Mental Health and Chemical Dependency Services at US Cancer Centers

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ABSTRACT

Background: It is standard of care and an accreditation requirement to screen for and address distress and psychosocial needs in patients with cancer. This study assessed the availability of mental health (MH) and chemical dependency (CD) services at US cancer centers. **Methods:** The 2017–2018 American Hospital Association (AHA) survey, Area Health Resource File, and Centers for Medicare & Medicaid Services Hospital Compare databases were used to assess availability of services and associations with hospital-level and health services area (HSA)-level characteristics. **Results:** Of 1,144 cancer centers surveyed, 85.4% offered MH services and 45.5% offered CD services; only 44.1% provided both. Factors associated with increased adjusted odds of offering MH services were teaching status (odds ratio [OR], 1.76; 95% CI, 1.18–2.62), being a member of a hospital system (OR, 2.00; 95% CI, 1.31–3.07), and having more beds (OR, 1.04 per 10-bed increase; 95% CI, 1.02–1.05). Higher population estimate (OR, 0.98; 95% CI, 0.97–0.99), higher percentage uninsured (OR, 0.90; 95% CI, 0.86–0.95), and higher Mental Health Professional Shortage Area level in the HSA (OR, 0.99; 95% CI, 0.98–1.00) were associated with decreased odds of offering MH services. Government-run (OR, 2.85; 95% CI, 1.30–6.22) and nonprofit centers (OR, 3.48; 95% CI, 1.78–6.79) showed increased odds of offering CD services compared with for-profit centers. Those that were members of hospital systems (OR, 1.61; 95% CI, 1.14–2.29) and had more beds (OR, 1.02; 95% CI, 1.01–1.03) also showed increased odds of offering these services. A higher percentage of uninsured patients in the HSA (OR, 0.92; 95% CI, 0.88–0.97) was associated with decreased odds of offering CD services. **Conclusions:** Patients' ability to pay, membership in a hospital system, and organization size may be drivers of decisions to co-locate services within cancer centers. Larger organizations may be better able to financially support offering these services despite poor reimbursement rates. Innovations in specialty payment models highlight opportunities to drive transformation in delivering MH and CD services for high-need patients with cancer.

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Background

Nearly 40% of patients with cancer have clinically significant psychiatric comorbidities,^{1–3} and 50% have reported significant distress.⁴ According to results from the National Epidemiologic Survey on Alcohol and Related Conditions-III (NESARC-III), patients diagnosed with cancer in the year of the survey had a higher 12-month prevalence of posttraumatic stress disorder, bipolar disorder, substance use disorder, and attempted suicide than patients with no cancer diagnosis.⁵ Additionally, the relative rates of mental and substance use disorders have been shown to increase in the months prior to cancer diagnosis and remain elevated 10 years after diagnosis.⁶ Furthermore, studies have shown that alcohol use increases the risk of breast,⁷ upper digestive tract, liver, and renal cancers.⁸

Hydes et al⁹ found that women consuming one bottle of wine in a week have an associated increase in the absolute risk of cancer, and that this risk is equivalent to the increased absolute risk of smoking 10 cigarettes per week. Using population-attributable fraction methodology, Shield et al¹⁰ estimated that 144,000 cases of breast cancer and 38,000 deaths caused by breast cancer could be attributable to alcohol consumption and that there was likely a dose-response relationship. An important distinction is to differentiate between moderate alcohol consumption and alcohol use disorder. In one study, the consumption of at least 6 grams of alcohol per day after a breast cancer diagnosis was associated with an increased risk of breast cancer recurrence.¹¹ Similarly, smoking is a well-known risk factor for cancer,¹² and active smoking status is associated with poorer outcomes.^{13–18} In patients with prostate cancer, smoking is associated with increased risk of recurrence and prostate cancer-specific mortality, whereas quitting for ≥ 10 years mitigates that increased risk.¹⁹ In another study, active smokers 1 year after prostatectomy were at higher risk of prostate cancer recurrence.²⁰

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Psychiatric comorbidities, including substance use disorders, are associated with a significant burden for patients with cancer and their family members.²¹ These comorbidities, especially depression,²² influence adherence to cancer treatment²³ and are associated with poorer quality of life,^{24,25} increased cost of care,^{26–29} and increased mortality.^{30,31} However, effective treatments are available,³² and may even improve cancer survival.³¹ The NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines) for Distress Management use the term *distress* to describe psychological (ie, cognitive, behavioral, emotional), social, physical and spiritual challenges experienced by patients with cancer, and advises that timely assessment and identification of distress can lead to effective distress management, which improves cancer treatment.³³ Screening for and addressing psychosocial needs by appropriately trained mental health (MH) professionals is one of the Commission on Cancer's (COC) accreditation standards for cancer centers.³⁴ Furthermore, to address distress adequately, a multidimensional construct and collaboration among various disciplines is needed. However, 96% of counties in the United States have an acute shortage of MH professionals.³⁵

It is critical to assess the availability of MH and chemical dependency (CD) services to patients with cancer. This need is compounded in the midst of the COVID-19 pandemic and its resultant impact on cancer care.^{36–38} Although other specialties such as primary care may help,³⁹ the availability of MH services at cancer centers is important to address patient needs in a timely fashion and is in accordance with NCCN Guidelines and COC accreditation standards. As such, this study assessed the availability of MH and CD services at US cancer centers.

