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Patterns and Predictors of Antidepressant Use in Ambulatory Cancer Patients with Common Solid Tumors

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Abstract

Purpose—Depressive symptoms and antidepressant use are prevalent among cancer patients. We sought to identify determinants of prescribing commonly used antidepressants.

Patients and Methods—This multi-institutional study enrolled 3106 ambulatory patients with cancer of the breast, prostate, colon/rectum, or lung. Five case-finding methods were used to identify patients with depressive symptoms. Logistic models were used to examine factors that impact antidepressant use.

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Dr. Fisch had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis and the decision to submit for publication.
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Results—Approximately 47% of patients were defined as having depressive symptoms. Clinicians rated being sad/depressed as one of the top three priority problems for 10.5% of patients. Antidepressants were prescribed in 19% of all patients; 25% with depressive symptoms and 14% non-depressed patients. After adjusting for other covariates, these variable categories were significantly associated with greater use of antidepressants: depressive symptoms, family history of depression, concurrent medication use, cancer treatment status, and certain other clinical and demographic variables. The strongest individual predictors were concurrent use of more than 10 medications (odds ratio [OR] = 3.3), a family history of depression (OR = 2.2), sedative use (OR=2.1), non-Hispanic white race (OR = 2.0), and anxiolytics use (OR = 2.0).

Conclusions—Depressive symptoms are found in nearly half of outpatients with cancer, and one-fourth of patients with depressive symptoms are taking an antidepressant. Patients receiving antidepressants are more often those taking multiple medications, those with a depression diathesis, and those with more extensive cancer treatment. Patients who were younger, white and female were also more likely to be taking antidepressants.

INTRODUCTION

Depression is a common complication of cancer at any point in the trajectory of illness.[1] Depression is understood on a continuum ranging from feelings of sadness to minor (subsyndromal) depression, to the syndrome of major depressive disorder. Various criteria have been developed for diagnosing depressive disorders in cancer patients, although there is no recognized consensus on the best approach [2]. The presence of depressive symptoms has been associated with significant consequences for patients, including less satisfaction with care[3], increased use of health services[4], delayed return to work[5], reduced quality of life[6], elevated risk of suicide[7, 8], and increased mortality.[9–11] Among adults with cancer, a diagnosis of depression was associated with a 39% increase in mortality and subsyndromal depressive symptoms were associated with a 25% increase in mortality risk [9]. Up to 16% of patients with cancer receive a diagnosis of major depression,[12–15] and a significantly higher proportion (20–40%) of outpatients with cancer have clinically significant depressive symptoms.[6, 12, 16]

Oncologists and other medical subspecialists often struggle to recognize significant depressive symptoms, in part due to the overlap between depressive symptoms and cancer- and treatment-related neurovegetative symptoms.[17–19] More than 50 questionnaires have been developed for distress and depression screening,[20] 29 of which have been assessed rigorously.[21] Although the use of distress screening is increasing,[22] most oncologists avoid using long questionnaires to screen for depressive symptoms[23] owing to time and logistical constraints. Ultra-short screening methods focused on depressed mood and anhedonia has been found to have case-finding and screening abilities that match or exceed those of longer instruments.[24]

Depressive disorders can be treated effectively using antidepressant medication and/or psychotherapy. Several dozen antidepressants are available, with at least seven distinct mechanisms of action.[25] Antidepressant prescribing rates among cancer patients have increased, from as low as 3% in the 1980s[26] to 10–15% by the early 2000s.[6, 27, 28]

Serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs) have been widely adopted over the past 25 years and may be considered first line in the treatment of depressive disorders in individuals with cancer. In clinical oncology practice, antidepressants are often prescribed for symptom control. However, evidence for the effectiveness of antidepressants for depressive symptoms (in the absence of formally diagnosed depressive disorders) in cancer patients remains limited [29–31], and prescribing patterns have not been well described.

