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Hospital Capabilities Associated With Behavioral Health Integration Within Emergency Departments

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Objectives: To identify hospital capabilities associated with behavioral health (BH) processes in emergency departments (EDs).

Research Design: Six hundred two hospital responses to the 2017/2018 National Survey of Healthcare Organizations and Systems were linked to 2017 American Hospital Association Annual Survey data. Separate multivariable regressions estimated how hospital capabilities (the use of quality improvement methods, approaches to disseminate best patient-care practices, barriers to using care delivery innovations, and inpatient beds for psychiatric or substance use) were associated with each of 4 ED-based BH processes: mental health and substance use disorder screening, team-based approaches to BH, telepsychiatry, and direct referrals to community-based BH clinicians. Models controlled for hospital structural characteristics and area-level socioeconomic factors.

Results: Most hospitals screened for BH conditions and provided direct referrals to community-based BH clinicians. Approximately half of the hospitals used a team approach to BH. A minority had implemented telepsychiatry. Each additional process used to disseminate best patient-care practices was associated with more screening for BH conditions (an increase of 4.07 points on the screening index, $P < 0.01$) and greater likelihood of using a team approach to BH [4.41 percentage point ($P < 0.01$) increase]. Hospitals reporting more barriers to the use of care delivery innovations reported less screening and use of a team approach [a decrease of 0.15 points on the screening index ($P < 0.01$) and 0.28 percentage points reduction in likelihood of team approach use ($P < 0.001$) for 1-point increase in the barrier index].

Conclusions: Research and interventions focused on removing innovation barriers or adding processes to disseminate best practices offer a path to accelerate BH integration in hospital EDs.

Key Words: behavioral health, mental health, emergency departments, hospitals, innovations, team-based care, dissemination strategies, substance use disorder screening, telepsychiatry, behavioral health referrals

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Emergency department (ED) encounters for mental illness and substance use disorders [referred to here as behavioral health (BH) disorders] are increasing over time across the United States, as are BH comorbidities among ED patients.[1,2] Patients with two or more BH diagnoses are twice as likely to use EDs compared with people without BH diagnoses.[3] However, EDs may be overcrowded and poorly equipped to deliver care for BH conditions.[4] To improve ED care, the American College of Emergency Physicians recommends that EDs integrate multiple BH processes, including routine screening for BH concerns such as alcohol use disorders and intimate partner violence, telehealth, the use of interdisciplinary team-based care, and referrals for ongoing care of BH conditions.[5] These processes have been shown to efficiently identify previously undiagnosed BH problems,[6,7] reduce wait times and time in the ED, and improve access to psychiatric consultation.[8–10]

The extent to which US hospital EDs have implemented recommended BH processes and whether specific hospital capabilities can support the integration of BH processes within EDs remains unclear. This study aims to understand the extent to which hospital capabilities are associated with greater adoption of BH care processes in ED. We examined the association of hospital capabilities and 4 BH care processes (screenings, a team care approach, telepsychiatry, and referrals to community-based BH clinicians) in a national sample of EDs.

First, because recent studies have found that hospitals using quality improvement methods were more likely to adopt care delivery innovations, we examined associations between BH care processes and hospital use of Lean, Six Sigma, or Robust Performance Improvement.[11–13] Second, we examined whether hospital processes to disseminate best practices were associated with the use of BH care processes, as prior evidence observed that hospitals with processes to

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disseminate best-care practices were more likely to use clinical decision support tools to enhance care in other clinical domains.[14] Third, based on evidence on the importance of innovation capacity in relation to other upstream care strategies,[15] we examined whether barriers to innovation may impede the implementation of new processes like BH care in the ED. Last, we examined the hospital capacity to treat BH conditions based on the presence of designated beds for psychiatric or substance use disorders. Prior evidence indicates that hospitals with psychiatric treatment capacity were more likely to adopt telepsychiatry[16] and it is possible that designated capacity is synergistic with other BH processes.

Overall, the hospital capabilities examined may indicate a hospital's recognition of the value of new external information, tools, and processes to support hospital performance.[17] They may also be an indication of resources to support organizational change and incorporate new BH processes into the workflows of busy EDs. Given that these BH processes can improve diagnosis and care quality for ED patients and BH integration in hospital EDs is strongly recommended by the World Health Organization (WHO), National Association of EMS Physicians, and US Preventive Services Task Force,[7,18,19] our study can provide insights about how hospitals can improve the implementation of BH care processes.

