

A Practice-Based Evaluation of Distress Screening Protocol Adherence and Medical Service Utilization

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Abstract

Background: This study examined the extent to which cancer programs demonstrated adherence to their own prescribed screening protocol, and whether adherence to that protocol was associated with medical service utilization. The hypothesis is that higher rates of service utilization are associated with lower rates of adherence to screening protocols. **Methods:** Oncology social workers at Commission on Cancer–accredited cancer programs reviewed electronic health records (EHRs) in their respective cancer programs during a 2-month period in 2014. Rates of overall adherence to a prescribed distress screening protocol were calculated based on documentation in the EHR that screening adherence and an appropriate clinical response had occurred. We examined documentation of emergency department (ED) use and hospitalization within 2 months after the screening visit. **Results:** Review of 8,409 EHRs across 55 cancer centers indicated that the overall adherence rate to screening protocols was 62.7%. The highest rates of adherence were observed in Community Cancer Programs (76.3%) and the lowest rates were in NCI-designated Cancer Centers (43.3%). Rates of medical service utilization were significantly higher than expected when overall protocol adherence was lacking. After controlling for patient and institutional characteristics, risk ratios for ED use (0.82) and hospitalization (0.81) suggest that when overall protocol adherence was documented, 18% to 19% fewer patients used these medical services. **Conclusions:** The observed associations between a mandated psychosocial care protocol and medical service utilization suggest opportunities for operational efficiencies and costs savings. Further investigations of protocol integrity, as well as the clinical care models by which psychosocial care is delivered, are warranted.

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Since the 1970s, investigations of cancer-related psychological distress have consistently reported prevalence rates ranging between 20% and 40%.^{1–6} Distress, as defined by NCCN, is “a multifactorial unpleasant emotional experience of a psychological...social, and/or spiritual nature that may interfere with the ability to cope effectively with cancer, its physical symptoms, and its treatment.”⁷ Distress is not a diagnosable disorder. Like fever or high blood pressure, distress is an indicator—a psychosocial marker—of conditions re-

quiring further clinical evaluation and response, including redress of the distress itself. Elevated distress may suggest that depression or anxiety are present at clinically significant levels, or that a patient is struggling with co-occurring physical, psychological, social, or spiritual-existential challenges that are likely to disrupt adherence to therapy.⁸

Distressed patients tend to experience poorer health outcomes, greater mortality and morbidity, poorer immune function, and greater healthcare expenditures.⁹

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Distress also contributes to greater service use.^{10–12} In 2007, the Institute of Medicine (now Health and Medicine Division, National Academies of Sciences, Engineering, and Medicine) identified critical shortcomings in the delivery of psychosocial care for patients with cancer and their families, particularly with regard to the detection of psychological distress.¹³ In response, the American College of Surgeons' Commission on Cancer (CoC), the primary accrediting body for as many as 1,500 cancer-treating programs serving approximately 70% of US patients with cancer, established new accreditation standards for patient-centered care, including Standard 3.2, a mandate requiring that all patients be screened for distress and that there be an appropriate clinical response when patients are identified as distressed.¹⁴

Evidence of the effect of distress screening on patient and institutional outcomes is mixed and underdeveloped. Some studies suggest that screening results in reductions in emotional distress, better quality of life, and improved patient–provider communication, along with increases in appropriate referral to psychosocial care providers.^{15,16} Others suggest that screening patients for distress may be of minimal benefit.^{17,18} Lacking, however, are studies demonstrating the effect of both screening and appropriate clinical response on patient and institutional outcomes.^{19,20} Just as we do not expect blood pressure screening alone to reduce symptoms of cardiovascular disease or stroke, we should not expect distress screening alone to improve outcomes.¹² There must also be an appropriate clinical response when risk conditions are detected, because patient outcomes are improved after receipt of evidence-based psychosocial support interventions.^{21–25}