In this secondary analysis of a large, prospective, observational study of symptoms in ambulatory cancer patients with a common solid tumor (E2Z02), we focused on three objectives: 1) to describe the prevalence of depressive symptoms; 2) to determine how frequently serotonin-reuptake inhibitors (SSRI/SNRIs) are being prescribed; and 3) to identify predictors for SSRI/SNRIs use.

METHODS

Study Design and Subjects

The Eastern Cooperative Oncology Group (ECOG) Symptom Outcomes and Practice Patterns (SOAPP) study (E2Z02) was conducted in 38 institutions and enrolled 3123 patients between March 2006 and May 2008. Patients with invasive breast, colorectal, prostate, or lung cancer were enrolled from outpatient oncology clinics at any stage of their disease or point in their care. Patients treated in academic centers were enrolled from disease site–specific clinics; whereas patients treated in community clinics were enrolled from general oncology clinics. The primary objective of the SOAPP study was to use cancer patient self-reports and clinician reports to describe the prevalence, severity, and interference of the patients' symptoms[32]. The protocol was approved by the institutional review board at each registering institution. All patients provided written informed consent. Further study details on the protocol and case report forms can be found on the study website (www.ecogsoapp.org).

Study Procedures

For the SOAPP study, patients were recruited when they checked in for a clinic appointment. Patients and their treating clinicians were surveyed at the initial visit and at follow-up 28–35 days later. The initial survey was used to collect patients' basic clinical and demographic information, including cancer treatment history and current therapies. At the initial and follow-up visits, patients reported symptom intensity and functional interference using the MD Anderson Symptom Inventory (MDASI), a validated 25-item measure that is very similar to the Brief Pain Inventory in terms of structure and patient burden assessment [33]. Patients were asked to read the instructions at the beginning of the questionnaire and complete all items with reference to their experience during the preceding 24 hours. Specifically, patients used the MDASI to rate on an 11-point Likert scale ranging from 0 ("not present") to 10 ("as bad as you can imagine") the highest level of intensity of the symptoms (19 items) and functional interference (6 items) that they had experienced in the previous 24 hours. At the initial visit, clinicians reported patients' medications use,

including those that were newly prescribed, and ascertained symptom prioritization for the patient.

Study Measures

Five case-finding indicators were used to identify patients with depressive symptoms at study enrollment. Three of these indicator methods were based on patient self-report using the MDASI scale: (1) feeling of sadness (MDASI item 11), (2) feeling of being distressed (MDASI item 5), and (3) interference with mood or enjoyment of life (MDASI items 21 and 25, respectively). The other two indicators were based on clinician reports: (4) presence of psychological distress using the Revised Edmonton Staging System (rESS)[34] and (5) listing sadness/depression as one of the top three symptoms causing difficulties for the patient from a list of 22 common concerns. In this report, a patient is defined to have depressive symptoms if their (1) score for feeling of sadness (MDASI item 11) is ≥4, (2) score for feeling distressed (MDASI item 5) is ≥4, and (3) score for interference with mood (MDASI item 21) or enjoyment (MDASI item 25) is ≥7; these items mirror the content of two items from the Personal Health Questionnaire (PHQ-9) often used for phased screening for depression. Furthermore, a patient is defined to have depressive symptoms if the clinician has reported (4) presence of psychological distress or ranked (5) sadness/depression as one of the top three symptoms causing difficulties for the patient.

SSRI/SNRIs use data were collected in the SOAPP study by asking patients at the enrollment visit whether they were currently taking (initiating or continuing) specific drugs, including separate categories for SSRI/SNRIs use to treat hot flashes or nerve pain. The medication use data was entered by clinicians and reflected what clinicians knew from the study forms, their interviews, and from the available medical records. For this analysis, a patient was defined as having exposure to SSRI/SNRIs if the patient was beginning or continuing treatment with an SSRI or SNRI such as venlafaxine, duloxetine, and mirtazapine. Also categorized was the use of other medications, including tricyclic antidepressants, bupropion, psychostimulants, opioid and non-opioid analgesics, herbal supplements, antihypertensive agents, and anxiolytics/sedative hypnotics.

