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Age Differences in Cancer Treatment Decision Making and Social Support

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Abstract

Objective: The aim of this study was to examine the decision-making (DM) styles of younger (18-39 years), middle-aged (40-59 years), and older (≥ 60 years) cancer survivors, the type and role of social support, and patient satisfaction with cancer treatment DM.

Method: Adult cancer survivors ($N = 604$) were surveyed using Qualtrics online software.

Results: Older adults reported significantly lower influence of support on DM than younger adults. The most common DM style for the age groups was collaborative DM with their doctors. Younger age was a significant predictor of independent ($p < .05$), collaborative with family ($p < .001$), delegated to doctor ($p < .01$), delegated to family ($p < .001$), and demanding ($p < .001$) DM styles.

Discussion: Despite having lower received social support in cancer treatment DM, older adults were more satisfied with their DM than younger and middle-aged adults. Health care workers should be aware of different DM styles and influence of social networks to help facilitate optimal patient DM and satisfaction.

Keywords: decision making, older adults, age differences, social support

Introduction

The number of people diagnosed with cancer during their lifetime has been steadily increasing. Currently, one in three women and one in two men in the United States will develop cancer in their lifetime (American Cancer Society, 2015). Increases in the number of individuals diagnosed with cancer each year, due in large part to aging and growth of the population, as well as improving survival rates, have led to an ever-increasing number of older cancer survivors (Siegel, Ma, Zou, & Jemal, 2014; Smith, Smith, Hurria, Hortobagyi, & Buchholz, 2009). Despite this increase, older survivors are understudied relative to pediatric survivors. Furthermore, in comparison with their younger counterparts, older adults with cancer experience several inadequacies in their cancer treatment and care, such as receiving less aggressive treatments (Bastiaannet et al., 2010; Schonberg et al., 2014; Schonberg et al., 2010).

Despite known differences in treatment, few studies have examined how older, middle-aged, and younger adults with cancer choose their treatment (Elkin, Kim, Casper, Kissane, & Schrag, 2007; Lifford et al., 2015; Pinqart & Duberstein, 2004), and how the decision-making (DM) process differs by age (Puts et al., 2015; Shelton et al., 2013). Often, patient DM is not the result of purely rational evaluation of all relevant information but is influenced by situational, interpersonal, and individual determinants in addition to prognosis (Petrisek, Laliberte, Allen, & Mor, 1997; Puts et al., 2015; Shelton et al., 2013). In geriatric oncology, balancing risks and benefits is generally difficult due to the lack of data on survival and quality of life (Repetto, Comandini, & Mammoliti, 2001; Tariman, Berry, Cochrane, Doorenbos, & Schepp, 2012). In addition, older adults with cancer may present age-related issues such as multiple comorbidities, cognitive issues, and polypharmacy, which can further complicate treatment DM (Puts, Papoutsis, Springall, & Tourangeau, 2012).

Cancer patients frequently consult with spouses, adult children, and extended family members when making medical treatment decisions (Chouliara, Kearney, Stott, Molassiotis, & Miller, 2004; Schumacher et al., 2008). Due to the multidimensional nature of treatment DM among older adults with cancer, the influence of social network members (family, friends, significant others, and physicians) and types of supportive behaviors (emotional, instrumental, informational, and appraisal) must be considered. Furthermore, the size and support provided by social networks may differ by age according to the socioemotional selectivity theory, which posits that as individuals age, they reduce their social networks to invest in emotionally meaningful goals and activities (Carstensen, Isaacowitz, & Charles, 1999).