Although now required as a component of quality psychosocial care, the CoC's distress screening standard does not prescribe a screening instrument nor dictate when or how often screening is to occur, other than at a "pivotal visit." The standard also does not dictate how providers must respond to distressed patients. Cancer programs determine their own protocols for clinical response (eg, immediate contact with a social worker, referral to supportive care services). Thus, given that individual cancer programs vary in their algorithms and pathways for how and when they screen for distress and respond to patients, the primary purpose of this study was to examine the capacity of individual cancer programs

to adhere to their own prescribed distress screening protocols. It also examined the extent to which protocol adherence was associated with subsequent medical service utilization, specifically rates of emergency department (ED) use and hospitalization. We hypothesized that higher rates of service utilization would be associated with lower rates of adherence to screening protocols, after controlling for select patient and institutional factors.

Methods

This study was conducted under the auspices of the Association of Oncology Social Work (AOSW) Project to Assure Quality Cancer Care (APAQCC), a quality assurance/quality improvement project that evaluated capacity to deliver psychosocial care at CoC-accredited US cancer centers (or similar designation in Canada). Anonymized patient data from electronic health records (EHRs) were reviewed to evaluate program compliance with CoC Standard 3.2 and the extent to which compliance on a case-by-case basis was associated with ED use or hospitalization within 2 months after the patient visit at which screening was to occur, as per each institution's own protocol.

Participants

Details regarding the identification and selection of cancer programs for the APAQCC project are reported elsewhere.²⁶ For purposes of this study, social workers at 55 participating cancer programs were charged with reviewing and abstracting data from EHRs at their respective institutions. All participating sites obtained Institutional Review Board approval or a waiver for nonregulated research activity prior to data collection.

Data Collection

From January through April 2015, social workers reviewed EHRs of patients seen in their respective cancer program during a 2-month window occurring between January 2014 and January 2015. For smaller cancer programs, data were feasibly collected for all patients; for larger programs, social workers were instructed to select all or a random subsample of records from single or multiple clinical units (eg, radiation oncology, medical oncology, multidisciplinary clinic). All social workers received formal

instructions (via webinar and a training manual) and ongoing guidance and support from the research staff on how to randomize select subsamples, if needed. Training materials also instructed social workers on how to abstract and code anonymized data (no personal health information was collected) and enter it into a Google form maintained by the principle investigator at the University of Michigan School of Social Work, where it was subsequently analyzed.

Measures

Screening Adherence, Responsiveness, and Overall Adherence: Assessing adherence to a prescribed protocol on a case-by-case basis involved locating documentation in an EHR that screening of the patient had occurred and that appropriate action was taken when clinically indicated. “Adherence” was noted as “yes” if an EHR contained a note, a scanned copy of the screening instrument, or a defined field with a score entered or a note indicating that screening had occurred. “Responsiveness” was noted as “yes” when the EHR contained documentation of appropriate action taken in response to the patient score, as per protocol (eg, referral, follow-up by social worker or other care provider, or no action when the screening score was below the program’s defined cut-point for response). “Overall adherence” was noted as “yes” when documentation of screening adherence and responsiveness were confirmed.

Medical Service Utilization: Service utilization was indicated by EHR documentation that a patient had (1) visited the ED at the institution housing the cancer program; or (2) been hospitalized. Investigators tabulated these numbers when occurring within 2 months of a patient visit at which screening occurred or should have occurred according to protocol.

Patient and Institutional Characteristics: Each cancer program in this study was coded according to its CoC designation as an Academic Comprehensive Cancer Program, Comprehensive Community Cancer Program, Community Cancer Program (CCP), or NCI-designated Comprehensive Cancer Center Program (NCIP), which is based on type of facility, services provided, and number of analytic cases per year.¹⁴ Cancer program registries were queried for distribution of racial minority patients, with 40% distinguishing “minority institutions,” similar to the NCI’s criterion for defining a Minority-Based Com-

munity Clinical Oncology Program.²⁷ Data for determining patient age, race, sex, and cancer diagnosis were extracted from EHRs.

