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. As the population...
ages, this proportion will markedly increase. The incidence of comorbid illness also increases with age. On average, people 65 years of age and older, 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.\(^{16}\) 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 α > 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 α = 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), 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: Characteristics of complex decisions (n=200)

| 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)    |

*An=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)     |

*An=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. 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.” 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. It is unclear why there were low levels of decisional conflict in this study. In one study, 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). 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.

When compared with the EORTC QLQ-C30 reference values for patients 70 years and older, 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. 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.

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. 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...
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 of 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 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) | 0-100 |
| 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   | 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 = Spearman’s rho*
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.\(^{31}\) 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...
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.

### References

1. National Cancer Institute. SEER Cancer Stat Facts: Cancer of any Site; 2017. Available from: http://www.seer.cancer.gov/statfacts/html/all.html. [Last accessed on 2018 Jun 04].

2. Extermann M, Aapro M, Bernabei R, Cohen HJ, Droz JP, Lichtman S, et al. Use of comprehensive geriatric assessment in older cancer patients: Recommendations from the...
task force on CGA of the international society of geriatric oncology (SIOG). Crit Rev Oncol Hematol 2005;53:241-52.
3. Marencic D, Marinello R, Berruti A, Gaspari F, Stasi MF, Rosato R, et al. Multidimensional geriatric assessment in treatment decision in elderly cancer patients: 6-year experience in an outpatient geriatric oncology service. Crit Rev Oncol Hematol 2008;68:157-64.
4. Balducci L. Supportive care in elderly cancer patients. Curr Opin Oncol 2009;21:310-7.
5. Bond SM. Physiological aging in older adults with cancer: Implications for treatment decision making and toxicity management. J Gerontol Nurs 2010;36:26-37.
6. Muss HB. Cancer in the elderly: A societal perspective from the United States. Clin Oncol (R Coll Radiol) 2009;21:92-8.
7. Zeber JE, Copeland LA, Hosek BJ, Karnad AB, Lawrence VA, Sanchez-Reilly SE. Cancer rates, medical comorbidities, and treatment modalities in the oldest patients. Crit Rev Oncol Hematol 2008;67:237-42.
8. Barry B, Henderson A. Nature of decision-making in the terminally ill patient. Cancer Nurs 1996;19:384-91.
9. Degner LF, Sloan JA. Decision making during serious illness: What role do patients really want to play? J Clin Epidemiol 1992;45:941-50.
10. Yogaparan T, Panju A, Minden M, Brandwein J, Mohamedali HZ, Alibhai SM, et al. Information needs of adult patients 50 or older with newly diagnosed acute myeloid leukemia. Leuk Res 2009;33:1288-90.
11. Chen H, Haley WE, Robinson BE, Schonwetter RS. Decisions for hospice care in patients with advanced cancer. J Am Geriatr Soc 2003;51:789-97.
12. Gauthier DM, Swigart VA. The contextual nature of decision making near the end of life: Hospice patients’ perspectives. Am J Hosp Palliat Care 2003;20:121-8.
13. Kolly-Powell ML. Personalizing choices: Patients’ experiences with making treatment decisions. Res Nurs Health 1997;20:219-27.
14. Laidsaar-Powell R, Butow P, Charles C, Gafni A, Entwistle V, Epstein R, et al. The TRIO framework: Conceptual insights into family caregiver involvement and influence throughout cancer treatment decision-making. Patient Educ Couns 2017;100:2035-46.