Data on patient demographics and disease characteristics were collected at initial assessment via questionnaires. Information collected included overall quality of life (QOL), which was assessed using one global item (i.e., “In general, would you say your overall quality of life is excellent, good, fair, poor, or very poor?”). Patients’ personal and family histories of depression were also collected.

Statistical Analysis

Chi-square tests were used to evaluate associations between categorical and binary variables. Multivariable logistic regression models were used to identify potential predictors of SSRI/SNRIs use. Robust standard errors were used to take account of the clustering effect of institutions (i.e., the possibility that outcome variables might not be independent among patients enrolled in the same institution). All P-values were two-sided. A p-value of 0.05 was considered statistically significant. STATA 11.0 statistical software (StataCorp, College Station, Texas) was used for all data analysis.

RESULTS

Patient Demographics and Disease Characteristics

Patient demographics and disease characteristics are summarized in Table 1. Fifty percent of the 3106 patients (1544 patients) had breast cancer; 38% of patients (1174) had advanced cancer. The median time from initial disease diagnosis to study registration was 15 months. With regard to cancer treatment, 74% of patients were currently receiving treatment for cancer and 6% of the full cohort was receiving radiation therapy. With regard to patients' overall health status, 70% rated their overall quality of life as excellent or good; 57% of patients had an ECOG performance status level of 0, and 29% were currently taking fewer than five medicines. The patients' median age was 61 years (range, 18–93 years), with 74% between 45 and 75 years of age. Most patients were women (2170, 70%), white (2648, 85%), and of non-Hispanic ethnicity (2572, 83%).

Prevalence of Depression Symptoms and Antidepressant Use at Enrollment

Table 2 lists the prevalence of depressive symptoms and SSRI/SNRIs use among study participants by case-finding method. Overall, 47% of patients (1457) were defined as having depressive symptoms by at least one method, with prevalence estimates ranging from 10.5–27.6% based on individual method. Prescribing of SSRI/SNRIs occurred in 19% of all study patients. Twenty-five percent of depressed patients and 14% of non-depressed patients were prescribed these drugs ($P < 0.001$). This association between depressed status and use of SSRI/SNRIs remained regardless of the case-finding method used to assess depressive symptoms. The prevalence of depressive symptoms (defined as having depressive symptoms by at least one method) and SSRI/SNRIs use by patient demographic and disease characteristics is summarized in Table 1.

Table 3 lists the categories of medicine patients were taking at enrollment, including sedative/hypnotics and anxiolytics. Only about 2% of the use of SSRI/SNRIs antidepressants was specifically directed at physical symptoms such as hot flashes or nerve pain. Other types of antidepressants, such as tricyclic antidepressants, psychostimulants, and bupropion, were prescribed for only 103 patients (3.3%). Of note, at the time of the follow-up visit, 223/2794 (8.0%) of patients were participating in a support group, and 240/2799 (8.6%) were receiving individual counseling.

Multivariable analysis for SSRI/SNRIs antidepressants use

Table 4 shows the results from multivariable logistic regression analysis of exposure to SSRIs or SNRIs. After adjusting for other covariates, factors associated with greater use of SSRI/SNRIs included concurrent use of ten or more medications (OR = 3.3; $P < 0.001$), a family history of depression (OR = 2.2; $P < 0.001$), sedative use (OR = 2.1; $P < 0.001$), non-Hispanic white race (OR = 2.0; $P < 0.001$), anxiolytic use (OR = 2.0; $P < 0.001$), enrollment at a community site rather than at an academic center (OR =1.8; $P < 0.012$), female sex (OR = 1.8; $P < 0.001$), current depressive symptoms (OR = 1.7; $P < 0.001$), duration of current cancer treatment >1 year (OR = 1.6; $P < 0.002$), receipt of counseling (OR = 1.6; $P = 0.041$), prior systemic cancer treatment (OR = 1.5; $P < 0.001$), patient-reported poor quality of life (OR = 1.3; $P = 0.016$), and age <55 years (OR = 1.2, $P = 0.046$). These significant

associations remained regardless of the case-finding indicator used to assess depressive symptoms (see Supplemental Table A1 in the appendix), with only slight changes in the magnitude of ORs and one exception, the OR for depressive symptoms defined by method 3 (OR = 1.04, $P = 0.74$).