Data Analysis

Univariate statistics described patient and institutional characteristics, rates of adherence, responsiveness and overall adherence, and frequencies for ED use and hospitalization. Cross-tabulations and chi-square tests of statistical significance were calculated to examine variations in overall screening protocol adherence by patient and institutional characteristics, and to examine associations between overall adherence and medical service utilization. Mixed effects logistic regression was used to examine the effect of overall screening adherence on ED use and hospitalization rates, after controlling for patient and institutional characteristics. Analyses were conducted using HLM software with restricted maximum likelihood estimation.²⁸ To enhance interpretation of data analytic results, odds ratios were converted to risk ratios using mixed-effects Poisson models with robust standard errors.²⁹

Mixed effects with random intercept models account for random variations among cases nested within different institutions. Within-hospital sample sizes ranged from 10 to 467, with 48 participating sites exceeding 40 cases. Statistical power analysis estimated a minimum detectable odds ratio of 0.80 with 80% power at 2-tailed $P < .05$, given outcome base rates between 14% and 20% and screening adherence rates of 70% to 75%. Intraclass coefficients (ICC) derived from these models estimated the proportion of variance in outcome that is attributed to variability among institutions composed of varied patient populations and varied screening procedures. An ICC of 0.15 (15%) is considered an average proportion of variance due to random variations among cases nested within and across institutions.²⁸

Prior to regression analysis, missing data patterns were examined. For the outcome variables, data were missing in 1,451 cases (17.3%) for ED visits and 1,448 cases (17.2%) for hospitalizations—rates well below those often reported in studies using EHRs.^{30,31} Our examination of these 2 outcome variables indicated that data were more likely to be missing in cases for which screening adherence was not documented; thus, outcome variables were not missing at random and could not reliably be imputed from existing data.³² There-

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Table 1. Patient Characteristics by Institution Type

	Total Cases (%)	ACAD (N=10)	CCCP (N=24)	CCP (N=14)	NCIP (N=7)
Cases, n	8,409 (100.0)	1,742 (20.7)	3,054 (36.3)	1,479 (17.6)	2,134 (25.4)
Age, y					
15–39	545 (6.5)	155 (8.9)	121 (4.0)	84 (5.7)	185 (8.7)
40–64	4,029 (47.9)	933 (53.7)	1,368 (44.8)	660 (44.6)	1,068 (50.1)
≥65	3,829 (45.5)	650 (37.4)	1,564 (51.2)	735 (49.7)	880 (41.3)
Race					
White	6,459 (76.8)	1,238 (83.4)	2,382 (86.2)	1,288 (88.7)	1,551 (80.5)
Black	641 (7.6)	135 (9.1)	231 (8.4)	104 (7.2)	641 (8.4)
Hispanic/Latino	295 (3.5)	76 (5.1)	64 (2.3)	39 (2.7)	116 (6.0)
Asian	195 (2.3)	32 (2.2)	75 (2.7)	14 (1.0)	195 (2.6)
AI/AN/NH/PI	35 (0.4)	3 (0.2)	10 (0.4)	7 (0.5)	35 (0.5)
Sex					
Female	5,214 (62.0)	1,090 (62.6)	1,882 (61.6)	1,053 (71.2)	1,189 (55.7)
Male	3,194 (38.0)	652 (37.4)	1,171 (38.4)	426 (28.8)	945 (44.3)
Cancer type					
Brain/CNS	131 (1.6)	30 (1.7)	46 (1.5)	15 (1.0)	40 (1.9)
Hodgkin lymphoma	59 (0.7)	15 (0.9)	21 (0.7)	12 (0.8)	11 (0.5)
NHL	353 (4.2)	59 (3.4)	142 (4.6)	79 (5.3)	73 (3.4)
Leukemia	276 (3.3)	33 (1.9)	54 (1.8)	136 (9.2)	53 (2.5)
Melanoma	261 (3.1)	29 (1.7)	57 (1.9)	13 (0.9)	162 (7.6)
Colorectal	582 (6.9)	115 (6.6)	251 (8.2)	74 (5.0)	142 (6.7)
All other gastrointestinal	722 (8.6)	142 (8.2)	255 (8.3)	72 (4.9)	253 (11.9)
Ovarian	519 (6.2)	163 (9.4)	75 (2.5)	186 (12.6)	95 (4.5)
Prostate	572 (6.8)	82 (4.7)	270 (8.8)	52 (3.5)	168 (7.9)
All other genitourinary	886 (10.5)	142 (8.2)	187 (6.1)	281 (19.0)	286 (13.4)
Head and neck	467 (5.6)	158 (9.1)	119 (3.9)	53 (3.6)	137 (6.4)
Lung	1,009 (12.0)	227 (13.0)	458 (15.0)	127 (8.6)	197 (9.2)
Breast (malignant)	2,275 (27.1)	451 (25.9)	1,041 (34.1)	355 (24.0)	428 (20.1)
All others	297 (3.5)	106 (6.1)	78 (2.6)	24 (1.6)	89 (4.2)

