical function	200	64.1 (23.9)	0-100
Role function	200	59.8 (28.6)	0-100
Emotional function	200	79.0 (20.0)	8.3-100
Cognitive function	200	80.1 (18.8)	16.7-100
Social function	200	68.3 (25.3)	0-100
Fatigue	200	41.4 (21.6)	0-100
Nausea/vomiting	200	11.3 (17.7)	0-83.3
Pain	200	30.6 (25.2)	0-100
Dyspnea	200	28.3 (26.7)	0-100
Insomnia	200	26.5 (27.2)	0-100
Appetite loss	200	25.5 (26.5)	0-100
Constipation	200	23.2 (29.6)	0-100
Diarrhea	200	12.3 (21.5)	0-100
Financial problems	198	22.7 (28.2)	0-100
SCQ	200	9.6 (4.1)	3-23

*n=200 reflects the total number of participants who initiated the survey. Not all items were answered by all participants. DCS: Decisional conflict scale, which consists of a global score and five subscales: S1: Informed, S2: Values clarity, S3: Support, S4: Uncertainty and S5: Effective decision, EORTC QLQ-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire, SCQ: Self-administered comorbidity questionnaire, SD: Standard deviation

Table 4: Correlation coefficients of study variables

Variables	r_s	P
Decisional conflict and quality of life	0.185	0.009
Quality of life and comorbidity	0.240	0.001
Decisional conflict and comorbidity	0.129	0.070

r_s: Spearman's rho

doctor, family, and cancer nurse. This is consistent with other studies that demonstrated the importance of family preference, family burden, and physician's opinion in making cancer-related treatment decisions.[14,32]

One of the aims of this study was to examine the relationship between and among decisional conflict, quality of life, and comorbidity. Correlational analysis indicated that decisional conflict was significantly correlated with quality life. The weak, though positive and significant, the correlation between decisional conflict and quality of life indicates that greater treatment-related decisional conflict may be associated with greater quality of life. A study[33] found that older adults with cancer chose their treatment decisions depending on the burden of the treatment, possible outcomes, and likelihood of adverse functional and cognitive outcomes. However, to date, there have been no published reports of the relationship between decisional conflict and quality of life. Additional studies are needed to validate the findings in this study.

The correlational analysis also indicated that quality of life was significantly correlated with comorbidity. The weak to moderate, though positive, correlation indicates that greater quality of life may be associated with greater comorbidity. This result must be interpreted cautiously since the SCQ was not found to have an acceptable level of reliability and thus, a Type I error may have occurred. Finally, decisional conflict and comorbidity were not found to be significantly correlated. However, due to the low level of reliability of the SCQ, this result must also be interpreted cautiously because a Type II error may have occurred.

The other aim of this study was to determine the degree to which quality of life and comorbidity predict decisional conflict. The results of the regression analysis of this data indicate that higher/healthier emotional function may be predictive of lower decisional conflict. Previous studies have documented a relationship between decisional conflict and emotional status, with mixed results. In a study of hospital patients,[34] the investigators found that a decrease in decisional conflict leads to less fretting and nervousness. Another study[35] found a similar relationship to the present study with a negative predictive relationship between anxiety and DCS.

Interestingly, of those physical symptoms that achieved significance, a negative relationship was found. The symptom of diarrhea (EORTC QLQ-C30) was significant in five of the six regression models, with the exception of the informed subscale. Other symptoms that were found to be significant included insomnia (values clarity subscale), fatigue (support subscale), and nausea/vomiting (effective decision subscale). This is a curious finding, as it would seem that worse physical symptoms, especially if they were treatment-related, may increase decisional conflict. Although an explanation for this finding is unclear, it may be that participants felt that the symptoms are expected with cancer treatment and thus, did not increase conflict in the decision-making process. Alternatively, if the symptoms are cancer-related, participants may have felt that the treatment was helping them

Financial problems, reported as a component of the EORTC QLQ-C30, were found to be predictive of higher DCS total, informed subscale, and uncertainty subscale. Lack of insurance and having a poor financial status are important contextual factors that can influence treatment choice.[36] In this study, >87% identified as "retired" or "disabled." Although financial information and insurance status were not collected in this study, it is reasonable to suspect that this majority would have some financial challenges or limitations being on a fixed income.