Since patient sex and disease site were highly correlated, only sex was included in the regression model in Table 4. Had disease site been included in the model, the ORs of antidepressant use would be 0.56 for colorectal cancer (95% CI 0.38–0.83; $P = 0.003$), 0.45 for prostate cancer (95% CI 0.28–0.70; $P = 0.0004$), and 0.66 for lung cancer (95% CI 0.49–0.88; $P = 0.0044$), relative to breast cancer.

DISCUSSION

Our results indicate that the point prevalence of antidepressant use (SSRIs or SNRIs) in ambulatory cancer care in the United States is 19.2% (598/3106). This rate is among the highest rates of antidepressant use described in ambulatory cancer care in the United States. This prescribing was overwhelmingly directed at depressive symptoms, with only about 2% of the use specifically directed at physical symptoms such as hot flashes or nerve pain. Furthermore, we found that use of other medications used to treat depressive symptoms, such as tricyclic antidepressants, psychostimulants, and bupropion, were uncommon, having been prescribed for only 103 patients (3.3%).

Using a multi-symptom patient-reported measure (MDASI) and clinician judgments about distress and symptom priorities to estimate the prevalence of significant depressive symptoms, we found a rate of depressive symptoms of 14–28%, depending on the case-finding criterion used. This finding is consistent with previously published estimates.[12–15] It is noteworthy that clinicians ranked sadness/depression as one of the top three priority concerns for only 10.5% of study patients, while 14.3% of patients reported severe levels (≥7/10 severity) of depressed mood and/or anhedonia. This observation is consistent with findings by Söllner and colleagues indicating that oncologists' judgments about psychological distress tend to have poor concordance with screening instruments[35] and with findings by Passik and colleagues that more severely depressed patients are often overlooked by clinicians[19]. This discordance between patients' and clinicians' reports may also reflect the tendency of oncology clinicians to focus on common toxicities of treatment and physical symptoms rather than on mental health concerns or to attribute mood-related symptoms to the effects of cancer and its treatment. Patients also face disincentives to the reporting of symptoms to their oncology team, particularly sensitive or personal concerns such as depressive symptoms.[36]

Among patients for whom at least one case-finding indicator of depressive symptoms was accorded, SSRI/SNRIs exposure was nearly twice as prevalent as it was for patients who had no current indicators of depressive symptoms (25.4% vs. 13.8%). Greater use of anti-depressants was associated with four kinds of factors: (1) depression diathesis, or predisposition based on depressive symptoms and family history; (2) comorbidity, as reflected by medication exposure; (3) longer duration of cancer treatment and 4) demographics such as younger age, White race, and female sex as well as certain other

clinical variables. Interestingly, family history of depression was an even stronger predictor of antidepressant exposure than were reports of depression symptoms. Family history, an element of patient assessment that is often overlooked, signifies a predisposition to depression and may therefore be a useful adjunct to distress screening and clinician judgment in assessing the underlying cause of depressive symptoms. Given that no method has been shown to be sufficiently accurate for depression screening or case-finding,[24] the use of other key findings in the history and physical examination is critical for assisting clinicians in addressing unmet patient needs. Predictors of depression such as young age, female sex, and poor health[37] were found to be predictors of antidepressant exposure in our study. In the community oncology experience described by Ashbury,[27] 19% of breast cancer patients but only 11% of colorectal and 13% of lung cancer patients were found to have been exposed to antidepressants. This analysis also identified disease-specific differences in rates: 24% of breast cancer patients were exposed to antidepressants, compared with 13% of patients with colorectal cancer, 19% of patients with lung cancer, and 12% of patients with prostate cancer. The strongest predictor of antidepressant use was the use of ≥10 medications of any kind, a likely an indicator of the overall complexity of a patient's condition and comorbidities. As cancer programs integrate psychosocial services in response to emerging accreditation standards,[38] this finding underscores the need for the availability of clinical providers who are well versed in the potential interactions between cancer treatments, comorbidities and antidepressant medications.[39]

Consistent with the findings of Lal and colleagues,[40] non-Hispanic White patients were also more likely to receive antidepressants. This may represent a disparity related to assessment or clinician prescribing and/or an indication of cultural differences in the acceptability of antidepressant therapy. Finally, antidepressants were more commonly prescribed for patients treated in the community than for those treated in an academic setting. It is unclear whether this finding signifies a difference between patient preferences in each setting or whether it reflects a difference in prescribing patterns or in the availability of counseling options in these settings.

