

Social Engagement and Subjective Well-Being in Older Adults Newly Diagnosed with Cancer

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Abstract

Cancer and its treatment can precipitate a range of physical and psychological health issues, particularly in old age. Older adult cancer patients have reported experiencing heightened levels of anxiety, depression, and isolation. The current study aims to understand the role of social engagement in influencing older adult cancer patients' subjective well-being through a Stress and Coping Framework lens. Using National Health and Aging Trends Study data, this research examines frequency of social engagement and its relationship with subjective well-being. Results indicate that greater social engagement improves subjective well-being in older adult cancer patients. Respondents who are unmarried and experiencing greater anxiety and depressive symptoms are at risk of having poor subjective well-being. Efforts to improve subjective well-being in older adults with cancer should consider promoting social engagement. Special attention should be paid to older adult cancer patients who are unmarried or experiencing elevated anxiety or depressive symptoms. Greater research should examine the mechanisms by which social engagement might impact subjective well-being and how this might vary among different racial/ethnic groups.

Keywords: Subjective well-being; social engagement; older adults; cancer survivorship.

1. Introduction

1.1. Background

An estimated 16.9 million people in the United States (U.S.) today are living with cancer, of whom 62% are 65 years or older [1, 2]. An additional 1.9 million new cancer cases are expected to be diagnosed in 2021 alone, with 63-68% of these cases expected to survive five years or more beyond diagnosis [1]. Alongside this greater survival from cancer, there is a parallel growth in the older adult population. The number of older adults in the U.S. is expected to double from 40.3 million in 2010 to 83.7 million in 2050 [3]. Combined, these two trends signal a tremendous boom in the older adult cancer survivor population [4].

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There is mounting evidence that older adult cancer patients' subjective well-being is an area in need of critical attention. Cancer and its treatment can precipitate a range of physical and psychological health issues. Chronic pain, fatigue, and decrements in physical functioning are common problems endured by cancer patients [5]. Furthermore, many cancer survivors experience immense psychological distress during cancer and develop anxiety and depression even after their cancer is in remission [6, 7, 8]. For the cancer survivor who is in old age, these threats to health are further amplified by declines in age-related physical functioning. Due to normal biological processes, older adults experience drops in physical functioning, such as decreased metabolic activity and reduced sensory and motor abilities [9].

The impact of age-related losses on older adult cancer survivors' functioning can be seen through the numerous reports of older adults having increased multi-morbidity and greater difficulties performing their usual activities following cancer diagnoses and treatment [10, 11, 12, 13]. Research has also shown that for older adults with limited social support – such as those in late late life who have lost their spouses and peers – cancer creates a tremendous burden and contributes to heightened feelings of isolation and depression [14]. Suicide and suicidal ideation following a cancer diagnosis are serious problems in the elderly cancer patient population [15, 16]. Thus, it is critical to focus on the subjective well-being of adult cancer survivors.

Subjective well-being is comprised of cognitive and affective assessments of one's current state, particularly in comparison to their needs and expectations [17, 18]. Higher evaluations of subjective well-being are often reflective of better coping and adjustment, greater satisfaction with social connections, and a stronger sense of life fulfillment [19]. In older adults and cancer patients, higher subjective well-being has been significantly associated with greater survival, increased longevity, and fewer functional limitations [20, 21]. Thus, improving cancer patients' subjective well-being is one of the most important goals of cancer care [22-24].

Predictors and outcomes of subjective well-being vary across sociodemographic groups. Adults in different age groups (thus different developmental life stages) find different aspects of life more influential in assessing subjective well-being [25]. For instance, while older adults in Ryff and his colleagues study [26] reported accepting change to be an important contributor to increased well-being, middle-aged adults focused more on self-confidence as an indicator of positive well-being. Studies have also shown that subjective well-being varies across gender, cultural, and income groups [25, 27]. For example, researchers found that for Americans, the strongest predictor of well-being was independence or personal control; however, for Japanese, interdependence or relational harmony was the greatest predictor of well-being [28]. Differences were also found in regards to geographical locale. Residents in Boston reported that adhering to established social norms heavily influenced their subjective well-being, while individuals living in San Francisco did not find social norms to be an important predictor of well-being [29]. These differences in subjective well-being across groups point to the importance of understanding how various factors can influence subjective well-being.

