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Nutritional Risk in Cancer Patients 65 and Older Undergoing Systemic Phase I Treatment

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Abstract

Malnutrition is common in cancer patients and recognized as an important component of adverse outcomes, including increased morbidity, mortality, and decreased quality of life (QOL). Quality of life is an overarching term for quality of various domains of life. It is a standard level that consists of the expectations of an individual for a good life. These expectations are guided by values, goals, and sociocultural context. It is a subjective, multidimensional concept defining a standard level for emotional, physical, material, and social well-being (Bottomley, 2012). Nutritional risk is not consistently assessed in the older adult cancer patient population. The purpose of this secondary analysis was to identify variables related to nutritional risk in the cancer patient 65 years and older receiving systemic treatments. The study described the relationship between nutritional risk and four domains of QOL (physical, social, emotional, and functional). A sample of 73 patients was accrued for this study from an NCI-funded RO1 aimed at integrating supportive care for cancer patients. The Mini Nutritional Assessment—Short Form instrument was used to assess for nutritional risk. Findings revealed the strongest correlation with nutritional risk was BMI status (r = .47, p < .0001). Multiple regression analysis demonstrated factors associated with nutritional risk included BMI, previous chemotherapy, and physical subscale of the Functional Assessment of Cancer Therapy—General QOL instrument. Descriptive data reinforced the importance of assessment and intervention to support nutritional status. Nutrition impacts all dimensions of QOL and is even more important in an aging population. Advanced practitioners can contribute greatly to advancing this area of practice.

Phase I trials are rigorous treatments, and geriatric patients are extremely vulnerable to the known and unknown side effects of treatments (McMahon, Decker, & Ottery, 1998). Nutrition plays a major but not always fully understood role in many aspects of cancer development and treatment. Nutritional risk

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is a common problem and component of adverse outcomes, including increased morbidity, mortality, and decreased QOL (Bottomley, 2012). Weight loss associated with malnutrition has also been identified as an indicator of poor prognosis in cancer patients (McMahon, Decker, & Ottery, 1998).

PURPOSE

The overall purpose of this secondary analysis study was to describe the nutritional risk of cancer patients 65 years and older who were receiving systemic treatments and the relationship between nutritional risk and the four domains of QOL (physical, social, emotional, and functional).

BACKGROUND

Nutritional risk means (a) detrimental or abnormal nutritional conditions detectable by biochemical or anthropometric measurements; (b) other documented nutritionally related medical conditions; (c) dietary deficiencies that impair or endanger health; or (d) conditions that predispose persons to inadequate nutritional patterns or nutritionally related medical conditions (Washington State Register, 2017). Proactive nutritional care can prevent or reduce the complications associated with the treatment of cancer (National Cancer Institute [NCI], 2016). Many nutritional problems stem from local effects of the tumor. Tumors in the gastrointestinal tract, for example, can cause obstruction, nausea, vomiting, impaired digestion, and/or malabsorption. In addition to the effects of the tumor, marked alterations in normal metabolism of carbohydrates, protein, and/or fats can occur (NCI, 2016).

The nutritional prognostic indicators most recognized as being predictive of poor outcome include weight loss, wasting, and malnutrition (Bales, 2001). Significant weight loss at diagnosis has been associated with decreased survival and reduced response to surgery, radiation therapy, and/or chemotherapy (Bales, 2001). Malnutrition and accompanying weight loss can be part of an individual's presentation and caused or aggravated by disease or treatments. Identification of nutritional problems and treatment of nutrition-related symptoms have been shown to stabilize or reverse weight loss in 50% to 88% of oncology patients (NCI, 2016). Screening and nutrition assessment should be interdisciplinary; all members of the health-care team (e.g., physicians, advanced practitioners, nurses, registered dietitians, social workers, and psychologists) should be involved in nutritional management throughout cancer care (NCI, 2016).