Table 5 Regression model explaining scores reflecting decisional conflict scale total

Variable	*B*	SE	β	*t*	*P*
Constant	38.654	11.081		3.488	0.001
Global health status/QOL	0.079	0.053	0.133	1.513	0.132
Physical function	0.072	0.055	0.141	1.314	0.190
Role function	−0.081	0.064	−0.186	−1.274	0.204
Emotional function	−0.201	0.057	−0.325	−3.519	0.001**
Cognitive function	−0.028	0.061	−0.043	−0.454	0.650
Social function	0.040	0.052	0.083	0.783	0.435
Fatigue	−1.24	0.079	−0.217	−1.564	0.120
Nausea/vomiting	−0.068	0.056	−0.098	−1.209	0.228
Pain	0.075	0.041	0.153	1.844	0.067
Dyspnea	0.026	0.037	0.056	0.696	0.488
Insomnia	−0.055	0.034	−0.121	−1.608	0.110
Appetite loss	0.019	0.040	0.041	0.474	0.636
Constipation	−0.011	0.031	−0.026	−0.344	0.731
Diarrhea	−0.131	0.041	−0.226	−3.173	0.002**
Financial problems	0.076	0.033	0.173	2.269	0.024*
SCQ	−0.045	0.227	−0.015	−0.199	0.842

*P<0.05; **P<0.01. F (16, 179)=3.299, P<0.001; adjusted R^2=0.159. DCS: Decisional conflict scale, QOL: Quality of life, SCQ: Self-administered comorbidity questionnaire, SE: Standard error

Table 6: Regression model explaining scores reflecting decisional conflict scale subscale 1 (informed subscale)

Variable	*B*	SE	β	*t*	*P*
Constant	41.789	13.589		3.075	0.002
Global health status/QOL	0.066	0.065	0.088	1.029	0.305
Physical function	0.084	0.069	0.129	1.220	0.224
Role function	−0.077	0.078	−0.141	−0.988	0.324
Emotional function	−0.191	0.070	−0.245	−2.722	0.007**
Cognitive function	−0.170	0.075	−0.207	−2.256	0.025*
Social function	0.118	0.063	0.191	1.854	0.065
Fatigue	−0.148	0.097	−0.206	−1.522	0.130
Nausea/vomiting	−0.062	0.069	−0.071	−0.895	0.372
Pain	0.041	0.050	0.066	0.814	0.417
Dyspnea	0.090	0.046	0.155	1.964	0.051*
Insomnia	−0.075	0.042	−0.133	−1.788	0.075
Appetite loss	−0.050	0.049	−0.086	−1.026	0.306
Constipation	0.036	0.039	0.069	0.923	0.357
Diarrhea	−0.090	0.050	−0.125	−1.796	0.074
Financial problems	0.130	0.041	0.235	3.165	0.002**
SCQ	0.185	0.282	0.049	0.655	0.513
Spiritual support person	−9.486	4.065	−0.162	−2.334	0.021*
Other resources	−7.233	4.508	−0.107	−1.605	0.110

*P≤0.05; **P<0.01. F (18, 179)=3.678, P<0.001, Adjusted R^2=0.197. DCS: Decisional conflict scale. QOL: Quality of life, SCQ: Self-administered comorbidity questionnaire, SE: Standard error

Table 7: Regression model explaining scores reflecting decisional conflict scale subscale 2 (values clarity subscale)