METHODS

Data and Sample

We linked the 2017/2018 National Survey of Healthcare Organizations and Systems (NSHOS) hospital survey with the 2017 American Hospital Association (AHA) Annual Survey. The NSHOS hospital survey (response rate = 46.5%) collected information on organizational structures and processes of a national sample of critical access and general acute care hospitals between June 2017 and August 2018.[20] The AHA Annual Survey provided information on hospital characteristics.[21] We excluded 18 hospitals that were not in the NSHOS sample frame (eg, due to respondent organization or role changes) and 137 hospitals without responses to the AHA Annual Survey. The analytic sample included 602 hospitals across 50 states that completed the NSHOS and AHA surveys.

Measures

Outcome Variables

NSHOS assessed 4 BH processes in hospital EDs: (1) routine screening and assessment for BH conditions, (2) team-based approaches to BH including mental health providers (ie, psychiatrist, psychiatric nurse practitioner), (3) the use of telehealth or telepsychiatry, and (4) referral to BH clinicians in the community. Routine BH screening was calculated as a composite index based on Yes versus No responses for each of the 6 conditions: (1) depression, (2) sexual, physical, or psychological abuse, (3) marijuana use, (4) opioid use, (5) alcohol abuse, and (6) other substance use [range = 0–100; internal consistency reliability (α) = 0.80]. The remaining 3 BH process measures were each dichotomous (Yes vs. No) (Appendix Table 1, Supplemental Digital Content 1, http://links.lww.com/MLR/C787).

Hospital Capabilities

We constructed 4 measures of hospital capabilities. First, we defined the use of quality improvement methods from the NSHOS as using any method: Lean, Six Sigma, or Robust Performance Improvement. Second, we measured dissemination processes for patient-care best practices from the NSHOS by constructing a count variable of 5 processes: regular staff meetings, regular listserv emails/newsletters, department representatives or champions, an electronic database of practice or system endorsed guidelines, and performance improvement events (Yes vs. No for each, composite range = 0–5). Third, we assessed 6 barriers that impede hospital implementation of care delivery innovations reported in the NSHOS, including: "lack of a process for identifying beneficial innovations," "lack of a process for disseminating information about innovations," "not enough time to implement," "insufficient financial resources to implement," "lack the necessary knowledge/expertise to implement," and "lack of incentives to implement." We assigned each item 100 points if a "Major barrier," 50 if a "Minor barrier," and 0 if "Not a barrier" and then calculated the unweighted average of all items (range = 0–100; α = 0.80). Fourth, we created an indicator for the availability of inpatient beds for psychiatric or substance use care based on AHA survey data.

Control Variables

We controlled for hospital ownership, hospital participation in a network, accreditation by the Joint Commission, health system membership, teaching hospital status, and hospital size (number of beds). To account for characteristics of communities served by hospitals, we controlled for US Census region (Northeast, Midwest, South, and West); ZIP-code-level Rural-Urban Commuting Area codes categorized as urban, large-rural, and small-rural[22]; and the proportion of the population below the federal poverty levels in a hospital's ZIP codes.

Statistical Analyses

Using NSHOS sampling and nonresponse weights, we first computed means and SD for continuous variables and frequencies and proportions for binary variables. Then, separate multivariable regression models were estimated for each of the 4 hospital ED BH processes to assess their association with hospital capabilities, controlling for hospital structural characteristics and area-level demographic characteristics (Table 1). We used linear regression for BH screening (index range: 0–100) and logistic regression for each of the 3 binary BH processes examined. Robust standard errors were used to account for the heteroscedasticity of the models. For ease of interpretation, we estimated marginal effects, which estimate the probability that an ED used the BH care process in response to a one-unit change in continuous hospital capability measures or a 0 to 1 change of binary hospital capability measures. Data analyses were conducted using Stata software, version 17.0.[23]

TABLE 1. Integration of Behavioral Health Processes in Hospital EDs and Hospital Characteristics

