Factors Predicting Unmet Supportive Care Needs among Adult Cancer Patients

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Objective: We investigated supportive care needs/preferences and their association with adult cancer patients' overall physical and mental health, and types of social support. **Methods:** Cross-sectional surveys were completed by 108 adult cancer patients ($M_{age} = 63.76$). **Results:** The physical and daily living domain had the highest levels of unmet needs, followed by psychological needs. Patients with low levels of physical health tended to have high levels of physical needs ($p < .001$), health system and information needs ($p < .05$), and patient care and support needs ($p < .05$). **Conclusions:** Our results provide evidence for assessing the importance of measuring unmet needs as a critical step in providing high quality care and developing tailored psychosocial interventions to meet the needs of cancer patients.

Key words: cancer patients; needs assessment; supportive care needs
***Health Behav Policy Rev.*™** 2018;5(6):38-49
DOI: https://doi.org/10.14485/HBPR.5.6.3

Cancer is the second most common cause of death in the United States (US), with projections estimating 1.7 million new cases and 600,640 deaths occurring in 2018. This translates to almost 1650 deaths per day from cancer.[1] Cancer diagnoses frequently cause patients emotional distress, which may be exhibited by increased feelings of vulnerability, loss of control, and uncertainty.[2] Approximately 45% of adult cancer patients report significant psychological distress.[3] Similarly, approximately 35% of adult cancer patients report significant psychological distress in the year following initial diagnosis.[4] In addition to emotional distress, cancer patients often experience severe physical symptoms and side effects during cancer treatment and after treatment ends. Among the most common symptoms of cancer and its treatments are pain,[5] depression, and fatigue.[6] A developing body of evidence suggests that screening for and addressing psychosocial and physical symptom distress through supportive care enhances quality of life and improves cancer outcomes.[7-9] Conversely, ignoring distress can lead to decreased quality of life, poorer health behaviors, and decreased immune function, contributing to poorer disease outcomes.[7]

Understanding the needs of cancer patients is necessary to provide the best possible support and ensure associated outcomes.[10] The literature is replete with accounts of significant unmet needs regarding supportive care for cancer patients and their families.[2-4] Cancer patients who utilize support and counseling services experience improvements in social adjustment, health behaviors, and adherence to treatment, which all contribute to improved course of the disease.[7] However, despite continued efforts to build supportive care options and networks and to implement screening for distress, many patients continue to underutilize the resources available or are not informed sufficiently

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on how to choose or access services.[13,14]

Supportive care has been defined as "care that helps the patient and their family to cope with cancer and treatment of [cancer] from pre-diagnosis, through the process of diagnosis and treatment, to cure, continuing illness or death into bereavement. It helps the patient to maximize the benefits of treatment and to live as well as possible with the effects of the disease."[5] Domains and dimensions of supportive care needs include physical, informational, emotional, psychological, social, spiritual, and practical, [6] as well as sexual, financial, and cultural needs.[5,7] Assessing supportive care needs is a critical step in examining the gap between patients' unmet needs and their experiences and services in cancer care.[8] It also provides important information for clinicians on how to deliver cancer care beyond medical treatment, focusing on needs identified by patients.[9]

Coping with illness is an inherently social process that is influenced by interactions between patients and members of their social networks.[10] Social support can enable and enhance adaptive coping with a health problem through informational or emotional aid.[20] Specifically, patients with more social support are likely to seek and process information, regulate their emotions, make critical medication decisions, and to experience better quality of life. Conversely, social isolation is associated with decreased psychological health[11,12] and physical health.[22] Finally, overall self-reported health status and individual's perceptions of their physical and mental health may further influence the needs for supportive care and ability to identify and seek services.

The combined experiences of the various types and levels of social support and an individual's physical and mental health may influence supportive care needs. Learning more about these relationships and predictions may result in important opportunities to provide improved guidance for developing psychosocial interventions to provide high quality cancer care.

The purpose of this study was to investigate supportive care needs and their association with overall physical and psychological health and types of social support, specifically in adult patients who are receiving or who have recently completed treatment for cancer. We begin by examining and describing predominant unmet needs of cancer patients undergoing different types of treatment by assessing perceived supportive care needs and preferences. We then explore how sociodemographic variables, social support, and physical and psychological health predict the different types of supportive care needs.