The nutritional status of patients diagnosed with cancer and entering treatment varies. Not everyone begins therapy with anorexia, weight loss, and symptoms of nutritional problems. For patients who have such symptoms, however, anticancer therapies can complicate the treatment and expected recovery (Bens, 2015).

Many individuals will present with preexisting comorbid diseases and illnesses that complicate treatment. Surgery, chemotherapy, and radiation can have a direct (mechanical) and/or an indirect (metabolic) negative effect on nutritional status (Bens, 2015). The success of the anticancer therapy will be influenced by a patient's ability to tolerate therapy, which will, in turn, be affected by nutritional status preceding treatment. The advanced practitioner should assess baseline nutritional status and be aware of the possible implications of the various therapies. Patients receiving aggressive cancer therapies typically need aggressive nutrition management.

Despite the current evidence, strategies to assess and identify patients at risk for malnutrition are not fully integrated into routine oncology care. Possible causes include the fact that the definition of nutritional risk is poorly understood (Isenring & Elia, 2015; van Bokhorst-van der Schueren et al., 2014) and a lack of assessment tools for nutritional risk in older cancer survivors (Isenring & Elia, 2015; van Bokhorst-van der Schuere et al., 2014).

The overall purpose of this study was to describe the nutritional status of elderly cancer patients undergoing therapy and examine the relationship between nutritional risk and aspects of quality of life. Results are expected to provide information that can be valuable in supporting patients undergoing cancer research treatment.

RESEARCH DESIGN

The study was a retrospective, descriptive, cross-sectional, correlational survey done at a single point in time. It was a secondary analysis that was part of a larger RO1 investigation.

Sample and Setting

The sample consisted of solid tumor cancer patients receiving disease-directed therapies in phase I clinical trials. Patients were enrolled in an NCI-funded R01 that evaluated the efficacy of a palliative care intervention.

The inclusion criteria were:

- Patients diagnosed with solid tumors who were eligible for participation in phase I clinical trials
- Age 65 years or over
- Able to read or understand English
- Able to understand the study protocol and provide written informed consent.

Participants were enrolled in the ambulatory clinic of an NCI-designated comprehensive cancer center in Southern California. Patients were identified by their oncologist. After eligibility screening, the investigator contacted eligible patients and explained the study purpose, answered any questions, and obtained written informed consent. Accrual began in March 2017 and continued through February 2019.

Research Instruments

Patients completed a demographic data form, the Functional Assessment of Cancer Therapy—General (FACT-G) QOL instrument (Cella, et al., 1993) and the Mini Nutritional Assessment—Short Form (MNA-SF) used extensively in ambulatory settings (Delacorte et al., 2004; Kaiser et al., 2009; Kondrup, Rasmussen, Hamberg, & Stanga, 2003; Salvà, Corman, Andrieu, Salas, & Vellas, 2004).

ANALYSIS OF THE DATA

Patient characteristics in this study were summarized using mean, standard deviation, median, and range for continuous data such as age, BMI, and number of comorbidities. Categorical data were summarized using frequencies and percentages. The FACT-G questionnaire was analyzed by individual questions within the questionnaire and summarized by subscale and overall score. The MNA-SF questionnaire contained six questions, analyzed with the overall score. In addition, MNA-SF scores were examined in more detail with respect to several key patient characteristics, including age, BMI, gender, and treatments received.

The Pearson correlation coefficient was calculated to observe the strength and significance of the association between demographic variables as well as QOL metrics and the overall MNA-SF score. Univariate and multivariate linear regression was then conducted to see how well the overall MNA-SF score could be predicted using age, BMI, gender, treatment (surgery, chemotherapy and radiation), the FACT-G overall score, and FACT-G subscales. Predictors included in the univariate analysis were entered into the multivariate model using the stepwise method. Variables were entered into the multivariate model if their corresponding p value fell below the threshold of 0.15 and were retained in the model if the p value remained below 0.10 once combined with the remaining variables sustained in the previous step or iteration (Tabachnick & Fidell, 2018). Since the data used in this analysis involved baseline data only, occurrence of missing values in the data was infrequent. Thus, no imputations or interpolation was needed or done.