An important factor that has emerged in the literature for understanding and improving subjective well-being is social engagement. Social engagement refers to the degree to which an individual participates in community or society, and can be operationalized by frequency or level of participation in specific social activities [30]. The productive aging literature documents the significant benefits of social engagement on health outcomes in late

life [31-36]. For instance, Kim & Ferraro [31] has found that greater social engagement contributed to lower bodily inflammation and better physical health outcomes in older adults. Baker and his colleagues [37] has also reported social engagement is associated with higher life satisfaction and greater social integration in later life. Moreover, Zhang & Zhang [38] found that social engagement positively affected subjective well-being, even after controlling for older adults' physical health and socio-economic statuses.

While the benefits of social engagement are widely supported in the productive aging literature, the role of social engagement in influencing health outcomes in the face of cancer is heavily understudied. Addressing this gap in the literature is critical for developing effective strategies to combat decrements in quality of life for older adult cancer patients. The current work aims to address this knowledge gap by examining the relationship between social engagement and subjective well-being among older adults recently diagnosed (≤ 1 year) with their first cancer. To test how group differences might affect subjective well-being, this study also examined how social engagement and subjective well-being vary by gender. Specifically, this work proposes the following research questions: (1) What is the main effect of social engagement and gender in predicting HRQOL in older adults who are newly diagnosed with cancer? (2) Are there any interaction effects that gender might have with other demographic variables in the relationship between social engagement and HRQOL in older cancer patients?

1.2 Conceptual Framework

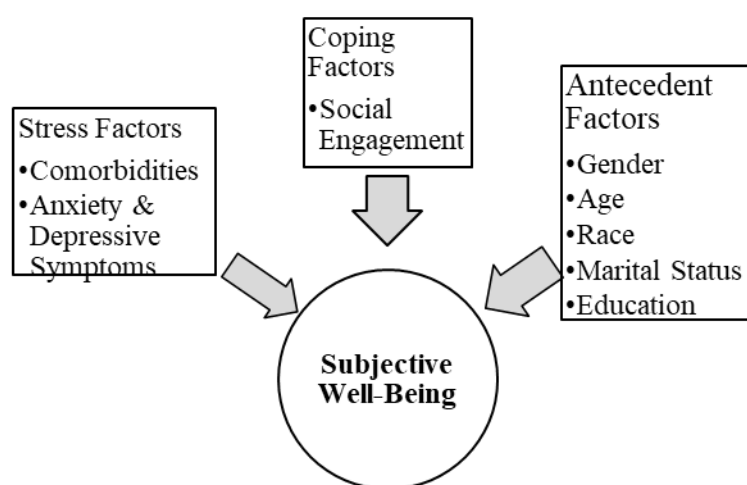


Figure 1: Stress and Coping Framework to Understand Relationship between Social Engagement and Subjective Well-Being.

The conceptual framework for this study is the Stress and Coping model [39]. This model uses a transactional framework to explain variations in health outcomes, and theorizes that the interplay between stress factors and coping strategies have a bi-directional influence on individuals' physical, psychological, and social health. "Stress" is defined as a relationship that is "appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" [39]. Coping is defined as a process of thoughts and/or behaviors undertaken to manage a demanding situation [39]. This theory also proposes that antecedent factors, such as

characteristics of the individual, have an important influence on the relationship between stress and coping factors and health and well-being outcomes. As shown in Figure 1, stress factors in the present study are identified as comorbidities and symptoms of anxiety and depression. The coping factor is conceptualized as social engagement. Antecedent factors are represented through gender, age, race, marital status, and education level.

2. Materials and Methods

2.1. Sample and Procedure

This study is a secondary data analysis of the National Health and Aging Trends Study (NHATS). Started in 2011, NHATS is a population-based, longitudinal study of Medicare beneficiaries age 65 and older [40]. All participants are followed throughout the lifetime of the survey, which is still ongoing. Information about activities of daily living, living arrangements, economic status and well-being, aspects of early life, and quality of life is collected annually. The current study's sample includes participants from the second NHATS wave, which was collected in 2012. Only NHATS participants who reported a new cancer diagnosis since their last NHATS interview (within one year) were included in this study. Respondents were excluded if they had any prior cancer diagnosis, resulting in an analytic sample size of $n=355$.

