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ORIGINAL ARTICLE

Unmet supportive care needs in Hispanic/Latino cancer survivors: prevalence and associations with patient-provider communication, satisfaction with cancer care, and symptom burden

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Abstract

Purpose The aim of this study was to elucidate the prevalence of unmet supportive care needs in Hispanic/Latino cancer survivors and examine the association between unmet needs and patient-provider communication, satisfaction with cancer care, and cancer-specific symptom burden.

Methods Hispanics/Latinos diagnosed with breast, prostate, or colorectal cancer within 15 months of treatment completion (n = 288) completed questionnaires as part of an NCI-funded project.

Results Hispanic/Latino cancer survivors reported greater unmet needs compared to previously published norms in primarily non-Hispanic/Latino white samples. Across the three cancer types, the two most common unmet needs were in the psychological domain: fear of metastasis (32.6%) and concern for close others (31.3%). However, unmet needs varied by cancer type. Factors associated with greater unmet needs included more recent cancer diagnosis (OR .98 [.96–.99]), younger age (OR .96–.97 [.93–.99]), female gender (OR 2.53–3.75 [1.53–7.36]), and being single (OR 1.82 [1.11–2.97]). Breast cancer survivors reported greater unmet needs than both prostate and colorectal cancer survivors (OR 2.33–5.86 [1.27–14.01]). Adjusting for sociodemographic and medical covariates, unmet needs were associated with lower patient-provider communication self-efficacy ($B = -.18$–$-.22$, p's $< .01$) and satisfaction with cancer care ($B = -3.57$–-3.81, p's $< .05$), and greater breast ($B = -4.18$–-8.30, p's $< .01$) and prostate ($B = -6.01$–-8.13, p's $< .01$) cancer-specific symptom burden.

Conclusions Findings document unmet supportive care needs in Hispanic/Latino cancer survivors and suggest that reducing unmet needs in Hispanic/Latino cancer survivors may improve not only satisfaction with care, but also health-related quality of life.

Keywords Hispanic · Latino · Survivorship · Supportive care · Unmet needs · Patient-provider communication · Satisfaction with care

Unmet supportive care needs are defined as concerns or needs that cancer survivors report have not been adequately addressed or met by the healthcare team [1–6], usually assessed across psychological (PSY), health system and information (HSI), patient care and support (PCS), physical and daily living (PDL), and sexuality (SXN) domains [1, 7–9]. Importantly, unmet supportive care needs in cancer survivors are associated with worse symptom burden, lower physical functioning, and greater emotional distress [4–6, 10, 11]. Furthermore, unmet needs are associated with lower satisfaction with cancer care [10] and lower patient ratings of patient-provider communication [12], which can lead to poor adherence to treatment [13–17] and, in turn, increases in healthcare

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costs, medical visits, and risk of disease progression and mortality [18–21].

Previous studies demonstrate that factors associated with greater unmet needs among non-Hispanic/Latino white cancer survivors include younger age, female gender, less time since diagnosis, and more advanced disease [6, 22–24]. Despite findings suggesting that Hispanics/Latinos (referred to as Hispanics hereafter) and other racial/ethnic minorities may not be amenable to psychosocial/supportive cancer care services due to cultural norms and stigma associated with mental health services [25], previous studies [26–28] demonstrate that Hispanic cancer survivors endorse greater unmet supportive care needs than non-Hispanic whites. In fact, one study [28] found that Hispanic cancer survivors endorse greater unmet supportive care needs (e.g., information regarding their disease, treatment side effects, pain management; support managing stress, depressed mood, and worries about close others) than African Americans, even when adjusting for covariates such as education, time since diagnosis, and treatment status. However, these studies have been limited by small subsamples of Hispanics (*n*'s = 40–48) [26, 28] or the use of author-created asessments of unmet needs [27].

Quality of life disparities are well-documented among Hispanic cancer survivors [29–32]; however, Hispanics remain underrepresented in cancer survivorship research and to our knowledge no previous research has characterized unmet supportive care needs using a well-validated measure in a relatively large, diverse sample of Hispanic cancer survivors in the United States. Therefore, the primary aim of this study was to assess and characterize unmet supportive care needs in Hispanics ($n = 288$) diagnosed and treated for the three most common non-skin cancers in this population: breast, prostate, and colorectal cancer [33]. More specifically, we aimed to elucidate the prevalence of unmet supportive care needs in order to facilitate comparison with previously published studies in non-Hispanic white cancer survivors and identify demographic, sociocultural, and medical factors associated with greater unmet supportive care needs. In light of previous research documenting the relationship of unmet supportive care needs with patient-provider communication [12], satisfaction with cancer care [10], and symptom burden [4, 5], we also examined the association between unmet supportive care needs with patient-provider communication self-efficacy, satisfaction with cancer care, and cancer-specific symptom burden.

Methods

Participants

The current sample ($n = 288$) was derived from baseline data of a National Cancer Institute (NCI) funded project that aimed to reduce symptom burden and improve adherence to treatment recommendations in Hispanic cancer survivors. Eligibility criteria included a diagnosis of breast, colorectal, or prostate cancer; completion of primary cancer treatment within the past 15 months; self-identification as Hispanic/Latino; and verbal fluency in Spanish or English. Individuals with evidence of metastatic disease, current severe mental illness (e.g., psychosis), active suicidal ideation, and/or substance dependence within the past year were excluded.

Procedures

Potential participants were identified via medical chart review and recruited from major tertiary medical centers in Chicago and San Antonio. Upon recruitment, participants provided informed consent and completed a comprehensive psychosocial baseline in-person assessment (approximately 90 min) with trained bilingual interviewers. Participants had the option of completing the baseline assessment in English or Spanish based on their language preferences and were compensated $25 for participation, as well as parking and other transportation reimbursements. All measures used in this study have been previously translated and validated in both English- and Spanish-speaking samples with good to excellent psychometric properties. All procedures performed were approved by the Institutional Review Board (IRB) of each institution and were in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments. Informed consent was obtained from all individual participants included in the study. Data were collected between February 2012 and January 2015.