METHODS

Participant Recruitment

Potential participants were adult patients (18 years or older) who were: (1) diagnosed with any form of cancer; (2) currently receiving cancer treatment or had completed treatment within 6 months at the Mayo Clinic in Arizona; (3) any gender, race, or ethnicity; and (4) spoke, read, and wrote in English. Because previous research found the highest levels of unmet supportive care needs of cancer patients were identified during treatment,[23] we excluded patients if it had been over 6 months since completing treatment or if they were unable to comply with study protocol due to cognitive impairment. Participants were recruited from ambulatory care clinics at the Cancer Center in the Phoenix metropolitan area through the distribution of an IRB-approved flyer and invitation letter distributed both physically and electronically between August 2014 and May 2016. If a patient expressed interest (in person or by calling our study phone line), the study coordinator explained the details of the study and, if the patient agreed to participate, he or she was screened for eligibility and completed a consent form and study questionnaire. Participants were given the option of completing the questionnaire in the clinic or taking it home, completing the questionnaire during the following 48-hour period, and mailing it back (in a pre-paid reply envelope) to the study coordinator within 7 days. No compensation was provided.

Measures

Supportive care needs. The Supportive Care Needs Survey Short Form (SCNS-SF34)[24] has 34 items measuring supportive care needs across 5 factors: physical and daily living (5 items), psychological (10 items), sexuality (3 items), patient care and support (5 items), and health system and information (11 items). Each item had 5 possible answer choices (1 = *Not applicable*, 2 = *satisfied*, 3 = *low need*, 4 = *moderate need*, and 5 = *high need*). Scores on the SCNS-SF34 subscale are summed and standardized on a scale ranging from 0 to 100.[25] This instrument has achieved high construct validity and high internal consistency (domain Cronbach's $\alpha = 0.86$ to 0.96).[24]

Supportive care preferences. The l5-item checklist (have used vs have not used but want) was used to assess supportive care preferences and services used based on the instrument used by Steginga et al.[26] We asked patients to indicate whether they have ever used any of a multitude of various supportive services and which types of support they would like to have provided. Examples of supportive care preferences include relaxation and exercise classes, in-person and online support groups, art therapy, and a service that connects patients to others who have experienced the same type of cancer.

Mental health and physical health. The 10-item short form of the Patient-Reported Outcomes Measurement Information System (PROMIS) Global Health Measure was used to measure 2 factors, overall physical health and overall mental health. All the items had 5-point response choices except the rating of average pain. Scores on these 2 factors are summed from items after reverse-coding 3 of the 10 items. The scale had high internal consistency with reliability coefficients of 0.81 and 0.86, respectively.[27]

Social support availability and social isolation. The PROMIS social support measure was implemented to capture patients' perceptions of emotional, informational, and institutional support, as well as level of isolation. Prior research using the measure in cancer populations shows strong evidence for reliability and validity.[28] Twelve 5-point Likert items (1 = *Never* and 5 = *Always*) measured these 4 factors. Higher scores on the emotional, informational, and instrumental support factors equate to the cancer patient having more support, whereas higher scores on social isolation indicate the negative experience of feeling isolated from others.

Data Preparation

Common to most datasets, there were instances of missing data. A missing values analysis was performed on 67 continuous level items from the questionnaire, which comprise the SCNS-SF34, PROMIS Global Health Measure, PROMIS social support measure, Ten Item Personality Inventory, and a global measure on overall satisfaction with care received. Of these 67 items, 24 had at least one missing value; however, no item had more than 6 missing values (5.6%). A missing completely at random (MCAR) test yielded non-significant results χ^2 (1376) = 1342.36, p = .737, suggesting no pattern to the missing data. Overall, only 135 of 7101 datapoints (1.87%) were missing from the dataset. Listwise deletion was considered as a possible strategy for addressing missing data, but further analysis of missing values showed that this would decrease the sample size by almost 25%. Thus, rather than excluding these participants from data analyses, multiple imputation was performed to estimate and replace the missing values. Specifically, multiple imputation was chosen over imputing the mean for each item because multiple imputation achieves better accuracy of estimation of variability and less bias in parameter estimates when handling missing data.[29] As Graham et al recommend,[30] mean scores of 20 imputations were used in place of the missing data points.

