

# Characteristics and Outcomes of Advanced Cancer Patients Who Received Palliative Care at a Public Hospital Compared with Those at a Comprehensive Cancer Center

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## Abstract

**Background:** Patients with advanced cancer experience severe physical, psychosocial, and spiritual distress requiring palliative care (PC). There are limited literature regarding characteristics and outcomes of patients evaluated by PC services at public hospitals (PHs).

**Objective, Design, Setting/Subjects, and Measurements:** To compare the outcomes of advanced cancer patients undergoing PC at a PH and those at a comprehensive cancer center (CCC). We reviewed 359 consecutive advanced cancer patients (PH, 180; CCC, 179) undergoing PC. Symptoms and outcomes at consultation and first follow-up visit were assessed. Summary statistics were used to describe patient characteristics and outcomes.

**Results:** The PH and CCC patients differed significantly according to race: 23% white, 39% black, and 36% Hispanic patients at the PH versus 66% white, 17% black, and 11% Hispanic patients at the CCC ( $p < 0.0001$ ). Ninety-six (53%) patients at PH and 178 (99%) at the CCC had health insurance ( $p < 0.0001$ ). Symptoms at consultation at PH and CCC were pain (85% and 91%, respectively;  $p = 0.0639$ ), fatigue (81% and 94%, respectively;  $p = 0.0003$ ), depression (51% and 69%, respectively;  $p = 0.0013$ ), anxiety (47% and 75%, respectively;  $p < 0.0001$ ), and well-being (63% and 93%, respectively;  $p < 0.0001$ ). Multiple interventions provided: opioids, reviews for polypharmacy, constipation management, and interdisciplinary counseling. Median time from outpatient consultation to follow-up was 29 days (range, 1–119 days) at the PH and 21 days (range, 1–275 days) at the CCC ( $p = 0.0006$ ). Median overall survival time from outpatient consultation was 473 days (95% confidence interval [CI], 205–699 days) at PH and 245 days (95% CI, 152–491 days) at CCC ( $p = 0.3408$ ).

**Conclusions:** Advanced cancer patients at both institutions frequently had multiple distressing physical and emotional symptoms, although the frequency was higher at CCC. The median overall survival duration was higher at the PH. More research is needed.

**Keywords:** advanced cancer; comprehensive cancer center; palliative care; symptom distress

## Introduction

PALLIATIVE CARE RELIEVES suffering and maximizes patients' quality of life from the time of diagnosis of a life-threatening illness in combination with curative and disease-modifying interventions.<sup>1,2</sup> The early implementation of palliative care (PC) is reportedly associated with

better quality of life, fewer depressive symptoms, less aggressive care at end of life, better longitudinal prognostic awareness, and, possibly, longer survival.<sup>3–5</sup> Meeting the needs of socioeconomically marginalized populations, as in all domains of PC, remains challenging.<sup>6–10</sup> Unfortunately, referrals for PC continue to be infrequent and offered late in the course of illness.<sup>11</sup>

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Socioeconomic disparities barriers limit some patients' access to PC specialty services.<sup>12</sup> Underserved patient populations with a high prevalence of ethnic minorities, poverty, and legal barriers, such as undocumented immigration are particularly vulnerable.<sup>13</sup>

The literature describing the demographic and clinical characteristics of patients with advanced cancer evaluated and cared for by PC teams in general public hospitals (PHs) in the United States is limited. In this study, we determined the main demographic and clinical characteristics, interventions, and outcomes of patients with advanced cancer evaluated by a PC team at a PH and those at a comprehensive cancer center (CCC).

### Patients and Methods

The Institutional Review Board at The University of Texas MD Anderson Cancer Center approved this retrospective study and waived the requirement for informed consent.

Three hundred fifty-nine consecutive advanced cancer patients referred to PC services (180 at Lyndon B. Johnson Hospital [Houston, TX] and 179 at MD Anderson Cancer Center) from March 1, 2009 to December 31, 2011, were analyzed.