Variable	*B*	SE	β	*t*	*P*
(Constant)	47.975	12.303		3.899	0.000
Global health status/QOL	0.010	0.058	0.016	0.177	0.859
Physical function	0.145	0.061	0.255	2.370	0.019*
Role function	−0.132	0.071	−0.276	−1.866	0.064
Emotional function	−0.201	0.063	−0.293	−3.166	0.002**
Cognitive function	−0.073	0.068	−0.102	−1.072	0.285
Social function	0.008	0.057	0.014	0.136	0.892
Fatigue	−0.169	0.088	−0.269	−1.923	0.056
Nausea/vomiting	−0.109	0.062	−0.142	−1.739	0.084
Pain	0.087	0.045	0.161	1.919	0.057
Dyspnea	0.077	0.041	0.151	1.860	0.064
Insomnia	−0.114	0.039	−0.230	−2.952	0.004**
Appetite loss	0.028	0.044	0.055	0.630	0.529
Constipation	−0.012	0.035	−0.026	−0.334	0.738
Diarrhea	−0.107	0.046	−0.167	−2.342	0.020*
Financial problems	0.065	0.037	0.135	1.764	0.079
SCQ	−0.412	0.252	−0.125	−1.631	0.105
Cancer nurse helpful	3.278	2.055	0.117	1.595	0.112

*P<0.05; **P<0.01. F (17, 179)=3.006, P<0.001; Adjusted R^2=0.148. DCS: Decisional conflict scale, QOL: Quality of life, SCQ: Self-administered comorbidity questionnaire, SE: Standard error

Table 8: Regression model explaining scores reflecting decisional conflict scale subscale 3 (support subscale)

Variable	*B*	SE	β	*t*	*P*
Constant	1529.501	472.413		3.238	0.001
Global health status/QOL	0.089	0.051	0.154	1.730	0.085
Physical function	0.059	0.054	0.121	1.101	0.273
Role function	−0.114	0.061	−0.272	−1.851	0.066
Emotional function	−0.140	0.055	−0.236	−2.538	0.012*
Cognitive function	0.021	0.059	0.033	0.350	0.727
Social function	0.023	0.050	0.049	0.455	0.650
Fatigue	−0.167	0.077	−0.304	−2.177	0.031
Nausea/vomiting	−0.025	0.055	−0.038	−0.456	0.649
Pain	0.052	0.039	0.111	1.323	0.187
Dyspnea	0.033	0.036	0.074	0.902	0.368
Insomnia	−0.004	0.033	−0.010	−0.136	0.892
Appetite loss	0.041	0.039	0.093	1.059	0.291
Constipation	−0.038	0.030	−0.095	−1.261	0.209
Diarrhea	−0.133	0.039	−0.244	−3.392	0.001**
Financial problems	0.057	0.032	0.137	1.782	0.076
SCQ	−0.138	0.221	−0.048	−0.625	0.533
Year diagnosed	−0.744	0.235	−0.223	−3.171	0.002**

*P<0.05; **P<0.01. F (17, 176)=3.107, P<0.001; Adjusted R^2=0.157. DCS: Decisional conflict scale, QOL: Quality of life, SCQ: Self-administered comorbidity questionnaire, SE: Standard error

In addition to decisional conflict and quality of life, components of the DIF were included in the regression analysis. The presence of spiritual support has been shown to impact treatment-related decisions.[37] In this study, the use of a spiritual support person for decision making significantly decreased scores in the informed and effective decision subscales. There are no published studies examining the relationship between spiritual support and decisional conflict; however, the results of this study are suggestive of spiritual support lowering some components of decisional conflict.

Limitations

There are several limitations that impact the generalizability of the findings of this study. It is important

Table 9: Regression model explaining scores reflecting decisional conflict scale subscale 4 (uncertainty subscale)

Variable	*B*	SE	β	*t*	*P*
Constant	48.454	16.382		2.958	0.004
Global health status/QOL	0.123	0.077	0.140	1.591	0.113
Physical function	0.014	0.081	0.019	0.175	0.862
Role function	−0.042	0.094	−0.066	−0.448	0.655
Emotional function	−0.233	0.084	−0.257	−2.766	0.006**
Cognitive function	−0.090	0.090	−0.094	−0.992	0.323
Social function	0.021	0.076	0.029	0.271	0.786
Fatigue	−0.172	0.117	−0.206	−1.461	0.146
Nausea/vomiting	−0.080	0.083	−0.079	−0.958	0.339
Pain	0.115	0.060	0.160	1.918	0.057
Dyspnea	−0.010	0.056	−0.015	−0.175	0.861
Insomnia	−0.061	0.050	−0.092	−1.207	0.229
Appetite loss	0.029	0.059	0.043	0.502	0.617
Constipation	0.001	0.046	0.001	0.014	0.989
Diarrhea	−0.146	0.061	−0.174	−2.395	0.018*
Financial problems	0.105	0.049	0.164	2.140	0.034*
SCQ	0.001	0.337	0.000	0.002	0.998
Chemotherapy	7.224	3.892	0.135	1.856	0.065