Our study had some important limitations. First, data were collected from ambulatory patients with common solid tumors seen in outpatient clinics affiliated with the Eastern Cooperative Oncology group. These data reflect the prevalence of depressive symptoms that persist despite current care patterns (including antidepressant prescribing, counseling, or any other effective interventions). Therefore, these data may not be generalizable to patients with other cancer types or patients seen in other settings or circumstances. For example, patients with gastric, pancreatic, and head/neck cancer are known to have particularly high rates of depression, and these patients were not sampled, nor were patients with hematologic malignancies. Moreover, it is not clear how many patients would have been identified as suffering from depression had more extensive methods for depression case-finding, such as clinical interview, been used systematically. It is noteworthy that in a population of patients receiving radiation therapy for malignancy (the RTOG 0841 study), a two-question screening approach that focused on depressed mood and anhedonia (the Patient Health Questionnaire-2) was found to have similar accuracy for detecting depression as a commonly used 9-item depression instrument (the Patient Health Questionnaire-9), each with an area under the curve of 0.83[41]. One of our case-finding methods takes the same

approach by examining the two MDASI items specifically addressing depressed mood and anhedonia. Indeed, the MDASI has been shown to be a valuable auxiliary resource for depression case-finding[42], but it should be noted that the psychometric properties of the MDASI compared with various depression-specific screening tools have not yet been examined thoroughly. An additional study limitation is that a detailed explanation for the reason for prescribing antidepressants, or not prescribing antidepressants, is not available in these data. For example, owing to their capacity for beneficial effects on non-depression-related complaints such as loss of appetite, nausea and/or itching, anxiety, and sleep disturbance, it is possible that antidepressants were prescribed for symptom control indications other than pain or hot flashes. As another example, the observation that younger patients were more likely to be prescribed antidepressants cannot be further elucidated from our data. We speculate that younger patients may evoke more emotions in providers and trigger a desire to treat depressive symptoms. Also, older patients are more prone to polypharmacy and this may cause reluctance from patients and providers to further prescribe. An additional limitation is that we do not know the duration of antidepressant treatment, which could have impact on the underlying rates of depressive symptoms and the severity of reported symptoms. Nonetheless, our data provide robust insights into modern prescribing patterns for antidepressants and the scope of depressive symptoms among a large cohort of cancer patients. Practice patterns are always evolving, and new guidelines and standards as well as changing attitudes and beliefs will undoubtedly cause shifts in the rates of depressive symptoms and in practice patterns. These data provide a useful anchor to assess for changes in the future, and to reflect upon the underpinnings of recent practice.

A major challenge of modern cancer care is the appropriate integration of psychosocial care to include screening for distress followed by more in-depth assessment of patients at risk and triage for psychosocial care as indicated.[43] Initiatives such as the 2015 American College of Surgeons patient-centered standards, including a new requirement for psychosocial screening will ideally lead to further improvement in the detection and management of distress[44]. Furthermore, the American Society of Clinical Oncology has recently published a guideline adaptation for the screening, assessment, and care of anxiety and depressive symptoms in adults with cancer[45]. In order to accomplish the goal of appropriate integration of psychosocial care throughout the trajectory of care for cancer patients, an improved understanding of current clinical practices for the management of distress and depressive symptoms is needed. This study clearly demonstrated that a significant proportion of oncology patients receiving community-based care are prescribed antidepressant medications and the rates of referral for individual counseling or group support are low. Thus, quality improvement initiatives related to antidepressant prescribing and referral for psychosocial support for outpatients with solid tumors likely present opportunities to cut costs and improve psychosocial outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Patient Demographic and Disease Characteristics and Prevalence of Depressive Symptoms and SSRI/SNRIs Use (N=3106)