Percentages do not always total 100% due to missing data or lack of specification.

Abbreviations: ACAD, Academic Comprehensive Cancer Program; AI/AN/NH/PI, American Indian/Alaskan Native/Native Hawaiian/Pacific Islander; CCCP, Comprehensive Community Cancer Program; CCP, Community Cancer Program; CNS, central nervous system; NCIP, NCI-designated Comprehensive Cancer Center Program NHL; non-Hodgkin's lymphoma.

fore, cases with missing outcome data were omitted from the analysis, and the sample sizes for each regression model vary. Missing data for explanatory independent variables was minimal, affecting just 5.3% of cases and 0.7% of the data matrix. To minimize case exclusion, missing values for explanatory variables were estimated using expectation maximization.

Results

Data were abstracted from EHRs of 8,409 patients confirmed as having cancer across 55 cancer centers.

Eleven cancer programs (20%) met NCI criterion for being at an institution treating a significant proportion of racial minority patients; 18% of all cases (n=1,541) were derived from minority institutions. Characteristics of participating cancer programs and patients are summarized in Table 1.

Adherence and Responsiveness to the Screening Protocol

In 84% of participating cancer programs, patients were screened using the NCCN Distress Thermometer and Problem List or some modification thereof.

Distress Screening Adherence

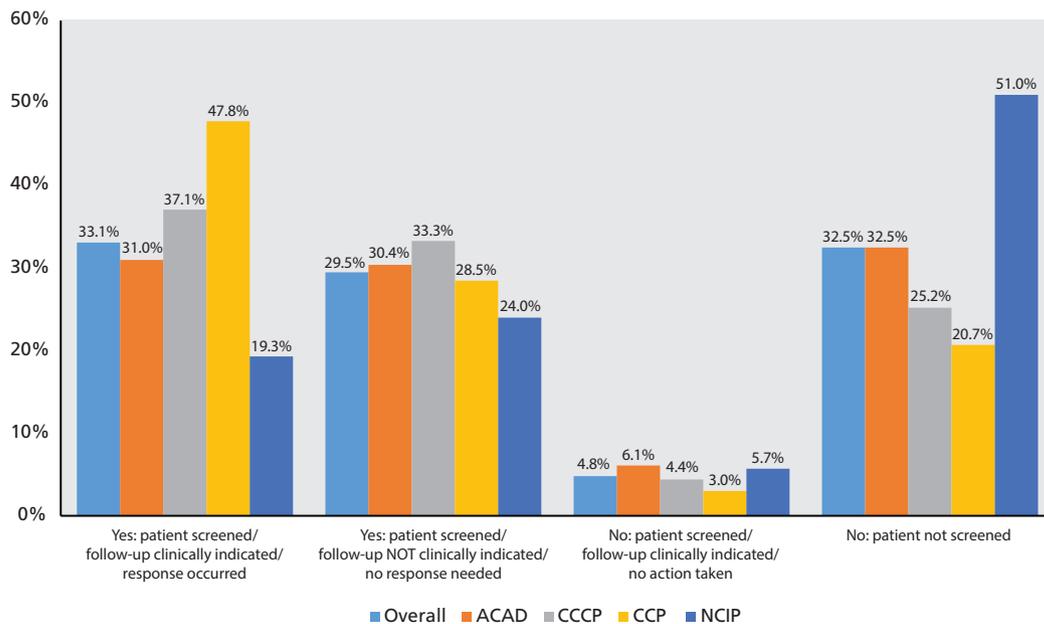


Figure 1. Documentation of appropriate clinical response to screening: was appropriate action taken? (n=8,409)

Cases screened (n=5,685)

Abbreviations: ACAD, Academic Comprehensive Cancer Program; CCCP, Comprehensive Community Cancer Program; CCP, Community Cancer Program; NCIP, NCI-designated Comprehensive Cancer Center Program.

Of 8,409 EHRs reviewed, 5,685 patients (67.6%) were identified as being screened in accordance with each respective institution's protocol; 2,400 (28.5%) were not. An additional 324 patients (3.9%) declined to be screened and were re-coded as "patient not screened" for subsequent analyses.