Demographic Data

The demographics of the sample (n = 73) are presented in Table 1. The average age of the participants was 71.4, and 53.4% were female. Over 76% were Caucasian, and 23% were minorities. The educational level yielded 79.5% college-educated subjects, and 34.2% were from Protestant religions. Sixty-nine percent (69.9%) were either married or partnered, with 69% living with a spouse or child.

Disease and Treatment Characteristics

Disease and treatment characteristics are described in Table 2. The sample included ovarian followed by colon as the most predominant cancers. The majority of patients were diagnosed 8 or more years ago, which is representative of patients who are now being placed on a phase I clinical trial. Most patients had previous surgery, chemotherapy, or radiation therapy.

Only 21.9% had tried alternative therapies. The average number of comorbidities was 2.2. Over 35% of the participants had an advance care directive and 39.7% had named a proxy decision maker. The patients were equally divided between having a do not resuscitate order and having a full

Table 1. Patient Demographics

Patient characteristics	n (%), mean (SD), or median (min, max)
Age, years	71.4 (5.1); 70 (65, 90)
Gender	
Female	39 (53.4%)
Male	34 (46.6%)
Race	
African American	2 (2.7%)
Asian	6 (8.2%)
Caucasian	56 (76.7%)
Hispanic/Latino	6 (8.2%)
Native American plus other race	1 (1.4%)
Native Haw/Pacific Islander	2 (2.7%)
Education	
Did not complete high school	1 (1.4%)
High school	7 (9.6%)
College	58 (79.5%)
Graduate/professional school	6 (8.2%)
Not reported	1 (1.4%)
Religion	
None	12 (16.4%)
Catholic	20 (27.4%)
Jewish	11 (15.1%)
Protestant	25 (34.2%)
Other	5 (6.8%)

Table 1. Patient Demographics (cont.)

Patient characteristics	n (%), mean (SD), or median (min, max)
Marital status	
Never married	3 (4.1%)
Married or partnered	51 (69.9%)
Divorced	10 (13.7%)
Widowed	9 (12.3%)
Other members	
Alone	14 (19.7%)
Children/parents/ relatives	5 (6.8%)
Friend	3 (4.2%)
Spouse/children	49 (69.0%)
Other	2 (0.3%)
Employment status	
Employed full-time	7 (9.6%)
Employed part-time	8 (11.0%)
Homemaker	2 (2.7%)
Retired	53 (72.6%)
Unemployed	3 (4.1%)
Family income	
$20,001 to $30,000	1 (1.4%)
$40,001 to $50,000	15 (20.5%)
Greater than $50,000	45 (61.6%)
Not reported	12 (16.4%)

code status. Only 11% had been referred to the pain and palliative care service, and only 56.2% had been referred to social work.

Demographic and Disease/Treatment Variables

Hypothesis 1 was that nutritional risk is associated with demographic and disease/treatment variables of age, gender, and time since diagnosis and treatments. To test this hypothesis, the Pearson correlation coefficient was calculated to show association between MNA-SF score and various demographic and clinical factors. Along with baseline patient demographics, these variables are described in Table 3. The disease and treatment variables and correlations are presented in Table 4. There was a very slight negative association between MNA-SF and age ($r = -0.12$; $p = .3$), indicating that older patients tend to have slightly lower MNA-SF scores. There was a very small association between MNA-SF score and gender, prior/current surgical treatment, prior/current chemotherapy, or radiation ($r < .1$). The largest association was seen with BMI, with $r = 0.47$ ($p < .0001$).

