AVAILABILITY OF BEHAVIORAL HEALTH CRISIS CARE AND ASSOCAITED CHANGES IN EMERGENCY DEPARTMENT UTILIZATION

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Ashlyn Brooke Burns

AVAILABILITY OF BEHAVIORAL HEALTH CRISIS CARE AND ASSOCIATED CHANGES IN EMERGENCY DEPARTMENT UTILIZATION

One in eight emergency department visits involves a behavioral health crisis. Yet, emergency departments are rarely equipped to meet the needs of patients experiencing a behavioral health crisis. Innovative care delivery models, such as behavioral health crisis care services delivered by mental health treatment facilities, offer a promising alternative to the emergency department. As decisions are being made around reimbursement and expansion of behavioral health crisis care models, empirical evidence on the relationship between these services and emergency department utilization is needed.

The purpose of this dissertation is to 1) assess availability of behavioral health crisis care services across the United States; 2) identify community-level characteristics associated with availability of behavioral health crisis care services; and 3) quantify changes in emergency department utilization associated with availability of behavioral health crisis care services. In doing so, this dissertation identifies gaps in the nation's existing behavioral health crisis care system and highlights the value of ensuring access to these life-saving services. As national implementation of the new 988 Suicide and Crisis Lifeline is underway, findings from this dissertation may help inform efforts to transform the crisis continuum and ensure access to care for all individuals experiencing a crisis.

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CHAPTER 1: INTRODUCTION

Introduction

One in eight emergency department (ED) visits involves a behavioral health crisis,[1] defined as an acute, unstable state related to a mental health condition or substance use disorder.[2] Importantly, behavioral health crises are increasing[1,2] at a much higher rate than overall ED utilization.[3,4] With the increase in anxiety and depression rates during the COVID-19 pandemic, it is more important than ever to ensure adequate access to behavioral health care, as untreated behavioral health conditions could lead to more severe outcomes, such as suicide.[5]

Inadequate access to behavioral health providers often leads individuals to seek care in the ED,[6–9] even when alternate care settings may be more appropriate to meet their needs.[1,2] Poor access to behavioral health services particularly affects low-income,[10] minority,[11] and rural populations.[12] Individuals seeking behavioral health care in the ED report doing so because they have nowhere else to go.[1,6,8] Under the Emergency Medical Treatment and Labor Act (EMTALA), EDs must provide emergency services to the public, regardless of an individual's ability to pay.[13] Thus, the ED may be the only point of failsafe access to care for vulnerable populations in many communities.[1,8,14] However, EDs are often not equipped to serve individuals with behavioral health needs.[1,6–8,14]

Individuals with behavioral health needs have unique care preferences and require specialized, ongoing care. Specifically, individuals with behavioral health needs desire quiet, safe spaces,[15] strong patient-provider communication,[16,17] and personalized care.[16,17] However, the ED is not designed to provide ongoing care, with ED staff frequently lacking behavioral health training.[1,6–8,14] Thus, the ED is often an inappropriate and ineffective

setting for delivering behavioral health care. [16–18] Individuals with behavioral health needs who have used the ED report feeling stigmatized and discharged without anticipated treatment.[18] Given research that indicates unmet behavioral health needs drive poor patient outcomes,[5] repeat ED visits,[18] longer stays,[19,20] and higher costs, [19–22] ensuring access to appropriate behavioral health care is critical to improving both quality and cost of care. Additionally, patients with behavioral health needs experience exceptionally long ED wait times,[11,12,15–17,23] due in part to workload demands, workforce shortages, overcrowding,[1,14,24,25] and limited training among ED staff.[26,27] Moreover, behavioral health utilization exacerbates ED overcrowding[1,14,24,25] and increases patient wait times,[26–28] leading to an increase in the risk of medical errors,[26,27] patient suffering,[1] and patient mortality.[26,28] Furthermore, racial minorities with behavioral health needs experience disparately long ED wait times.[11]

Behavioral health crisis care (BHCC) offered by hospitals and mental health treatment facilities is a potential alternative to the ED for individuals with behavioral health needs.[2,29,30] BHCC is recommended by the Substance Abuse and Mental Health Services Administration (SAMHSA) as a best practice to meet patient needs. [2] While mental health treatment facilities may adopt a range of BHCC services,[2] SAMHSA recommends comprehensive BHCC as a best practice.[2] Per SAMHSA's National Guidelines for Behavioral Health Crisis Care,[2] BHCC must be accessible to anyone, at any time, and should include the following BHCC services:

- ***Mobile Crisis Teams*:** Respond to individuals anywhere in the community and meet them where they are experiencing a crisis. Services may not be restricted to select locations within the region.