*P<0.05, **P<0.01. F (17, 180)=2.957; P<0.001; adjusted R^2=0.144. DCS: Decisional conflict scale, QOL: Quality of life, SCQ: Self-administered comorbidity questionnaire, SE: Standard error

Table 10: Regression model explaining scores reflecting decisional conflict scale subscale 5 (effective decision subscale)

Variable	*B*	SE	β	*t*	*P*
Constant	28.155	12.055		2.336	0.021
Global health status/QOL	0.117	0.057	0.180	2.039	0.043*
Physical function	0.050	0.060	0.090	0.838	0.403
Role function	−0.024	0.069	−0.051	−0.344	0.731
Emotional function	−0.239	0.062	−0.356	−3.847	0.000**
Cognitive function	0.121	0.067	0.171	1.818	0.071
Social function	−0.022	0.056	−0.042	−0.398	0.691
Fatigue	−0.101	0.086	−0.163	−1.169	0.244
Nausea/vomiting	−0.132	0.061	−0.176	−2.159	0.032*
Pain	0.073	0.044	0.137	1.648	0.101
Dyspnea	−0.009	0.041	−0.019	−0.233	0.816
Insomnia	−0.030	0.037	−0.060	−0.792	0.429
Appetite loss	0.061	0.043	0.121	1.405	0.162
Constipation	−0.006	0.035	−0.014	−0.177	0.859
Diarrhea	−0.133	0.045	−0.214	−2.979	0.003**
Financial problems	0.036	0.036	0.076	0.999	0.319
SCQ	0.156	0.250	0.048	0.623	0.534
Spiritual support person	−10.956	3.563	−0.217	−3.075	0.002**

*P<0.05; **P<0.01. F (17, 179)=3.096, P<0.001, adjusted R^2=0.154. DCS: Decisional conflict scale, QOL: Quality of life, SCQ: Self-administered comorbidity questionnaire, SE: Standard error

to recognize that these data are reflective of a group of predominantly white cancer patients from a suburban area and are not representative of the nation. Therefore, the results of this study may not be generalizable to individuals with different demographic characteristics. All of the data utilized in this study was self-reported, which could impact the accuracy of the data. Although study participation was voluntary and anonymous, it is possible that not all participants were comfortable exploring some of the psychosocial or emotional components of the surveys. Since most of the participants reported that they do not go to their appointments alone, the surveys may have been completed in the presence of someone else. This may have affected their responses. Furthermore, about comorbidity, it is possible that the SCQ was not the best instrument to use in this population given the low Cronbach's alpha.

Future research

Research that focuses on older adults with cancer is limited in the literature. This was the first study to examine the variables of decisional conflict, quality of life, and comorbidity in older adults. Future research should focus on the additional investigation of these variables, particularly with a diverse sample, and to further validate these study results. Since decisional conflict can diminish over time, it would be helpful to repeat this study with patients who are currently in the process of making a treatment-related decision and possibly, prospectively follow them over a period. In light of the results of the regression analyses, further research is indicated about emotional function, spiritual support, and symptom management in the setting of decision making in older adults with cancer.

Conclusion

This study examined the relationships between decisional conflict, quality of life, and comorbidity in older adults with cancer. Participants in this study were found to experience decisional conflict in the uncertainty subscale, have a poor quality of life, and suffer from cancer- and treatment-related symptoms. A relationship may exist between decisional conflict and quality of life, as well as the quality of life and comorbidity. With patient-centered care at its core, nursing is poised to empower patients to communicate their needs, values, and preferences related to treatment-related decisions.

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Conflicts of interest

There are no conflicts of interest.

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