	(N = 602)
	N (%) or mean (SD)
Behavioral health integration	
Screening for mental and substance use conditions	
Mean of 0 to 100 index (SD)	75.9 (29.8)
Use of a team approach to behavioral health, N (%)	277 (46.0)
Use of telepsychiatry, N (%)	240 (39.8)
Referrals to community-based behavioral health clinicians, N (%)	498 (82.7)
Organizational capabilities	
Any quality improvement method, N (%)	391 (65.0)
Dissemination of best patient-care practice approaches	
Mean of number of approaches (SD)	3.9 (1.2)
Barriers to the adoption of evidence-based clinical treatments	
Mean of 0 to 100 index (SD)	51.9 (26.0)
Having inpatient beds for psychiatric/substance use care, N (%)	177 (29.4)
Structural characteristics	
Participate in network, N (%)	302 (50.2)
Health system member, N (%)	391 (65.0)
Ownership, N (%)	
Public	127 (21.1)
Private, nonprofit	409 (67.9)
Private, for profit	66 (11.0)
Joint Commission Accreditation, N (%)	378 (62.8)
Teaching hospital, N (%)	238 (39.5)
Hospital bed, mean (SD)	179 (213)
Area-level characteristics	
US Census region, N (%)	
West	117 (19.4)
Northeast	88 (14.6)
Midwest	169 (28.1)
South	228 (37.9)
Rurality (by ZIP code), N (%)	
Urban	311 (51.7)
Large-rural	115 (19.1)
Small-rural	176 (29.2)
% population below census poverty level, N (%)	
< 10%	147 (24.4)
10%–20%	324 (53.8)
20%–30%	86 (14.3)
> 30%	35 (5.8)
Missing	10 (1.7)

ED indicates emergency department.

Source: 2017/2018 National Survey of Healthcare Organizations and Systems (NSHOS) hospital survey with the 2017 American Hospital Association (AHA) Annual Survey. All descriptive statistics were weighted using National Survey of Healthcare Organizations and systems (NHSOS) survey sampling weights.

RESULTS

Descriptive Statistics

Behavioral Health Processes

Routine screening for BH conditions was common in hospital EDs (mean = 75.9, SD = 29.8). Nearly half (46%) of the hospitals used team-based approaches to BH, 40% used telehealth or telepsychiatry, and 83% referred patients to BH clinicians in the community (Table 1).

Hospital Capabilities

Most hospitals (N = 391, 65%) reported using at least one quality improvement method. Hospitals used multiple approaches to disseminate the best patient-care practices, averaging 4 out of 6 approaches (SD = 1.2). The average index of barriers to the use of care delivery innovations was 51.9 out of 100 (SD = 26.0). A minority (29%) of the hospitals had inpatient care capacity for psychiatric or substance use disorders (Table 1).

Multivariable Regression Analyses

In adjusted analyses, hospitals using more methods for disseminating best practices conducted routine screening and assessment for more BH conditions in the ED. For one additional process used to disseminate best patient-care practices, the screening index (0–100 scale) increased by 4.07 points ($P < 0.01$) (Table 2). Further, hospitals with more barriers to using care delivery innovations implemented BH screening for fewer conditions. The BH screening index was 0.15 points lower per 1-point increase in the 0–100 barrier index ($P < 0.01$), highlighting that EDs with more methods to disseminate best practices and fewer barriers to the use of care innovations were more likely to screen for BH conditions.

Similarly, hospitals were more likely to use team-based approaches for BH in the ED when more methods were used to disseminate best practices (4.41 percentage point increase in use of team-based for an additional method of disseminating best practices, $P < 0.01$) and when they experienced fewer barriers to innovation (0.28 percentage point increase in the use of team-based approaches for 1-point reduction in the barrier index, $P < 0.001$). Hospitals were also more likely to report using team-based approaches when the hospital reported capacity for inpatient care for psychiatric/substance use disorders compared with hospitals without inpatient care capacity ($P < 0.001$).

Neither the use of telepsychiatry in EDs nor the presence of a referral system to community-based BH clinicians was associated with hospital capabilities. Teaching hospitals were more likely to adopt team-based approaches compared to nonteaching hospitals ($P < 0.05$).