Measures

Electronic health records were reviewed to capture: diagnosis, stage of disease (TNM staging system), treatment type, months since diagnosis, and months since treatment completion. The 34-item short form Supportive Care Needs Survey (SCNS) [2, 7] was used to assess unmet needs across five domains: psychological (PSY), health system and information (HSI), patient care and support (PCS), physical and daily living (PDL), and sexuality (SXN). For each item, participants indicated their level of need over the past month [1 (*not applicable*), 2 (*satisfied*), 3 (*low need*), 4 (*moderate need*), and 5 (*high need*)]. Following standard scoring procedures for this measure [3, 8, 9, 34], each domain was dichotomized to categorize participants as having unmet needs if they endorsed at least one 'moderate' to 'high' unmet need in that domain. Per scoring guidelines, standardized sum scores were also computed to facilitate comparison with previous samples [7–9]. The 10-item Perceived Efficacy in Patient-Physician Interactions (PEPPI) [35] assessed self-efficacy (i.e., confidence) in patient-provider communication. The 18-item

Table 1 Sociodemographic characteristics

	Combined		Breast cancer		Prostate cancer		Colorectal cancer	
	(*n* = 288)		(*n* = 128)		(*n* = 90)		(*n* = 70)	
Age, mean (*SD*)	56.05	(10.20)	51.44	(9.13)	63.07	(8.23)	55.03	(9.30)
Years living in the US, mean (*SD*)	28.65	(14.48)	24.64	(14.21)	32.89	(14.52)	29.68	(12.97)
Gender, % (*n*)								
Female	53.8	(155)	100	(128)	0	(0)	38.6	(27)
Male	46.2	(133)	0	(0)	100	(90)	61.4	(43)
Race, % (*n*)								
White	88.2	(254)	86.7	(111)	86.7	(78)	92.9	(65)
Black	.3	(1)	0	(0)	1.1	(1)	0	(0)
Native American	.3	(1)	0	(0)	1.1	(1)	0	(0)
Other	8.7	(25)	10.2	(13)	9.0	(9)	4.3	(3)
Unknown	2.1	(6)	3.1	(4)	0	(0)	2.8	(2)
Missing	.3	1	0	(0)	1.1	(1)	0	(0)
Ethnicity, % (*n*)								
Hispanic/Latino	100	(288)	100	(128)	100	(90)	100	(70)
Country/territory of origin, % (*n*)								
Mexico	80.6	(232)	78.1	(100)	84.4	(76)	80.0	(56)
Puerto Rico	5.2	(15)	4.7	(6)	6.7	(6)	4.3	(3)
Central America	1.7	(5)	3.1	(4)	1.1	(1)	0	(0)
South America	6.2	(18)	6.3	(8)	6.7	(6)	5.7	(4)
Caribbean	1.0	(3)	1.5	(2)	0	(0)	1.4	(1)
Other	1.0	(3)	1.5	(2)	1.1	(1)	0	(0)
Unknown	.7	(2)	0	(0)	0	(0)	2.9	(2)
Missing	3.5	(10)	4.7	(6)	0	(0)	5.7	(4)
Language, % (*n*)								
English monolingual	17.0	(49)	15.6	(20)	15.6	(14)	21.4	(15)
Spanish monolingual	54.2	(156)	49.2	(63)	66.7	(60)	47.1	(33)
English-Spanish bilingual	26.0	(75)	30.5	(39)	17.8	(16)	28.6	(20)
Missing	2.8	(8)	4.7	(6)	0	(0)	2.9	(2)
Nativity, % (*n*)								
US born	37.8	(109)	36.7	(47)	33.3	(30)	45.7	(32)
Foreign born	59.4	(171)	58.6	(75)	66.7	(60)	51.4	(36)
Missing	2.8	(8)	4.7	(6)	0	(0)	2.9	(2)
Immigrant generation, % (*n*)								
1st generation	56.6	(163)	52.3	(67)	67.8	(61)	50.0	(35)
2nd generation	12.8	(37)	12.5	(16)	12.2	(11)	14.2	(10)
3rd generation	10.8	(31)	14.0	(18)	5.5	(5)	11.4	(8)
4th generation	6.6	(19)	4.6	(6)	7.7	(7)	8.5	(6)
5th generation	6.9	(20)	7.8	(10)	5.5	(5)	7.1	(5)
Not applicable	2.1	(6)	2.3	(3)	0	(0)	4.2	(3)
Unknown	.7	(2)	0.8	(1)	0	(0)	1.4	(1)
Missing	3.4	(10)	5.4	(7)	1.1	(1)	2.9	(2)
Household income, % (*n*)								
Less than $11,9999	22.2	(64)	21.8	(28)	18.8	(17)	27.1	(19)
Between $12,000 and $24,999	26.7	(77)	26.5	(34)	30.0	(27)	22.8	(16)
Between $25,000 and $49,999	19.5	(56)	20.3	(26)	18.8	(17)	18.5	(13)
Between $50,000 and $99,999	9.8	(28)	6.2	(8)	13.3	(12)	11.4	(8)
More than $100,000	5.6	(16)	7.8	(10)	4.4	(4)	2.9	(2)

Table 1 (continued)

	Combined		Breast cancer		Prostate cancer		Colorectal cancer	
	($n = 288$)		($n = 128$)		($n = 90$)		($n = 70$)	
Unknown	12.5	(36)	10.1	(13)	14.4	(13)	14.2	(10)
Missing	3.8	(11)	7.0	(9)	0	(0)	2.9	(2)
Educational history, % (*n*)								
Less than high school	39.2	(113)	30.4	(39)	44.4	(40)	48.5	(34)
High school or equivalency (GED)	26.4	(76)	25.7	(33)	25.5	(23)	28.5	(20)
Associate's degree	6.3	(18)	7.0	(9)	4.4	(4)	7.1	(5)
Bachelor's degree	8.0	(23)	8.6	(11)	11.1	(10)	2.9	(2)
Master's degree	2.1	(6)	3.1	(4)	2.2	(2)	0	(0)
Doctoral degree (PhD, DPhil)	1.0	(3)	.8	(1)	1.1	(1)	1.4	(1)
Professional degree (MD, JD, DDS)	.7	(2)	.8	(1)	0	(0)	1.4	(1)
Other	3.1	(9)	4.6	(6)	2.2	(2)	1.4	(1)
Missing	13.2	(38)	18.7	(24)	8.8	(8)	8.5	(6)
Relationship Status, % (*n*)								
Single	11.5	(33)	10.9	(14)	8.8	(8)	15.7	(11)
Married or living with partner	61.5	(177)	56.2	(72)	76.6	(69)	51.4	(36)
Dating	.3	(1)	0	(0)	0	(0)	1.4	(1)
Separated	5.6	(16)	7.8	(10)	3.3	(3)	4.2	(3)
Divorced	13.5	(39)	14.8	(19)	7.7	(7)	18.5	(13)
Widowed	4.9	(14)	5.4	(7)	3.3	(3)	5.7	(4)
Missing	2.8	(8)	4.6	(6)	0	(0)	2.9	(2)
Parental status, % (*n*)								
Yes	87.8	(253)	8.6	(11)	7.7	(7)	12.8	(9)
No	9.4	(27)	86.7	(111)	92.2	(83)	84.2	(59)
Missing	2.8	(8)	4.6	(6)	0	(0)	2.9	(2)