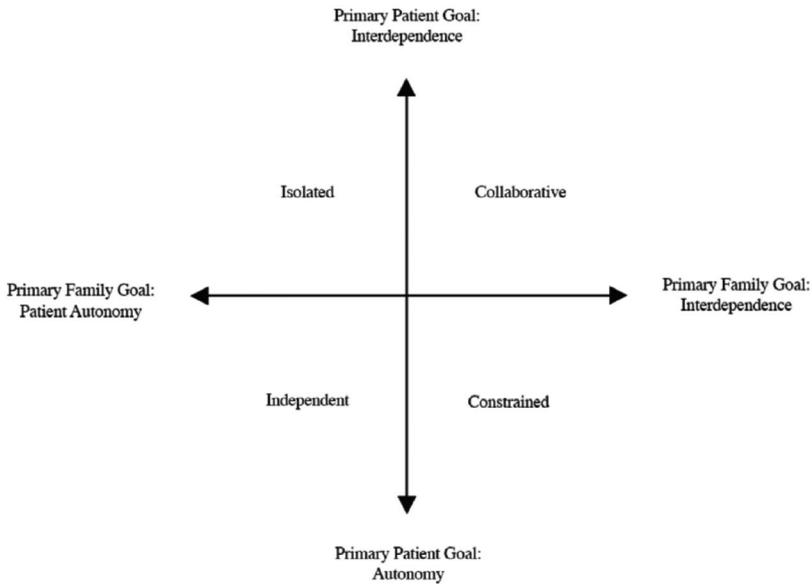


Figure 1. Typology of family decision-making styles.

Several theoretical frameworks have attempted to explain the role of social support on treatment DM. The most applicable was developed by Degner and Beaton (1987) who identified four patterns of DM, which include doctor-controlled (i.e., passive), patient-controlled (i.e., active), jointly controlled (i.e., shared), and family-controlled. However, this model does not take into account the extent to which patients desire decisional support and the extent to which they perceive receiving decisional support. A recent typology, the Family DECIDE (*Determinants of Clinical Decision-Making*) Typology developed by Krieger (2014), focuses on cancer treatment DM and the interactions between patients and family members in five distinct styles. This configuration (Figure 1), moving clockwise from bottom left, includes independent (no desired and received DM support), isolated (desired DM support, no received DM support), collaborative (desired and received DM support), delegated (strong desire for DM support, received DM support), and demanding (no desired DM support, received DM support) family DM styles. Results from this typology stress the importance of understanding the patient preference for autonomy or interdependence in his or her DM and the received DM support from his or her family (Krieger, Krok-Schoen, et al., 2015; Krieger, Palmer-Wackerly, et al., 2015).

Numerous studies have explored age differences in the cancer treatment DM process; however, the results are inconsistent (Presutti et al., 2014). For example, the few studies that have examined older adult DM preferences found older adults

have a preference for a passive role in treatment DM compared with younger adults (Cassileth, Zupkis, Sutton-Smith, & March, 1980; Davison & Breckon, 2012; Levinson, Kao, Kuby, & Thisted, 2005; Xie, Wang, Feldman, & Zhou, 2014). Conversely, other studies have found no age differences in cancer treatment DM preferences (Brown et al., 2012; Bruera, Willey, Palmer, & Rosales, 2002; Ramfelt, Langius, & Bjoervell, 2000) while others have found the large majority of older adult patients preferred some or full control in treatment DM (Tariman, Doorenbos, Schepp, Singhal, & Berry, 2014). Thus, it is unclear regarding what role older cancer survivors play in their treatment DM, how much influence their social network has on their treatment decisions, and how their treatment DM compare with younger and middle-aged cancer survivors. This study aims to (a) describe the DM styles of younger, middle-aged, and older cancer survivors; and (b) explore the role of social support on their cancer treatment DM.

Method

We developed a cross-sectional survey about cancer treatment DM, clinical trial enrollment, and information seeking behaviors among cancer survivors. Anonymous surveys were administered in April 2014 using Qualtrics survey software (Qualtrics Laboratories, Inc., Provo, UT, USA). Eligible participants were recruited from the Qualtrics web panel via an email invitation with an embedded, secure individualized link to the survey instrument.

To be eligible for this study, potential participants had to be 18 years or older, U.S. residents, had received a cancer diagnosis within the past 2 years, and current participants in Qualtrics survey network. Informed consent was obtained through an online informed consent form that provided study information, the survey duration, participant rights, and contact information for a study representative about questions or concerns. The university institutional review board approved this study.

Measures

Demographic characteristics. Participants provided information about their age, gender, race, ethnicity, marital status, education, household income (in US dollars), employment status, and health insurance. Age was divided into three age groups: younger (18-39 years), middle-aged (40-59 years), and older (<60 years). The cutoff of 60 years of older age was based on cutoffs used in previous studies of cancer patients (Krok, Baker, & McMillan, 2013; Pinquart, Frohlich, & Silbereisen, 2007; Politi, Enright, & Weihs, 2007).