Data Analysis

Data analysis was performed using the SPSS version 24.0 software program. Descriptive statistics were obtained from the demographic data and instruments. Means and standard deviations were calculated for all continuous variables. Unmet supportive care needs prevalence was determined using the proportion of patients reporting scores of 3 or above (unmet needs) for each of the 34 SCNS-SF34 items and then listing these by descending frequency. Next, stepwise multiple regression models were constructed to investigate whether supportive care needs strength (standardized Likert-summated scores) was associated with demographic variables (eg, age, gender, and marital, education, and occupational status) and medical characteristics (eg, disease type and treatment status), as well as patient satisfaction, global health, and physical/psychological health. Variable entry into each model was determined using the stepwise method with p-value for entry of < .05 and for removal of > 10. Final models were confirmed using forced entry.

RESULTS

Sample Characteristics

Participants (N = 108) were 83 female and 25 male cancer patients from the Mayo Clinic Cancer Center in Arizona ranging in age from 24 to 91 years (M = 63.76 years, SD = 13.89). Most participants (89.8%) were white and all but 4 reported English as the primary language spoken in their household. Additionally, most (54.6%) had been diagnosed in the past year. Overall, 67.3% of this sample were currently undergoing treatment, whereas 32.7% of them had completed the treatment within 6 months. Breast cancer was the most commonly reported cancer type (52.4%), followed in frequency by colorectal cancer (10.5%) and lymphoma (10.5%). Another 23.8% of participants reported cancer at other sites located throughout the body, whereas 2.8% of participants did not report their cancer type. Participants' cancers ranged from stage 1 to 4 (Mode = Stage 4) and most participants had undergone chemotherapy (78.7%), surgery (63.9%), or radiation treatment (38%). Furthermore, 7.4% of this sample reported utilizing some form of psychological support service or program and a substantial majority (94.4%) reported having at least one person in their life who they considered a primary caregiver. Table 1 provides additional data on the relationship types of primary caregivers.

Of the 118 patients who consented, 82% (N = 96) of participants completed the questionnaire in the clinic while receiving the treatment, whereas 18% of this sample (N = 22) took it home due to various reasons, including feeling tired during the treatment or time constraints. Twelve participants did not return the questionnaire (response rate by mail: 46%). There were 108 of the 118 patients included in the final analysis (overall response rate: 91.5%).

Prevalence of Needs

One of the purposes of our study was to describe cancer patients' specific areas of unmet supportive care needs. Thus, the 34 SCNS items of need were dichotomized into no needs (score = 1 to 3) and moderate/severe needs (score 4 or 5). The frequency of moderate/severe scores was ranked to identify the top 10 unmet needs (Table 2). The most common concerns were physical, particularly not being able to do the things you used to do (27.8%), followed by psychological concerns including uncertainty about the future (24.1%) and fears about the cancer spreading (24.1%). Table 2 presents the full results of the prevalence of needs.

Supportive Care Preferences and Services

A brief checklist of supportive care preferences was utilized to identify the types of supportive care services the patient has used or wished to use. The results showed that most patients (76.4%) have used brochures about services and benefits for patients with cancer, followed by using a library of books and videos (64.4%), attending a series of talks by staff members about aspects of coping with cancer and cancer treatment (54.2%), and telephone support service (52.2%). In addition, the types of supportive care that patients have not used but most desire include relaxation class (90.2%), drop-in centers where they can meet informally with other patients (90%), in-person support groups for family members (88.9%) and patients (85.7%), online support groups (79.1%), services that connect patients with others who have experienced the same type of cancer (76.7%), exercise class (69.6%), and one-on-one counseling (60.4%).

Predictors of Need

To explore whether any variable predicted reports of needs, separate multiple regression analyses were completed for each of the 5 domains as outcome variables: (1) physical needs; (2) psychological needs; (3) health system and information needs; (4) patient care and support needs; and (5) sexuality needs. The domain score, the average score for all items in the domain, was only calculated for those participants who answered all needs items within the domain. In each multiple regression, predictor variables included overall physical and mental health, as well as patients' perceptions of emotional, informational, and institutional support, as well as level of isolation. For each regression, the multicollinearity diagnostics indicated the non-multicollinearity assumption underlying the use of multiple regression was met. Table 3 summarizes results of the regressions.