Patient Satisfaction with Cancer Care Scale [36] assessed satisfaction with cancer care. Symptom burden subscales for the FACT-B [37] (10 items) and FACT-P [38] (12 items) were administered to assess cancer-specific symptom burden in breast ($n = 128$) and prostate ($n = 90$) cancer survivors, respectively. *Lower scores reflect worse symptom burden.* The symptom burden subscale for the FACT-C [39] (7 items) was not analyzed because of low internal consistency ($\alpha < .70$), possibly due to fewer items in this subscale and the smaller subsample of colorectal cancer survivors ($n = 70$). The 12-item Short Acculturation Scale for Hispanics (SASH) [40] assessed US acculturation.

Statistical analyses

All analyses were conducted in SPSS 23.0 (IBM). Descriptive analyses examined the percentage of individuals that endorsed supportive care needs as a 'moderate' or 'high' unmet need, both across the sample and by each cancer type, in order to identify the ten most prevalent unmet needs. Descriptive analyses also examined the percentage of individuals endorsing at least one 'moderate' or 'high' unmet need in each of the five supportive care needs domains.

Correlates of unmet supportive care needs in each domain were identified using logistic regression analyses that regressed each supportive care need domain (dichotomized: 0 = no or low need and 1 = at least one moderate to high unmet need, per standard scoring procedures for this measure [3, 8, 9, 34]) on demographic (i.e., gender, age, income, marital status, and education), sociocultural (i.e., nativity, acculturation, and language), and medical variables (i.e., time since diagnosis, cancer stage, cancer type, and treatment type). The relationship between unmet supportive care needs with patient-provider communication self-efficacy, satisfaction with cancer care, and cancer-specific symptom burden was examined using linear regression analyses. Patient-provider communication self-efficacy, satisfaction with cancer care, and cancer-specific symptom burden were separately regressed on each supportive care need domain (dichotomized: 0 = no or low need and 1 = at least one moderate to high unmet need) adjusting for the identified demographic, sociocultural, and medical correlates of each supportive care need domain (cancer type was only controlled for in analyses examining

Table 2 Medical and cancer characteristics

	Combined		Breast cancer		Prostate cancer		Colorectal cancer	
	(*n* = 288)		(*n* = 128)		(*n* = 90)		(*n* = 70)	
Months since diagnosis, mean (*SD*)	11.98	(5.53)	11.16	(5.04)	11.78	(5.45)	13.76	(6.17)
Months since treatment, mean (*SD*)	5.00	(4.38)	3.92	(3.68)	5.17	(4.57)	6.64	(4.78)
Cancer type, % (*n*)								
Prostate	31.3	(90)	0	(0)	100	(90)	0	(0)
Breast	44.4	(128)	100	(128)	0	(0)	0	(0)
Colorectal	24.3	(70)	0	(0)	0	(0)	100	(70)
Cancer stage, % (*n*)								
0	2.1	(6)	4.7	(6)	0	(0)	0	(0)
I	20.1	(58)	33.5	(43)	10.0	(9)	8.5	(6)
II	35.4	(102)	35.1	(45)	42.2	(38)	27.1	(19)
III	25.0	(72)	14.0	(18)	22.2	(20)	48.5	(34)
Missing	17.3	(50)	12.5	(16)	25.5	(23)	15.7	(11)
Treatment type, % (*n*)								
Neoadjuvant chemotherapy	16.0	(46)	16.4	(21)	0	(0)	35.7	(25)
Adjuvant chemotherapy	31.3	(90)	39.8	(51)	1.1	(1)	54.3	(38)
Radiation therapy	56.6	(163)	63.3	(81)	62.2	(56)	37.1	(26)
Hormone therapy	46.9	(135)	75.8	(97)	29.7	(38)	0	(0)
Immunotherapy	7.6	(22)	16.4	(21)	1.1	(1)	0	(0)
Study site, % (*n*)								
San Antonio	59.4	(171)	57.8	(74)	55.6	(50)	67.1	(47)
Chicago	40.6	(117)	42.2	(54)	44.4	(40)	32.9	(23)

patient-provider communication self-efficacy and satisfaction with cancer care since symptom burden was specific to each cancer type [within group]).

Results

Tables 1 and 2 display the sociodemographic and medical characteristics of the sample, respectively. Participants were on average 56 years old ($M = 56.05$, $SD = 10.20$), married or cohabitating (61.5%), and reported a high school education or less (65.6%) and a combined household income less than $50,000 (68.4%) with approximately half of the sample reporting a combined household income less than $25,000 (48.9%). Most participants were foreign born (59.4%) and were either monolingual Spanish-speaking (54.2%) or English-Spanish bilingual (26.0%). Participants were on average diagnosed 12 months previously ($M = 11.98$, $SD = 5.53$) with breast (44.4%), colorectal (24.3%), and prostate (31.3%) cancer. The majority of participants were diagnosed with stage 0 (2.1%), I (20.1%), and II (35.4%) cancer, and one quarter of participants were diagnosed with stage III (25.0%). Approximately one third received chemotherapy (31.3%) and half received radiation (56.6%) and hormone therapy (46.9%).

Table 3 displays the top ten most prevalent 'moderate' to 'high' unmet supportive care needs, across the sample and by cancer type. Across the three cancer types, the two most common unmet needs were in the PSY domain: fear of metastasis (32.6%) and concern for close others (31.3%). Table 4 displays standardized sum scores for each supportive care need domain and the percentage of individuals endorsing at least one 'moderate' or 'high' unmet need in each supportive care need domain, across the sample and by cancer type. Across the three cancer types, the top two domains with at least one 'moderate' or 'high' unmet need were the PSY and HSI domains (49.3% and 36.8%, respectively).