Prognosis and perceptions of cancer. Respondents were first asked about their cancer including date of diagnosis, type of diagnosed cancer, and chances that cancer is/will be cured (less than 50% or more than 50%). Next, participants were asked to respond to the statements, "Having cancer is/was a severe threat to my health," "Having cancer is/was a serious threat to my quality of life," and "Having cancer is/was very harmful to my well-being." Responses were on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*). Responses were divided into agree (i.e., *strongly agree, agree*) and disagree (i.e., *strongly disagree, disagree*).

Participants were also asked, "What are the chances that your cancer is/ will be cured?" Responses were on a 5-point scale (*90% or better, about 75%, about 50/50, about 25%, 10% or less*). Responses for prognosis of cancer were dichotomized into $\geq 50\%$ chance that the cancer is/will be cured ("90% or better, about 75%, about 50/50") and $< 50\%$ chance that the cancer is/will be cured ("about 25%, 10% or less").

DM style. As modeled by Krieger (2014), treatment DM style was categorized into five patterns: independent, isolated, collaborative, delegated, and demanding. This scale measures the respondent's level of control in treatment DM, using six statements to indicate different response categories that best describe the extent to which the respondents were involved in treatment DM. Based on their responses, participants were categorized as independent/isolated ("I made the important decisions about my cancer treatment by myself"), collaborative ("I made the important decisions about my cancer treatment with my doctor"; "I made the important decisions about my cancer treatment with my family members"), delegated ("My doctor made all of the important decisions about my cancer treatment"; "My family made all of the important decisions about my cancer treatment"), or demanding ("I went along with my families' advice on the important decisions, even when I disagreed") roles. Responses were on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*).

Satisfaction. To measure satisfaction in treatment DM, participants were asked to respond to two statements: "The treatment decision I made was the best decision for me personally" and "Satisfaction with your role in cancer treatment decision-making process." Responses were on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*).

Type of social support and influence. As developed by House (1981), social support type was categorized into four categories: emotional (feelings of trust and love), informational (providing someone with information or advice), instrumental (providing resources such time or money), and appraisal (providing evaluative

feedback). To assess type of social support received during treatment DM, participants were asked to respond in separate reference to their oncologist, significant other, and adult children to the statements, "Showing care and concern for me" (emotional support), "Giving me valuable information about my treatment options" (informational support), "Giving me advice about which treatment option would be better for me" (instrumental support), and "Giving me a different point of view (appraisal support)." Responses were on a 5-point Likert-type scale (1 = *strongly disagree* to 5 = *strongly agree*).

Influence of social support members was measured by the question, "How much did the opinion of the following individuals—family doctor, oncologist, significant other, adult child(ren), parent(s), sibling(s), friend(s)—influence your decisions about your cancer treatment?" Responses were on a 5-point Likert-type scale (1 = *we did not discuss*, 2 = *not at all*, 3 = *a little*, 4 = *moderately*, and 5 = *very much*).

Analyses

Participant characteristics were compared descriptively using means for continuous variables and percentages for categorical variables. One-way ANOVAs and Tukey's HSD post hoc comparisons were used to determine significant age differences in continuous demographic data. Cross-tabulations with chi-square comparisons were used to determine significant age differences in categorical demographic data and the participants' prognosis and perceptions of cancer (controlling for cancer type and gender).

Univariate general linear models, controlling for cancer type and gender, were used to determine possible age differences in the DM styles, influence of social support on DM, and types of support received by social support members. Forward stepwise linear regression models were used to determine the significant predictors for each DM style. Covariates entered in the final model included age, gender, race, education, marital status, income, and health insurance (Step 1), and time since diagnosis, cancer type, and survival prognosis (Step 2). Perceived cancer threat to health, well-being, and quality of life were excluded due to multicollinearity. Separate analyses were conducted for the entire sample and by age group. All analyses were conducted using IBM SPSS Statistics 23.0 (IBM Corp, Armonk, NY, USA).

Results

Sample and Cancer Characteristics

Baseline characteristics of the 606 participants are shown in Table 1. For the younger participants, the mean age was 30.8 years, and the majority of

Table 1. Sample Characteristics.