Lyndon B. Johnson (LBJ) Hospital is an institutional part of Harris Health system. Harris Health is a public healthcare system that primarily serves uninsured and indigent patients in Harris County, Texas (Houston metropolitan region is included). LBJ Hospital is a 235 licensed-bed acute care institution that is staffed by physician faculty and residents of The University of Texas Health Science Center at Houston (UT Health). The division of Geriatrics and PC delivers Supportive and PC to patients with life-threatening malignant and nonmalignant illnesses through an interdisciplinary team integrated by PC specialists, internal medicine residents, geriatric and PC fellows, nurse practitioners, social worker, case manager, and chaplain. They deliver PC in the inpatient (as a consult service) and outpatient (as PC clinic and house call visits) settings. At the time of the study there were two attending physicians, two nurse practitioners, a chaplain, a case manager, and social worker from the institution.

MD Anderson Cancer Center is a 690-bed CCC with a 12-bed state-of-the-art PC Unit. A PC consultation service has been provided at MD Anderson since October 1999. This service consists of PC specialists, PC and oncology fellows, advanced practice nurses, social worker, case manager, child life specialist, chaplain, and psychological counselors. These providers consult with patients in all areas of the institution about symptom control and PC issues via a consult team, an outpatient Supportive/PC clinic, and an inpatient PC unit. At the time of the study there were 10 attending physicians, 4 nurse practitioners, a chaplain, a psychology counselor, a case manager, and a social worker from the institution.

At both sites, the PC consultation consisted of a comprehensive evaluation to identify and treat multiple distressing physical, psychosocial, and spiritual symptoms. Fellows, advanced nurse practitioners and faculty members provided individualized recommendations and plan of care that involved pharmacological and nonpharmacological interventions, including chaplain, psychology counselors, and other members of the interdisciplinary team. Follow-up was scheduled depending on patient needs. All patients included in this study received multiple interventions from supportive/

PC specialists and interdisciplinary team with common clinical pathways at consultation and during follow-up according to the patients' needs. A retrospective chart review was performed to obtain information about the patients' demographics, type and stage of cancer, clinical findings, interventions, and outcomes of interventions. Also, the median number of days from PC consultation to death was determined.

Symptom profiles were collected using the Edmonton Symptom Assessment Scale (ESAS) a visual-analog scale from 0-none to 10-worst symptom,<sup>14-16</sup> Delirium was determined using the Memorial Delirium Assessment Scale, a validated tool to evaluate patients with delirium.<sup>17-19</sup>

Based on prior studies of patients with clinically important responses to palliative interventions,<sup>20-22</sup> an intervention was considered successful when the ESAS symptom score decreased by at least two points or 30% of the baseline score.

Summary statistics were provided to describe patients' demographic and clinical characteristics. The Kruskal-Wallis test and either a chi-square test or the Fisher exact test were used for comparisons of the patients in the PH and CCC and of inpatients and outpatients for continuous and categorical variables, respectively.

Improvements in ESAS and delirium scores were assessed for each patient using the Wilcoxon signed rank test. Kaplan-Meier survival analysis, including the log-rank test, was used to assess the difference in time to death from consultation between the PH and CCC patients and between the inpatients and outpatients. *p* Values <0.05 were considered statistically significant. All computations were carried out using the SAS software program (version 9.3; SAS-Institute, Inc., Cary, NC).

### Results

The patients' median ages were 57 years at the PH and 54 years at the CCC. Table 1 lists the demographic characteristics of the patients. The age, sex, and cancer diagnosis distributions were similar at both sites. However, the racial distribution differed significantly between the PH and CCC ( $p < 0.0001$ ).

The median time from outpatient consultation to follow-up was 29 days (range, 1-119 days) at the PH and 21 days (range, 1-275 days) at the CCC ( $p = 0.0006$ ). In comparison, the median overall survival time from consultation to death for the outpatients was 473 days (95% confidence interval [CI], 205-699 days) at the PH and 245 days (95% CI, 152-491 days) at the CCC ( $p = 0.3408$ ).