Correlates of unmet supportive care needs

Table 5 displays identified correlates of unmet supportive care need domains. Younger age was associated with greater unmet needs across all domains (OR .96–.97, 95% CI [.93–.99], p's $< .01$) except SXN ($p > .10$). Women endorsed greater unmet needs than men across all supportive care needs domains (OR 2.53–3.75, 95% CI [1.53–7.36], p's $< .001$) except SXN ($p > .10$). Single survivors (i.e., single, divorced, and widowed) endorsed greater unmet PSY supportive care needs than married survivors (OR 1.82 95% CI [1.11–2.97], p

Table 3 Most prevalent ‘moderate’ to ‘high’ unmet supportive care needs

Overall				Prostate cancer				Breast cancer				Colorectal cancer			
Rank	Item	%	Domain	Rank	Item	%	Domain	Rank	Item	%	Domain	Rank	Item	%	Domain
1	Fears about the cancer spreading	32.6	PSY	1	Changes in your sexual relationships	32.6	SXN	1	Fears about the cancer spreading	43.8	PSY	1	Concerns about the worries of those close to you	31.0	PSY
2	Concerns about the worries of those close to you	31.3	PSY	2	Changes in sexual feelings	28.1	SXN	2	Uncertainty about the future	36.7	PSY	1	Not being able to do the things you used to do	31.0	PDL
3	Not being able to do the things you used to do	29.2	PDL	3	To be given information re. sexual relationships	27.0	SXN	3	Not being able to do the things you used to do	35.2	PDL	3	Fears about the cancer spreading	26.8	PSY
4	Uncertainty about the future	26.7	PSY	4	Fears about the cancer spreading	21.3	PSY	4	Worry that the results of treatment are beyond your control	32.8	PSY	4	Uncertainty about the future	25.4	PSY
5	Changes in your sexual relationships	26.0	SXN	5	Anxiety	20.2	PSY	4	Lack of energy and tiredness	32.8	PDL	5	Lack of energy and tiredness	22.5	PDL
6	Changes in sexual feelings	24.7	SXN	6	Feeling down or depressed	19.1	PSY	6	Feelings of sadness	31.3	PSY	6	Feelings of sadness	21.1	PSY
6	Lack of energy and tiredness	24.7	PDL	6	Not being able to do the things you used to do	19.1	PDL	7	Being informed about cancer which is under control or diminishing (i.e., remission)	30.5	HSI	6	Feeling down or depressed	21.1	PSY
8	Feelings of sadness	24.3	PSY	8	Feelings of sadness	16.9	PSY	8	Learning to feel in control of your situation	29.7	PSY	6	Anxiety	21.1	PSY
9	Feeling down or depressed	23.6	PSY	9	Concerns about the worries of those close to you	14.6	PSY	9	Being adequately informed re. the benefits/side effects of treatments before you choosing	28.1	HSI	9	Worry that the results of treatment are beyond your control	19.7	PSY
10	Anxiety	23.3	PSY	9	Lack of energy and tiredness	14.6	PDL	9	Feeling down or depressed	28.1	PSY	9	Changes in your sexual relationships	19.7	SXN
												9	Pain	19.7	PDL

Table 4 Supportive care need domains: prevalence of unmet needs and standardized sum scores

	Overall		Prostate cancer		Breast cancer		Colorectal cancer	
Supportive care need domain	% Unmet need	M (SD)	% Unmet need	M (SD)	% Unmet need	M (SD)	% Unmet need	M (SD)
Psychological (PSY)	49.3	32.05 (27.41)	33.7	22.00 (23.80)	62.5	41.63 (26.42)	45.1	28.22 (28.23)
Health system and information (HSI)	36.8	28.46 (26.00)	22.5	18.08 (21.69)	50.0	39.24 (26.00)	31.0	22.92 (24.16)
Patient care and support (PCS)	19.4	21.95 (24.03)	7.9	11.24 (18.48)	31.3	33.34 (25.21)	12.7	15.94 (19.54)
Physical and daily living (PDL)	19.4	21.95 (24.22)	7.9	11.24 (18.48)	31.3	33.26 (25.63)	12.7	15.94 (19.54)
Sexuality (SXN)	29.2	31.26 (32.47)	36.0	36.65 (32.45)	27.3	31.13 (33.11)	23.9	24.51 (30.50)

'Unmet need' defined as the endorsement of at least one 'moderate' or 'high' unmet need in corresponding domain

$< .05$). Survivors with at least a high school education endorsed marginally greater unmet HSI needs than those with less than a high school education (OR 1.58, 95% CI [.94–2.66], $p < .10$). Greater US acculturation was associated with greater unmet needs in the PCS and PDL domains (OR 1.46–1.47, 95% CI [1.10–1.96], p's $< .01$) and marginally greater unmet SXN needs (OR 1.25, 95% CI [.97–1.62], $p < .10$). English monolingual survivors endorsed greater unmet needs in the PCS, PDL, and SXN domains (OR 2.31–2.32, 95% CI [1.10–4.86], p's $< .05$) than Spanish monolingual survivors (bilingual survivors did not differ from either English or Spanish monolingual survivors). Greater time since diagnosis was associated with lower unmet PSY needs (OR .98, 95% CI [.96–.99], $p < .05$). Breast cancer survivors endorsed greater unmet needs across all domains (OR 2.33–5.93, 95% CI [1.27–14.01], p's $< .01$) than both prostate and colorectal cancer survivors except SXN (prostate and colorectal cancer survivors did not differ). Unmet needs were not associated with income, nativity, cancer stage, or treatment type.

Patient-provider communication self-efficacy, satisfaction with cancer care, cancer-specific symptom burden

Table 6 displays the association of unmet supportive care need domains with satisfaction with cancer care and cancer-specific symptom burden when adjusting for the demographic, sociocultural, and medical correlates of each supportive care need domain that were identified above. Unmet PSY needs were associated with lower patient-provider communication self-efficacy ($B = -.18$, $p < .01$) and greater symptom burden in prostate ($B = -6.01$, $p < .01$) and breast ($B = -8.30$, $p < .001$) cancer survivors. Unmet HSI needs were associated with lower patient-provider communication self-efficacy ($B = -.22$, $p < .01$) and satisfaction with cancer care ($B = -3.81$, $p < .01$) and greater symptom burden in prostate ($B = -6.75$, $p < .01$) and breast ($B = -6.36$, $p < .001$) cancer survivors. Unmet PCS needs were associated with marginally lower patient-provider communication self-efficacy ($B = -.15$, $p < .10$), lower satisfaction with cancer care ($B = -3.57$, $p < .05$), and greater symptom burden in breast cancer survivors ($B = -4.20$, $p < .01$). Unmet PDL needs were associated with lower satisfaction with cancer care ($B = -3.65$, $p < .05$) and greater symptom burden in breast cancer survivors ($B = -4.18$, $p < .01$). Unmet SXN needs were associated with marginally lower satisfaction with cancer care ($B = -2.05$, $p < .10$) and greater symptom burden in prostate ($B = -8.13$, $p < .001$) and breast ($B = -6.24$, $p < .001$) cancer survivors.