2.2. Measures

Subjective Well-Being. The outcome variable in this study, subjective well-being was measured using methods adopted from Kim and his colleagues [41]. A single well-being score was developed by summing scores from eleven well-being questions that utilized a Likert-type scale ranging from one to five. Prior to analyzing the data, negative questions were reverse-coded so that higher scores indicated more positive affect. The appropriateness of using a single well-being score for analyzing NHATS data is supported by Kim and his colleagues [41], who conducted a confirmatory factor analysis and tested the construct validity of the single-factor construct.

Independent Variables. Following the Stress and Coping framework, independent variables were classified as antecedent, stress, or coping factors. Antecedent factors included survivor's gender, age, race, marital status, and education. Gender was dichotomized as male (0) or female (1). Age was measured using participant's age group, as follows: "young old" (ages 65-74 = 0), "middle old" (ages 75-84 =1), and "old old" (ages 85 and up =2). Race was categorized as either Non-Hispanic White (0) or racial/ethnic minority (1). Education level was operationalized as a continuous variable. Prior to analyzing this variable as continuous, tests of deviations from linearity were conducted, which demonstrated that the education level variable did not deviate significantly from linearity, as assessed by Type III Analyses [42].

Stress factors were conceptualized as co-morbidities and anxiety/depressive symptoms. The co-morbidities variable was measured by summing the number of following health conditions participants reported they had experienced (No=0, Yes=1): heart attack, heart disease, high blood pressure, arthritis, osteoporosis, diabetes, lung disease, stroke, dementia/Alzheimer's. The anxiety/depressive symptoms variable was assessed using the

PHQ-4 measurement [43].

To examine coping factors, this study utilized social engagement. Social engagement was operationalized as the sum of No (0) or Yes (1) responses to having participated in the following activities within the last month: (1) Visiting family and friends; (2) Attending religious services; (3) Participating in clubs, classes, or other organized activities besides religious services; (4) Going out for enjoyment, such as to dinner, a movie, to gamble, or hear music or see a play; and (5) Volunteering.

2.3. Data Analysis

All data were analyzed using SAS 9.4. Univariate analyses were conducted for all variables. To assess the magnitude and direction of the relationship between variables, zero-order correlation coefficients (r) were calculated and inter-correlations among the variables were examined. Bivariate analyses were conducted to examine differences in antecedent, stress, and coping factors between males and females; chi-square tests were used for categorical variables, and t-tests were performed for continuous variables.

Hierarchical linear regressions were conducted to examine the role of the independent variables in predicting subjective well-being in the sample. In the additive model, antecedent factors (gender, age, race/ethnicity, marital status, and education level) were entered first, followed by stress factors (number of comorbidities and anxiety/depressive symptoms). Finally, the coping factor (social engagement) was entered into the model. Only observations with no missing data were included in the analyses.

To test potential interactions with gender, all explanatory factors were combined with gender to produce interactive terms. Interactive terms exist when the effect of an independent variable on the outcome variable depends on the particular value of another independent variable [44]. Should a significant interaction ($p < .05$) exist, a main and interactive effects model would be created, and significant interaction terms would be retained in the final model. Furthermore, parallel regression analyses would be conducted to better examine the relationship between gender, stress and coping factors, and subjective well-being.

3. Results

3.1. Descriptive Statistics

A total of 355 observations were used for in-data analysis. As shown in Table 1, slightly over half of the participants were male (52.4%). Out of the three age groups, a greater proportion of the respondents were in the “middle old” age group (45.9%). Most of the participants identified as Non-Hispanic White (81%), and over half were married (54.37%). In terms of stress factors, the average number of co-morbidities was 2.93, and the average PHQ-4 score was relatively low at 2.26. In regards to the coping factor, the average level of social engagement was 2.65.