DISCUSSION

To our knowledge, our study is the first national assessment of the integration of BH processes within hospital EDs. Most hospitals were found to use screening for BH conditions and had referral processes to community-based BH clinicians in place. Approximately half of the hospitals used a team approach to BH. A minority had implemented telepsychiatry.

Hospitals with more extensive methods for disseminating patient-care best practices and fewer barriers to implementing care delivery innovations were more likely to conduct routine screening and assessment for BH conditions and to use team-based approaches to BH in the ED. Our results offer context for past research suggesting the ED was an important setting to address BH problems given the high rates of BH conditions among ED patients.[24] Implementing universal screening may require hospital investment in personnel or increased workloads for existing staff. Hospitals would require support or reallocation

TABLE 2. Associations Between Hospital Characteristics and Behavioral Health Processes in Emergency Departments

	Behavioral health processes in hospital emergency departments			
	Screening for mental health/ substance use disorders	**Team approach to behavioral health**	**Telehealth/ telepsychiatry**	**Referrals to community-based behavioral health clinicians**
Hospital characteristics	**Coefficients [95% CI]**	**Marginal effects [95% CI]**	**Marginal effects [95% CI]**	**Marginal effects [95% CI]**
Organizational capabilities				
Barriers to the adoption of care delivery innovations	−0.15 [−0.24; −0.05]**	−0.28 [−0.41; −0.14]***	−0.06 [−0.21; 0.10]	0.09 [−0.21; 0.03]
Any quality improvement method	−0.51 [−6.65; 5.63]	1.64 [¯7.00; 10.28]	6.13 [−3.66; 15.92]	2.40 [−4.88; 9.68]
Dissemination of best patient-care practices	4.07 [1.69; 6.46]**	4.41 [1.22; 7.59]**	3.29 [−0.50; 7.07]	0.66 [−2.02; 3.35]
Having inpatient beds for psychiatric/substance use care	2.03 (−3.84; 7.90])	27.7 [19.77; 35.68]***	1.65 [−7.77; 11.06]	0.72 [−7.09; 8.52]
Structural characteristics				
Participate in network	−0.83 [−5.85; 4.19]	−4.15 [−11.61; 3.30]	−7.69 [−15.93; 0.55]	−6.36 [−12.95; 0.24]
Health system member	−2.95 [−9.10; 3.19]	−3.91 [−13.21; 5.38]	8.92 [−1.12; 18.97]	1.68 [−6.01; 9.36]
Ownership (reference = public)				
Private, nonprofit	3.58 [−4.21; 11.37]	9.72 [−1.55; 21.00]	3.85 [−8.70; 16.40]	5.61 [−3.67; 14.90]
Private, for profit	0.71 [−12.83; 14.25]	3.11 [−18.83; 25.05]	14.02 [−8.67; 36.71]	4.69 [−11.35; 20.72]
Joint Commission Accreditation	−2.66 [−8.31; 2.99]	−8.87 [−17.87; 0.12]	−5.83 [−15.28; 3.62]	−9.76 [−17.22; −2.31]*
Teaching hospital	4.58 [−1.42; 10.58]	10.83 [1.66; 20.01]*	−7.65 [−17.94; 2.64]	0.51 [−7.17; 8.20]
Hospital beds	−1.88 [−4.86; 1.11]	3.05 [−3.27; 9.36]	4.09 [−1.40; 9.57]	4.64 [−1.08; 10.36]
Area-level characteristics				
US Census region (ref = West)				
Northeast	2.07 [−5.79; 9.94]	−14.85 [−27.68; −2.02]*	9.53 [−4.94; 24.01]	3.07 [−8.97; 15.10]
Midwest	−1.91 [−9.10; 5.29]	−12.00 [−22.36; −1.64]*	7.06 [−4.60; 18.72]	−2.97 [−11.71; 5.77]
South	−3.57 [−10.51; 3.36]	−22.57 [−32.99; −12.16]***	7.77 [−3.98; 19.52]	4.96 [−4.75; 14.68]
Rurality (by ZIP code, ref = urban)				
Large-rural	−4.57 [−12.38; 3.25]	−5.44 [−17.45; 6.56]	2.37 [−10.62; 15.37]	2.81 [−7.74; 13.37]
Small-rural	−1.70 [−9.75; 6.36]	−2.43 [−14.35; 9.49]	11.30 [−1.56; 24.15]	−8.38 [−17.64; 0.89]
% population below census poverty level (ref = <10%)				
10%–20%	−4.74 [−10.62; 1.14]	−2.56 [−11.94; 6.82]	−2.82 [−12.77; 7.14]	−5.82 [−13.88; 2.23]
20%–30%	−0.42 [−7.81; 6.98]	−1.95 [−14.84; 10.94]	−10.29 [−23.16; 2.58]	−3.66 [−14.24; 6.93]
> 30%	−4.23 [−5.19; 13.66]	5.68 [−10.48; 21.84]	−7.60 [−25.57; 10.37]	−6.88 [−21.77; 8.00]