Table 2 shows the frequency of ESAS symptoms at PC consultation in the two patient groups. The most frequent symptoms in patients at the PH and CCC were pain (132 [85%] and 148 [91%], respectively;  $p = 0.0639$ ), fatigue (127 [81%] and 150 [94%], respectively;  $p = 0.0003$ ), depression (79 [51%] and 108 [69%], respectively;  $p = 0.0013$ ), anxiety (72 [47%] and 119 [75%], respectively;  $p < 0.0001$ ), and well-being (94 [63%] and 129 [93%], respectively;  $p < 0.0001$ ). The symptom intensities at PC consultation are presented in Table 3. The median ESAS scores were significantly higher in patients at the CCC than at the PH for fatigue (6 vs. 5;  $p = 0.002$ ), anxiety (5 vs. 0;  $p < 0.0001$ ), lack of appetite (6 vs. 2;  $p < 0.0001$ ), and well-being (5 vs. 2;  $p < 0.0001$ ).

Table 4 describes multiple interventions of the PC teams performed to the advanced cancer patients. There was no significant difference among interventions provided to the patients: opioids, medication reviews for polypharmacy,

TABLE 1. PATIENT CHARACTERISTICS

Characteristic	PH			CCC						
	Total (n=180)	Inpatient (n=88)	p <sup>a</sup>	Outpatient (n=92)	Total (n=179)	Inpatient (n=90)	p <sup>b</sup>	Outpatient (n=92)	p <sup>c</sup>	p <sup>d</sup>
Median age, years (range)	57 (24–83)	56.5 (24–83)	0.8458	57 (25–75)	54 (20–88)	54 (20–88)	0.6875	55 (28–72)	0.0818	
Sex, n (%)										
Female	79 (44)	41 (47)	0.4750	38 (41)	78 (44)	40 (45)	0.7135	38 (42)	0.9523	
Male	101 (56)	47 (53)	<b>0.0001</b>	54 (59)	101 (56)	49 (55)	0.2764	52 (58)	<b>&lt;0.0001</b>	
Race, n (%)										
Asian	3 (2)	0 (0)		3 (3)	11 (6)	7 (8)		4 (4)		
Black	69 (39)	47 (55)		22 (24)	29 (17)	10 (11)		19 (22)		
Hispanic	63 (36)	24 (28)		39 (42)	20 (11)	11 (13)		9 (10)		
White	41 (23)	14 (17)	<b>&lt;0.0001</b>	27 (29)	115 (66)	59 (68)	1.000	56 (64)	<b>&lt;0.0001</b>	
Health insurance coverage, n (%)										
Not reported	84 (47)	22 (25)		62 (67)	1 (1)	0 (0)		1 (1)		
Reported	96 (53)	66 (75)	0.6622	30 (33)	178 (99)	89 (100)	0.3702	89 (99)	1.000	
CAGE questionnaire results, n (%)										
Negative	77 (76)	36 (78)		41 (75)	115 (76)	50 (79)		65 (73)		
Positive	24 (24)	10 (22)	<b>0.0035</b>	14 (25)	37 (24)	13 (21)	0.247	24 (27)	0.1142	
Primary cancer, n (%)										
Gastrointestinal	58 (46)	25 (42)		33 (50)	38 (31)	21 (37)		17 (27)		
Head/neck	25 (20)	15 (25)		10 (15)	31 (26)	10 (18)		21 (33)		
Urological	14 (11)	3 (5)		11 (17)	14 (12)	8 (4)		6 (9)		
Breast	16 (13)	5 (8)		11 (17)	17 (14)	6 (10)		11 (17)		
Hematological	8 (6)	7 (12)		1 (1)	9 (7)	6 (10)		3 (5)		
Gynecological	4 (3)	4 (7)		0 (0)	12 (10)	6 (10)		6 (9)		
Median time from consultation to ESAS follow-up, days (range); number of patients <sup>d</sup>	124, 4.5 (0, 119)	64, 1 (0,10)	<b>&lt;0.0001</b>	60, 29 (1, 119)	163, 9 (1, 275)	88, 3 (1,65)	<b>&lt;0.0001</b>	75, 21 (1, 275)	0.6812	<b>0.0006</b>
Median overall survival time from consultation, days (95% CI)	199 (116, 243)	67 (31, 123)	<b>&lt;0.0001</b>	473 (205, 699)	77 (54, 132)	34 (24, 51)	<b>&lt;0.0001</b>	245 (152, 491)	<b>0.013</b>	0.3408