Conclusions

The primary aim of this paper was to document the prevalence of unmet supportive care needs in Hispanic cancer survivors and examine the association between unmet needs and patient-provider communication self-efficacy, satisfaction with cancer care, and cancer-specific symptom burden. Unmet supportive care needs were assessed in five domains: psychological (PSY), health system and information (HSI), patient care and support (PCS), physical and daily living (PDL), and sexuality (SXN). Our sample was primarily foreign born, Spanish-speaking, had a high school education or less and an annual household income below $50,000. Unmet supportive needs in the current sample were elevated compared to previously published norms in primarily non-Hispanic white samples (see [7–9] for standardized sum scores; see [3, 9, 34] for rates of most prevalent unmet needs). Similar to findings in previous studies [9, 34], the two most common unmet needs across the three cancer types were in the PSY domain with approximately one third of survivors

Table 5 Correlates of unmet supportive care need domains

	Unmet supportive care need domain									
	Psychological needs (PSY)		Health system and information needs (HSI)		Patient care and support needs (PCS)		Physical and daily living needs (PDL)		Sexuality needs (SXN)	
	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)	B (SE)	OR (95% CI)
Demographic variables										
Age (years)	− .04 (.01)**	.96 (.94–.99)	− .05 (.01)**	.97 (.93–.98)	− .04 (.02)**	.96 (.93–.99)	− .04 (.02)**	.96 (.93–.99)	− .01 (.01)	.99 (.96–1.01)
Gender										
Female vs. male (ref)	1.10 (.25)***	3.01 (1.85–4.90)	.93 (.26)***	2.53 (1.53–4.19)	1.32 (.34)***	3.75 (1.91–7.36)	1.31 (.34)***	3.72 (1.90–7.29)	− .21 (.26)	.81 (.49–1.36)
Marital status										
Not married vs. married (ref)	.60 (.25)*	.1.82 (1.11–2.97)	.06 (.26)	1.06 (.64–1.75)	.04 (.31)	1.04 (.57–1.92)	.03 (.31)	1.03 (.56–1.89)	-.38 (.28)	.68 (.39–1.18)
Education										
At least H.S. vs. less than H.S. (ref)	.35 (.25)	1.43 (.87–2.34)	.46 (.27)†	1.58 (.94–2.66)	.54 (.34)	1.72 (.89–3.31)	.55 (.34)	1.73 (.90–3.34)	.23 (.28)	1.26 (.73–2.18)
Sociocultural variables										
Acculturation	.15 (.12)	1.17 (.93–1.47)	.12 (.12)	1.13 (.89–1.43)	.39 (.15)**	1.47 (1.11–1.96)	.38 (.15)**	1.46 (1.10–1.95)	.23 (.13)†	1.25 (.97–1.62)
Language										
English vs. Spanish monolingual (ref)	.45 (.33)	1.57 (.82–3.00)	.46 (.33)	1.58 (.83–3.02)	.84 (.38)*	2.31 (1.10–4.86)	.84 (.38)*	2.31 (1.10–4.86)	.78 (.34)*	2.32 (1.11–4.28)
Bilingual vs. Spanish monolingual (ref)	.13 (.28)	1.14 (.66–1.98)	.03 (.29)	1.03 (.58–1.82)	.39 (.36)	1.47 (.73–2.96)	.37 (.36)	1.45 (.72–2.91)	.25 (.31)	1.29 (.70–2.38)
Bilingual vs. English monolingual (ref)	.32 (.37)	1.37 (.66–2.85)	.43 (.38)	1.54 (.74–3.21)	.45 (.42)	1.57 (.69–3.58)	.47 (.42)	1.60 (.70–3.64)	.53 (.39)	1.69 (.80–3.60)
Medical variables										
Time since Diagnosis (months)	− .03 (.01)*	.98 (.96–.99)	− .01 (.01)	.99 (.98–1.01)	− .02 (.02)	.98 (.95–1.01)	− .02 (.02)	.98 (.95–1.01)	− .01 (.01)	1.01 (1.00–1.03)
Cancer type										
Breast vs. prostate cancer (ref)	1.31 (.29)***	3.71 (2.09–6.60)	1.31 (.31)***	3.69 (2.01–6.76)	1.78 (.44)***	5.93 (2.51–14.01)	1.77 (.44)***	5.86 (2.48–13.83)	− .32 (.30)	.72 (.40–1.30)
Breast vs. colorectal cancer (ref)	.85 (.31)**	2.33 (1.27–4.28)	.92 (.32)**	2.51 (1.34–4.70)	1.19 (.41)**	3.28 (1.48–7.28)	1.18 (.41)**	3.24 (1.46–7.18)	.31 (.35)	1.36 (.68–2.70)
Prostate vs. colorectal cancer (ref)	− .47 (.33)	.63 (.33–1.20)	− .38 (.36)	.68 (.34–1.39)	− .59 (.53)	.55 (.20–1.57)	− .59 (.53)	.55 (.20–1.57)	.63 (.36)	1.88 (.93–3.81)

$^{\dagger}p<.10$, $^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$

Table 6. Association of unmet supportive care needs with patient-provider self-efficacy, satisfaction with cancer care, and cancer-specific symptom burden

	Patient-provider communication self-efficacy		Satisfaction with cancer care		Prostate cancer symptom burden		Breast cancer symptom burden	
Unmet supportive care needs	B (SE)	(95% CI)	B (SE)	(95% CI)	B (SE)	(95% CI)	B (SE)	(95% CI)
Psychological (PSY)	− .18 (.07)**	(− .32 to − .05)	− 1.66 (1.23)	(− 4.08 to .75)	− 6.01 (2.02)**	(− 10.03 to − 1.98)	− 8.30 (1.33)***	(− 10.95 to − 5.66)
Health system and information (HSI)	− .22 (.07)**	(− .36 to − .08)	− 3.81 (1.18)**	(− 6.14 to − 1.48)	− 6.75 (2.12)**	(− 10.96 to − 2.54)	− 6.36 (1.39)***	(− 9.12 to − 3.60)
Patient care and support (PCS)	− .15 (.09)†	(− .32 to .03)	− 3.57 (1.47)*	(− 6.46 to − .68)	− 5.80 (3.54)	(− 12.84 to 1.24)	− 4.20 (1.45)**	(− 7.07 to − 1.32)
Physical and daily living (PDL)	− .14 (.09)	(− .31 to .03)	− 3.65 (1.46)*	(−6.53 to − .77)	− 5.80 (3.54)	(− 12.84 to 1.24)	− 4.18 (1.44)**	(− 1.33 to − 7.04)
Sexuality (SXN)	− .08 (.08)	(− .23 to .07)	− 2.05 (1.24)†	(−4.49 to .39)	− 8.13 (1.67)***	(−11.44 to − 4.81)	− 6.24 (1.54)***	(− 9.29 to − 3.20)