First, the regression investigating predictors of physical supportive care needs yielded a statistically significant model $F(6, 101) = 14.20$, $p < .001$,

Table 1
Study Group Characteristics (N = 108)

	Variable	Frequency (%)
Sociodemographic		
Sex	Female	83 (76.9)
	Male	25 (23.1)
Age	18-29	2 (1.9)
	30-39	2 (1.9)
	40-49	12 (11.1)
	50-59	24 (22.2)
	60-69	26 (24.1)
	70-79	27 (25.0)
	80+	14 (13.0)
Education	High school graduate	20 (18.5)
	Some college	12 (11.1)
	College graduate (associate or bachelors)	39 (36.1)
	Post graduate education	26 (24.1)
Employment status	Full time worker	25 (23.1)
	Part time worker	10 (9.3)
	Retired	14 (13.0)
	Not employed	53 (49.1)
Household income ($USD)	< 20,000	5 (4.6)
	20,000 to less than 60,000	23 (21.3)
	> 60,000	58 (53.7)
Marital status	Married	25 (23.1)
	Never married	10 (9.3)
	Divorced, widowed, separated	53 (49.1)
	Non-marriage committed relationship	5 (4.6)
Primary language spoken	English	104 (96.3)
	Spanish	2 (1.9)
	Dutch	1 (0.9)
	Tagalog	1 (0.9)
Health Status		
Cancer stage	1	18 (16.7)
	2	18 (16.7)
	3	18 (16.7)
	4	25 (23.1)
	Not reported or unstaged	29 (26.9)
Cancer type/site	Breast	55 (52.4)
	Colorectal (small and large intestines, rectum)	11 (10.2)
	Leukemia	5 (4.6)
	Lymphoma	11 (10.2)
	Gynecologic	5 (4.6)
	Liver	3 (2.8)
	Pancreas	2 (1.9)

(***continued on next page***)

Table 1 (*continued*)
Study Group Characteristics (N = 108)

	Variable	Frequency (%)
	Neuroendocrine	1 (0.9)
	Pancreas	2 (1.9)
	Lungs	4 (3.7)
	Skin	1 (0.9)
	Head/neck	1 (0.9)
	Bladder	2 (1.8)
	Myodyplastic syndrome (MDS)	1 (0.9)
	Myelofribrosis/myeloma	5 (4.6)
	Kidney	1 (0.9)
Completed treatments	Chemotherapy	44 (40.7)
	Radiation	7 (6.5)
	Surgery	1 (0.9)
Current treatments	Chemotherapy	85 (78.7)
	Radiation	41 (38.0)
	Surgery	69 (63.9)
Number of previous cancer diagnoses	Zero	64 (59.3)
	One	5 (4.6)
	Two	23 (21.3)
	Three	12 (11.1)
	Four	1 (0.9)
	Five	1 (0.9)
Insurance and Support		
Health insurance	Yes	73 (67.6)
	No	35 (32.4)
Relationship of primary caregiver	No primary caregiver reported	6 (5.6)
	Spouse, significant other, partner	68 (63.0)
	Sibling	14 (13.0)
	Son	20 (18.5)
	Daughter	32 (29.6)
	Friend	33 (30.6)
	Bible study group member	4 (3.7)
	Parents	6 (5.6)
	Niece/nephew	2 (1.9)
	Daughter-in-law/son-in-law	4 (3.7)
	Grandchild	3 (2.8)
	Other relatives	2 (1.9)
	Support group member	1 (0.9)
	Paid caregiver	1 (0.9)
Utilization of psychosocial support programs or services	Yes	19 (17.6)
	No	88 (81.5)

Table 2
Prevalence of Needs

Rank	Item	Percent of sample reporting a moderate/high need	Domain
1	Not being able to do the things you used to do	27.8 (N = 104)	Physical and Daily Living
2	Uncertainty about the future	24.1 (N = 105)	Psychological
3	Fears about the cancer spreading	24.1 (N = 104)	Psychological
4	Lack of energy/tiredness	23.1 (N = 103)	Physical and Daily Living
5	Pain	18.5 (N = 105)	Physical and Daily Living
5	Learning to feel in control of your situation	18.5 (N = 105)	Psychological
5	Work around the home	18.5 (N = 105)	Physical and Daily Living
8	Concerns about the worries of those close to you	17.6 (N = 105)	Sexuality
9	Being informed about things you can do to help yourself to get well	16.7 (N = 106)	Health system and Information
10	Anxiety	16.7 (N = 105)	Psychological

adjusted R^2 = .43. Overall physical health was negatively associated with physical supportive care needs ($\beta = -.67$, $p < .001$). In other words, patients who were physically distressed tended to have a high level of physical support needs.