<sup>a</sup>Inpatients versus outpatients at the PH.

<sup>b</sup>Inpatients versus outpatients at the CCC.

<sup>c</sup>Total PH versus CCC.

<sup>d</sup>Between the PH and CCC for outpatient care.

<sup>e</sup>Considering patients only with ESAS at follow-up.

PH, public hospital; CCC, comprehensive cancer center; CI, confidence interval; ESAS, Edmonton Symptom Assessment Scale.

Bold p-values are significant values only.

TABLE 2. FREQUENCY OF SYMPTOMS IN ADVANCED CANCER PATIENTS AT CONSULTATION

Variable <sup>a</sup>	No. patients (%)								
	PH				CCC				
	Total (n=180)	Inpatient (n=88)	p <sup>b</sup>	Outpatient (n=92)	Total (n=179)	Inpatient (n=89)	p <sup>c</sup>	Outpatient (n=90)	p <sup>d</sup>
Pain	132 (85)	62 (86)	0.6317	70 (83)	148 (91)	66 (92)	0.9005	82 (91)	0.0639
Fatigue	127 (81)	56 (80)	0.7988	71 (82)	150 (94)	65 (94)	<b>0.9479</b>	85 (94)	<b>0.0003</b>
Nausea	69 (44)	27 (39)	0.2233	42 (48)	87 (55)	39 (56)	0.8227	48 (54)	<b>0.0556</b>
Depression	79 (51)	37 (54)	0.4483	42 (48)	108 (69)	46 (69)	0.9112	62 (69)	<b>0.0013</b>
Anxiety	72 (47)	33 (49)	0.6466	39 (45)	119 (75)	54 (79)	0.2994	65 (72)	<b>&lt;0.0001</b>
Drowsiness	78 (50)	31 (46)	0.2973	47 (54)	117 (77)	46 (73)	0.3993	71 (79)	<b>&lt;0.0001</b>
Appetite	89 (57)	43 (61)	0.2822	46 (53)	143 (91)	62 (91)	0.8028	81 (90)	<b>&lt;0.0001</b>
Dyspnea	72 (46)	37 (52)	0.1531	35 (41)	105 (65)	43 (61)	0.2708	62 (69)	<b>0.0005</b>
Sleep	90 (59)	39 (60)	0.8641	51 (59)	139 (88)	56 (82)	0.0590	83 (92)	<b>&lt;0.0001</b>
Well-being	94 (63)	46 (72)	0.0539	48 (57)	129 (93)	47 (94)	0.6830	82 (92)	<b>&lt;0.0001</b>
Delirium <sup>e</sup>	8 (7)	7 (15)	<b>0.0032</b>	1 (1)	17 (11)	12 (19)	<b>0.0090</b>	5 (6)	0.1919

<sup>a</sup>Symptoms present with an Edmonton Symptom Assessment Scale score  $\geq 1$  of 10.

<sup>b</sup>Inpatients versus outpatients at the PH.

<sup>c</sup>Inpatients versus outpatients at the CCC.

<sup>d</sup>Total PH versus CCC.

<sup>e</sup>Delirium present with a Memorial Delirium Assessment Scale value of  $\geq 7$  of 30.

Bold p-values are significant values only.