Methods

Data Sources

Data were obtained from the American Hospital Association (AHA) 2017–2018 Annual Survey of Hospitals and the 2017–2018 Area Health Resource File (AHRF) county-level database. The AHA survey database includes responses from >6,400 US hospitals, with a response rate >75%.^{40,41} All open and operational hospitals (ie, licensed and accredited by agencies as approved by Title 18 of the Social Security Act) were invited to participate in the survey. The database contains information about hospital characteristics, services offered, and staffing, and responses are validated through review, comparison, and member checking by the AHA.⁴¹ The AHA data were used under license for this study. The AHRF is publicly available and is compiled by the US Department of Health and Human Services Health Resources & Services Administration from >50 sources.⁴²

For data analysis, the hospital information from the AHA to county-level data from the AHRF were merged using the Federal Information Processing Standards (FIPS) code for each hospital's county. Data were then aggregated to the health services area (HSA) level using a crosswalk file from the NCI SEER program.⁴³ Hospital financial information was extracted from publicly available Centers for Medicare & Medicaid Services (CMS) Hospital Cost Reports, which contain financial data reported by Medicare healthcare providers back to CMS.⁴⁴ This was matched to hospital survey data using the hospitals' Medicare identification numbers.

Measures

All nonfederal cancer centers in the United States that responded to the AHA survey were included. Psychiatric services are defined in the AHA questionnaire as the provision of “acute or long-term care to patients with mental or emotional disorders, including patients admitted for diagnosis and those admitted for treatment of psychiatric disorders, on the basis of physicians' orders and approved nursing care plans. Long-term care may include intensive supervision to persons with chronic/severe mental illness.”⁴⁰

For this analysis, hospitals were considered to offer MH services if they reported offering any of the following types of psychiatric services: consultation-liaison, emergency, geriatric, outpatient, partial hospitalization, or residential. Alcoholism/CD services are defined in the AHA questionnaire as the provision of “diagnosis and therapeutic services to patients with alcoholism or other drug dependencies. Includes care for inpatient/residential treatment for patients whose course of treatment involves more intensive care than provided in an outpatient setting or where patient requires supervised withdrawal.”⁴⁰ Hospitals were considered to offer CD services if they reported offering inpatient, partial hospitalization, or outpatient alcohol/drug abuse or dependency services. Hospitals were considered to offer combination services if they reported offering both MH and CD services.

Other hospital-level variables assessed included hospital ownership, teaching status, hospital system membership, rural health clinic status, Medicare and Medicaid discharge percentages, and number of beds (operationalized in models to indicate an increase of 10 beds). Social work services are defined by AHA as “organized services that are properly directed and sufficiently staffed by qualified individuals who provide assistance and counseling to patients and their families in dealing with social, emotional, and environmental problems associated with illness or disability, often in the context of financial or discharge planning coordination.”⁴⁰ Social work services were also examined but the variable was not included in models, because the extent to which social workers provide the services relevant to the current assessment is

not clear, and because of lack of variation within the sample. HSA variables included racial diversity index (2010),⁴⁵ per capita personal income (2016), unemployment rate (among individuals aged ≥ 16 years) (2017), population estimate (2017), median age (2010), percentage uninsured (among individuals aged < 65 years) (2016), number of hospitals per 100,000 people (2016), number of community MH centers per 100,000 people (2017), number of federally qualified health centers per 100,000 people (2017), and Mental Health Professional Shortage Area (MHPSA) rating (2018). The racial diversity index was calculated from 2010 US Census population racial percentages using the Esri definition⁴⁵ based on 6 racial groups. The index ranges from 0 (no diversity) to 100 and indicates the probability that 2 individuals chosen at random will be from different racial groups. The MHPSA level of the HSA was created by converting the MHPSA code for each county from a categorical format (0 = none, 1 = whole county, 2 = part county) to a continuous variable (0 = none, 50 = part county, 100 = whole county) and averaging it across all counties in the HSA.⁴⁶ Hospital operating margin is the ratio of the difference of total operating revenue and total operating expense to total operating revenue and is calculated using CMS hospital financial data.⁴⁷

Statistical Methods

Descriptive statistics were calculated overall and by MH, CD, and combination services. Medians and ranges are presented for continuous variables, and frequencies and percentages are presented for categorical variables. Associations between services and hospital- and HSA-level predictors were examined using unadjusted logistic regression models. Generalized linear mixed models adjusted for all predictors showing a trend toward association with services offered ($P < .20$) and for the random intercepts of HSA region were then performed on all predictors. Odds ratios, 95% confidence intervals, and P values are presented for each model. The random effect of HSA was included to account for the similarity of cancer centers within a single HSA. P values of $< .05$ were considered statistically significant, and analyses were not adjusted for multiple testing. Modeling was performed using PROC LOGISTIC and PROC GLIMMIX in SAS 9.4 (SAS Institute Inc).

Results

Descriptive statistics for the 1,144 cancer centers in the United States and the 448 HSAs in which they are located are shown in Table 1. Among all cancer centers, 977 (85.4%) offered MH services, 520 (45.5%) offered CD services, and 505 (44.1%) offered combination services. Most centers were nonprofit (81.9%), teaching hospitals (75.3%), and members of hospital systems (79.4%). Nearly all hospitals (98.7%) offered social work services, and the median hospital size was 279 beds.