Variable	No. of Patients	Column %	% with Depressive Symptoms*	% using SSRI/SNRIs
Disease site/type				
Breast	1544	49.7	44.6	24.0
Colorectal	718	23.1	46.4	12.7
Prostate	320	10.3	41.2	11.9
Lung	524	16.9	57.8	18.7
Race and ethnicity				
Non-Hispanic White	2193	70.6	45.1	23.0
Others	913	29.4	51.3	10.3
Sex				
Female	2170	69.9	47.6	22.3
Male	936	30.1	45.2	12.3
Age				
≥55	2140	68.9	43.4	18.0
<55	966	31.1	54.7	22.1
Disease stage				
Non-advanced	1921	62.1	41.8	19.1
Advanced	1174	37.9	55.2	19.7
ECOG performance status				
0	1755	56.8	37.4	18.6
1–4	1336	43.2	59.4	20.3
Weight loss in past 6 months				
<5%	2631	85.7	45.2	19.4
≥5%	439	14.3	57.2	18.7
Individual counseling				
No	2795	90.3	45.0	18.5
Yes	299	9.7	66.6	26.4
Participate in support group				
No	2890	93.4	46.5	19.0

Variable	No. of Patients	Column %	% with Depressive Symptoms*	% using SSRI/SNRIs
Yes	204	6.6	53.4	23.5
QOL patient on study				
Good	2170	70.2	36.4	17.6
Poor	920	29.8	72.0	23.3
Exposure to steroids				
No	2550	82.1	45.6	19.0
Yes	556	17.9	53.1	20.5
Exposure to anxiolytics				
No	2498	80.4	42.9	15.0
Yes	608	19.6	63.3	36.8
Exposure to sedatives				
No	2905	93.5	46.1	17.6
Yes	201	6.5	59.2	43.3
Exposure to beta-blocker				
No	2466	79.4	46.7	19.3
Yes	640	20.6	47.7	19.1
Pain treatment				
Under-treated	670	22.2	60.4	17.2
Adequately treated	2353	77.8	43.2	19.7
# of medicines taking				
0–4	900	32.2	41.7	9.9
5–9	1208	43.2	44.9	21.0
≥10	687	24.6	57.9	30.6
Duration of current treatment				
No current treatment	807	26.1	40.3	16.4
Within 1 month	573	18.5	51.1	18.2
Within 1 year	1232	39.8	52.4	19.4
>1 year	480	15.5	39.2	25.4
Prior chemo-/immune-/hormonal therapy				
No	1195	38.5	47.4	15.3
Yes	1910	61.5	46.6	21.7

Variable	No. of Patients	Column %	% with Depressive Symptoms*	% using SSRI/SNRIs
Prior radiation therapy				
No	1782	57.9	47.3	16.7
Yes	1297	42.1	46.3	22.5
Institution				
Academic	303	9.8	57.4	11.6
CCOP	2214	71.3	43.4	22.2
MBCCOP	589	19.0	54.5	12.1
Personal history of depression				
No	2199	71.0	40.1	8.6
Yes	896	29.0	63.8	45.3
Family history of depression				
No	2077	68.2	43.2	13.8
Yes	970	31.8	56.8	30.4
Total£	3106	100.0	46.9	19.2

Abbreviations: ECOG PS, Eastern Cooperative Oncology Group performance status; QOL, quality of life; CCOP, Community Clinical Oncology Program; MBCCOP, Minority-Based Community Clinical Oncology Program

*Depression symptoms defined as combined results from case-finding categories 1–5 (depressive by any method).

£The total number of patients was not equal to 3106 for some variables due to missing data.

