

Depression and use of health care services in patients with advanced cancer

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Abstract

Objective To examine whether depression in patients with advanced cancer is associated with increased rates of physician visits, especially to primary care.

Design Retrospective, observational study linking depression survey data to provincial health administration data.

Setting Toronto, Ont.

Participants A total of 737 patients with advanced cancer attending Princess Margaret Hospital, who participated in the Will to Live Study from 2002 to 2008.

Main outcome measures Frequency of visits to primary care, oncology, surgery, and psychiatry services, before and after the depression assessment.

Results Before the assessment, depression was associated with an almost 25% increase in the rate of primary care visits for reasons not related to mental health (rate ratio [RR]=1.23, 95% CI 1.00 to 1.50), adjusting for medical morbidity and other factors. After assessment, depression was associated with a 2-fold increase in the rate of primary care visits for mental health-related reasons (RR=2.35, 95% CI 1.18 to 4.66). However, depression was also associated during this time with an almost 25% reduction in the rate of oncology visits (RR=0.78, 95% CI 0.65 to 0.94).

Conclusion Depression affects health care service use in patients with advanced cancer. Individuals with depression were more likely to see primary care physicians but less likely to see oncologists, compared with individuals without depression. However, the frequent association of disease-related factors with depression in patients with advanced cancer highlights the need for communication between oncologists and primary care physicians about the medical and psychosocial care of these patients.

EDITOR'S KEY POINTS

- Before the depression assessment, individuals who were later identified as depressed visited primary care physicians for reasons not related to mental health approximately 25% more often than those who were not depressed.
- After the depression assessment, individuals with depression visited their primary care physicians for mental health reasons more than twice as often as individuals without depression.
- Depression was associated with less use of cancer-related health services in the look-forward period. This might reflect both the need for psychological assistance in this population and the relative ease of access to primary care services in a setting of universal health care.

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Dépression et utilisation des services de santé chez les patients souffrant de cancer avancé

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Résumé

Objectif Déterminer si la présence d'une dépression chez des patients souffrant de cancer avancé s'accompagne d'une augmentation du nombre de visites au médecin, notamment dans le cadre des soins primaires.

Type d'étude Étude observationnelle rétrospective concernant le lien entre les données d'une enquête portant sur la dépression et les données administrative provinciales sur la santé.

Contexte Toronto, Ontario.

Participants Un total de 737 cancéreux avancés traités au Princess Margaret Hospital et ayant participé au Will to Live Study entre 2002 et 2008.

Principaux paramètres à l'étude Fréquence des visites dans les départements de soins primaires et les services d'oncologie, de chirurgie et de psychiatrie, avant et après une évaluation positive de la dépression.

Résultats Avant qu'on en fasse le diagnostic, la dépression était associée à une augmentation de près de 25% du taux de visites aux départements de soins primaires pour des raisons sans rapport avec la santé mentale (rapport des taux [RT]=1,23, IC à 95% 1,00 à 1,50) après ajustement pour la morbidité médicale et pour d'autres facteurs. Après sa confirmation, la dépression était associée à un nombre 2 fois plus grand de visites aux soins primaires pour des raisons liées à la santé mentale (RT=2,35, IC à 95% 1,18 à 4,66). Durant cette période toutefois, la présence de dépression s'accompagnait d'une réduction de près de 25% du taux de visites en oncologie (RT=0,78, IC à 95% 0,65 à 0,94).

Conclusion La dépression affecte l'utilisation des services de santé chez les patients souffrant d'un cancer avancé. Ceux qui étaient déprimés étaient plus susceptibles que les non déprimés de consulter les médecins de première ligne, mais moins susceptibles de consulter les oncologues. Toutefois, le fait qu'il existe souvent une association entre des facteurs liés à la maladie et la dépression chez les cancéreux avancés fait ressortir le besoin d'une meilleure communication entre les oncologues et les médecins de première ligne en ce qui concerne les soins de nature médicale et psychosociale de ces patients.

POINTS DE REPÈRE DU RÉDACTEUR

- Avant que la dépression soit reconnue, les patients qui, par la suite, avaient reçu un diagnostic de dépression consultaient des médecins de première ligne pour des raisons sans rapport avec la santé mentale environ 25% plus souvent que ceux qui n'étaient pas déprimés.
- Après la confirmation de la dépression, les patients déprimés avaient consulté des médecins de première ligne pour des questions de santé mentale plus de 2 fois plus que les non déprimés.
- Une fois la dépression reconnue, les patients utilisaient moins les services de santé liés au cancer. Cela pourrait refléter le fait que cette population requiert un support psychologique et que l'accès aux soins de santé primaires est relativement facile dans un contexte de couverture universelle des soins de santé.