Table 1. Hospital and HSA Characteristics of US Cancer Centers

Characteristic	Value
Hospital, N	1,144
Ownership	
For-profit, n (%)	69 (6.0)
Government (nonfederal), n (%)	138 (12.1)
Nonprofit, n (%)	937 (81.9)
Teaching status, n (%)	861 (75.3)
Member of a hospital system, n (%)	908 (79.4)
Rural location, n (%)	126 (11.0)
Medicare discharge percentage, median (range)	52.0 (9.9 to 86.1)
Medicaid discharge percentage, median (range)	19.7 (0.0 to 70.6)
Number of hospital beds, median (range)	279 (12 to 2,877)
Operating margin (2016–2018), median (range)	6.1 (–111.3 to 160.6)
Mental health services, n (%)	977 (85.4)
Chemical dependency services, n (%)	520 (45.5)
Combination services, n (%)	505 (44.1)
HSA, N	448
Diversity index (2010), median (range)	29.7 (3.2 to 78.5)
Per capita personal income (per \$1,000 USD) (2016), median (range)	45.1 (24.5 to 116.0)
Unemployment rate, among individuals aged ≥ 16 y (2017), median (range)	4.5 (2.2 to 11.6)
Population estimate (100,000 people) (2017), median (range)	2.2 (0.1 to 101.6)
Median age (5-y increase) (2010), median (range)	7.8 (5.7 to 10.3)
Percentage uninsured aged < 65 y (2016), median (range)	7.9 (2.8 to 29.0)
Hospitals per 100,000 people (2016), median (range)	1.8 (0.0 to 18.2)
Community mental health centers per 100,000 people (2017), median (range)	0.0 (0.0 to 0.7)
Federally qualified health centers per 100,000 people (2017), median (range)	1.9 (0.0 to 52.1)
Mental Health Professionals Shortage Area level (2017), median (range)	50.0 (0.0 to 100.0)

HSA-level statistics were calculated using all 1,144 hospitals, even if they are located in the same HSA.

Abbreviation: HSA, health services area.

MH Services

Descriptive statistics for all centers stratified by MH services are displayed in Table 2, and unadjusted logistic regression results are presented in Table 3. Factors included as adjustment variables included teaching status, hospital system membership, rural location, Medicare and Medicaid discharge percentages, number of beds, per capita income in the HSA, population estimate in

Table 2. Hospital and HSA Characteristics by Mental Health Services

Characteristic	No	Yes
Total, N	167	977
Hospital		
Ownership		
For-profit, n (%)	15 (9.0%)	54 (5.5%)
Government (nonfederal), n (%)	18 (10.8%)	120 (12.3%)
Nonprofit, n (%)	134 (80.2%)	803 (82.2%)
Teaching status, n (%)	90 (53.9%)	771 (78.9%)
Member of a hospital system, n (%)	118 (70.7%)	790 (80.9%)
Rural location, n (%)	29 (17.4%)	97 (9.9%)
Medicare discharge percentage, median (range)	56.6 (18.5 to 86.1)	51.4 (9.9 to 84.8)
Medicaid discharge percentage, median (range)	16.2 (0.0 to 55.5)	20.1 (1.6 to 70.6)
Number of beds (per 10-bed increase), median (range)	19.3 (1.2 to 60.4)	29.2 (1.2 to 287.7)
Operating margin (2016–2018), median (range)	6.8 (–33.2 to 35.5)	5.9 (–111.3 to 40.6)
HSA		
Diversity index (2010), median (range)	31.4 (3.4 to 78.5)	29.5 (3.2 to 74.2)
Per capita personal income (per \$1,000 USD) (2016), median (range)	43.8 (27.0 to 77.6)	45.4 (24.5 to 116.0)
Unemployment rate, among individuals aged ≥16 y (2017), median (range)	4.5 (2.3 to 8.2)	4.5 (2.2 to 11.6)
Population estimate (100,000 people) (2017), median (range)	1.5 (0.2 to 101.6)	2.3 (0.1 to 101.6)
Median age (5-y increase) (2010), median (range)	7.9 (6.1 to 10.3)	7.8 (5.7 to 10.2)
Percentage uninsured aged <65 y (2016), median (range)	9.7 (2.8 to 25.4)	7.6 (2.8 to 29.0)
Hospitals per 100,000 people (2016), median (range)	2.2 (0.0 to 18.2)	1.8 (0.4 to 18.2)
Community mental health centers per 100,000 people (2017), median (range)	0.0 (0.0 to 0.6)	0.0 (0.0 to 0.7)
Federally qualified health centers per 100,000 people (2017), median (range)	2.2 (0.0 to 52.1)	1.9 (0.0 to 46.9)
Mental Health Professionals Shortage Area level (2017), median (range)	62.5 (25.0 to 100.0)	50.0 (0.0 to 100.0)

Abbreviation: HSA, health services area.

the HSA, median age in the HSA, percentage uninsured in the HSA, hospitals per 100,000 people in the HSA, and MHPSA level in the HSA. After adjustment, teaching status (odds ratio [OR], 1.76; 95% CI, 1.18–2.62), being a member of a hospital system (OR, 2.00; 95% CI, 1.31–3.07), and having more beds (OR, 1.04 per 10-bed increase; 95% CI, 1.02–1.05) were associated with significantly increased odds of offering MH services. Higher population estimate in the HSA (OR, 0.98; 95% CI, 0.97–0.99), higher percentage uninsured in the HSA (OR, 0.90; 95% CI, 0.86–0.95), and higher MHPSA level in the HSA (OR, 0.99; 95% CI, 0.98–1.00) were significantly associated with reduced odds of offering MH services. The diversity index in the HSA was also statistically significant in adjusted models, with centers in HSAs with greater diversity showing reduced odds of offering MH services (OR, 0.98; 95% CI, 0.97–0.99).