The regression model for predicting psychological supportive care needs also was statistically significant, F(6, 101) = 6.17, $p < .001$, adjusted R^2 = .23. Overall psychological health was negatively associated with psychological supportive care needs ($\beta = -.47$, $p < .001$). That is, cancer patients who were psychologically distressed (eg, depression and anxiety) were more likely to report psychological supportive care needs.

Predictors of health system and information needs were examined with a multiple regression that produced a statistically significant model, F(6, 101) = 2.64, p = .02, adjusted R^2 = .08. Overall physical health was a significant negative predictor of health system and information needs ($\beta = -.39$, $p < .05$). Physically distressed patients (eg, pain and fatigue) tended to have higher levels of health system and information needs.

A fourth regression investigating predictors of patient care and support needs generated a statistically significant model, F(6, 101) = 2.17, p = .05, adjusted R^2 =.06. Overall physical health was negatively related to patient care and support needs ($\beta = -.29$, $p < .05$). Patients who were physically distressed were more likely to have higher patient care and support needs.

Finally, the fifth regression sought to uncover predictors of sexuality needs, which also produced a statistically significant model, F(6, 101) = 2.86, p = .01, adjusted R^2 = .11. The only statistically significant predictor of sexuality supportive care needs was overall mental health ($\beta = -.26$, $p < .05$).

To probe these results further, we conducted a one-way ANOVA to determine if statistically significant differences in sexuality supportive care needs exist among patients who are either married, never married, divorced, or separated, and not currently in a committed relationship. Results were statistically significant, F(3, 103) = 6.78, $p < .001$. Scheffé *post hoc* tests were utilized to determine which groups significantly differed from each other regarding sexuality supportive care needs. Results of the *post hoc* analysis show those who are married had greater sexuality support needs (M = 30.46; SE = 2.98) than those who are divorced or separated (M = 8.44; SE = 4.39).

DISCUSSION

This study examined different domains of supportive care needs of cancer patients and explored factors associated with unmet supportive care needs. Our overall findings revealed cancer patients who are undergoing treatment, or have completed treatment within the past 6 months, continue to experience moderate to high levels of unmet sup-

Table 3
Regressions Predicting Cancer Patients' Supportive Care Needs (N = 108)

	Physical needs[a]			Psychological needs[b]			Sexuality needs[c]			Patient care and support needs[d]			Health system and information needs[e]		
Variable	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**	**B**	**SE B**	**β**
Emotional support	-.49	4.19	-.001	-6.72	4.61	-.21	.58	5.80	.02	-5.39	3.21	-.26	-2.72	4.37	-1.00
Informational support	1.23	4.38	.03	7.95	4.83	.23	5.55	6.07	.14	2.83	3.36	.13	1.81	4.57	.06
Instrumental support	-1.96	2.26	-.07	-.03	2.49	-.01	-1.42	3.13	-.05	.97	1.74	.06	1.72	2.36	.08
Social Isolation	-2.24	2.67	-.08	1.54	2.94	.06	3.37	3.70	.11	2.00	2.05	.12	3.82	2.79	.16
Global physical health	-5.33	.72	-.67**	-.14	.79	-.02	-.70	1.00	-.08	-1.38	.55	-.29*	-2.53	.75	-.39*
Global mental health	-.28	.75	-.04	-3.27	.82	-.47**	-2.12	1.04	-.26*	.42	.58	.10	1.30	.78	.21