QOL Variables

Hypothesis 2 was that nutritional risk is associated with QOL, including physical, emotional, social, and functional well-being and overall QOL. FACT QOL data used in the regression analysis is presented in Table 5, with a summary by subscale. The actual items and subscales are

presented in order to describe the specific factors associated with QOL. The three predictors were BMI, previous chemotherapy, and the FACT-G physical subscale.

Variables were selected to be included in the regression analysis based on a review of the literature and recognition of the variables that are most commonly known to be associated with nutritional risk. Additionally, because this study was a secondary analysis of an existing database, the study was limited to the data available.

Responses to the six questions from the MNA-SF questionnaire, as well as the overall MNA-SF summary score, are reported in Table 6. The scores presented show a moderate problem with food intake over the past 3 months, a small decrease in weight in the past 3 months, and notable stress or severe illness. It was interesting to see that the mean overall MNA-SF score was 9.7 (8–11 being at risk). This reinforces the need to closely monitor these patients. The MNA-SF allows the advanced practitioner to assess nutrition more comprehensively than merely documenting weight. It is the most validated tool for the elderly, yielding accurate and important information. It also requires minimal training of health-care personnel and may be filled out in fewer than 5 minutes (Delacorte et al., 2004).

Table 2. Disease and Treatment Characteristics

Disease/treatment characteristics	n (%), mean (SD), or median (min, max)
Type of cancer	
Ovarian	11 (15.1%)
Colon	9 (12.3%)
Lung	8 (11.0%)
Prostate	8 (11.0%)
Bladder	4 (5.5%)
Breast	4 (5.5%)
Pancreatic	4 (5.5%)
Rectal	3 (4.1%)
Other	22 (30.1%)
Year of cancer diagnosis	
2010 or earlier	14 (19.2%)
2011–2015	35 (37.9%)
2016	10 (13.7%)
2017	13 (17.8%)
2018	1 (1.4%)
Current/previous surgical procedure	59 (80.8%)
Current/previous chemotherapy	59 (80.8%)
Current and previous radiation therapy	32 (43.8%)
Tried alternative therapies	16 (21.9%)
Number of comorbidities	2.2 (1.3); 2 (0, 5)
Advance care directive	
Yes	26 (35.6%)
No	47 (64.4%)
Proxy decision maker	
Yes	29 (39.7%)
No	44 (60.3%)
Code status	
DNR	30 (41.1%)
Full code	30 (41.1%)
Not reported	13 (17.8%)
Referred to pain/palliative	8 (11.0%)
Referred to social work	41 (56.2%)

Regression Analysis

To address Hypothesis 2, stepwise multiple regression was used to find significant predictors of total MNA-SF score (Table 7). Additional MNA-SF score distributions were examined with respect to age, gender, BMI, race/ethnicity, and time since cancer diagnosis.

In the univariate model, only BMI was found to be a significant predictor. We found that a 4-point increase in BMI was associated with a 1-point increase in MNA-SF score. The stepwise selection method was used to find a multivariate model from the list of predictors tested in the univariate analysis, using 0.15 level for entry into the model and 0.10 significance level to remain in the model. The resulting model contained three final predictors: BMI, previous chemotherapy, and FACT-G physical subscale score.

Physical subscale totals were positively associated with higher MNA-SF scores, with an 8-point increase in the subscale score corresponding to a 1-point increase in MNA-SF scores. Receiving chemotherapy tended to increase MNA-SF scores by 9%, but was only approaching significance (p =