Variable	Younger 18-39 years (n = 227) n (%)	Middle-aged 40-59 years (n = 183) n (%)	Older 60+ years (n = 196) n (%)	p
Age, M (SD)	30.8 (5.06)	49.6 (5.75)	68.6 (6.4)	
Gender (% female)	142 (62.6)	131 (71.6)	110 (56.1)	.01
Race				
White	162 (71.4)	160 (87.4)	190 (96.9)	<.001
Black	30 (13.2)	13 (7.1)	4 (2.1)	
Asian	26 (11.5)	7 (3.8)	0 (0.0)	
Other	9 (4.0)	3 (1.6)	2 (1.0)	
Marital status				
Married	157 (69.2)	120 (65.6)	130 (66.3)	<.001
Divorced/ separated/ widowed	3 (1.3)	40 (21.8)	52 (26.6)	
Single	67 (29.5)	23 (12.6)	14 (7.1)	
Education				
Less than high school	5 (2.2)	1 (0.6)	2 (1.0)	<.001
High school/GED	22 (9.7)	35 (19.1)	28 (14.3)	
Some college	64 (28.2)	78 (42.6)	85 (43.4)	
College graduate/ graduate school	136 (59.9)	69 (37.7)	81 (41.3)	
Income				
Less than \$30,000	27 (11.9)	42 (23.0)	46 (23.6)	.20
\$30,001- \$75,000	110 (48.5)	83 (45.3)	98 (50.2)	
\$75,001 or more	90 (39.6)	90 (31.7)	51 (26.2)	
Health insurance				
Private	175 (78.8)	115 (66.1)	64 (32.7)	<.001
Public	35 (15.8)	54 (31.0)	115 (64.3)	
Uninsured	12 (5.4)	5 (2.9)	0 (0.0)	
Type of cancer				
Breast	84 (37.0)	55 (30.1)	32 (16.3)	<.001
Prostate	29 (12.8)	16 (8.7)	26 (13.3)	
Lung	31 (13.7)	12 (6.6)	12 (6.1)	
Colorectal	12 (5.3)	12 (6.6)	12 (6.1)	
Diagnosis date				
<3 months ago	44 (15.4)	20 (10.9)	21 (10.7)	<.001
3-6 months ago	73 (32.2)	30 (16.4)	21 (10.7)	
7-12 months ago	75 (33.0)	55 (30.1)	45 (23.0)	
13-24 months ago	35 (15.4)	78 (42.6)	109 (55.6)	

(continued)

Table 1. (continued)

Variable	Younger 18-39 years (<i>n</i> = 227) <i>n</i> (%)	Middle-aged 40-59 years (<i>n</i> = 183) <i>n</i> (%)	Older 60+ years (<i>n</i> = 196) <i>n</i> (%)	<i>p</i>
Prognosis and perceptions of cancer ^a				
Having cancer is/ was a severe threat to my health	212 (97.2)	155 (88.6)	127 (74.7)	<.001
Having cancer is/ was a serious threat to my quality of life	209 (96.3)	147 (86.5)	121 (70.3)	<.001
Having cancer is/ was very harmful to my well-being	213 (96.8)	150 (90.4)	126 (75.4)	<.001
More than 50% chance that your cancer is/will be cured	199 (90.5)	157 (90.8)	160 (93.0)	.64

Some variables have missing data. GED = General Educational Development.

a. Adjusted for cancer type and gender.

participants (62.6%) were female, White (71.4%), married or living as a couple (69.2%), had at least a high school education (97.8%), private health insurance (78.8%), and household incomes <\$75,000/year (60.4%). The most common type of cancer among younger participants was breast (37.0%), followed by lung (13.7%) and prostate cancer (12.8%)

Middle-aged participants were predominately female (71.6%) with a mean age of 49.6 years. The majority of the middle-aged participants were White (87.4%), married or living as a couple (65.6%), had at least a high school education (99.4%), private health insurance (66.1%), and household incomes <\$75,000/year (68.3%). The most common type of cancer among middle-aged participants was breast (30.1%), followed by prostate (8.7%) and lung cancer (6.6%).

Older participants were predominately female (56.1%) with a mean age of 68.6 years. The majority of the older participants were White (96.9%), married or living as a couple (66.3%), had at least a high school education (99%), public health insurance (64.3%), and household incomes <\$75,000/year (73.8%). The most common type of cancer among older participants was breast (16.3%), followed by prostate (13.3%) and lung cancer (6.1%).