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Table 2

Prevalence of Depressive Symptoms and SSRI/SNRIs Use by Case-Finding Method

		Depression Symptoms		Exposure to SSRI/SNRIs		
Case-Finding Method	**Depression Symptoms**	**No. of patients**	**Col %**	**No. of patients**	**Row %**	***P* value**
#1 Sadness/Depression ≥ 4	No	2458	79.7	394	16.0	<0.001
	Yes	623	20.3	198	31.8	
	Total	3,081	100.0			
#2 Distress ≥ 4	No	2,341	76.1	385	16.4	<0.001
	Yes	736	23.9	209	28.4	
	Total	3,077	100.0			
# 3 Interference with mood ≥7 or enjoyment ≥ 7	No	2,634	85.7	480	18.2	
	Yes	439	14.3	109	24.8	
	Total	3,073	100.0			
#4 Per clinician, presence of psychological distress	No	2,232	72.4	346	15.5	<0.001
	Yes	852	27.6	247	29.0	
	Total	3,084	100.0			
#5 Per clinician, depression listed as one of top three symptoms	No	2,779	89.5	494	17.8	<0.001
	Yes	327	10.5	104	31.8	
	Total	3,106	100.0			
At least one criterion (1–5)	No	1,649	53.1	228	13.8	<0.001
	Yes	1,457	46.9	370	25.4	
	Total	3,106	1000	598	19.2	

Abbreviations: SSRI, selective serotonin reuptake inhibitor; SNRI, serotonin-norepinephrine reuptake inhibitor

Note: P values are from Chi square test

Table 3

Medication Prescribing by Depression Status at Baseline

	Case-Finding Method*									
	# 1		#2		#3		#4		#5	
Category/ Name	**No (n=2458)**	**Yes (n=623)**	**No (n=2341)**	**Yes (n=736)**	**No (n=2634)**	**Yes (n=439)**	**No (n=2232)**	**Yes (n=852)**	**No (n=2779)**	**Yes (n=327)**
Anti-depressants										
SSRI/SNRIs	14.4	30.0	14.7	26.8	16.4	23.7	13.8	27.5	16.0	30.6
Antidepressant treatment of hot flashes	1.5	1.0	1.5	1.2	1.5	0.7	1.5	1.2	1.3	1.8
Antidepressant treatment for nerve pain	0.4	1.0	0.5	0.7	0.5	0.7	0.4	0.9	0.5	0.6
Psychostimulants	0.8	1.0	0.9	0.7	0.8	1.1	0.7	1.1	0.8	1.2
Tricyclic antidepressants	2.0	5.0	2.0	4.3	2.2	4.6	2.2	3.6	2.4	4.0
Herbals										
Herbal or other supplements (for pain)	0.7	1.0	0.8	0.4	0.6	1.1	0.7	0.8	0.7	0.6
Herbal supplements (for other symptoms)	10.9	6.3	11.1	6.8	10.6	6.6	11.0	7.3	10.2	8.0
Steroids										
Antiemetics	18.0	18.1	17.8	18.6	17.1	22.8	16.0	23.2	18.3	14.4
HTN agents										
B-blocker	20.7	20.4	20.5	21.2	20.6	20.7	21.0	19.8	20.9	17.7
Diuretic	18.7	19.9	19.2	18.5	18.5	21.4	19.4	17.8	19.5	13.5
Calcium-channel blocker	11.1	11.2	11.3	10.7	10.9	11.6	11.5	10.4	11.6	7.6
Angiotensin II inhibitor	8.1	7.2	8.2	7.2	8.3	6.2	8.5	6.5	8.3	4.9
ACE inhibitor	15.4	14.6	15.8	13.7	14.7	18.2	15.7	14.4	15.7	11.3
Anxiolytic/sedatives										
Long-acting agents	4.7	13.3	4.6	12.5	5.6	11.8	4.5	11.7	5.9	11.3
Intermediate-acting agents	1.9	3.4	1.7	3.4	2.0	3.0	1.7	3.4	2.0	3.7
Short-acting agents	10.8	17.2	10.5	17.0	10.9	19.1	9.6	18.3	12.2	11.0
Non-benzodiazepine	5.9	8.8	5.3	10.2	5.8	10.0	5.6	9.0	6.3	8.3

Abbreviations: SSRI, selective serotonin reuptake inhibitor; SNRI, serotonin-norepinephrine reuptake inhibitor; HTN, hypertension; ACE, angiotension-converting enzyme inhibitors

Note:

1) Patient was coded yes (i.e., receiving the medicine) as long as he/she mentioned the medicine at the baseline visit, either initiating the medicine or continuing the medicine.