Cet article a fait l'objet d'une révision par des pairs.
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Clinically important depressive symptoms are common in patients with cancer, with prevalence rates of 16% to 25%,^{1,2} compared with rates of approximately 5% in the general population.³ Although these symptoms might compromise quality of life and adversely affect compliance with medical treatment,⁴ they frequently remain undetected and untreated in usual oncology care.^{5,6} In noncancer medical populations, depression has also been associated with greater use of health care services, including physician visits not related to mental health, even after adjustments are made for comorbidity and severity of physical disease.⁷⁻¹⁰ This increased service use might be partly explained by the more frequent help-seeking and health care-seeking of individuals with clinically important distress or mental illness.⁷ However, medical help-seeking might represent an inefficient use of health care resources, if mental health issues are not addressed during such clinical encounters.¹¹

Early research into the association between depression and use of health care services among cancer patients has shown mixed results. Mood disorders have been associated with increased length of hospitalization among patients with hematologic cancer,¹² but a recent study of a mixed sample of oncology patients did not find an association between depression and self-reported health care use.¹³ It is also unclear whether the association between depression and use of services can be demonstrated in patients with advanced cancer, as their substantial need for medical services over a relatively short period of time might be an overriding factor.

In this study, conducted in the Canadian setting of universal health care insurance, we examined patterns of health care service use in patients with advanced or metastatic cancer to determine whether usage rates were higher in individuals with clinically important depressive symptoms than in those without such symptoms. Our general hypothesis was that depression, assessed by a one-time self-report measure of depression, would be associated with more frequent physician visits. Health administration data were objectively assessed both before and after the time of the depression assessment. We expected this increase in health care service use to be owing to visits to primary care physicians rather than to other specialists, as patients might have greater direct access to the former.

METHODS

Participants, setting, and procedure

This study received approval from the Research Ethics Board of the University Health Network and Sunnybrook Health Sciences Centre. Participants were 747 patients with advanced cancer recruited to the Will to Live Study^{2,14,15} between 2002 and 2008. They were recruited,

by a research assistant uninvolved in clinical care, during routine visits to the medical and radiation oncology outpatient clinics at Princess Margaret Hospital, a comprehensive cancer centre in Toronto, Ont, that is part of the University Health Network.

Princess Margaret Hospital has a multidisciplinary psychosocial oncology department in which psychosocial care is provided by psychiatrists, social workers, and psychologists. Referrals for psychosocial care are most often made by the primary oncologist based on assessment of patient need, with routine referral occurring for approximately 33% of patients with advanced cancer.⁵ It is the general policy at Princess Margaret Hospital to provide care for patients for cancer-related symptoms, although patients are advised to see their family physicians for treatment of noncancer-related problems.

Eligible patients were 18 years of age or older, were sufficiently fluent in English to provide informed consent and to complete self-report questionnaires, and had a confirmed diagnosis of stage IV gastrointestinal, breast, gynecologic, or genitourinary cancer, or stage IIIA, IIIB, or IV lung cancer. Individuals were excluded if they had carcinoid or neuroendocrine tumours, or substantial cognitive impairment documented in their medical charts or identified by the Short Orientation-Memory-Concentration Test,¹⁶ a cognitive screening test administered at recruitment.

Patients who gave written informed consent provided basic medical and demographic information and were given questionnaires to complete. Their responses to the questionnaires, which included a depression rating scale, were not communicated to the clinical team, nor were these responses reported back to patients. Data from 737 participants were successfully linked using a unique encrypted identifier to information about their physician visits, as billed to the Ontario Health Insurance Plan, the administrative databases of which are housed at the Institute for Clinical Evaluative Sciences in Toronto.

Measures

Depressive symptoms were assessed with the Beck Depression Inventory-II (BDI-II).¹⁷ Based on the guidelines of Beck et al,¹⁷ a cutoff score of 20 or greater was used to identify individuals with clinically important depression. Physical symptom burden was assessed using the Memorial Symptom Assessment Scale¹⁸ to measure the presence of 25 common physical symptoms of cancer (eg, pain, cough, dyspnea, constipation) in the previous week.

Physical comorbidity with cancer was measured using the Johns Hopkins Adjusted Clinical Groups System,¹⁹ which identifies individuals as falling into any of 32 possible ambulatory diagnostic groups (ADGs) characterizing different medical conditions. Individuals were categorized based on their health care service use in

the preceding 2 years before the depression assessment. Ambulatory diagnostic groups measuring either cancer or psychosocial issues (4 in total) were removed, leaving 28 remaining ADGs and a maximum total comorbidity score of 28. The resulting ADG score captures physical comorbidity independent of cancer and its symptoms.