Significant differences were found in race, marital status, education, and insurance between the three age groups. Controlling for gender and cancer type, there were significant age differences in perceived threat of cancer to their health (97.2% vs. 88.6% vs. 74.7%, $p < .001$), quality of life (96.3% vs. 86.5% vs. 70.3%, $p < .001$), and well-being (96.8% vs. 90.4% vs. 75.4%, $p < .001$) for younger, middle-aged, and older adults, respectively, with younger adults reporting the highest perceived threat of cancer. There were no significant age differences regarding the participants' curative prognosis for the younger, middle-aged, and older adults (90.5% vs. 90.8% vs. 93.0%, $p = .64$, respectively; Table 1).

Social Support

For all age groups, the highest received support was emotional support from their significant other followed by informational support from their oncologist. However, significant differences were found in the amount of emotional, instrumental, informational, and appraisal support reported among the age groups, with the oldest group reporting the lowest received social support in their cancer treatment DM. After controlling for covariates, there was a significant age group effect on oncologist appraisal support, $F(2, 426) = 9.91, p < .001$. There were also significant age group effects on emotional, $F(2, 316) = 4.05, p < .05$; instrumental, $F(2, 316) = 11.40, p < .001$; informational, $F(2, 316) = 14.99, p < .001$; and appraisal, $F(2, 316) = 28.16, p < .001$, support from significant others. Finally, there were significant age group effects on emotional, $F(2, 189) = 3.66, p < .05$; instrumental, $F(2, 189) = 11.96, p < .001$; informational, $F(2, 189) = 13.44, p < .001$; and appraisal, $F(2, 189) = 20.92, p < .001$, support from adult children (Table 2).

Social Support Influence

For all age groups, the highest reported social support influence on cancer treatment DM was from their oncologist followed by their significant other. The amount of influence of social support on cancer treatment decisions also differed by age group, with the oldest group reporting the lowest levels of social support influence on their cancer treatment DM with the exception of the oncologist, in which the oldest age group was more influenced than the younger and middle-aged group. After controlling for covariates, there were significant age group effects on the influence of their family doctor, $F(2, 411) = 21.49, p < .001$; significant other, $F(2, 342) = 5.54, p < .01$; adult child(ren), $F(2, 251) = 3.79, p < .05$; parent(s), $F(2, 303) = 52.32, p < .001$; sibling(s), $F(2, 347) = 32.40, p < .001$; and friend(s), $F(2, 393) = 35.13, p < .001$, on cancer treatment

Table 2. Social Support in Treatment Decisions by Age Group.

Variable	Younger 18-39 years n (%)	Middle-aged 40-59 years n (%)	Older 60+ years n (%)	p ^a
Oncologist^b				
Showing care and concern for me	4.23 (0.06)	4.19 (0.08)	4.12 (0.09)	.62
Giving me valuable information about my treatment options	4.43 (0.06)	4.41 (0.07)	4.31 (0.08)	.46
Giving me advice about which treatment option would be better for me	4.40 (0.06)	4.31 (0.08)	4.17 (0.09)	.09
Giving me a different point of view	4.02 (0.07)	3.89 (0.09)	3.47 (0.10)	<.001
Significant other^c				
Showing care and concern for me	4.69 (0.05)	4.64 (0.06)	4.44 (0.07)	<.05
Giving me valuable information about my treatment options	4.06 (0.09)	3.56 (0.12)	3.34 (0.14)	<.001
Giving me advice about which treatment option would be better for me	4.17 (0.08)	3.79 (0.10)	3.39 (0.12)	<.001
Giving me a different point of view	4.42 (0.08)	3.97 (0.10)	3.42 (0.11)	<.001
Adult children^d				
Showing care and concern for me	4.46 (0.14)	4.31 (0.13)	3.99 (0.11)	<.05
Giving me valuable information about my treatment options	3.79 (0.17)	3.09 (0.15)	2.72 (0.14)	<.001
Giving me advice about which treatment option would be better for me	3.69 (0.16)	3.01 (0.15)	2.61 (0.13)	<.001
Giving me a different point of view	4.20 (0.16)	3.33 (0.14)	2.89 (0.13)	<.001

Scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*.

a. Adjusted for cancer type and gender.

b. $N = 602$, $n = 226$ for younger adults, $n = 183$ for middle-aged adults, $n = 193$ for older adults.

c. $N = 443$, $n = 173$ for younger adults, $n = 136$ for middle-aged adults, $n = 134$ for older adults.

d. $N = 287$, $n = 52$ for younger adults, $n = 84$ for middle-aged adults, $n = 151$ for older adults.

DM (Table 3).