Among the 5,685 patients screened, a clinical response was documented in 2,783 cases (49.0%) in which screenings indicated need for response as per protocol. Clinical response was not clinically indicated (and thus not appropriate) in 43.5% of cases (n=2,478). Documentation was absent in 424 cases (7.5%) in which screens indicated need for a clinical response. The rate of responsiveness among patients when screened was 92.5%. However, screening did not occur in 2,724 of the total 8,409 cases (32.4%); therefore, the overall adherence rate for the entire sample of 8,409 cases was 62.6%.

Overall adherence rates—the extent to which programs screened and responded appropriately—varied by institution and patient characteristics (Figure 1, Table 2). They were highest in CCPs (76.3%) and lowest in NCIPs (43.3%). Adherence rates for patients aged 15 to 39 years (58.5%) were significantly lower than expected compared with older patients.

Highest rates of overall adherence were observed for patients identified in the EHR as Black/African American (70.5%), and lowest for patients of American Indian/Alaska Native/Native Hawaiian/Pacific Island descent (45.7%). Rates also varied significantly for patients depending on their cancer diagnosis (Table 2).

Medical Service Utilization

Among cases for which service utilization data were collected, 954 (13.7%) used the ED at the institution where they were screened at least once, and 1,398 (20.1%) were hospitalized at least once during the 2 months following the visit at which they were screened (Figure 2).

Service Utilization and Overall Protocol Adherence

Rates of ED use and hospitalization were significantly higher than expected when overall adherence was lacking. When overall protocol was followed, 12.8% of patients were reported to have used the ED compared with 15.7% of patients for whom protocol was not followed ($\chi^2=9.97$; $P=.002$). Among patients for whom overall protocol was followed, 18.6% were

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Table 2. Does Overall Adherence to a Distress Screening Protocol Vary by Institutional and Patient Characteristics?