Health care service use was measured by the frequency of 4 types of physician visits. These were the frequencies of primary care non-mental health visits, primary care mental health visits, oncology visits, and visits to surgery, including obstetrics and gynecology. Using the measure-A categorization of service and diagnosis billing codes reported by Steele et al,²⁰ primary care visits were divided into 2 mutually exclusive categories—mental health visits and non-mental health visits. This measure has a sensitivity of 84% to 96% and a specificity of 93% to 97% for distinguishing mental health primary care visits. We examined the frequency of physician visits looking backward and forward in time, up to 1 year from the date of the depression assessment (Figure 1). When looking backward, we truncated the observation window to the cancer diagnosis date if it was less than 1 year before the date of assessment. When looking forward, observation was terminated if the patient died before 1 year had elapsed.

Statistical analysis

We primarily used negative binomial regression to predict physician-visit frequencies.²¹ The parameter estimates from this analysis are exponentiated into rate ratios, which indicate the change in visit rates across levels of an explanatory factor. When predicting primary care mental health visits, which had an excess of zero counts, we used zero-inflated negative binomial regression, a 2-part modeling procedure that also yields rate ratios.²¹

We analyzed visit counts during the look-back period separately from the look-forward period. Each type of physician visit was regressed on depression, controlling

for age, sex, diagnosis site, income, physical comorbidity, physical symptom count, and the length of the observation window. Controlling for the length of the observation window in the look-forward period equates to controlling for time to death. We could not statistically model visits to surgery looking forward or visits to psychiatry looking forward and back, as these visit types were too infrequent.

Finally, missing data were minimal, with only 7.7% (n=57) of participants failing to complete enough of the BDI-II to be assigned a total score. Multiple imputation was used to estimate the missing data. We reported the regression results aggregated across imputations.^{22,23}

RESULTS

Table 1 presents descriptive statistics for the participants assigned total scores on the BDI-II. Approximately 9% (n=67) of the sample population was taking antidepressant medication at baseline. On average, the look-back and look-forward windows were 9 months long. Descriptive comparisons, without controlling for covariates, revealed that individuals with depression were generally younger and had more physical symptoms than individuals without depression. Depression was associated with more primary care visits in the look-back period. In the look-forward period, depression was associated with more primary care mental health visits but fewer oncology visits.

We focused the paper by reporting only the regression results involving depression, the main predictor of interest, adjusted for control variables. Table 2 presents the depression findings during the look-back period across the 4 physician-visit categories. The rate at which individuals with depression saw primary care physicians for non-mental health visits was 1.23 times that of individuals without depression in the look-back period. Table 3 presents the depression findings during the look-forward period. The rate at which individuals with depression saw primary care physicians for mental health visits was 2.35 times that of individuals without depression in the look-forward period, but the rate at which individuals with depression saw oncologists was 0.78 times that of individuals without depression.

We investigated whether the drop in oncologist visits in the look-forward period might have been accompanied by more visits to palliative care physicians. However, for the sample of 737 individuals, there were only 54 palliative care visits in the look-forward window—about