DM Style and Satisfaction

Due to multiple styles of DM employed simultaneously by the cancer survivors, the mean scores of agreement to the statements regarding DM styles are reported. The highest reported DM style for the age groups was collaborative DM with doctors, followed by independent DM.

However, the utilization of other different cancer treatment DM styles differed by age group. After controlling for covariates, there were significant age group effects on the utilization of independent, $F(2, 429) = 3.47$, $p < .05$; collaborative with family, $F(2, 429) = 10.89$, $p < .001$; delegated to doctor, $F(2, 429) = 4.44$, p

Table 3. Social Support Influence on Cancer Treatment Decisions by Age Group.

Variable	Younger	Middle-aged	Older	<i>p</i> ^a
	18-39 years M (SD)	40-59 years M (SD)	60+ years M (SD)	
The opinion of my family doctor	4.14 (0.10)	3.81 (0.12)	3.07 (0.13)	<.001
The opinion of my oncologist	4.61 (0.06)	4.59 (0.07)	4.67 (0.09)	.72
The opinion of my significant other	4.43 (0.08)	4.19 (0.10)	3.99 (0.12)	<.01
The opinion of my adult child(ren)	3.53 (0.14)	3.21 (0.15)	2.95 (0.15)	<.05
The opinion of parent(s)	4.04 (0.08)	3.42 (0.12)	1.96 (0.19)	<.001
The opinion of my sibling(s)	3.72 (0.09)	3.24 (0.12)	2.33 (0.15)	<.001
The opinion of my friend(s)	3.59 (0.08)	3.03 (0.11)	2.35 (0.12)	<.001

Scale: 1 = *we did not discuss*, 2 = *not at all*, 3 = *a little*, 4 = *moderately*, 5 = *very much*.

a. Adjusted for cancer type and gender.

Table 4. Patient Decision-Making Style by Age Group.

Variable	Younger	Middle-aged	Older	<i>p</i> ^a
	18-39 years (<i>n</i> = 226) M (SD)	40-59 years (<i>n</i> = 183) M (SD)	60+ years (<i>n</i> = 196) M (SD)	
Decision-making style				
Independent	3.88 (0.08)	3.64 (0.10)	3.55 (0.11)	<.05
Collaborative				
Doctor	4.35 (0.06)	4.26 (0.08)	4.45 (0.08)	.22
Family	3.75 (0.09)	3.53 (0.11)	3.08 (0.12)	<.001
Delegated				
Doctor	3.35 (0.09)	2.96 (0.11)	3.12 (0.12)	<.05
Family	2.86 (0.08)	2.41 (0.10)	1.92 (0.11)	<.001
Demanding (family-controlled)	2.74 (0.08)	2.50 (0.10)	1.71 (0.11)	<.001

Scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, 5 = *strongly agree*.

a. Adjusted for cancer type and gender.

< .05; delegated to family, $F(2, 429) = 25.10, p < .001$; and demanding, $F(2, 429) = 27.72, p < .001$, DM (Table 4).

There were high satisfaction scores for all age groups. Older adults reported higher satisfaction with their role in the treatment DM process ($M = 4.40, SD = 1.04$) than the younger ($M = 4.06, SD = 1.03$) and middle-aged ($M = 4.25, SD = 1.04$) groups. After controlling for covariates, there were significant age group effects on the satisfaction with their role in the treatment DM process,

$F(2, 429) = 4.17, p < .05$. Older adults also reported higher endorsement of the statement, "The treatment decision I made was the best decision for me personally" ($M = 4.56, SD = 0.79$) than younger ($M = 4.32, SD = 0.77$) and middle-aged ($M = 4.44, SD = 0.77$) groups. After controlling for covariates, there were significant age group effects on the satisfaction with their treatment decision, $F(2, 429) = 3.38, p < .05$.

Predictors of DM Styles

Independent DM. There were no significant demographic (age, gender, race, education, marital status, income, health insurance) or cancer-related (diagnosis date, cancer threat, and survival prognosis) predictors for independent DM style.

Collaborative DM. Analyses found that income was the only significant predictor of reporting collaborative DM with their doctor, $F(10, 596) = 0.90, p = .54$. Specifically, participants who had higher incomes ($\beta = .06, p < .05$) were significantly more likely to report collaborative DM with their doctor. Analyses found that age, gender, race, and marital status were significant predictors of reporting collaborative DM with their family, $F(10, 597) = 5.76, p < .001$. Specifically, participants were significantly more likely to report collaborative DM with their family if they were younger ($\beta = -.29, p < .001$), female ($\beta = .34, p < .01$), non-White ($\beta = .15, p < .05$), and married ($\beta = -.12, p < .001$).