Number of hospital beds were standardized and its coefficients are the changes in the outcomes associated with a standard deviation change in the number of beds.

*$P < 0.05$.

**$P < 0.01$.

***$P < 0.001$.

Source: Variables from 2017/2018 National Survey of Healthcare Organizations and Systems (NSHOS) hospital survey: all organizational capabilities except for "Having inpatient beds for psychiatric/substance use care," rurality, and % population below census poverty level. Variables from the 2017 American Hospital Association (AHA) Annual Survey: all structural characteristics, and US Census region. Estimates based on linear regression (for screening for mental/substance disorders) or logistic regressions of the remaining dependent variables as a function of the hospital characteristics shown in the table. 95% CIs are in brackets.

of resources to improve BH care processes and balance the benefits and costs of integrating these BH care processes for patients and staff. Similarly, team-based care for emergency psychiatric services that involves nurses, physicians, and psychiatrists can improve wait times and reduce the use of restraint.[8] Hospital policies that focus on information sharing and communication across disciplines might support the use of team care models in EDs. Programs or policies that enable hospitals to develop formal approaches to share patient-care best practices that are enabled by structured communication opportunities can strengthen BH assessment and treatment capabilities in EDs. One example is the Agency for Healthcare Research and Quality's Learning Health Systems initiative that assists organizations in improving the uptake of effective clinical interventions into routine practice through evidence appraisal, information sharing, and dissemination of best practices.[25]

None of the hospital capabilities assessed in the study were associated with telepsychiatry or referrals to community-based BH clinicians. Prior research observed that the receipt of telepsychiatry in the ED was associated with improved outcomes including reduced time in the ED, less crowding, reduced travel time for physicians, and improved access to on-site psychiatric consultation.[9,10] Patients with BH conditions need coordinated and accessible care across community and hospital settings. Our null results suggest that hospitals need more resources to integrate BH processes in the ED, including licensed psychiatrists or other BH providers, reimbursement mechanisms for telepsychiatry, and increased access to community-based BH care providers.[16,26,27] More evidence is needed to better understand how hospitals can foster the use of telepsychiatry and referrals to community-based BH clinicians and improve the effectiveness of these systems.

However, limitations should be considered when interpreting our results. First, we examined whether hospital EDs adopted BH care processes, but we did not assess the types of screening tools for mental health and substance abuse disorders, the structure of team-based care models, telepsychiatry modalities, referral processes, and follow-up, or how consistently BH care processes were used. Second, we were not able to control for several patients (eg, payer mix, illness severity) and organizational characteristics (eg, availability of mental health professionals). The inclusion of additional covariates could alter the results and the impact of these covariates on BH processes in the ED should be examined when relevant data are available. Third, the lack of statistically significant associations observed for some outcomes could be due to the modest sample size. Finally, we were not able to examine whether the use of BH services in hospital EDs was associated with patient outcomes. However, given scant evidence on hospital implementation of BH processes within EDs at a national scale, this study provides a foundation for future research.

CONCLUSIONS

Our study is the first to explore hospital adoption of recommended BH care processes in EDs. We found that methods for disseminating patient-care best practices and strategies to encourage the use of care delivery innovations were associated with a greater use of BH screening and the use of team-based approaches to care. More evidence, however, is needed about how hospitals can integrate telepsychiatry services and strengthen ED referral systems for community-based BH clinicians.

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