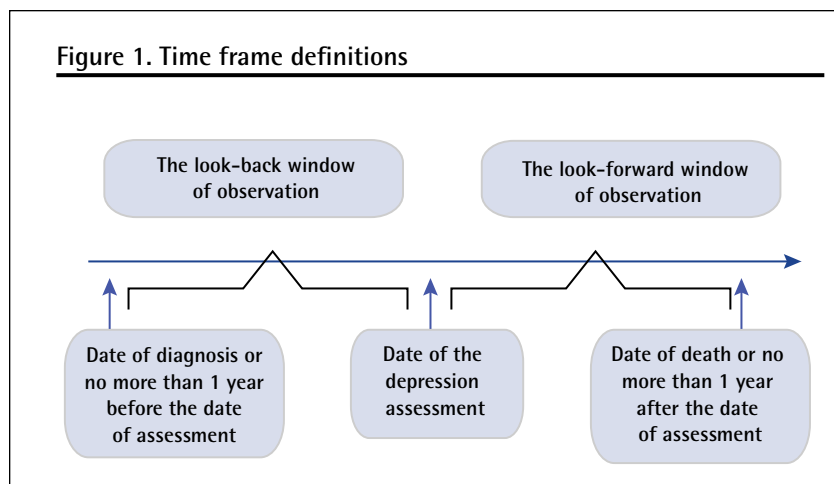


Table 1. Descriptive statistics

VARIABLE	PATIENTS WITHOUT DEPRESSION (BDI-II SCORE < 20), N = 597	PATIENTS WITH DEPRESSION (BDI-II SCORE ≥ 20), N = 83	TOTAL, N = 680	P VALUE
Baseline variables				
Female sex, n (%)	285 (47.7)	42 (50.6)	327 (48.1)	.63
Age, y, n (%)				<.001
• < 45	41 (6.9)	11 (13.3)	52 (7.6)	
• 45-64	318 (53.3)	58 (69.9)	376 (55.3)	
• ≥ 65	238 (39.9)	14 (16.9)	252 (37.1)	
Household income > \$100 000, n (%)	133 (22.3)	11 (13.3)	144 (21.2)	.06
Cancer site, n (%)				.38
• Breast	31 (5.2)	7 (8.4)	38 (5.6)	
• Gastrointestinal	333 (55.8)	42 (50.6)	375 (55.1)	
• Gynecologic or genitourinary	77 (12.9)	8 (9.6)	85 (12.5)	
• Lung	156 (26.1)	26 (31.3)	182 (26.8)	
Physical symptom count				
• Mean (SD)	6.42 (4.33)	10.51 (4.56)	6.92 (4.56)	<.001
• Median (IQR)	6 (3-9)	10 (8-13)	6 (4-9)	<.001
Days since diagnosis				
• Mean (SD)	885 (1263)	858 (1311)	882 (1268)	.85
• Median (IQR)	451 (173-1036)	428 (170-893)	451 (173-1032)	.90
Days to death				
• Mean (SD)	402 (338)	398 (412)	402 (347)	.92
• Median (IQR)	318 (156-548)	212 (129-484)	306 (151-537)	.19
No death, n (%)	100 (16.8)	18 (21.7)	118 (17.4)	.27
No. of ADGs				
• Mean (SD)	9.36 (2.96)	9.36 (2.87)	9.36 (2.94)	>.99
• Median (IQR)	9 (7-11)	9 (7-11)	9 (7-11)	.80
Look-back outcomes				
No. of primary care non-mental health visits				
• Mean (SD)	5.34 (5.73)	7.22 (7.94)	5.57 (6.07)	.008
• Median (IQR)	4 (1-7)	5 (2-9)	4 (2-8)	.04
No. of primary care mental health visits				
• Mean (SD)	0.73 (2.23)	2.34 (9.48)	0.93 (3.94)	<.001
• Median (IQR)	0 (0-1)	0 (0-1)	0 (0-1)	.01
No. of psychiatry visits				
• Mean (SD)	0.52 (3.09)	0.86 (3.01)	0.56 (3.08)	.351
• Median (IQR)	0 (0-0)	0 (0-0)	0 (0-0)	.017
No. of oncology visits				
• Mean (SD)	11.40 (10.04)	10.64 (9.46)	11.31 (9.97)	.51
• Median (IQR)	9 (4-15)	7 (4-16)	8 (4-16)	.44
No. of surgery visits				
• Mean (SD)	2.24 (2.55)	2.47 (2.33)	2.27 (2.53)	.44
• Median (IQR)	1 (0-3)	2 (1-3)	2 (0-3)	.14
Days observed				
• Mean (SD)	280 (114)	275 (114)	279 (114)	.61
• Median (IQR)	365 (176-365)	365 (165-365)	365 (173-365)	.40
Look-forward outcomes				
No. of primary care non-mental health visits				
• Mean (SD)	7.38 (6.92)	8.90 (8.75)	7.57 (7.18)	.07
• Median (IQR)	6 (3-10)	6 (2-13)	6 (3-10)	.48
No. of primary care mental health visits				
• Mean (SD)	0.59 (2.02)	2.08 (6.96)	0.77 (3.11)	<.001
• Median (IQR)	0 (0-0)	0 (0-1)	0 (0-0)	.01
No. of psychiatry visits				
• Mean (SD)	0.48 (2.80)	0.77 (2.27)	0.51 (2.74)	.364
• Median (IQR)	0 (0-0)	0 (0-0)	0 (0-0)	.011
No. of oncology visits				
• Mean (SD)	12.11 (10.61)	9.31 (8.67)	11.77 (10.43)	.02
• Median (IQR)	10 (4-17)	7 (3-14)	9 (4-17)	.02
No. of surgery visits				
• Mean (SD)	0.98 (1.82)	0.95 (2.21)	0.98 (1.87)	.90
• Median (IQR)	0 (0-1)	0 (0-1)	0 (0-1)	.51
Days observed				
• Mean (SD)	280 (111)	262 (118)	278 (112)	.18
• Median (IQR)	365 (193-365)	365 (144-365)	365 (189-365)	.37

ADG—ambulatory diagnostic group, BDI-II—Beck Depression Inventory-II, IQR—interquartile range.