	No	Yes	X ² (P Value)
Institution type			
ACAD	671 (38.6)	1,069 (61.4)	537.72 (.000)
CCCP	903 (29.6)	2,148 (70.4)	
CCP	348 (23.7)	1,122 (76.3)	
NCIP	1,207 (56.7)	922 (43.3)	
Minority institution			
No	2,553 (37.2)	4,301 (62.8)	.034 (.854)
Yes, ≥40% racial minority patients	576 (37.5)	960 (62.5)	
Age, y			
15–39	226 (41.5)	318 (58.5)	6.16 (.046)
40–64	1,459 (36.3)	2,562 (63.7)	
≥65	1,438 (37.7)	2,381 (62.3)	
Race			
White/Caucasian	2,374 (36.8)	4,072 (63.2)	23.35 (.000)
Black/African American	188 (29.5)	449 (70.5)	
Hispanic/Latino	116 (39.3)	179 (60.7)	
Asian	84 (43.3)	110 (56.7)	
AI/AN/NH/PI	19 (54.3)	16 (45.7)	
Sex			
Female	1,907 (36.7)	3,294 (63.3)	2.34 (.126)
Male	1,222 (38.3)	1,966 (61.7)	
Cancer type			
Breast (malignant)	822 (36.2)	1,451 (63.8)	65.93 (.000)
Lung/Bronchus	390 (38.8)	616 (61.2)	
Colorectal	253 (43.5)	329 (56.5)	
All other gastrointestinal	273 (37.9)	448 (62.1)	
Ovarian	151 (29.1)	368 (70.9)	
Prostate	192 (33.6)	379 (66.4)	
All other genitourinary	298 (33.8)	584 (66.2)	
Head and neck	173 (37.0)	294 (63.0)	
Hodgkin lymphoma	19 (32.8)	39 (67.2)	
NHL	125 (35.8)	224 (64.2)	
Leukemia	116 (42.0)	160 (58.0)	
Melanoma	125 (48.4)	133 (51.6)	
Brain/CNS	50 (38.2)	81 (61.8)	
All other	142 (47.8)	155 (52.2)	

Subsample sizes vary due to missing data.

Abbreviations: ACAD, Academic Comprehensive Cancer Program; AI/AN/NH/PI, American Indian/Alaskan Native/Native Hawaiian/Pacific Islander; CCCP, Comprehensive Community Cancer Program; CCP, Community Cancer Program; CNS, central nervous system; NCIP, NCI-designated Comprehensive Cancer Center Program; NHL, non-Hodgkin's lymphoma.

hospitalized at least once within 2 months after the visit at which they were screened compared with 23.5% of patients for whom overall protocol was not followed ($X^2=21.61$; $P=.000$).

Table 3 presents the results of mixed-effects regression models analyzing associations of overall

adherence with ED visits and hospitalizations. After controlling for the independent effects of institutional and patient characteristics on outcome, the risk ratio for ED use (0.82) indicates that overall adherence to a distress screening protocol is associated with an 18% reduction in the likelihood of using the

Distress Screening Adherence

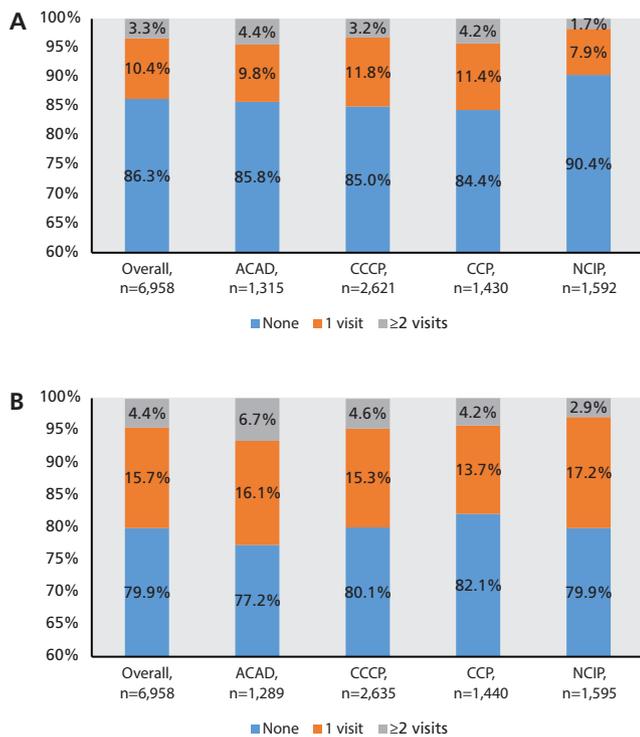


Figure 2. Service utilization within 2 months of screening date (frequency and percent) via (A) emergency department visits (n=6,958) and (B) hospitalizations (n=6,958). Abbreviations: ACAD, Academic Comprehensive Cancer Program; CCCP, Comprehensive Community Cancer Program; CCP, Community Cancer Program; NCIP, NCI-designated Comprehensive Cancer Center Program.