Note.
***p < .05; **p < .001**

a: F(6, 101) = 14.20, p < .001. Adjusted R^2 = .43
b: F(6, 101) = 6.17, p < .001. Adjusted R^2 = .23
c: F(6, 101) = 2.86, p = .013. Adjusted R^2 = .10
d:. F(6, 101) = 2.17, p = .052. Adjusted R^2 = .06
e: F(6, 101) = 2.64, p = .02. Adjusted R^2 = .08

portive care needs across different domains. The physical and daily living domain had the highest levels of unmet needs. Specifically, the most frequently reported physical and daily living unmet needs included not being able to do the things an individual used to do, lack of energy, and pain. Additionally, moderate to high levels of unmet needs also occurred in the psychological domain, which included uncertainty about the future, fears about the cancer spreading, and learning to feel in control of one's situation. Most participants were undergoing treatments that have been associated with myriad physical and psychological problems. For example, chemotherapy is associated with physical symptoms, including fatigue, nausea, hair loss, pain, and vomiting.[13,14]_Empirical evidence suggests that levels of anxiety, depression, physical symptoms, and perceived supportive care needs are interrelated,[3] suggesting that if patients could manage one of those problems it could, in turn, improve the other domains.

The supportive care preferences data indicated the majority of patients had a substantial interest in physical and psychological care needs, especially regarding relaxation, exercise, and supportive social support services, as well as support groups for both family and friends. However, 88% of participants had not utilized psychosocial support programs or services. This finding suggests that there is a gap between preferences and use. There may be many reasons that responses indicating interest do not match utilization, including lack of information about supportive services available or lack of motivation or time to participate. Identifying how this gap occurs would be important for individual cancer centers to explore and remedy for the various needs of their patients. Interventions can be individualized sessions, support group sessions, or interventions specifically designed to incorporate caregivers and families. This latter suggestion of providing and promoting interventions for those supporting cancer patients is particularly important given recent findings that some people who know a recently diagnosed cancer patient may consciously choose not to provide emotional support for a multitude of reasons, including not knowing what to say and fear of losing control of their own emotions.[32] Furthermore, instances of a would-be supporter not providing support can, at times, be viewed by the cancer patient to be just as detrimental as receiving low-quality, insensitive support messages.[33]

The association between overall physical health and unmet needs suggests patients with significant physical symptoms and distress were more likely to have physical, patient care and support, and health system and information needs. Patients who experience physical symptoms may restrict their physical and usual daily activities and not reach out to access help. The health system and information domain assesses need for information about diagnosis, treatment, and follow-up, suggesting that these services are not readily accessible, or encouraged.

Furthermore, levels of overall psychological health were related to reports of psychological needs and sexuality needs. Intuitively, one would expect lower levels of psychological health to be associated with greater psychological needs, and indeed prior research has confirmed this;[34,35] yet, we found those with greater psychological health were more likely to seek help.

Prior research suggests cancer patients benefit when they consider mental health issues a normal part of receiving care for cancer.[36] The ability of a patient to recognize his or her own psychological needs during treatment may be a sign of mental health awareness, and is important considering health care professionals continue to underestimate patients' levels of distress.[37] Given the mixed results of our study relative to others' findings, it appears that there may be different patterns of mental health/psychosocial support seeking behavior. Recognizing and seeking help should not be on the shoulders of patients, whether they present themselves as psychologically healthy or not; they should not have to rely solely on their own self-assessments of their mental well-being to determine whether they ought to seek support. The reality though is that few cancer centers systematically screen patients for psychological distress, and patients who are currently utilizing psychological services are mainly those who also reported a desire for such services.[36] Therefore, our results echo previous findings and reinforce the call for cancer centers and other healthcare organizations to routinely screen cancer patients for potential unmet psychological supportive care needs.

Sexuality needs of cancer patients include adjustment to intimate and sexual changes experienced during and after treatment. Although sexuality needs of cancer patients are included in quality of life measures such as the SCNS-SF-34, few healthcare professionals choose to address sexuality needs[38] and believe they lack the time or experience to address these issues.[39] Oftentimes, healthcare providers believe the patients' concerns are limited to physical issues such as sexual performance, menopause, or infertility,[40] and research has correspondingly addressed these physical issues.[38,41] However, our results suggest unmet sexuality needs are positively related to psychological health issues, rather than physical health problems. This finding partially confirms prior research that found sexuality needs of cancer patients emerge from a combination of biological and psychological factors.[42] However, research has shown healthcare providers tend to view patients' sexuality concerns as secondary and that addressing treatment-induced sexual side effects is an adequate approach to addressing sexuality concerns.[40] Therefore, the findings regarding sexuality presented herein reinforce the importance of healthcare providers attending to sexuality needs based on the patient's psychological health.