Table 2. Regression results for the effect of depression on visit outcomes in the look-back period, adjusted for control variables: Control variables were age, sex, diagnosis site, income, physical comorbidity, physical symptom count, and the length of the observation window.

OUTCOME	EXPLANATORY FACTOR	PE	RR (95% CI)	P VALUE
Primary care non-mental health visits	Depression	0.20	1.23 (1.00-1.50)	.05
Primary care mental health visits	Depression	0.42	1.52 (0.84-2.78)	.17
Oncology visits	Depression	-0.15	0.87 (0.72-1.04)	.12
Surgery visits	Depression	0.01	1.01 (0.77-1.34)	.93

PE—parameter estimate, RR—rate ratio.

Table 3. Regression results for the effect of depression on visit outcomes in the look-forward period, adjusted for control variables: Control variables were age, sex, diagnosis site, income, physical comorbidity, physical symptom count, and the length of the observation window.

OUTCOME	EXPLANATORY FACTOR	PE	RR (95% CI)	P VALUE
Primary care non-mental health visits	Depression	0.19	1.21 (0.96-1.53)	.10
Primary care mental health visits	Depression	0.85	2.35 (1.18-4.66)	.015
Oncology visits	Depression	-0.25	0.78 (0.65-0.94)	.008

PE—parameter estimate, RR—rate ratio.

1% of all look-forward visits. This number is too low to support the view that individuals were receiving palliative care in place of oncology visits during the look-forward period.

DISCUSSION

In this study, we linked depression data in a large sample of patients with advanced cancer to health administration data to test whether depression was associated with increased use of primary care services. We examined physician-visit frequencies looking backward and forward in time from the date of the depression assessment, and found support for this hypothesis. Before the depression assessment, those individuals who were later identified as depressed visited primary care physicians for non-mental health reasons at a rate that was approximately 25% higher than those who were not depressed at assessment. After the depression assessment, the rate at which individuals with depression visited their primary care physicians for mental health reasons was more than twice that of the individuals without depression. However, we also found that depression was associated with less use of cancer-related health services in the look-forward period. During that time, the rate at which individuals with depression visited oncologists was almost 25% less than that of individuals without depression. These patterns were observed without the depression data being communicated to nurses or clinicians.

We have found in previous research that hopelessness, low self-esteem, and greater anxiety about the availability of meaningful support are predictors of depression in patients with advanced cancer.^{2,15} These

and other psychosocial vulnerabilities might predispose patients with incurable disease and depression to seek medical support from primary care physicians, who might be more available and familiar to them than their oncologists are. This pattern of service usage is consistent with the important role that family physicians have been shown to play in the detection and treatment of depression and other mental health disturbances in the general population,²⁴ and with cancer patient preferences to have family physicians involved in their care.²⁵

Collaborative care interventions have been shown to be effective in the treatment of depression in cancer patients.²⁶ However, it is not known to what extent communication and coordination between oncologists and family physicians tends to occur in the usual care of patients with advanced cancer.²⁷ Such collaboration is likely to be important in this population because of the close relationship between depression and cancer-related symptoms^{2,15} and because the symptom management, complex treatment decisions, and advance care planning required for these patients would benefit from a coordinated involvement of oncologists and primary care physicians.^{27,28}

Limitations

Study limitations include the inability to test mechanisms underlying the observed differences in usage rates, although the models included covariates for comprehensive risk adjustment. We did not have data concerning the use of nonphysician services, such as psychology and social work. Further, the sample was composed of cognitively intact outpatients attending a comprehensive, urban cancer centre in the context of universal health care coverage, and only one assessment of depression was obtained across the full sample.

Conclusion

Our findings confirmed that depression substantially affected health care use in patients with advanced cancer. It is striking that this finding occurred in a sample in which there was a relatively brief time for depression to influence service use and among patients who were, overall, expected to be high users of health care services. This observation suggests that the relationship between depression and health care service use is robust. The increased use of mental health services among patients with advanced cancer who are depressed might reflect both the need for psychological assistance in this population and the relative ease of access to such services in a setting of universal health care. Despite high overall health care service use, the decreased visits to oncologists by patients with depression would be concerning if it were shown to reflect inadequate cancer care or inadequate coordination of care. Further research is needed to understand the cost-benefit relationship and causes of these usage patterns associated with depression. Whether specialized depression treatment mitigates increased health care service use in patients with advanced cancer, as has been demonstrated in early-stage breast cancer patients²⁹ and those with diabetes,³⁰ is also worthy of exploration.

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Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

Competing interests

None declared

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