Table 3. MNA-SF Score Statistics by Demographic Variable Stratification

		MNA total score	
Demographic variable	**n**	**Mean (SD)**	**Median (min, max)**
Age group (y)			
65–69	31	10.5 (1.9)	12 (5, 12)
70–74	22	8.8 (2.6)	8 (5, 14)
75–79	15	9.5 (2.0)	10 (6, 13)
80+	5	9.8 (3.1)	11 (6, 13)
Gender			
Female	39	9.6 (2.4)	10 (5, 14)
Male	34	9.9 (2.2)	10.5 (6, 13)
BMI			
< 18.5 (underweight)	5	5.8 (1.3)	5 (5, 8)
18.5–24.9 (normal)	41	9.5 (2.1)	9 (5, 13)
25.0–29.9 (overweight)	20	10.8 (1.7)	12 (7, 12)
30.0–34.9 (obese)	4	10 (3.6)	9.5 (7, 14)
≥ 35 (morbidly obese)	3	12 (0)	12 (12, 12)
Years since diagnosis			
2010 or earlier	14	10.3 (2.4)	12 (5, 12)
2011–2015	35	9.6 (2.3)	10 (5, 13)
2016	10	9.8 (2.7)	9 (7, 14)
2017	13	9.5 (2.3)	10 (6, 12)
2018	1	7 (–)	7 (7, 7)

.09). Overall, the coefficient of determination for the model was rather low (R^2 = .26), which means our multivariate model explains 26% of the variability of the response variable (MNA-SF scores) using the predictors available. Thus, we believe that there may be predictors that were omitted that may help better explain the changes of MNA-SF scoring.

DISCUSSION

Based on previous literature and this study, the MNA-SF tool is a reliable and valid measure for nutritional risk in older cancer patients (Berry et al., 2019). This sample's demographics had a mean age of 71. There is a need for the advanced practitioner to pay even more attention to older adults as the US population ages. As most of the sample was married or partnered, this would be an important factor to consider in future research or clinical practice, as other patients may be living alone and have less nutritional support (Bales, 2001).

The study findings related to Hypothesis 1 (nutritional risk is associated with demographic and disease/treatment variables of age, gender, and time since diagnosis and treatments) were of interest. Very few of the patients were newly diagnosed. Almost half were diagnosed in 2015 or earlier; thus, most had a cancer diagnosis for 4 or more years. People are now living longer with their illness, having undergone multiple previous treatments. The effects of treatment may be cumulative, and advanced practitioners should consider the entire treatment trajectory and treatment history to assess nutritional risk (Berry et al., 2019).

It is also interesting to note that these people with cancer had 2.2 other comorbid conditions. This is very important to acknowledge, as they may be experiencing symptoms from other comorbidities, which in turn are likely to affect their nutrition (Brugel et al., 2014). It is disturbing to find that only 35% of this group had an advance directive, and only 39% had identified a proxy

Table 4. Pearson Correlation Coefficient Between MNA-SF Score and Demographic/Clinical Variables

	MNA-SF total score	
Demographic and clinical factors	***r***	***p* value**
BMI	.47	< .0001
Age	−.12	.30
Male (1 = male; 0 = female)	.063	.60
Physical subscale score	.17	.16
Social subscale score	−.01	.93
Emotional subscale score	.05	.70
Functional subscale score	.10	.39
FACT-G index total score	.12	.30
Surgery (1 = surg; 0 = no surg)	−.07	.54
Chemotherapy (1 = chemo; 0 = no chemo)	−.0025	.98
Radiation (1 = XRT; 0 = no XRT)	.092	.44
Number of total therapies[a]	.024	.84

Note. All variables continuous unless otherwise noted as dichotomous.
[a]Total therapies counts the number of therapy modalities (previous surgery, previous chemotherapy, previous radiation, collected at baseline) that the patient listed, and ranges from 0 to 3.