- ***Onsite Crisis Receiving and Stabilization*:** Offer the community no-wrong-door access to mental health and substance use care like a hospital emergency department.
- ***Walk-in Services*:** Accept walk-ins, referrals, and first responder drop-offs with a no rejection policy.
- ***Crisis Intervention Teams*:** Staff a multidisciplinary team capable of meeting the needs of individuals experiencing all levels of crisis.
- ***Peer Support Specialists*:** Include peers as team members, with lived experience similar to the population served.
- ***Suicide Prevention*:** Screen for suicide risk and complete comprehensive suicide risk assessments and planning when clinically indicated. [2]

Widespread adoption of BHCC has the potential to improve access and efficiency issues related to behavioral health ED utilization.[2] In terms of access, BHCC presents an opportunity to increase access to specialized behavioral health services and increase capacity for around-the-clock, walk-in care. Access to around-the-clock care is critical, as individuals may experience behavioral health crises at any time of day. As for efficiency, care delivered by BHCC facilities may be more clinically appropriate for individuals with behavioral health needs, and more cost-effective, than ED care. Nevertheless, evidence of the effectiveness of BHCC in real-world practice is still limited.

As a first step to understanding the potential role of BHCC from a community health perspective, it is important to identify facilities offering BHCC and examine barriers to BHCC adoption by mental health treatment facilities. National surveys indicate that just over half of the mental health treatment facilities in the US offer at least one BHCC

service.[31,32] However, it is unknown how frequently mental health treatment facilities offer comprehensive BHCC best practices. To date,[9] no known study has quantitatively examined market factors associated with adoption of comprehensive BHCC best practices on a national scale. Insights about barriers to BHCC adoption will be useful in the development of policies and strategies to improve access to this evidence-based model of care. Generalizable and actionable information may ensure that individuals can access BHCC. Finally, the impact of BHCC on ED utilization has not been established. The inappropriateness of the ED for behavioral health crises is the primary justification for BHCC. While case studies suggest BHCC services may be a viable alternative to EDs, many of these studies rely on the assumption that patients seen in BHCC facilities would have otherwise visited the ED.[2,29,30] However, the evidence for this assumption is very limited. Thus, there is a lack of empirical evidence to quantify the impact of access to BHCC on ED utilization.

Overview of Dissertation

BHCC is a potential alternative to the challenges of behavioral health care in the ED. Still, BHCC is an intervention with limited evidence on adoption and effectiveness. Thus, the purpose of this dissertation is to identify comprehensive BHCC facilities, examine market characteristics associated with their locations, and assess the relationship between BHCC services and ED utilization. Chapter 2 maps out access to all mental health treatment facilities that offer comprehensive BHCC in the United States and describes their organizational characteristics. Chapter 3 examines market characteristics associated with comprehensive BHCC facility locations. Chapter 4 examines the relationship between BHCC services and behavioral health-related ED utilization.

Chapter 2 examines the adoption of comprehensive BHCC by mental health treatment facilities in the United States. While previous studies have described the availability of individual types of BHCC services, this study is the first to examine how often mental health treatment facilities adopt comprehensive BHCC. To identify facilities that have adopted comprehensive BHCC, this study uses a national registry of mental health treatment facilities from SAMHSA. Using a cross-sectional design, this study also provides insight into organizational characteristics associated with adoption of comprehensive BHCC services.

Chapter 3 assesses market factors associated with comprehensive BHCC. Resource dependence theory (RDT) argues that organizations rely on resources in their environment for survival.[33] RDT has been used widely by health services researchers to examine adoption of services among various types of organizations. [34] To analyze the association between market factors and BHCC adoption, this study merges a national dataset of BHCC services with county-level market data.

Chapter 4 uses a longitudinal panel analysis to determine the relationship between BHCC services and behavioral health-related ED visits. One goal of BHCC is to reduce inappropriate ED utilization. Yet, it remains unclear whether BHCC is an effective solution for diverting patients from the ED. This study tests the association between availability of BHCC and changes in behavioral health-related ED utilization.

Overall, this dissertation represents a significant step in developing the evidence base on BHCC, an innovative model for delivering emergency behavioral health services. Given that BHCC is a promising best practice,[2] there is a critical need to identify policy solutions to address gaps in access to BHCC. This dissertation provides insight into

geographic disparities in access to BHCC and associated factors, which can inform the development of policies and strategies to ensure access to care. Decision makers may use this information to mitigate identified barriers and encourage the adoption of evidence based BHCC services in areas with the highest need, promoting equity in access and improving the overall quality, effectiveness, continuity, and value of mental health services across diverse settings.