Delegated and demanding DM. Analyses found that age, education, time since diagnosis, and cancer type were significant predictors of reporting delegated DM to their doctor, $F(10, 597) = 3.45, p < .001$. Specifically, participants who were younger ($\beta = -.23, p < .01$), had lower education ($\beta = -.11, p < .05$), were recently diagnosed with cancer ($\beta = -.18, p < .01$), and had breast cancer ($\beta = .09, p < .01$) were significantly more likely to report delegated DM to their doctor.

Age, gender, marital status, and time since diagnosis were significant predictors of reporting delegated DM to their family, $F(10, 597) = 7.17, p < .001$. Specifically, participants were significantly more likely to report delegated DM to their family if they were younger ($\beta = -.47, p < .001$), male ($\beta = -.23, p < .05$), married ($\beta = -.09, p < .01$), and were recently diagnosed with cancer ($\beta = -.14, p < .05$).

Age and gender were significant predictors of reporting demanding DM, $F(10, 596) = 6.81, p < .001$. Specifically, participants were significantly more likely to report demanding DM if they were younger ($\beta = -.46, p < .001$) and male ($\beta = -.39, p < .001$) (Table 5).

Table 5. Demographic and Health Predictors of Decision-Making Styles.

Variable	Independent B (SE)	Collaborative with doctor B (SE)	Collaborative with family B (SE)	Delegated to doctor B (SE)	Delegated to family B (SE)	Demanding (family-controlled) B (SE)
Model 1						
Age	-0.06 (0.07)	0.04 (0.06)	-0.29 (0.08)***	-0.23 (0.08)**	-0.47 (0.07)***	-0.46 (0.08)***
Gender	0.01 (0.12)	0.10 (0.09)	0.34 (0.12)**	-0.14 (0.12)	-0.23 (0.11)*	-0.39 (0.12)***
Race	0.02 (0.07)	-0.04 (0.05)	0.15 (0.07)*	-0.03 (0.08)	0.10 (0.07)	0.11 (0.07)
Marital status	-0.04 (0.05)	0.04 (0.03)	-0.12 (0.04)***	-0.06 (0.04)	-0.09 (0.03)**	-0.07 (0.04)
Education	0.04 (0.05)	-0.01 (0.04)	-0.03 (0.05)	-0.11 (0.06)*	-0.05 (0.05)	0.01 (0.06)
Income	0.01 (0.04)	0.06 (0.03)*	0.04 (0.04)	-0.01 (0.04)	0.02 (0.03)	-0.03 (0.04)
Health insurance	-0.02 (0.05)	0.02 (0.04)	-0.06 (0.05)	0.06 (0.05)	-0.02 (0.05)	-0.08 (0.05)
F of model	1.24	1.02	8.12***	2.45*	9.20***	9.02***
R ²	.01	.01	.11	.02	.12	.12
Model 2						
Time since diagnosis	-0.04 (0.06)	0.03 (0.05)	-0.02 (0.06)	-0.18 (0.06)**	-0.14 (0.06)*	-0.04 (0.06)
Cancer type	0.04 (0.04)	0.03 (0.03)	0.03 (0.04)	0.09 (0.04)**	0.02 (0.03)	0.06 (0.04)
More than 50% chance that your cancer is/will be cured	-0.10 (0.21)	-0.09 (0.16)	0.05 (0.21)	-0.29 (0.21)	0.09 (0.20)	0.25 (0.21)
F of model	1.05	0.90	5.76***	3.45***	7.17***	6.81***
R ²	.01	.01	.10	.06	.13	.12