2) *Depressive symptoms case-finding method: (1) sadness/ depression ≥ 4; (2) distress ≥ 4; (3) interference with mood ≥ 7 or enjoyment ≥ 7; (4) presence of psychological distress (per clinician-report); (5) depression being listed as one of top three symptoms (per clinician-report).

Table 4

Multivariable Logistic Regression for Exposure to SSRI/SNRIs

Covariate	Level	OR	95% CI		P value
Depression Diathesis					
Depression Symptoms*	**Yes vs. no**	**1.68**	**1.29**	**2.19**	**<0.001**
Family history of depression	**Yes vs. no**	**2.15**	**1.79**	**2.57**	**<0.001**
Comorbidity Indicators					
Number of medicines currently taking	**5–9 vs. 0–4**	**2.20**	**1.57**	**3.08**	**<0.001**
	≥10 vs. 0–4	**3.32**	**2.33**	**4.73**	**<0.001**
	Missing vs. 0–4	1.54	1.03	2.31	0.036
Pain management index	Adequately vs. under-treated	1.07	0.82	1.40	0.605
	Missing vs. under-treated	1.83	1.10	3.05	0.020
Exposure to steroids	Yes vs. no	0.76	0.56	1.04	0.086
Exposure to beta-blockers	Yes vs. no	0.86	0.69	1.07	0.171
Exposure to anxiolytics	**Yes vs. no**	**2.04**	**1.62**	**2.58**	**<0.001**
Exposure to sedatives	**Yes vs. no**	**2.10**	**1.42**	**3.10**	**<0.001**
Cancer Treatment Status					
Current cancer therapy	Within 1 month vs. no	0.81	0.59	1.12	0.206
	Within 1 year vs. no	0.89	0.67	1.18	0.418
	>1 year vs. no	**1.58**	**1.19**	**2.11**	**0.002**
Prior systemic therapy	**Yes vs. no**	**1.49**	**1.18**	**1.89**	**0.001**
Prior radiotherapy	Yes vs. no	1.12	0.89	1.40	0.334
Clinical and Demographic Factors					
Race/Ethnicity	**Other vs. Non-Hispanic White**	**0.49**	**0.34**	**0.71**	**<0.001**
Sex	**Male vs. female**	**0.54**	**0.40**	**0.73**	**<0.001**
Age	**<55 vs. ≥55**	**1.24**	**1.00**	**1.53**	**0.046**
Duration of cancer	Continuous (years)	0.99	0.97	1.02	0.451
Disease status	Advanced vs. Non-advanced	0.88	0.74	1.04	0.123
ECOG PS	1–4 vs. 0	0.92	0.74	1.15	0.454
Weight loss in past 6 months	>5% vs. ≤5%	0.83	0.57	1.21	0.341
Participation in a support group	Yes vs. no	1.12	0.79	1.59	0.522

Covariate	Level	OR	95% CI		P value
Participation in counseling service	**Yes vs. no**	**1.61**	**1.02**	**2.54**	**0.041**
Perceived QOL	**Poor vs. good**	**1.32**	**1.05**	**1.65**	**0.016**
Type of institution	**CCOP vs. academic**	**1.80**	**1.14**	**2.83**	**0.012**
	MBCCOP vs. academic	1.47	0.78	2.80	0.236

Abbreviations: OR: odds ratio, CI, confidence interval; ECOG PS, Eastern Cooperative Oncology Group performance status; QOL, quality of life; CCOP, Community Clinical Oncology Program; MBCCOP, Minority-Based Community Clinical Oncology Program

* Depressive symptoms defined as combined results from case-finding categories 1–5 (depressive by any method).