3.2. Bivariate Analyses

Bivariate analyses (Table 1) indicated that only being married ($p<.0001$) and level of education ($p=.007$) differed significantly between males and females. Male survivors were significantly more likely to be married than female survivors (72.04% vs. 34.91%, $p<.0001$). In addition, male survivors also reported a significantly higher education level on average ($\bar{x}=5.623$, $SD=2.430$) than female survivors ($\bar{x}=4.952$, $SD=2.196$; $p=0.007$). No significant gender differences were seen in any of the stress and coping factors. Additionally, there were no significant differences in the t-test scores of subjective well-being between the two gender groups.

Table 1: Characteristics of the Study Sample.

	Male		Female		Total		
	n	%	n	%	n	%	
Demographic Factors							
Gender	186	52.39	169	47.61	355	100.00	
Age Group							
65-74	53	28.49	46	27.22	99	27.89	
75-84	85	45.7	78	46.15	163	45.92	
85 and older	48	25.81	45	26.63	93	26.2	
Racial/Ethnic							
Minority	33	17.93	34	20.12	67	18.98	
Married	134	72.04	59	34.91	193	54.37	****
	$\bar{x}$	SD	$\bar{x}$	SD	$\bar{x}$	SD	
Education	5.623	2.430	4.952	2.196	5.302	2.342	**
Stress Factors							
Comorbidities	2.774	1.790	3.094	1.681	2.926	1.749	
PHQ-4	2.069	2.584	2.479	2.577	2.264	2.585	
Coping Factors							
Social							
Engagement	2.688	1.281	2.603	1.249	2.647	1.265	
Subjective Well-Being	33.625	4.645	33.733	4.335	33.675	4.497	

* $p<.05$, ** $p<.01$, *** $p<.001$, **** $p<.0001$

3.3. Multiple Linear Regressions

The adjusted R^2 of each model indicated that entry of each set of variables increased the explanatory power of the model. Furthermore, the analyses showed that as stress and coping variables were entered into the model, the education level variable ceased to be significantly associated with subjective well-being. Additionally, while being male was significantly and negatively associated with subjective well-being in the second model, gender was no longer significantly related to subjective well-being when coping factors (social engagement scores) were entered into the model. All models were found to have good fit ($p<.05$).

The results of the final multiple linear regression, as shown in Table 2, indicated that marital status, anxiety and depressive symptoms, and social engagement significantly predicted subjective well-being. To be specific, being unmarried compared to married decreased well-being by 1.172 points on average, after controlling for all other variables ($p<.01$). In addition, every one point increase in PHQ-4 scores (anxiety/depressive symptoms) significantly predicted a 1.055 decrease in subjective well-being, after accounting for the effect of other

variables ($p < .0001$). The regression also showed that for every one increase in social engagement, there was a .529 increase in participant's subjective well-being score ($p < .01$). No significant effect was found for the relationship between gender and subjective well-being.

Table 2: Multiple Linear Regression of Subjective Well-Being in Older Adults with Cancer.

Variables	β	SE	t	
Young old (ref: Old old)	-0.160	0.533	-0.3	
Middle old (ref: Old old)	0.393	0.488	0.81	
Male	-0.765	0.411	-1.86	
Non-Hispanic White	-0.874	0.514	-1.7	
Not Married	-1.172	0.439	-2.67	**
Education Level	0.015	0.090	0.17	
Comorbidities	-0.120	0.118	-1.02	
PHQ-4	-1.055	0.081	-13.04	****
Social Engagement	0.529	0.167	3.17	**
Intercept	36.343	1.040	34.94	****
Adj. R^2	0.420			
F-test	27.28****			

* $p < .05$, $p < .01$, $p < .001$, $p < .0001$

Following the main effects model, all interactions with gender were tested. No explanatory factors were found to have an interactive effect with gender, suggesting that the influence of stress and coping factors on subjective well-being did not vary by gender in this sample. Thus, no parallel regressions were conducted for this study.

4. Discussion

This study documents positive associations between social engagement and subjective well-being in older adults who are newly diagnosed with cancer. This is a finding that is in line with the gerontology literature, which has widely reported the increased well-being of older adults who participate in social activities [30, 38, 45-47]. One explanation for this observed relationship is that social engagement promotes social ties [37, 48]. For instance, findings from Zhang & Zhang [38] indicate that participation in social organizations enhanced retirees' social identity and sense of belonging, which helped maintain participants' subjective well-being. This notion was also echoed in Gilmour [47], who found that the relationship between social engagement and well-being was mediated by social support. Thus, it is possible that for older adults coping with a cancer diagnosis, social engagement improves well-being by strengthening social connections, promoting social integration, and increasing life satisfaction.