CD Services

Descriptive statistics for all centers stratified by CD services are displayed in Table 4, and unadjusted logistic

regression model results are presented in Table 5. Factors included as adjustment variables included hospital ownership type, teaching status, hospital system membership, rural location, Medicare and Medicaid discharge percentages, number of beds, per capita income in the HSA, unemployment rate in the HSA, median age in the HSA, percentage uninsured in the HSA, hospitals per 100,000 people in the HSA, federally qualified health centers per 100,000 people in the HSA, and MHPSA level in the HSA. In adjusted models, government-run (OR, 2.85; 95% CI, 1.30–6.22) and nonprofit centers (OR, 3.48; 95% CI, 1.78–6.79) showed significantly increased odds of offering CD services compared with for-profit centers, and those that were members of hospital systems (OR, 1.61; 95% CI, 1.14–2.29) and had more beds (OR, 1.02; 95% CI, 1.01–1.03) also showed significantly increased odds. Centers with a higher percentage of uninsured individuals in the HSA (OR, 0.92; 95% CI, 0.88–0.97) and centers in HSAs with greater diversity showed reduced adjusted odds of offering CD services (OR, 0.97; 95% CI, 0.96–0.99).

Table 3. Unadjusted and Adjusted Logistic Models for Mental Health Services

Characteristic	Unadjusted OR (95% CI)	P Value	Adjusted ^a OR (95% CI)	P Value
Hospital				
Ownership				
For-profit	Ref	Ref	Ref	Ref
Government (nonfederal)	1.85 (0.87–3.95)	.22	1.93 (0.80–4.63)	.14
Nonprofit	1.67 (0.91–3.04)	.35	1.07 (0.53–2.14)	.85
Teaching status	3.20 (2.28–4.50)	<.001	1.76 (1.18–2.62)	.006
Member of a hospital system	1.75 (1.21–2.54)	.003	2.00 (1.31–3.07)	.002
Rural location	0.53 (0.33–0.82)	.005	1.48 (0.85–2.57)	.16
Medicare discharge percentage	0.97 (0.96–0.99)	<.001	0.99 (0.97–1.01)	.44
Medicaid discharge percentage	1.04 (1.02–1.06)	<.001	1.01 (0.99–1.04)	.24
Number of hospital beds (per 10-bed increase)	1.04 (1.03–1.05)	<.001	1.04 (1.02–1.05)	<.001
Operating margin (median 2016–2018)	1.00 (0.98–1.01)	.59	0.99 (0.98–1.01)	.38
HSA				
Diversity index (2010)	1.00 (0.99–1.01)	.59	0.98 (0.97–0.99)	.007
Per capita personal income (per \$1,000 USD) (2016)	1.03 (1.01–1.05)	<.001	1.01 (0.99–1.04)	.22
Unemployment rate, among individuals aged ≥16 y (2017)	0.99 (0.86–1.15)	.91	1.03 (0.86–1.23)	.75
Population estimate (100,000 people) (2017)	0.99 (0.98–1.00)	.16	0.98 (0.97–0.99)	.002
Median age (5-y increase) (2010)	0.80 (0.60–1.07)	.13	0.81 (0.58–1.13)	.21
Percentage uninsured aged <65 y (2016)	0.92 (0.89–0.95)	<.001	0.90 (0.86–0.95)	<.001
Hospitals per 100,000 people (2016)	0.93 (0.87–0.99)	.021	0.98 (0.90–1.08)	.68
Community mental health centers per 100,000 people (2017)	3.23 (0.31–33.93)	.33	0.71 (0.06–7.86)	.78
Federally qualified health centers per 100,000 people (2017)	0.99 (0.96–1.02)	.45	1.00 (0.96–1.04)	.97
Mental Health Professional Shortage Area level (2017)	0.98 (0.98–0.99)	<.001	0.99 (0.98–1.00)	.044

Abbreviations: HSA, health services area; OR, odds ratio.

^aAdjusted for ownership, teaching status, system membership, rural location, Medicare percentage, Medicaid percentage, number of beds, per capita income in the HSA, population estimate in the HSA, median age in the HSA, percentage uninsured in the HSA, hospitals per 100,000 people in the HSA, Mental Health Professionals Shortage Area level in the HSA, and random effect of HSA.