Analyses controlled for sociodemographic and medical covariates associated with each supportive care need domain. $^{\dagger}p < .10$, $^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

reporting fear of metastasis and concern for close others. Across the three cancer types, six of the ten most common unmet needs were in the PSY domain and the top two domains with at least one 'moderate' or 'high' unmet need were the PSY and HSI domains. Findings of the current study underline the importance of assessing and addressing supportive care needs among Hispanic cancer survivors. In particular, PSY needs, such as fear of metastasis and recurrence, distress, depressed mood, and difficulty managing social support, should be closely monitored as these were the most highly endorsed unmet needs across the three cancer types.

Unmet supportive care needs also varied by cancer type. Importantly, breast cancer survivors reported greater unmet needs across all domains except SXN than both prostate and colorectal cancer survivors and may be at particular risk for untoward outcomes, even when compared to other Hispanic cancer survivors. This is consistent with our previous research demonstrating that Hispanic breast cancer survivors report lower quality of life and overall self-efficacy compared to Hispanic prostate and colorectal cancer survivors [41]. Although the top two most common unmet needs among both breast and colorectal cancer survivors were in the PSY and PDL domains, the two most common unmet needs among prostate cancer survivors were in the SXN domain with approximately one third of survivors reporting changes in sexual relationships and sexual feelings. Furthermore, the top two domains with at least one 'moderate' or 'high' unmet need among both breast and colorectal cancer survivors were in the PSY and HSI domains, whereas as they were the SXN and PSY domains for prostate cancer survivors. These findings are consistent with previous research examining unmet supportive care needs in non-Hispanic prostate cancer survivors [24] and an extensive literature documenting persistent, bothersome sexual dysfunction in men diagnosed and treated for prostate cancer [42–44], and suggest that Hispanic prostate cancer survivors also desire increased attention and support around SXN needs.

Similar to previous research examining unmet supportive care needs in non-Hispanic cancer survivors [6, 22, 23], the current study demonstrates that recent cancer diagnosis, younger age, female gender, and being single are risk factors associated with greater unmet needs among Hispanic cancer survivors. Hispanic cancer survivors who were more acculturated to the United States and highly educated also reported greater unmet needs, suggesting that they may feel more empowered or comfortable endorsing domains in which they desire more support and resources. This pattern of results is consistent with previous research demonstrating greater unmet needs in more highly educated cancer survivors [11], including cancer survivors diagnosed and treated in Mexico [23] and Puerto Rico [45]. Although a relationship between cancer stage and unmet needs was not observed in the current study, it is difficult to interpret this finding given our exclusion of survivors diagnosed with stage IV disease and oversampling of survivors with stage 0 to II cancer (which significantly truncates variance in cancer stage). Our findings highlight the importance of considering sociodemographic and medical characteristics like age, gender, acculturation, and recency of cancer diagnosis when working with Hispanics in cancer care settings as these factors may help identify individuals who are more likely to experience elevations in unmet supportive care needs and experience untoward outcomes.

The current study demonstrates that unmet supportive care needs were associated with lower patient-provider communication self-efficacy and satisfaction with cancer care as well as greater breast and prostate cancer-specific symptom burden, even when adjusting for sociodemographic and medical covariates. These findings are consistent with previous research that documents the relationship between unmet needs with lower satisfaction with cancer care [10] and greater symptom burden [6] in non-Hispanic cancer survivors. Given that lower satisfaction with patient-provicer communication and cancer care is associated with worse adherence to treatment [13–17], which, in turn, can lead to increases healthcare costs, medical visits, and risk of disease progression and mortality [18–21], unmet needs among Hispanic cancer survivors may have important consequences for both quality of life and healthcare utilization. However, given the cross-sectional design of this study, it is important to note more research is needed to determine whether unmet supportive care needs prospectively predict changes in patient-provider communication self-efficacy, satisfaction with cancer care, and cancer-specific symptom burden, or vice versa. Nevertheless, it is possible that Hispanic cancer survivors who perceive that their supportive care needs are inadequately addressed may experience lower confidence in their ability to communicate effectively with their provider, less satisfaction with their overall cancer care, and greater cancer-specific burden. Therefore, reducing unmet needs may be a viable target for future intervention efforts aimed at improving outcomes, such as patient-provider communication, satisfaction with care, and symptom burden, among Hispanic cancer survivors.

Strengths and limitations

The current study has several strengths, including the first comprehensive assessment of unmet supportive care needs using a well-validated measure in a relatively large, unique sample of US Hispanic cancer survivors diagnosed with the three most common non-skin cancers in this population. The primary limitation of the current study is its cross-sectional design. It is important to note that causal inference cannot be concluded, and lower patient-provider communication self-efficacy and satisfaction with cancer care or worse symptom burden may drive greater unmet supportive care needs among Hispanic cancer survivors. An important future direction is the use of longitudinal designs to examine how these relationships unfold across time and establish temporal precedence. Furthermore, future studies should consider the inclusion of Hispanic cancer survivors with primary sites of disease beyond the breast, prostate, and colon/rectum and diagnoses that span the full spectrum of disease severity (i.e., stages 0 to IV).

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Compliance with ethical standards

All procedures performed were approved by the Institutional Review Board (IRB) of each institution and were in accordance with the ethical standards of the 1964 Helsinki declaration and its later amendments.

Conflict of interest The authors declare that they have no conflict of interest.