Table 5. Quality-of-Life Metrics

Quality-of-life items, subscales, and total	Mean (SD) or median (min, max)
Physical well-being subscale	23.1 (4.4), 24 (3, 28)
Lack energy	2.4 (1.1)
Have nausea	3.6 (0.7)
Trouble meeting family needs	3.3 (0.9)
Have pain	3.1 (0.9)
Bothered by side effects	3.6 (0.8)
Feel ill physically	3.7 (0.7)
Forced in bed	3.4 (0.9)
Social well-being subscale	25.5 (3.5), 26 (6, 28)
Close to friends	3.7 (0.8)
Emotional support from family	3.9 (0.7)
Support from friends	3.8 (0.7)
Family accepted illness	3.8 (0.7)
Satisfied with communication about illness	3.9 (0.3)
Feel close to partner	3.5 (1.3)
Satisfied with sex life	2.8 (1.5)
Emotional well-being subscale	17.4 (4.4), 18 (7, 24)
Feel sad	3.4 (0.9)
Coping with illness	3.7 (0.7)
Losing hope with fighting illness	2.5 (0.9)
Feel nervous	3.0 (1.0)
Worry about dying	2.8 (1.3)
Worry condition will get worse	2.0 (1.2)
Functional well-being subscale	21.6 (4.3), 22 (6, 28)
Able to work	3.0 (0.9)
Work is fulfilling	3.1 (0.9)
Able to enjoy life	2.9 (1.1)
Accepted illness	3.8 (0.5)
Sleeping well	3.0 (1.0)
Enjoying things for fun	3.1 (1.1)
Content with quality of life	2.6 (1.0)
Overall FACT-G index	87.5 (11.0), 89 (57, 108)

Note. QOL scale: 0 = not at all to 5 = very much.

decision maker. An important issue is that nutritional problems associated with advanced disease lead to decision-making regarding instituting tube feedings or nutritional supplementation (Delacorte et al., 2004). If these people have no advance directive or proxy designated, they may receive more aggressive treatments for nutrition than is clinically beneficial.

As to nutritional risk assessed through the MNA-SF and correlated with demographics, the only variable that showed a significant correlation was BMI, which is basically a computation of height and weight (Table 3). It is very important for advanced practitioners to closely monitor a patient's weight, because it is a significant predictor of a patient's nutritional status, particularly for older patients who may experience other chronic illnesses (Berry et al., 2019).

Table 5 reveals interesting information on the four domains of QOL. Physically, the scale showed low energy being by far the biggest physical factor. This could easily be related to nutrition or weight loss and should be a symptom that is monitored closely (Freyer et al., 2005). Socially, good scores were reported overall except in sexuality, which

Table 6. MNA-SF Scores (0–14) and BMI Data

MNA-SF items	Screening scale score/values	n (%)
Food intake declined over last 3 months	0 = severe 1 = moderate 2 = no decrease	6 (8.2%) 34 (46.6%) 33 (45.2%)
Weight loss in last 3 months	0 ≥ 7 lbs 1 = do not know amount of weight lost 2 = between 2 to 7 lb 3 = no weight loss	21 (28.8%) 1 (1.4%) 18 (24.7%) 33 (45.2%)
Current mobility	0 = unable to get out of bed 1 = able to get out of bed with assistance 2 = able to leave home	0 (0%) 0 (0%) 73 (100%)
Stress or severe illness past 3 months	0 = yes 2 = no	67 (91.8%) 6 (8.2%)
Dementia or severe sadness	0 = severe dementia or sadness 1 = mild dementia and no severe sadness 2 = neither dementia nor sadness	0 (0%) 0 (0%) 73 (100%)
BMI group	0 = BMI ≤ 19 1 = BMI 19 to < 21 2 = BMI 21 to < 23 3 = BMI ≥ 23	5 (6.8%) 11 (15.1%) 13 (17.8%) 44 (60.3%)
Overall MNA-SF score[a]	0–7 8–11 12–14	15 (20.6%) 23 (45.2%) 25 (34.2%)

Note. [a]Total of all items. 12–14 = normal nutrition, 8–11 = at risk, 0–7 = malnourished.

could also be a QOL issue and related to nutrition due to lack of energy, weight loss, or body image. Emotionally, worry over their condition or worry about dying were factors of greatest concern. This is also important to overall QOL and could be related to nutritional status (Freyer et al., 2005). Functional well-being revealed that the lowest item was their ability to enjoy life and satisfaction with overall QOL. These findings reveal how low QOL scores on the FACT-G could be related to nutritional risk. Nutrition is very closely associated with QOL and should be a priority in the care of the patient (Freyer et al., 2005).