TABLE 3. INTENSITY OF SYMPTOMS AT CONSULTATION

Symptom	N/median ESAS score (range)		p <sup>a</sup>	N/median ESAS score (range)		p <sup>b</sup>	PH	CCC	p <sup>c</sup>
	Inpatient PH	Inpatient CCC		Outpatient PH	Outpatient CCC				
Pain	72.7.5 (0.10)	72.6 (0.10)	0.0463	84.6 (0.10)	90.6 (0.10)	0.9686	156.7 (0.10)	162.6 (0.10)	0.1733
Fatigue	70.5 (0.10)	69.7 (0.10)	<b>0.0108</b>	87.5 (0.10)	90.6 (0.10)	0.0589	157.5 (0.10)	159.6 (0.10)	<b>0.002</b>
Nausea	70.0 (0.9)	70.1 (0.10)	<b>0.0316</b>	87.0 (0.10)	89.1 (0.10)	0.7433	157.0 (0.10)	159.1 (0.10)	0.0882
Depression	68.2 (0.10)	67.3 (0.10)	0.6751	87.0 (0.10)	90.2 (0.10)	0.2073	155.2 (0.10)	157.2 (0.10)	0.2214
Anxiety	68.0 (0.10)	68.4 (0.10)	<b>0.0009</b>	87.0 (0.10)	90.3 (0.10)	<b>0.0145</b>	155.0 (0.10)	158.5 (0.10)	<b>&lt;0.0001</b>
Drowsiness	68.0 (0.10)	63.5 (0.10)	<b>0.0029</b>	87.2 (0.10)	90.4 (0.10)	<b>0.0010</b>	155.1 (0.10)	153.4 (0.10)	<b>&lt;0.0001</b>
Appetite	70.3 (0.10)	68.7 (0.10)	<b>&lt;0.0001</b>	87.2 (0.10)	90.5 (0.10)	<b>&lt;0.0001</b>	157.2 (0.10)	158.6 (0.10)	<b>&lt;0.0001</b>
Dyspnea	70.1 (0.10)	71.3 (0.10)	<b>0.3782</b>	86.0 (0.10)	90.3 (0.10)	<b>0.0005</b>	157.0 (0.10)	161.3 (0.10)	<b>0.0013</b>
Sleep	65.2 (0.10)	68.5 (0.10)	<b>0.0019</b>	87.3 (0.10)	90.6 (0.10)	<b>&lt;0.0001</b>	152.5 (0.10)	158.6 (0.10)	<b>&lt;0.0001</b>
Well-being	64.5 (0.10)	50.6 (0.10)	<b>0.0009</b>	85.2 (0.10)	89.5 (0.10)	<b>&lt;0.0001</b>	149.2 (0.10)	139.5 (0.10)	<b>&lt;0.0001</b>

<sup>a</sup>Between the PH and CCC for inpatient care.

<sup>b</sup>Between the PH and CCC for outpatient care.

<sup>c</sup>Between the PH and CCC for each covariate.

Bold p-values are significant values only.

TABLE 4. PALLIATIVE CARE INTERVENTIONS DELIVERED TO ADVANCED CANCER PATIENTS AT A PUBLIC HOSPITAL AND AT A COMPREHENSIVE CANCER CENTER

Covariate	No. of patients (%)								
	PH				CCC				
	Inpatient (n=90)	p <sup>a</sup>	Outpatient (n=92)	Total (n=182)	p <sup>c</sup>	Total (n=182)	Inpatient (n=90)	P value <sup>b</sup>	Outpatient (n=92)
Pain management									
Opioid started	30 (42)	<b>0.415</b>	22 (55)	52 (47)	0.8416	54 (42)	26 (39)	<b>0.0478</b>	28 (53)
Opioid rotation	12 (17)		6 (15)	18 (16)		23 (18)	18 (27)		5 (9)
Opioid adjusted	29 (41)		12 (30)	41 (37)		43 (40)	23 (34)		20 (38)
Started									
Bowel regimen	47 (52)	<b>&lt;0.0001</b>	17 (19)	64 (35)	0.6340	68 (38)	26 (29)	<b>0.0224</b>	42 (46)
Antiemetics	29 (32)	<b>&lt;0.0001</b>	6 (7)	35 (19)	0.2811	43 (24)	21 (24)	0.9273	22 (24)
Steroids	10 (11)	0.0470	3 (3)	13 (7)	0.5181	10 (5)	6 (7)	0.5338	4 (4)
Changed									
Bowel regimen	15 (17)	0.0609	7 (8)	22 (12)	0.4953	26 (15)	19 (22)	<b>0.0083</b>	7 (8)
Antiemetics	8 (9)	0.1306	3 (3)	11 (6)	0.4873	8 (4)	6 (7)	0.1642	2 (2)