Combination MD/CD Services

Descriptive statistics for all centers stratified by combination services are shown in supplemental eTable 1 (available with this article at JNCCN.org). Factors included as adjustment variables included hospital ownership type, teaching status, hospital system membership, rural location, Medicare and Medicaid discharge percentages, number of beds, per capita income in the HSA, unemployment rate in the HSA, median age in the HSA, percentage uninsured in the HSA, hospitals per 100,000 people in the HSA, federally qualified health centers per 100,000 people in the HSA, and MHPSA level in the HSA. After adjustment, government-run (OR, 2.76; 95% CI, 1.27–6.03) and nonprofit centers (OR, 3.13; 95% CI, 1.60–6.11) showed increased odds of offering combination services compared with for-profit centers (supplemental eTable 2). Centers that were members of hospital systems (OR, 1.56; 95% CI, 1.10–2.21) and those with more beds (OR, 1.02; 95% CI, 1.01–1.03) also showed significantly increased odds

of offering them. Centers with a higher percentage uninsured in the HSA (OR, 0.92; 95% CI, 0.87–0.96) also showed reduced odds. Centers in HSAs with greater diversity also showed reduced odds of offering combination services in adjusted models (OR, 0.97; 95% CI, 0.96–0.99).

Discussion

This study of >1,000 cancer centers found that most cancer centers offered MH services, but only half offered CD services and even fewer offered both CD and MH services. Results indicated that cancer centers with more beds, academic cancer centers, and centers that were members of hospital systems were more likely to offer MH services. Cancer centers located in HSAs with a lower population, lower percentage of uninsured residents, and lower MHPSA levels showed increased odds of offering MH services. Larger cancer centers (more beds), members of a healthcare system, government-run or nonprofit centers (vs for-profit centers), and centers in

Table 4. Hospital and HSA Characteristics by Chemical Dependency Services

Characteristic	No	Yes
Total, N	624	520
Hospital		
Ownership		
For-profit, n (%)	55 (8.8%)	14 (2.7%)
Government (nonfederal), n (%)	87 (13.9%)	51 (9.8%)
Nonprofit, n (%)	482 (77.2%)	455 (87.5%)
Teaching status, n (%)	437 (70.0%)	424 (81.5%)
Member of a hospital system, n (%)	472 (75.6%)	436 (83.8%)
Rural location, n (%)	86 (13.8%)	40 (7.7%)
Medicare discharge percentage, median (range)	53.4 (9.9 to 86.1)	50.1 (11.5 to 84.8)
Medicaid discharge percentage, median (range)	19.1 (0.0 to 70.6)	20.2 (1.6 to 63.8)
Number of beds (per 10-bed increase), median (range)	25.4 (1.2 to 287.7)	31.9 (3.0 to 254.0)
Operating margin (2016–2018), median (range)	6.1 (–111.3 to 140.6)	5.9 (–50.2 to 50.3)
Health services area		
Diversity index (2010), median (range)	29.8 (3.2 to 78.5)	28.3 (5.4 to 74.2)
Per capita personal income (per \$1,000 USD) (2016), median (range)	44.0 (27.0 to 116.0)	46.3 (24.5 to 108.1)
Unemployment rate, among individuals aged ≥16 y (2017), median (range)	4.5 (2.2 to 11.6)	4.4 (2.4 to 11.6)
Population estimate (100,000 people) (2017), median (range)	2.0 (0.1 to 101.6)	2.6 (0.2 to 101.6)
Median age (5-y increase) (2010), median (range)	7.8 (6.1 to 10.3)	7.8 (5.7 to 9.2)
Percentage uninsured aged <65 y, median (range) (2016)	8.8 (2.8 to 25.4)	7.2 (2.8 to 29.0)
Hospitals per 100,000 people (2016), median (range)	1.9 (0.0 to 18.2)	1.7 (0.4 to 18.2)
Community mental health centers per 100,000 people (2017), median (range)	0.0 (0.0 to 0.6)	0.0 (0.0 to 0.7)
Federally qualified health centers per 100,000 people (2017), median (range)	2.2 (0.0 to 52.1)	1.7 (0.0 to 42.2)
Mental Health Professionals Shortage Area level (2017), median (range)	60.0 (0.0 to 100.0)	50.0 (0.0 to 100.0)

Abbreviation: HSA, health services area.

HSAs with a lower percentage of uninsured residents were more likely to offer CD services. A greater diversity index score was associated with lower adjusted odds of offering MH and CD services, although the effect sizes were small.

It is reassuring that most cancer centers offered MH services, but lack of specialized CD services to address the comorbid substance use disorder at approximately 65% of the cancer centers is a significant concern. Substance use disorders are common among patients with cancer. One meta-analysis reported substance use disorder rates of 2% to 35% (18% for opioid use disorder and 25.5% for alcohol use disorder).⁴⁸ The associated risks of additional cancers, negative influences on overall health, adverse effects on quality of life, and increased risk of cancer recurrence if substance use disorders are not addressed appropriately warrant both assessing and actively managing comorbid substance use disorders in patients with cancer. As an example, consider opioid use disorders in these patients. Cancer pain is common, and 1 in 3 patients also

experiences noncancer pain.⁴⁹ The use of opioids to address pain can become a challenge, especially in patients with preexisting or new-onset opioid use disorders.^{50–52} Careful evaluation to identify at-risk groups, early recognition and timely treatment of opioid use disorders,⁵² and access to specialized substance use disorder programs such as buprenorphine/naloxone⁵¹ and other nonpharmacologic treatments can be better accomplished when CD treatment services are available at cancer centers.