CLINICAL IMPLICATIONS

A key clinical implication was that age is a significant factor, indicating that the older adult cancer patient should be closely monitored regarding his/her nutritional assessment. Another recommendation would be to ensure that patients and caregivers are educated by advanced practitioners regarding nutrition and referred to nutritional services and assessment by a registered dietician (Berry et al., 2019). In addition, advanced practitioners in the clinical setting should be educated about the nutritional needs and assessment of older patients. The MNA-SF should be included as a standard of care for this population, as the nutritional aspect of care for older patients is very important (Kaiser et al., 2009). Weight should be monitored throughout the cancer trajectory. Other physical, social, emotional, and functional symptoms that could impact nutrition (for example, fatigue, living alone, access to food, mobility, low income, and depression) should also be assessed. Many cancer patients are monitored and treated on an outpatient basis, making it all the more important for advanced practitioners to monitor them closely, identifying those at risk (Krishnasamy, Yoong, Chan, Choong, & Chinna, K., 2019). Research has also shown that systematic screening followed by nutrition referral for appropriate interventions is rare (Berry et al., 2019). It has been found that only 50% of patients receive professional dietary counseling (Hartmuller & Desmond, 2014). Regarding oncology nurses, 43% believed they were ill-equipped with sufficient knowledge to provide nutrition advice (Hartmuller & Desmond, 2014).

Table 7. Regression Analysis Results

	Univariate analysis		Multivariate analysis	
Predictor	**Parameter estimate (stderr)**	***p* value**	**Parameter estimate (stderr)**	***p* value**
Age (continuous)	−0.057 (0.054)	.30		
BMI (continuous)	0.24 (0.054)	< .0001	0.28 (0.055)	< .0001
Male (vs. female)	0.29 (0.55)	.60		
Surgery (vs. no surgery)	−0.43 (0.70)	.54		
Chemo (vs. no chemo)	0.15 (0.70)	.98	1.09 (0.63)	.09
Radiation (vs. no XRT)	0.43 (0.55)	.44		
Number of therapies (cont)	0.071 (0.36)	.84		
Physical score	0.090 (0.063)	.16	0.12 (0.055)	.03
Social score	−0.0068 (0.078)	.93		
Emotional score	0.024 (0.063)	.70		
Functional score	0.055 (0.064)	.39		
FACT-G index total score	0.026 (0.025)	.30		

This reflects the need for education on this very important subject to provide the best nutritional care to oncology patients.

The findings indicate that more research is needed in this area, with larger sample sizes and more diverse populations. Clinical implications reveal the need to educate both health-care professionals along with patients and caregivers to ensure that nutritional risk is assessed as a part of geriatric oncology care.

LIMITATIONS

This study included a small sample size (n = 73), and patients were assessed at one timepoint, and not followed throughout the phase I clinical trial trajectory. The participants were also accrued at a specialized national cancer center, thus were closely monitored. Lastly, the regression analysis accounted for 26% of variance, and there may be other issues affecting a patient's nutritional status.

RECOMMENDATIONS FOR FUTURE RESEARCH

A recommendation is to repeat the work within a larger and more diverse sample. As this study was conducted with one assessment at baseline, a more longitudinal study may be in order to obtain better information. Future studies should include patients from other settings such as community medical centers and health-care systems. Samples might include the oldest-old and follow-up for nutritional risk over a longer period of time. Future research should look at other variables impacting nutrition.

CONCLUSION

Nutrition strongly impacts patients' QOL. Nutritional assessment and risk should be routinely assessed, and this subject should be a core part of advanced practitioner education. Nutrition impacts all dimensions of QOL and will be even more important in an aging population. The advanced practitioner can contribute greatly to advancing this area of practice.

Disclosure

The author has no conflict of interest to disclose.

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