ED. Similarly, the risk ratio for hospitalization (0.81) indicates that overall adherence was associated with a 19% reduction in likelihood for hospitalization.

Discussion

As of 2015, CoC Standard 3.2 requires demonstration of compliance with distress screening as a condition for cancer center accreditation. The 62.5% overall rate of adherence to a psychosocial distress screening protocol across a large and representative sample of cancer programs in the United States (and 2 in Canada) suggests that in the aggregate, cancer centers are approximately two-thirds of the way to full implementation of the standard. These findings are consistent with an earlier phase of the APAQCC evaluation study, in which cancer programs were characterized as doing moderately well in terms of organizational capacity to identify patients' psychosocial needs but less well in responding to those needs over time.²⁶ Particularly concerning is the finding that documentation of psychosocial screen-

ing is lacking in 1 of every 3 cases in this representative sample. The absence of these clinical data can compromise the ability of oncology care providers to know whether patients are receiving the psychosocial care and support they need when they need it.

The observed associations between overall adherence and medical service utilization are notable because they suggest opportunities for enhanced operational efficiencies and costs savings. In the current study, risks of using the ED and being hospitalized for those who were screened and responded to as per protocol were 18% to 19% less than those who were not screened and responded to according to protocol. Thus, if 100% of patients were screened and responded to according to their cancer program's protocol, then cancer programs that screen and respond to all their patients could expect, on average, 18% fewer ED visits and 19% fewer hospitalizations when compared with settings in which there was no screening. This finding is consistent with a recent study in which the rate of ED visits among patients with breast cancer undergoing adjuvant chemotherapy was 43% lower for those screened for symptomatic distress compared with those not screened.³³

Distress management protocols have the potential to uncover debilitating conditions or situations that, if properly identified and addressed, might prevent unnecessary use of scarce resources later. For example, distress screening could lead to identification of a patient's spouse/partner experiencing anxiety related to being responsible for maintaining the patient's central line at home. Appropriate screening and identification of distress would flag referral to a social worker, whose clinical assessment would uncover the cause of the patient's distress and lead to clinical engagement and delivery of an appropriate evidence-informed intervention (eg, cognitive behavioral therapy). In this instance, screening and appropriate response could preempt improper home care, reduce risk for central line infection, and thus prevent a subsequent patient visit to the ED or a hospitalization for septicemia, an oft-implicated reason for unplanned hospitalization among patients with cancer.³⁴

Responding to CoC mandates for distress screening is challenging for cancer programs given the uneven distribution of resources and variations in institutional capacity to screen, assess, treat, and follow-up with all patients in need of services across the multiple and varied settings where patients receive

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Table 3. Relative Risk Ratios for Effects of Overall Protocol Adherence, After Controlling for Institutional and Patient Characteristics