There are several possible explanations for the lack of MH and CD services at cancer centers. Policy barriers may make it challenging to offer MH and CD services.^{53–55} The Bipartisan Policy Center report identified insurance coverage and reimbursement barriers, workforce barriers, and administrative barriers limiting the integration of MH services.⁵⁵ Our study found that cancer centers located in HSAs with higher uninsured populations were less likely to provide MH and CD services. Given the negative relationship between social economic status (the relevant hypotheses

Table 5. Unadjusted and Adjusted Logistic Models for Chemical Dependency Services

Characteristic	Unadjusted OR (95% CI)	P Value	Adjusted ^a OR (95% CI)	P Value
Hospital				
Ownership				
For-profit	Ref	Ref	Ref	Ref
Government (nonfederal)	2.30 (1.17–4.55)	.44	2.85 (1.30–6.22)	.009
Nonprofit	3.71 (2.03–6.76)	<.001	3.48 (1.78–6.79)	<.001
Teaching status	1.89 (1.43–2.50)	<.001	1.19 (0.84–1.70)	.33
Member of a hospital system	1.67 (1.24–2.25)	<.001	1.61 (1.14–2.29)	.008
Rural location	0.52 (0.35–0.77)	.001	1.11 (0.68–1.83)	.67
Medicare discharge percentage	0.98 (0.97–0.99)	<.001	0.99 (0.97–1.00)	.12
Medicaid discharge percentage	1.01 (1.00–1.02)	.041	0.99 (0.98–1.01)	.38
Number of beds (per 10-bed increase)	1.02 (1.01–1.02)	<.001	1.02 (1.01–1.03)	<.001
Operating margin (median 2016–2018)	1.00 (0.99–1.01)	.60	1.00 (0.99–1.01)	.95
HSA				
Diversity index (2010)	1.00 (0.99–1.01)	.59	0.97 (0.96–0.99)	<.001
Per capita personal income (per \$1,000 USD) (2016)	1.03 (1.02–1.04)	<.001	1.01 (0.99–1.02)	.51
Unemployment rate, among individuals aged ≥16 y (2017)	0.88 (0.79–0.98)	.020	0.91 (0.79–1.06)	.21
Population estimate (100,000 people) (2017)	1.00 (0.99–1.01)	.85	0.99 (0.97–1.01)	.17
Median age (5-y increase) (2010)	0.77 (0.63–0.95)	.013	0.82 (0.61–1.10)	.18
Percentage uninsured aged <65 y (2016)	0.93 (0.90–0.96)	<.001	0.92 (0.88–0.97)	<.001
Hospitals per 100,000 people (2016)	0.91 (0.86–0.97)	.002	0.99 (0.91–1.07)	.72
Community mental health centers per 100,000 people (2017)	1.59 (0.37–6.81)	.53	0.75 (0.11–5.05)	.77
Federally qualified health centers per 100,000 people (2017)	0.97 (0.94–1.00)	.023	1.00 (0.97–1.04)	.97
Mental Health Professionals Shortage Area level (2017)	0.99 (0.98–0.99)	<.001	1.00 (0.99–1.00)	.19

Abbreviations: HSA, health services area; OR, odds ratio.

^aAdjusted for ownership, teaching status, system membership, rural location, Medicare percentage, Medicaid percentage, number of beds, per capita income in the HSA, unemployment rate in the HSA, median age in the HSA, percentage uninsured in the HSA, hospitals per 100,000 people in the HSA, federally qualified health centers in the HSA, Mental Health Professionals Shortage Area level in the HSA, and random effect of HSA.

are reviewed by Hudson⁵⁶) and MH, this population may have the highest prevalence of MH and CD disorders. For-profit cancer centers were also significantly less likely to offer CD services than government-run and nonprofit centers. One possible explanation for this is poor reimbursement for MH and CD services. A national report found that 42% of the US population identified increased cost and insufficient insurance coverage as a major barrier to accessing MH care.⁵⁷ Major federal MH laws have attempted to address the coverage and reimbursement barriers and to achieve parity. The Mental Health Parity Act of 1996⁵⁸ temporarily removed the lifetime and annual limits for MH coverage. The Paul Wellstone and Pete Domenici Mental Health Parity and Addiction Equity Act (MHPAEA) of 2008⁵⁹ made the parity permanent, but it did not apply to fee-for-service (FFS) plans. The Patient Protection and Affordability Care Act of 2010⁶⁰ made MH services an “essential health benefit” for employer-based plans. Finally, the 21st Century Cures Act of

2016⁶¹ sought to increase coordination and accountability for federal MH offerings. Despite this concerted effort, coverage parity of MH services remains a challenge. In fact, recent interpretations of these laws, state-waivers, and short-term insurance plans with limited MH coverage are threatening the progress made over the years.⁵⁵

Although coverage of MH services is a key factor, it is not sufficient to guarantee unhindered access. Despite progress in coverage reforms, barriers to MH provider access, even among insured patients, are well-documented, with a recent National Alliance on Mental Illness survey reporting barriers to access in the form of narrow networks, distance to specialized care, and MH providers not accepting new patients.⁶² Our study underscores yet another key barrier: the immediate care delivery model responsible for the patient’s care episode failing to support and facilitate access to necessary MH and CD services. In the case of cancer care, this may occur at a time when these services are acutely needed,

yet perhaps most likely to be neglected given the aggregate burden of navigating the care delivery system during an episode of cancer. In this respect, cancer centers have an opportunity to treat the full needs of the patient during a cancer episode by ensuring co-location of MH and CD services. When that is not possible, cancer centers may formalize collaborative relations with other community partners to address patients and their caregivers' MH needs.