References

1. Richardson A, Medina J, Brown V, Sitzia J (2007) Patients' needs assessment in cancer care: a review of assessment tools. Support Care Cancer 15:1125–1144. https://doi.org/10.1007/s00520-006-0205-8
2. Bonevski B, Sanson-Fisher R, Girgis A, Burton L, Cook P, Boyes A, the Supportive Care Review Group (2000) Evaluation of an instrument to assess the needs of patients with cancer. Cancer 88:217–225. https://doi.org/10.1002/(SICI)1097-0142(20000101)88:1<217::AID-CNCR29>3.0.CO;2-Y
3. McDowell ME, Occhipinti S, Ferguson M, Dunn J, Chambers SK (2010) Predictors of change in unmet supportive care needs in cancer. Psychooncology 19:508–516. https://doi.org/10.1002/pon.1604
4. Snyder CF, Garrett-Mayer E, Brahmer JR, Carducci MA, Pili R, Stearns V, Wolff AC, Dy SM, Wu AW (2008) Symptoms, supportive care needs, and function in cancer patients: how are they related? Qual Life Res 17:665–677
5. Snyder CF, Garrett-Mayer E, Blackford AL, Brahmer JR, Carducci MA, Pili R, Stearns V, Wolff AC, Dy SM, Wu AW (2009) Concordance of cancer patients' function, symptoms, and supportive care needs. Qual Life Res 18:991–998. https://doi.org/10.1007/s11136-009-9519-6
6. Fiszer C, Dolbeault S, Sultan S, Brédart A (2014) Prevalence, intensity, and predictors of the supportive care needs of women diagnosed with breast cancer: a systematic review. Psychooncology 23:361–374. https://doi.org/10.1002/pon.3432
7. McElduff P, Boyes A, Zucca A, Girgis A, et al (2004) Supportive Care Needs Survey: a guide to administration, scoring and analysis. Centre for Health Research & Psycho-oncology, Newcastle
8. Boyes A, Girgis A, Lecathelinais C (2009) Brief assessment of adult cancer patients' perceived needs: development and validation of the 34-item Supportive Care Needs Survey (SCNS-SF34). J Eval Clin Pract 15:602–606. https://doi.org/10.1111/j.1365-2753.2008.01057.x
9. Armes J, Crowe M, Colbourne L, Morgan H, Murrells T, Oakley C, Palmer N, Ream E, Young A, Richardson A (2009) Patients' supportive care needs beyond the end of cancer treatment: a prospective, longitudinal survey. J Clin Oncol 27:6172–6179. https://doi.org/10.1200/JCO.2009.22.5151
10. Brédart A, Kop J-L, Griesser A-C, Fiszer C, Zaman K, Panes-Ruedin B, Jeanneret W, Delaloye J-F, Zimmers S, Berthet V, Dolbeault S (2013) Assessment of needs, health-related quality of life, and satisfaction with care in breast cancer patients to better target supportive care. Ann Oncol 24:2151–2158. https://doi.org/10.1093/annonc/mdt128
11. Schmid-Büchi S, Halfens RJG, Müller M, Dassen T, van den Borne B (2013) Factors associated with supportive care needs of patients under treatment for breast cancer. Eur J Oncol Nurs 17:22–29. https://doi.org/10.1016/j.ejon.2012.02.003
12. Walling AM, Keating NL, Kahn KL, Mack JW, Malin J, Arora NK, Adams JL, Antonio ALM, Tisnado D (2016) Lower patient ratings of physician communication are associated with unmet need for

symptom management in patients with lung and colorectal cancer. J Oncol Pract 12:564–e669. https://doi.org/10.1200/JOP.2015.005538