<sup>a</sup>Inpatients versus outpatients at the PH.

<sup>b</sup>Inpatients versus outpatients at the CCC.

<sup>c</sup>Total PH versus CCC.

Bold p-values are significant values only.

constipation management, antiemetics, and interdisciplinary counseling.

The intensity of ESAS at the beginning of the evaluation and at the follow-up time in the different settings (inpatient and outpatient) is showed in Table 5. Also in Table 6 we describe the changes in symptoms after interventions by PC teams. We observed significant improvement in the following symptoms at the PH and CCC: pain (26% and 41%, respectively;  $p=0.0479$ ), anxiety (23% and 38%, respectively;  $p=0.0202$ ), lack of appetite (19% and 36%, respectively;  $p=0.0043$ ), sleep (25% and 40%, respectively;  $p=0.0215$ ), nausea (30% and 34%, respectively;  $p=0.3879$ ), and depression (23% and 29%, respectively;  $p=0.2796$ ).

## Discussion

We found that symptoms using the ESAS were very frequent and severe among advanced cancer patients evaluated by PC teams at both the PH and CCC. Despite this significant symptom burden in both settings, we found some important differences between the two populations. Racial minorities made up the majority of the population at the PH, and they had significantly less health insurance coverage than did white patients. Poor and marginalized populations are more likely than middle-class and insured populations to undergo care in PHs.<sup>23</sup> Unfortunately, this disparity is most significant at the end of life because of barriers to the development of PC programs at general public institutions.<sup>12,23,24</sup> The majority of PHs in the United States are owned by local or state governments.<sup>25</sup> The PH in this study has a well-established interdisciplinary PC program that is affiliated with a university system.

Inpatient and outpatient PC teams may provide improved access to PC and hospice services for racial and ethnic minorities.<sup>26–28</sup> The effective management of symptom distress requires comprehensive multicultural competency-trained interdisciplinary care.<sup>21,24</sup> These teams improve symptom management, facilitate physician-patient communication about prognosis and end-of-life decision-making, and provide emotional support to patients and family members,<sup>28</sup> also decreased healthcare costs,<sup>29–31</sup> use of intensive care at the end-of-life,<sup>29,32</sup> and more hospice referral.<sup>33,34</sup> More studies are needed to investigate these associations, especially in the PH setting.

Another interesting finding in this study is the difference in frequency and intensity of physical and emotional symptoms at the PH and CCC, specifically, less symptom expression at the former than at the latter. Although a clear explanation for this finding is lacking, differences between the two institutions in culture, possibly patient trust or fears to express the real symptom burden, prior therapy, closeness to death, lower expression of similar levels of symptom burden, and belief system may have played a role. Culture may play an important role in the perception of illness, differences in decisions about healthcare services, treatments, the possible responses of disease to the treatments, and end of life.<sup>35,36</sup> More research is needed to better understand the difference in symptom burden among this population. Clinician bias in prescribing analgesic medications, patients' beliefs, and access to appropriate pain assessment and treatment can contribute to further disparities in these settings.<sup>37–40</sup> More research is needed to determine the roles of all of these factors in symptoms expression.