Our study also suggests that the impact of some barriers are perhaps mitigated when cancer centers have a greater number of beds or are part of a larger hospital system. An economic analysis studying the impact of hospital mergers⁶³ noted that when hospitals pool their resources, they can become more efficient, realize savings, are able to innovate, improve quality of care, and reduce operating expenses by approximately 2.5%. The net effect is that they are able to offer more services, and care becomes more comprehensive.⁶⁴

Notably, the Oncology Care Model (OCM) provides a key example of how the value-based payment paradigm may be leveraged to address persisting MH and CD access challenges. Distress screening and addressing psychosocial needs are both OCM requirements. OCM participants are assessed based on whether they facilitate treatment of both the MH and the cancer treatment needs of their patients.⁶⁵ This model illustrates the opportunity to drive MH care delivery transformation through specialty value-based payment model design—a policy lever that could influence care delivery design outside of larger systems.

Academic medical centers (AMCs) care for high-cost and high-need patients⁶⁶ and have begun to consider this a potential opportunity in the era of value-based payment models.⁶⁷ Existing evidence showing that comorbid MH and CD conditions in patients with cancer are associated with increased cost of cancer care^{27,29} provides an impetus to have such services available for these patients. Furthermore, AMCs also provide training to future clinicians, increasing the likelihood of availability of comprehensive services. The combination of these factors makes it more likely for AMCs to offer MH and CD services.

HSAs with a lower percentage of MHPSAs were more likely to offer MH services. However, it is probable that cancer centers are more successful in hiring MH professionals than organizations with fewer resources. Despite this, shortage of MH professionals remains a significant factor. Greater flexibilities in payment for telehealth and alternative modes of care delivery may offer one partial solution for this persisting challenge.

We also found a significant association between diversity index in the HSA and reduced odds of

offering MH, CD, and combination services. Although the effect size was small and could be a statistical artifact, the existence of disparities in MH and cancer care for minority patients is well-documented.^{68,69} Further research is needed to understand how various underrepresented groups of patients with cancer may be impacted by the availability of these services near where they live.

Limitations exist in our study. First, we used only secondary data sources. The AHA is self-reported by hospitals, and thus there is a risk of incompleteness and/or incorrectness. Additionally, responses to the AHA survey can show whether such services are available, yet they do not account for the adequacy of the services. Thus, there is a risk of overestimating the access to these services. Additionally, use of these data prevented us from clearly identifying whether MH and CD services were being provided by psychiatrists, psychologists, or other MH professionals. Our use of the term “MH services” is consistent with the term used in the source database, wherein AHA defines the nature of services but does not explicitly ask who at those centers is providing such services. In other words, services that “offer immediate initial evaluation and treatment to patients with mental or emotional disorder” could conceivably be provided by a psychiatrist or a psychologist. Hence the generic term was used but does not indicate the specific availability of prescribers (psychiatrists) versus nonprescribers (psychologists, advanced practice psychiatric nurses, social workers, licensed professional counselors, and marriage and family therapists) at these cancer centers. Additionally, previous research shows varying degrees of shortages for these two categories.³⁵ Furthermore, some of the AHRF data are from the 2010 US Census and may not be current, and therefore could potentially affect the results. However, both the AHA and AHRF are commonly used, high-quality datasets. Finally, in this cross-sectional study, we could only measure associations among variables but could not define causality.

Conclusions

Considering the prevalence of psychiatric comorbidities in patients with cancer, the effect of distress on outcomes, and the importance placed on screening for and addressing psychosocial needs within NCCN Guidelines and COC accreditation standards, one would expect that cancer centers will continue to work on integrating MH and CD services in cancer care. In particular, the lack of availability of CD services in cancer centers is a significant concern. System-level, workforce, and insurance-related factors affect the likelihood of provision of these services. Innovative payment models can transform the delivery of MH and CD services

to patients with cancer. These models will be most effective when they not only establish requirements but also directly support transformation in settings that lack resources and specialized knowledge available in large systems and AMCs.

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Disclaimer: The data that support the findings of this study are available from the American Hospital Association. Restrictions apply to the availability of these data, which were used under license for this study. Data are available at <https://www.ahadata.com/aha-annual-survey-database-asdb/> with the permission of the American Hospital Association. Publicly available data for the Area Health Resource File can be found at <https://data.hrsa.gov/data/download>, and for the CMS Hospital Cost Reports can be found at <https://www.cms.gov/Research-Statistics-Data-and-Systems/Downloadable-Public-Use-Files/Cost-Reports/Cost-Reports-by-Fiscal-Year.html>.