13. Liu Y, Malin JL, Diamant AL, Thind A, Maly RC (2013) Adherence to adjuvant hormone therapy in low-income women with breast cancer: the role of provider–patient communication. Breast Cancer Res Treat 137:829–836. https://doi.org/10.1007/s10549-012-2387-8
14. Jacobs JM, Pensak NA, Sporn NJ, MacDonald JJ, Lennes IT, Safren SA, Pirl WF, Temel JS, Greer JA (2017) Treatment satisfaction and adherence to oral chemotherapy in patients with cancer. J Oncol Pract 13:e474–e485. https://doi.org/10.1200/JOP.2016.019729
15. Jung B, Stoll C, Feick G, Prott FJ, Zell J, Rudolph I, Huebner J (2016) Prostate cancer patients' report on communication about endocrine therapy and its association with adherence. J Cancer Res Clin Oncol 142:465–470. https://doi.org/10.1007/s00432-015-2059-2
16. Moon Z, Moss-Morris R, Hunter MS, Carlisle S, Hughes LD (2017) Barriers and facilitators of adjuvant hormone therapy adherence and persistence in women with breast cancer: a systematic review. Patient Prefer Adherence 11:305–322. https://doi.org/10.2147/PPA.S126651
17. Lin C, Clark R, Tu P, Bosworth HB, Zullig LL (2017) Breast cancer oral anti-cancer medication adherence: a systematic review of psychosocial motivators and barriers. Breast Cancer Res Treat 165:247–260. https://doi.org/10.1007/s10549-017-4317-2
18. Makubate B, Donnan PT, Dewar JA, Thompson AM, McCowan C (2013) Cohort study of adherence to adjuvant endocrine therapy, breast cancer recurrence and mortality. Br J Cancer 108:1515–1524. https://doi.org/10.1038/bjc.2013.116
19. Ganesan P, Sagar TG, Dubashi B, Rajendranath R, Kannan K, Cyriac S, Nandennavar M (2011) Nonadherence to Imatinib adversely affects event free survival in chronic phase chronic myeloid leukemia. Am J Hematol 86:471–474. https://doi.org/10.1002/ajh.22019
20. McCowan C, Wang S, Thompson AM, Makubate B, Petrie DJ (2013) The value of high adherence to tamoxifen in women with breast cancer: a community-based cohort study. Br J Cancer 109:1172–1180. https://doi.org/10.1038/bjc.2013.464
21. Darkow T, Henk HJ, Thomas SK, Feng W, Baladi J-F, Goldberg GA, Hatfield A, Cortes J (2007) Treatment interruptions and non-adherence with imatinib and associated healthcare costs. PharmacoEconomics 25:481–496. https://doi.org/10.2165/00019053-200725060-00004
22. Sanson-Fisher R, Girgis A, Boyes A, Bonevski B, Burton L, Cook P, Supportive Care Review Group (2000) The unmet supportive care needs of patients with cancer. Cancer 88:226–237. https://doi.org/10.1002/(SICI)1097-0142(20000101)88:1<226::AID-CNCR30>3.0.CO;2-P
23. Pérez-Fortis A, Fleer J, Sánchez-Sosa JJ, Veloz-Martínez MG, Alanís-López P, Schroevers MJ, Ranchor AV (2017) Prevalence and factors associated with supportive care needs among newly diagnosed Mexican breast cancer patients. Support Care Cancer 25:3273–3280. https://doi.org/10.1007/s00520-017-3741-5
24. Lintz K, Moynihan C, Steginga S, Norman A, Eeles R, Huddart R, Dearnaley D, Watson M (2003) Prostate cancer patients' support and psychological care needs: survey from a non-surgical oncology clinic. Psychooncology 12:769–783. https://doi.org/10.1002/pon.702
25. Hewitt M, Rowland JH (2002) Mental health service use among adult cancer survivors: analyses of the National Health Interview Survey. J Clin Oncol 20:4581–4590. https://doi.org/10.1200/JCO.2002.03.077
26. Tish Knobf M, Ferrucci LM, Cartmel B, Jones BA, Stevens D, Smith M, Salner A, Mowad L, Knobf MT, Ferrucci LM, Cartmel B, Jones BA, Stevens D, Smith M, Salner A, Mowad L (2012) Needs assessment of cancer survivors in Connecticut. J Cancer Surviv 6:1–10. https://doi.org/10.1007/s11764-011-0198-2
27. Yoon J, Malin JL, Tisnado DM, Tao ML, Adams JL, Timmer MJ, Ganz PA, Kahn KL (2008) Symptom management after breast cancer treatment: is it influenced by patient characteristics? Breast Cancer Res Treat 108:69–77. https://doi.org/10.1007/s10549-007-9580-1
28. Moadel AB, Morgan C, Dutcher J (2007) Psychosocial needs assessment among an underserved, ethnically diverse cancer patient population. Cancer 109:446–454. https://doi.org/10.1002/cncr.22357
29. Ayanian JZ, Zaslavsky AM, Guadagnoli E, Fuchs CS, Yost KJ, Creech CM, Cress RD, O'Connor LC, West DW, Wright WE (2005) Patients' perceptions of quality of care for colorectal cancer by race, ethnicity, and language. J Clin Oncol 23:6576–6586. https://doi.org/10.1200/JCO.2005.06.102
30. Penedo FJ, Dahn JR, Shen B-J, Schneiderman N, Antoni MH (2006) Ethnicity and determinants of quality of life after prostate cancer treatment. Urology 67:1022–1027. https://doi.org/10.1016/j.urology.2005.11.019
31. Yanez B, Thompson EH, Stanton AL (2011) Quality of life among Latina breast cancer patients: a systematic review of the literature. J Cancer Surviv 5:191–201. https://doi.org/10.1007/s11764-011-0171-0
32. Luckett T, Goldstein D, Butow PN, Gebski V, Aldridge LJ, McGrane J, Ng W, King MT (2011) Psychological morbidity and quality of life of ethnic minority patients with cancer: a systematic review and meta-analysis. Lancet Oncol 12:1240–1248. https://doi.org/10.1016/S1470-2045(11)70212-1
33. American Cancer Society (2015) Cancer facts & figures for Hispanics/Latinos 2015–2017. American Cancer Society, Atlanta
34. Boyes AW, Girgis A, D'Este C, Zucca AC (2012) Prevalence and correlates of cancer survivors' supportive care needs 6 months after diagnosis: a population-based cross-sectional study. BMC Cancer 12:150. https://doi.org/10.1186/1471-2407-12-150
35. Maly RC, Frank JC, Marshall GN, DiMatteo MR, Reuben DB (1998) Perceived Efficacy in Patient-Physician Interactions (PEPPI): validation of an instrument in older persons. J Am Geriatr Soc 46:889–894. https://doi.org/10.1111/j.1532-5415.1998.tb02725.x
36. Jean-Pierre P, Fiscella K, Freund KM, Clark J, Darnell J, Holden A, Post D, Patierno SR, Winters PC, the Patient Navigation Research Program Group (2011) Structural and reliability analysis of a patient satisfaction with cancer-related care measure. Cancer 117:854–861. https://doi.org/10.1002/cncr.25501
37. Brady MJ, Cella DF, Mo F, Bonomi AE, Tulsky DS, Lloyd SR, Deasy S, Cobleigh M, Shiomoto G (1997) Reliability and validity of the Functional Assessment of Cancer Therapy-Breast quality-of-life instrument. J Clin Oncol 15:974–986. https://doi.org/10.1200/jco.1997.15.3.974
38. Esper P, Mo F, Chodak G, Sinner M, Cella D, Pienta KJ (1997) Measuring quality of life in men with prostate cancer using the Functional Assessment of Cancer Therapy-Prostate instrument. Urology 50:920–928. https://doi.org/10.1016/S0090-4295(97)00459-7
39. Ward WL, Hahn EA, Mo F, Hernandez L, Tulsky DS, Cella D (1999) Reliability and validity of the Functional Assessment of Cancer Therapy-Colorectal (FACT-C) quality of life instrument. Qual Life Res 8:181–195
40. Marin G, Sabogal F, Marin BV, Otero-Sabogal R, Perez-Stable EJ (1987) Development of a short acculturation scale for Hispanics. Hisp J Behav Sci 9:183–205. https://doi.org/10.1177/07399863870092005
41. Moreno PI, Ramirez AG, Miguel-Majors SLS, Fox RS, Castillo L, Gallion KJ, Munoz E, Estabrook R, Perez A, Lad T, Hollowell C,

Penedo FJ Satisfaction with cancer care, self-efficacy, and health-related quality of life in Latino cancer survivors. Cancer 124:1770–1779. https://doi.org/10.1002/cncr.31263

42. Potosky AL, Reeve BB, Clegg LX, Hoffman RM, Stephenson RA, Albertsen PC, Gilliland FD, Stanford JL (2002) Quality of life following localized prostate cancer treated initially with androgen deprivation therapy or no therapy. J Natl Cancer Inst 94:430–437. https://doi.org/10.1093/jnci/94.6.430
43. Stanford JL, Feng Z, Hamilton AS, Gilliland FD, Stephenson RA, Eley JW, Albertsen PC, Harlan LC, Potosky AL (2000) Urinary and sexual function after radical prostatectomy for clinically localized prostate cancer: the prostate cancer outcomes study. JAMA 283: 354–360. https://doi.org/10.1001/jama.283.3.354
44. Litwin MS, Flanders SC, Pasta DJ, Stoddard ML, Lubeck DP, Henning JM (1999) Sexual function and bother after radical prostatectomy or radiation for prostate cancer: multivariate quality-of-life analysis from CaPSURE. Urology 54:503–508. https://doi.org/10.1016/S0090-4295(99)00172-7
45. Gonzalez V, Velez M, Pedro E, Cruz C, Cotto M, Colon M, Romaguera J, Chevere-Mourino C, Delgado- Mateu LA, Tirado-Gomez M (2009) Identification of supportive care needs in a sample of Puerto Rican cancer patients with the Supportive Care Needs Survey-34 (SCNS-34). J Clin Oncol 27:e20697–e20697. doi: https://doi.org/10.1200/jco.2009.27.15_suppl.e20697