TABLE 5. INTENSITY OF SYMPTOMS IN ADVANCED CANCER PATIENTS AT CONSULT AND FOLLOW-UP VISIT

Symptom	N/median ESAS score (range)				N/median ESAS score (range)			
	Inpatient PH Consult	Inpatient PH follow-up	Inpatient CCC consult	Inpatient CCC follow-up	Outpatient PH consult	Outpatient PH follow-up	Outpatient CCC consult	Outpatient CCC follow up
Pain	72.7.5 (0.10)	25.5 (0.10)	72.6 (0.10)	49.4 (0.10)	84.6 (0.10)	57.6 (0.10)	90.6 (0.10)	63.5 (0.10)
Fatigue	70.5 (0.10)	19.5 (0.10)	69.7 (0.10)	40.6 (1.10)	87.5 (0.10)	57.4 (0.10)	90.6 (0.10)	63.5 (0.10)
Nausea	70.0 (0.9)	21.0 (0.10)	70.1 (0.10)	40.1 (0.10)	87.0 (0.10)	57.0 (0.10)	89.1 (0.10)	63.1 (0.8)
Depression	68.2 (0.10)	17.0 (0.10)	67.3 (0.10)	37.2 (0.8)	87.0 (0.10)	57.0 (0.10)	90.2 (0.10)	63.2 (0.10)
Anxiety	68.0 (0.10)	18.0.5 (0.10)	68.4 (0.10)	40.3 (0.9)	87.0 (0.10)	57.0 (0.10)	90.3 (0.10)	<b>63.1 (0.10)</b>
Drowsiness	68.0 (0.10)	18.2 (0.10)	63.5 (0.10)	38.3 (0.8)	87.2 (0.10)	57.0 (0.9)	90.4 (0.10)	62.2 (0.10)
Appetite	70.3 (0.10)	17.5 (0.10)	68.7 (0.10)	33.6 (0.10)	87.2 (0.10)	57.3 (0.10)	90.5 (0.10)	63.5 (0.10)
Dyspnea	70.1 (0.10)	22.0 (0.10)	71.3 (0.10)	40.1 (0.10)	86.0 (0.10)	56.0 (0.10)	90.3 (0.10)	63.3 (0.10)
Sleep	65.2 (0.10)	19.4 (0.10)	68.5 (0.10)	38.3 (0.10)	87.3 (0.10)	56.2 (0.10)	90.6 (0.10)	63.5 (0.10)
Well-being	64.5 (0.10)	17.5 (0.10)	50.6 (0.10)	30.5 (2.9)	85.2 (0.10)	54.0 (0.10)	89.5 (0.10)	17.4 (0.10)

<sup>a</sup> $p$  value between inpatient PH consult versus inpatient PH follow-up.

<sup>b</sup> $p$  value between inpatient CCC consult versus inpatient CCC follow-up.

<sup>c</sup> $p$  value between outpatient PH consult versus outpatient PH follow-up.

<sup>d</sup> $p$  value between outpatient CCC consult versus inpatient CCC follow-up.

Bold  $p$ -values are significant values only.

TABLE 6. SYMPTOM RESPONSE AFTER PALLIATIVE CARE INTERVENTIONS AT A GENERAL PUBLIC HOSPITAL AND AT A COMPREHENSIVE CANCER CENTER

Improvement in ESAS variable <sup>a</sup>	No. of patients (%)								
	PH				CCC				
	Total (n=80)	Inpatient (n=24)	p <sup>b</sup>	Outpatient (n=56)	Total (n=104)	Inpatient (n=44)	p <sup>c</sup>	Outpatient (n=63)	p <sup>d</sup>
Pain	21 (26)	11 (46)	<b>0.0092</b>	10 (18)	43 (41)	20 (45)	0.3530	23 (37)	<b>0.0469</b>
Fatigue	24 (30)	5 (21)	0.6596	19 (34)	35 (34)	15 (34)	0.2261	20 (32)	0.5760
Nausea	24 (30)	5 (21)	0.3952	19 (34)	35 (34)	15 (34)	0.5461	20 (32)	0.3879
Depression	18 (23)	2 (8)	0.2126	16 (29)	30 (29)	11 (25)	0.6026	19 (30)	0.2796
Anxiety	18 (23)	3 (13)	0.5344	15 (27)	40 (38)	18 (41)	0.1111	22 (35)	<b>0.0202</b>
Drowsiness	23 (29)	4 (17)	0.5586	19 (34)	34 (33)	10 (23)	0.6977	24 (38)	0.3659
Shortness of breath	18 (23)	7 (29)	0.2062	11 (20)	33 (32)	12 (27)	0.9238	21 (33)	0.1368
Appetite	15 (19)	4 (17)	0.7363	11 (20)	37 (36)	12 (27)	0.6739	25 (40)	<b>0.0043</b>
Sleep	20 (25)	2 (8)	0.1263	18 (32)	42 (40)	18 (41)	0.0922	24 (38)	<b>0.0215</b>
Feeling of well-being	19 (24)	7 (29)	0.0741	12 (21)	16 (15)	9 (20)	0.8305	7 (44)	0.0796