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Supplemental online content for:

Mental Health and Chemical Dependency Services at US Cancer Centers

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eTable 1: Hospital and HSA Characteristics by Combination Mental Health/Chemical Dependency Services

eTable 2: Unadjusted and Adjusted Logistic Models for Combination Mental Health/Chemical Dependency Services

eTable 1. Hospital and HSA Characteristics by Combination MH/CD Services

Characteristic	No	Yes
Total, N	639	505
Hospital		
Ownership		
For-profit, n (%)	55 (8.6%)	14 (2.8%)
Government (nonfederal), n (%)	87 (13.6%)	51 (10.1%)
Nonprofit, n (%)	497 (77.8%)	440 (87.1%)
Teaching status, n (%)	446 (69.8%)	415 (82.2%)
Member of a hospital system, n (%)	486 (76.1%)	422 (83.6%)
Rural location, n (%)	88 (13.8%)	38 (7.5%)
Medicare discharge percentage, median (range)	53.2 (9.9 to 86.1)	50.1 (11.5 to 84.8)
Medicaid discharge percentage, median (range)	19.0 (0.0 to 70.6)	20.6 (1.6 to 63.8)
Number of beds (per 10-bed increase), median (range)	25.4 (1.2 to 287.7)	32.1 (3.0 to 254.0)
Operating margin (median 2016–2018), median (range)	6.2 (–111.3 to 140.6)	5.9 (–50.2 to 50.3)
HSA		
Diversity index (2010), median (range)	29.9 (3.2 to 78.5)	27.9 (5.4 to 74.2)
Per capita personal income (per \$1,000 USD) (2016), median (range)	44.0 (27.0 to 116.0)	46.5 (24.5 to 108.1)
Unemployment rate, among individuals aged ≥ 16 y (2017), median (range)	4.5 (2.2 to 11.6)	4.5 (2.4 to 11.6)
Population estimate (100,000 people) (2017), median (range)	2.0 (0.1 to 101.6)	2.6 (0.2 to 101.6)
Median age (5-y increase) (2010), median (range)	7.8 (6.1 to 10.3)	7.8 (5.7 to 9.2)
Percentage uninsured aged <65 y (2016), median (range)	8.9 (2.8 to 25.4)	7.2 (2.8 to 29.0)
Hospitals per 100,000 people (2016), median (range)	1.9 (0.0 to 18.2)	1.7 (0.4 to 18.2)
Community mental health centers per 100,000 people (2017), median (range)	0.0 (0.0 to 0.6)	0.0 (0.0 to 0.7)
Federally qualified health centers per 100,000 people (2017), median (range)	2.1 (0.0 to 52.1)	1.7 (0.0 to 42.2)
Mental Health Professionals Shortage Area level (2017), median (range)	60.0 (0.0 to 100.0)	50.0 (0.0 to 100.0)

Abbreviations: CD, chemical dependency; HSA, health services area; MH, mental health.

eTable 2. Unadjusted and Adjusted Logistic Models for Combination MH/CD Services

Characteristic	Unadjusted OR (95% CI)	P Value	Adjusted* OR (95% CI)	P Value
Hospital				
Ownership				
For-profit	Ref	Ref	Ref	Ref
Government (nonfederal)	2.30 (1.17–4.55)	.37	2.76 (1.27–6.03)	.011
Nonprofit	3.48 (1.91–6.34)	<.001	3.13 (1.60–6.11)	<.001
Teaching status	2.00 (1.50–2.65)	<.001	1.25 (0.87–1.78)	.22
Member of a hospital system	1.60 (1.19–2.16)	.002	1.56 (1.10–2.21)	.013
Rural location	0.51 (0.34–0.76)	.001	1.12 (0.68–1.84)	.67
Medicare discharge percentage	0.98 (0.98–0.99)	.001	0.99 (0.97–1.01)	.21
Medicaid discharge percentage	1.01 (1.00–1.02)	.021	0.99 (0.98–1.01)	.49
Number of beds (per 10-bed increase)	1.02 (1.01–1.02)	<.001	1.02 (1.01–1.03)	<.001
Operating margin (median 2016–2018)	1.00 (0.99–1.01)	1.00	1.00 (0.98–1.01)	.67
HSA				
Diversity index (2010)	1.00 (0.99–1.01)	.65	0.97 (0.96–0.99)	<.001
Per capita personal income (per \$1,000 USD) (2016)	1.03 (1.02–1.04)	<.001	1.01 (0.99–1.02)	.54
Unemployment rate, among individuals aged ≥16 y (2017)	0.90 (0.81–1.00)	.060	0.93 (0.81–1.08)	.36
Population estimate (100,000 people) (2017)	1.00 (0.99–1.01)	.91	0.99 (0.97–1.00)	.093
Median age (5-y increase) (2010)	0.76 (0.62–0.94)	.010	0.80 (0.59–1.07)	.13
Percentage uninsured aged <65 y (2016)	0.92 (0.90–0.95)	<.001	0.92 (0.87–0.96)	<.001
Hospitals per 100,000 people (2016)	0.90 (0.85–0.96)	.001	0.99 (0.91–1.07)	.77
Community mental health centers per 100,000 people (2017)	1.98 (0.46–8.46)	.36	0.87 (0.13–5.69)	.88
Federally qualified health centers per 100,000 people (2017)	0.97 (0.94–1.00)	.032	1.00 (0.97–1.04)	.99
Mental Health Professionals Shortage Area level (2017)	0.98 (0.98–0.99)	<.001	0.99 (0.99–1.00)	.13

Abbreviations: CD, chemical dependency; HSA, health services area; MH, mental health; OR, odds ratio.

*Adjusted for ownership, teaching status, system membership, rural location, Medicare percentage, Medicaid percentage, number of beds, per capita income in the HSA, unemployment rate in the HSA, median age in the HSA, percentage uninsured in the HSA, hospitals per 100,000 people in the HSA, federally qualified health centers in the HSA, Mental Health Professionals Shortage Area level in the HSA, and random effect of HSA.