* $p < .05$; ** $p < .01$; *** $p < .001$

Discussion

This study examined the treatment DM styles of older, middle-aged, and younger cancer survivors, and the role of social support on their cancer treatment DM. In this study, collaborative DM with doctors and independent DM was the most endorsed DM style for all age groups. However, there were differences in treatment DM styles among the age groups, with younger age being a significant predictor of collaborative DM with doctor, delegated DM to doctor, delegated DM to family, and demanding DM from family. The finding of younger adults preferring more family involvement than older cancer survivors is somewhat surprising. This result contrasts previous studies that have found older adults were more likely to prefer passive DM roles than younger adults (Cassileth et al., 1980; Davison & Breckon, 2012; Levinson et al., 2005; Xie et al., 2014). One can suggest that the paternalistic model of physician–patient relationship (Rosenstein, 1986) is losing ground and that patients of all ages are becoming more active participants in their health care. This shift may be attributed to the growth of the shared DM approach (Elwyn et al., 2012), where clinicians and patients share the best available evidence when faced with the task of making decisions, and where patients are supported to consider options, to achieve informed preferences (Elwyn et al., 2010; Elwyn et al., 2012). Future studies should continue to evaluate the patient–physician DM processes while considering the influence of the patient’s social support network.

Older participants reported less received social support and less influence from their social network on their cancer treatment DM. Previous studies have found that family and significant others influence cancer treatment DM (Arora, Finney Rutten, Gusafson, Moser, & Hawkins, 2007; Petrisek et al., 1997; Schonberg et al., 2014; Sio et al., 2014). In contrast with our study, Sio and colleagues (2014) found that the amount of influence from social networks on treatment DM does not differ by age. Our study’s finding of age differences in the influence of social network members may be explained by older adults’ extensive previous and varied life experiences with the comorbidities and multiple exposures to the health care system (Tariman et al., 2014). Previous studies have found that older adults’ DM has been noted to be more “experiential,” that is, more likely than younger adults to integrate new information with prior experiences, rendering older adults less reliant on others for information and subsequently less influenced regarding their opinions on cancer DM (Gould, 1999; Lockenhoff & Carstensen, 2004). In addition, this finding is supported by previous studies that have found older adults’ support systems have little influence on their treatment decisions (Ciambrone, 2006). It also provides evidence for the Socioemotional Selectivity theory, which assumes with age, individuals reduce

their social networks to provide meaningful social interactions (Carstensen et al., 1999). This preference for limited, close social networks is further highlighted among older individuals with a cancer diagnosis (Pinquart & Silbereisen, 2006). Thus, these results suggest that the presence and influence of social networks of cancer patient populations differ by age.

A number of studies have shown age-associated differences in adjustment to cancer diagnosis, with younger adults having worse quality of life and well-being, more disease concerns, and depression (Avis, Crawford, & Manuel, 2004; Krok et al., 2013; Linden, Vodermaier, MacKenzie, & Greig, 2012). Younger adults also may consider a cancer diagnosis as an “off-time event” and more of a crisis compared with older adults, who may perceive their cancer diagnosis as an “on-time” event, normal and expected (Neugarten, 1996). Furthermore, the DM approach may differ in that younger adults believe they have a longer life expectancy and want to ensure they are making the treatment decision that will offer them the best chance of survival. They also may rely more on the support of their family because of possible child care and career obligations compared with older adults. It is important for future studies to explore the models of DM within families, the DM preference of patients, and family members’ assumed or assigned roles in this DM process to improve patient communication and satisfaction with DM (Krieger, Krok-Schoen, et al., 2015; Krieger, Palmer-Wackerly, et al., 2015).

Strengths/Limitations

Our study has several important strengths including the large sample of cancer survivors, the examination of multiple DM styles, and possible correlates of these styles. It also sheds light on the received support and influence of social network members on treatment DM. In addition to the cross-sectional nature of the study design, there were some additional limitations.

First, the data are based on self-report and we do not know the specific details about the participants’ cancer treatments and prognosis. Second, participants were asked about their perspective of treatment DM and support received; future studies would benefit from including the perspectives of patients’ social networks as well as patients’ desired support, which would have better illustrated the DM process. Most participants were White, married, and well-educated, limiting generalizability to different survivor populations and the general population. Finally, this study did not include any external factors (e.g., other diseases, personal/social issues) that may affect cancer treatment DM.

Conclusion

In summary, despite having lower received social support in cancer treatment DM, older adults are more satisfied with their treatment decisions than younger and middle-aged adults. Results found that collaborative DM with doctors was the most common DM style among cancer survivors. Finally, younger age was a significant predictor of collaborative DM with family, delegated DM to doctor, delegated DM to family, and demanding (family-controlled) DM, which demonstrates the need for clinicians to inform and counsel patients and their families about different treatment options. Ideally, cancer treatment decisions would consider all patients' life expectancy, preferences, and social support networks to properly promote collaborative DM.

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