<sup>a</sup>Defined as a decrease in ESAS score of at least two-point or a 30% of the baseline intensity.

<sup>b</sup>Between inpatients and outpatients for each covariate at the PH.

<sup>c</sup>Between inpatients and outpatients for each covariate at the CCC.

<sup>d</sup>Between PH and CCC for each covariate.

Bold p-values are significant values only.

In the outpatient setting, although the median time to referral to PC teams was more than 6 months before death in both the PH and CCC, PH patients were referred earlier, and the follow-up was less frequent than in CCC patients. It is possible that patients in the PH were referred earlier due to much more limited cancer treatment options and therefore they arrived with a lower overall symptoms burden and referred earlier to PC as compared with CCC who have more treatment options, including immunotherapy, targeted and phase I clinical trials. More research is needed to explore this finding. Improved integration of oncology and PC teams will allow patients to access earlier PC with better quality of life, symptom control, patient and family/caregiver satisfaction, communication, quality of end-of-life care, survival, and costs of care (2–5).

Probably follow-ups in CCC were more frequent due to patient’s worse symptom expression and also different clinical and staff resources to cover these needs. Our group previously showed that patients’ symptoms can change considerably over time and that they must undergo frequent follow-up examinations.<sup>41</sup> It has been reported also that simple interventions such as phoning patients to follow-up after interventions done during the clinical visit may result in improved symptom expression.<sup>42</sup> In this study we did not measure if calls were performed or not, and the quantity and content of them if they were done to the patients as a way of following the symptoms after interventions. Further studies are encouraged to evaluate the value of this type of interventions.

Another very important intervention provided by the PC teams is the support for patients and caregivers in decision making regarding end-of-life care, addressing function, spirituality, and well-being for both. Increased understanding of the reasons for delayed initial contact by the patient and the PC team and the different circumstances that may result in decreased frequency of follow-up examinations for these patients is very important.

In this study, most symptoms improved after PC intervention at both institutions, although pain, anxiety, and sleep improved more among the CCC patients. The PH and CCC patients underwent similar interventions; the lower symptom expression at follow-up may have been affected by a number of factors; the higher intensity of symptoms seen among CCC patients, and differences in culture, beliefs, trust in the medical system, patients’ psychosocial and spiritual and religious support; and also by related to differences in clinical staffing support and resources of each institution.

This study is not without its limitations. Because of its retrospective nature, we cannot establish causality of the reasons or circumstances related with the early and late involvement of PC teams in both institutions and the possible outcomes of the symptoms of the patients. Also, describing all of the interventions provided by the PC teams in the inpatient and outpatient settings at both institutions is difficult. In this study, we compared only one highly specialized CCC that serves a specific and unique population of cancer patients with only one general PH with a very different population and evaluated both inpatients and outpatients. Performing prospective multicenter studies in national and international settings is very important.

**Conclusions**

Advanced cancer patients evaluated at both institutions frequently had multiple distressing physical and emotional symptoms. Although the symptom frequency and severity was higher in patients at the CCC survival after referral was significant longer among PH patients. More research is needed to characterize the patterns of referral and PC in different settings.

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