Interestingly, social support and social isolation were found to be non-significant factors, which is inconsistent with some previous studies.[34,43] In our study, most participants (94.4%) reported they had a primary caregiver in their social network. With this high level of primary caregiver support, the ceiling effect would not allow detection of a relationship of needs with having less support. We only can speculate that patients have primary caregivers who can provide emotional, instrumental, and social support; therefore, they may not have high levels of perceived unmet needs. Given this finding, additional research is needed to examine the interrelationships among different types of social support, social isolation, and supportive care needs in longitudinal studies among a sample of patients with and without strong primary caregiver support. This will help to ascertain how those factors may relate to unmet supportive care needs of cancer patients. Our results suggest that screening for levels of social isolation and distress are important indicators that may predict levels of physical and psychological needs.

IMPLICATION FOR HEALTH BEHAVIOR OR POLICY

This study has important implications for both health behavior researchers and policymakers. A systematic review paper that examined unmet supportive care needs of people with cancer found the highest levels of unmet need for most domains were identified during treatment.[23] However, the current investigation further highlights the importance of assessing patients' needs because unmet supportive care needs continue past the end of treatment and into survivorship.[8,15,16] Furthermore, educating healthcare professionals about the importance of assessing patients' needs may be a critical step to begin the process of matching services to physical and psychological needs.

Whereas it is not a new recommendation, our results confirm that targeted psychosocial interventions designed to mitigate unmet needs of cancer patients through the dissemination of personalized, relevant, and high-quality health information through various health communication channels and support services may make significant contributions to promoting health for cancer patients. [17]For example, individualized interventions led by healthcare professionals and telephone interventions have been efficacious in reducing the unmet supportive care needs.[46,47] This would ensure that those at risk of experiencing unresolved needs could be identified and support implemented.

Our study provides an initial indication of some predictors of unmet needs, but further research is needed to confirm these findings. Future studies also need to identify appropriate intervention channels and campaigns to deliver tailored psychosocial interventions for cancer patients who are at risk of unmet needs.

Conclusion

As with any research endeavor, this study had both strengths and limitations. For one, the sample was mostly white women and just over half of the participants were reporting on a breast cancer diagnosis. However, other aspects of the sample were more diverse, particularly in terms of age, education level, and staging and site of the cancer diagnosis. The sample also may be unrepresentative of the general population of cancer patients as the participants were drawn from a private hospital system that is not engaged with underserved, minority populations that are more often served in safety-net systems of care. Future studies should attempt more rigorous sampling approaches to ensure more representative samples.

Results from this and other research will provide evidence to further assess the importance of measuring unmet needs as a critical step in providing high quality care and developing tailored psychosocial interventions to meet the needs of cancer patients.[46] This study also may provide at least one practical insight for healthcare professionals. Although our data are cross-sectional, by enrolling participants across the cancer care and immediate post-care continuum, insight is provided as to the continued presence of unmet needs into the early survivorship phase. The implication is that supportive care needs would best be assessed and monitored at various time points, beginning with initial diagnosis and continuing through the start of treatment, completion of primary treatment, and early survivorship and/or recurrence. Bridges between the systems providing treatment and those providing follow-up care (including palliative care may be served best by strengthening the spectrum of assessments through the transition planning process. By assessing needs at key time points, healthcare professionals can develop and implement individualized care not only for the recently diagnosed, but for those at any point in their cancer journey.

Acknowledgments

The authors dedicate this article to the memory of Julie McNulty, RN, PhD, CPHQ, who passed away at the end of data collection. The authors gratefully acknowledge her contribution in developing and conducting this research. Her passion for, and dedication to improving health and wellness for cancer patients and survivors will be remembered. This study was supported by the

Francis Postdoctoral Fellowship in Bio-behavioral Oncology at ASU College of Nursing and Health Innovation and the Mayo Clinic Arizona, Research on Health Equity and Community Health.

Human Subjects Approval Statement

Mayo Clinic Institutional Subject Review Board # 14-000278, for the protocol entitled "Supportive Care Needs and Resource Assessment in Cancer Patients" was classified as minimal risk and approved on August 26, 2014.

Conflict of Interest Disclosure Statement

The authors have no conflicts of interest to declare.

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