15. Golla DF. Quality of life: The concept. J Palliat Care 1992;8:8-13.
16. O’Connor AM. Ottawa Decision Support Framework to Address Decisional Conflict; 2006. Available from: http://www.oahri.ca/decisionaid. [Last accessed on 2018 Jun 04].
17. Légare F, O’Connor AM, Graham ID, Wells GA, Tremblay S. Impact of the Ottawa decision support framework on the agreement and the difference between patients’ and physicians’ decisional conflict. Med Decis Making 2006;26:373-90.
18. Sinding C, Wiernikowski J, Aronson J. Cancer care from the perspectives of older women. Oncol Nurs Forum 2005;32:1169-75.
19. Hughes N, Closs SJ, Clark D. Experiencing cancer in old age: A qualitative systematic review. Qual Health Res 2009;19:1139-53.
20. Thomé B, Dykes AK, Gunnars B, Hallberg IR. The experiences of older people living with cancer. Cancer Nurs 2003;26:85-96.
21. O’Connor AM. Validation of a decisional conflict scale. Med Decis Making 1995;15:25-30.
22. O’Connor AM. User Manual – Decisional Conflict Scale. Available from: http://www.oahri.ca/decisionaid. [Last accessed on 2018 Jun 28].
23. Sangha O, Stucki G, Liang MH, Fossel AH, Katz JN. The self-administered comorbidity questionnaire: A new method to assess comorbidity for clinical and health services research. Arthritis Rheum 2003;49:156-63.
24. Aaronson NK, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, et al. The European organization for research and treatment of cancer QLQ-C30: A quality-of-life instrument for use in international clinical trials in oncology. J Natl Cancer Inst 1993;85:365-76.
25. Chien CH, Chuang CK, Liu KL, Li CL, Liu HE. Changes in decisional conflict and decisional regret in patients with localised prostate cancer. J Clin Nurs 2014;23:1959-69.
26. Scott N, Fayers PM, Aaronson NK, Bottomley A, de Graaff A, Groenvold M, et al. EORTC QLQ-C30 Reference Values Manual. Brussels: EORTC Quality of Life Group; 2008.
27. Black B, Herr K, Fine P, Sanders S, Tang X, Bergent-Jackson K, et al. The relationships among pain, nonpain symptoms, and quality of life measures in older adults with cancer receiving hospice care. Pain Med 2011;12:880-9.
28. Solomon R, Kirwin P, Van Ness PH, O’Leary J, Fried TR. Trajectories of quality of life in older persons with advanced illness. J Am Geriatr Soc 2010;58:837-43.
29. Merriman JD, Aouizerat BE, Cataldo JK, Dunn L, Cooper BA, West C, et al. Association between an interleukin 1 receptor, type I promoter polymorphism and self-reported attentional function in women with breast cancer. Cytokine 2014;65:192-201.
30. Schjolberg TK, Dodd M, Henriksen N, Rustoen T. Factors affecting hope in a sample of fatigued breast cancer outpatients. Palliat Support Care 2011;9:63-72.
31. Bansal A, Koepl LM, Fedorenko CR, Li C, Smith JL, Hall JJ, et al. Information seeking and satisfaction with information sources among spouses of men with newly diagnosed local-stage prostate cancer. J Cancer Educ 2018;33:325-31.
32. Kutner JS, Vu KO, Prindiville SA, Byers TE. Patient age and cancer treatment decisions. Patient and physician views. Cancer Pract 2000;8:114-9.
33. Fried TR, Bradley EH, Towle VR, Allore H. Understanding the treatment preferences of seriously ill patients. N Engl J Med 2002;346:1061-6.
34. Knops AM, Goossens A, Ubbink DT, Legemate DA, Stalpers LJ, Bossuyt PM, et al. Interpreting patient decisional conflict scores: Behavior and emotions in decisions about treatment. Med Decis Making 2013;33:78-84.
35. Rini C, O’Neill SC, Valdimarsdottir H, Goldsmith RE, Jandorf L, Brown K, et al. Cognitive and emotional factors predicting decisional conflict among high-risk breast cancer survivors who receive uninformative BRCA1/2 results. Health Psychol 2009;28:569-78.
36. Tariman JD, Berry DL, Cochrane B, Doorenbos A, Schepp KG. Physician, patient, and contextual factors affecting treatment decisions in older adults with cancer and models of decision making: A literature review. Oncol Nurs Forum 2012;39:E70-83.
37. Mollica MA, Underwood W 3rd, Homish GG, Homish DL, Orom H. Spirituality is associated with better prostate cancer treatment decision making experiences. J Behav Med 2016;39:161-9.