	ED Use (95% CI) (n=6,939)	Hospitalization (95% CI) (n=6,942)
Intercept	0.08 (0.049, 0.133)***	0.122 (0.082, 0.182)***
Institution type		
ACAD	1.88 (1.135, 3.099)*	1.13 (0.644, 1.974)
CCCP	1.86 (1.203, 2.881)**	1.33 (0.871, 2.038)
CCP	1.98 (1.194, 3.298)**	1.06 (0.679, 1.645)
NCIP	Ref	Ref
Minority cancer program		
Yes, ≥40% racial minority patients	1.21 (0.825, 1.771)	1.20 (0.808, 1.776)
No	Ref	Ref
Age, y		
15–39	0.96 (0.692, 1.320)	0.87 (0.681, 1.103)
40–64	0.93 (0.812, 1.063)	1.11 (1.004, 1.219)*
≥65	Ref	Ref
Race		
White	0.66 (0.505, 0.865)**	0.93 (0.794, 1.095)
Nonwhite	Ref	Ref
Sex		
Male	1.00 (0.832, 1.212)	1.03 (0.898, 1.170)
Female	Ref	Ref
Cancer type		
Brain/CNS	2.53 (1.712, 3.743)***	2.33 (1.472, 3.697)***
Hodgkin lymphoma	1.34 (0.574, 3.106)	0.83 (0.326, 2.136)
NHL	1.61 (1.192, 2.174)**	1.65 (1.245, 2.198)**
Leukemia	1.05 (0.614, 1.785)	1.39 (0.912, 2.124)
Melanoma	1.21 (0.638, 2.282)	1.01 (0.624, 1.622)
Colorectal	1.72 (1.286, 2.302)***	1.60 (1.231, 2.067)***
All other gastrointestinal	2.53 (2.012, 3.193)***	1.88 (1.494, 2.355)***
Ovarian	1.73 (1.150, 2.588)**	1.92 (1.393, 2.633)***
Prostate	1.15 (0.788, 1.690)	1.14 (0.728, 1.784)
All other genitourinary	1.37 (0.952, 1.959)	1.93 (1.420, 2.620)***
Head and neck	2.06 (1.470, 2.895)***	1.94 (1.370, 2.760)***
Lung	2.35 (1.889, 2.933)***	1.89 (1.480, 2.423)***
All other solid tumor/soft tissue	1.93 (1.302, 2.870)**	2.21 (1.525, 3.203)***
Breast (malignant)	Ref	Ref
Overall adherence		
Yes	0.82 (0.688, 0.970)*	0.81 (0.676, 0.972)*
No	Ref	Ref
–2 log likelihood	19,594.562	19,649.614
Random effects variance	0.474	0.401
Intraclass coefficient – null model	0.122	0.120
Variance accounted for by model	.262	.105

Generalized linear mixed effects models.

Abbreviations: ACAD, Academic Comprehensive Cancer Program; CCCP, Comprehensive Community Cancer Program; CCP, Community Cancer Program; CNS, central nervous system; ED, emergency department; NCIP, NCI-designated Comprehensive Cancer Center Program; NHL, non-Hodgkin's lymphoma.

* $P < .05$; ** $P < .01$; *** $P < .001$.

care.²⁶ Furthermore, the evidence base for these new patient-centered standards is underdeveloped and mixed in terms of demonstrating a positive effect of distress screening on patient outcomes and health-care cost containment.¹ Further research is needed to identify the patient, provider, and system characteristics that either hinder or promote implementation of comprehensive psychosocial care protocols, and to demonstrate whether these protocols improve the patient experience and contribute to reductions in medical service utilization and associated costs.

Conclusions

This study is the first large-scale empirical investigation of distress screening implementation in non-experimental practice settings. Although limited in that neither a randomized controlled trial design nor standardized distress screening protocol was used across all participating treatment centers, the study is pragmatic and accounts for real-life conditions in which cancer treatment programs adapt distress screening protocols to match their own organizational structures, clinic operations, and available resources. The findings are not intended to suggest that screening adherence causes reductions in service utilization, because the study is limited by its cross-sectional design, modest rates of missing data (although comparable to studies using EHRs), lack of detailed patient data, and variation across participating cancer programs in terms of the complexity of cases treated. For example, a greater likelihood of ED use or hospital admission may be attributable to a patient's disease or treatment status. Alternatively, variations in rates of ED use and hospitalization attributed to lack of screening adherence may also be partially explained by the fact that larger academically affiliated cancer centers treat more complex cases and therefore patients may experience greater distress. Rates of ED use and hospitalization also may have been differentially affected in cases wherein an ED visit or hospital admission occurring outside the treating institution was not documented. However, the results derived from this substantially powered and sizeable study suggest that adherence to a standardized distress screening protocol is associated with, and may contribute to, enhanced operational efficiencies via reduction in use of medical services and their associated costs.

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