Contrary to most of the literature on older adults [49-52], this study did not find a significant association between gender and subjective well-being, nor did it find any gender variations in the relationship between

social engagement and subjective well-being. A potential explanation for this is that the current study's sample is uniquely different from other older adults, being composed solely of older adults who are coping with a new cancer diagnosis. Another explanation is that social engagement is measured differently in different studies. For instance, Gilmour [47] measured social engagement by weekly and monthly frequency, while my study only asked participants about participation within the last month. In addition, the types of social engagement activities included in my study could have contributed to the different findings. For example, researchers have demonstrated that volunteering and participating in religious activities improved older adults' subjective well-being, regardless of gender [53, 54]. Thus, future research should examine how gender could moderate the relationship between specific types of social engagement activities and subjective well-being.

Similar to the literature [27, 55, 56], I found that marital status was a significant predictor of subjective well-being in my sample of older cancer patients. It has been well documented that spouses serve as a key source of social support, which is even more pronounced when one spouse is coping with a life-threatening illness, such as cancer [57, 58]. Of note, significantly more men (72%) than women (35%) in the present study reported being married, which is in line with reports from other studies with older adults [59]. How widows and other cancer patients living alone are coping with cancer should be a priority for future research.

My study also suggests that newly diagnosed, older cancer patients who experience anxiety and depressive symptoms are at risk of having poor quality of life. Indeed, the findings from my hierarchical linear regressions indicated that PHQ-4 scores explained a large part of the variation in this model. Thus, symptoms of anxiety and depression cannot be ignored when addressing the well-being of older cancer patients. Older cancer patients should be routinely screened for signs of psychological distress as a part of their survivorship care plan.

The present study is not without limitations. The cross-sectional nature of this study precludes any generalizations regarding causality; thus, it is not known whether social engagement affects subjective well-being or vice versa. Since this study only included older adults in Medicare, findings cannot be generalized to those who are not enrolled in Medicare, such as undocumented immigrants. Additionally, data for this study relied on self-report, which might not be accurate. Furthermore, cancer type, stage, and treatment were not known, which limits our ability to understand how the relationship between social engagement and subjective well-being might vary by cancer-related factors. Moreover, sample size and available race variables limited understanding of how race/ethnicity could play a role in shaping participants' well-being. Likewise, the interview was offered only in English, which prevented non-English speaking older adults from participating, and limits our understanding of how language might play a role in shaping well-being.

5. Conclusion

Despite these limitations, findings from this study contribute to the gerontology literature by demonstrating positive associations exist between social engagement and subjective well-being in older adults newly diagnosed with cancer. This lends support for including social engagement activities in interventions to improve older cancer patients' well-being, and underscores the importance of making psychological distress screening a routine part of cancer care. One critical barrier to social engagement that should be considered is patient's health

limitation. Older adults have identified health limitations as one of the key barriers to participating in social activities [46, 47, 48]. Mobile services and home health programs should be made available to older cancer survivors. One promising avenue in which social engagement could be promoted is through online social networking interventions [60]. Further research is needed to investigate the effectiveness of online resources. In addition, future research should include diverse samples to understand how culture and social engagement might interact to influence older cancer survivors' well-being. Quality of life and well-being studies from other countries have shed some light on the importance of culture. For instance, in a study of older Japanese adults, women who engaged in socializing activities reported significantly increased benefits in quality of life, but men did not [52]. Instead, men in the study were found to derive greater benefit from taking on leadership roles in established organizations [52]. Furthermore, researchers have found that predictors and outcomes of older adults' subjective well-being vary across the globe [61]. Thus, it is crucial to include cultural variables in efforts to improve subjective well-being in older adults with cancer.

Acknowledgements

The author is grateful to Dr. Ada Mui for her expertise and guidance through all aspects of this study. The author is also thankful to the American Cancer Society for generously supporting this work through a doctoral training grant.

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