CHAPTER 2: ADOPTION OF BEHAVIORAL HEALTH CRISIS CARE BEST PRACTICES BY MENTAL HEALTH TREATMENT FACILITIES IN THE US

Introduction

A behavioral health crisis is an acute episode of severe distress associated with a mental health or substance use disorder requiring emergency intervention.[2] One in eight patients seeking care in the emergency department (ED) does so for a behavioral health crisis.[1] Importantly, patients with a behavioral health crisis can be safely and efficiently treated through behavioral health crisis care (BHCC) services delivered in alternate care settings.[29] Additionally, patients who have received care in both ED and BHCC settings reported a preference for BHCC settings.[8] However, patients who have experienced behavioral health crises frequently cite access barriers to alternative care sites, such as BHCC settings, as a primary reason for seeking care in the ED.[8] Improving access to BHCC offers an opportunity to avoid a substantial number of ED visits.[9] Thus, in addition to providing improved care to patients experiencing a behavioral health crisis, increasing adoption of BHCC services is a promising solution to reduce ED overcrowding.[2,9,29]

Various types of health care organizations, including public and private mental health treatment facilities, have adopted BHCC services.[2] The Substance Abuse and Mental Health Services Administration (SAMHSA) outlines minimum expectations and requirements that facilities must meet to fully align with best practices for BHCC. The following services are included among these BHCC best practices: emergency psychiatric walk-ins, crisis intervention teams, onsite stabilization, mobile crisis responses, suicide prevention, and peer support specialists.[2] Additionally, BHCC organizations should provide care to anyone, regardless of ability to pay for services.[2] When BHCC services are

not implemented comprehensively, care may be inadequate and fragmented, and may fail to meet patient needs.[2] Despite their value, the adoption of BHCC services among mental health treatment facilities varies greatly.[31,32] In fact, recent studies report that the vast majority of mental health treatment facilities do not offer these services.[31,32] However, it is important to note that these prior studies utilized data aggregated to the state level to describe the availability of services in each state.[31,32] Thus, limited information is available on the geographic distribution of service availability. Furthermore, prior studies examined the availability of individual crisis services but not how frequently all of these BHCC services are adopted by the same facility. As such, it remains unclear whether mental health treatment facilities adopt these best practices comprehensively, independently, or at all.

The purpose of this study is to examine the adoption of best practice BHCC services. Limitations of previous studies are overcome in the current study by using the most recent data from SAMHSA's Behavioral Health Treatment Services Locator tool to identify facilities that have adopted BHCC services. Organizational characteristics associated with each BHCC service and the geographic distribution of BHCC best practice facilities by county are presented. Findings from this study may be of interest to leaders of mental health treatment facilities as well as other types of health care organizations that offer BHCC services. Furthermore, as efforts to transform the crisis care system, such as the transition to the 988 Suicide and Crisis Lifeline, are implemented across the U.S., it is critical to identify gaps in access to BHCC services. Policy and decision-makers can use our findings to address gaps in the system and support the adoption of BHCC services in areas lacking availability.

Methods

Design. This is a cross-sectional study using secondary data from SAMHSA's Behavioral Health Treatment Services Locator (hereafter, 'the Locator'), which can be accessed at https://findtreatment.samhsa.gov/.

Sample. This study uses secondary data from mental health treatment facilities (n=11355) downloaded on January 8, 2022. As noted by previous studies, residential treatment facilities and facilities owned by the U.S. Department of Veterans Affairs (VA) serve very specific populations and do not provide services to the general public.[31] Thus, we excluded these facilities, bringing the final sample size to n=9385 facilities.

The Locator is an online, searchable database which includes information on facilities included in the National Mental Health Services Survey (N-MHSS). The N-MHSS is a cross-sectional survey designed to collect statistical information on all known public and private mental health treatment facilities in the United States.[35] Facility staff, including directors or administrators, complete the survey annually. In 2020, 89 percent of eligible facilities responded to the N-MHSS. Additionally, facility information and service listings are updated weekly when facilities inform SAMHSA of changes. Thus, the Locator is the most up-to-date data source on mental health treatment facilities and service availability. As an added advantage, data from the Locator includes detailed information on facility locations, making it possible to examine the distribution of services by state and county. More details on the N-MHSS are available at https://www.datafiles.samhsa.gov/.[35]

Variables. The primary dependent variable captures whether a mental health treatment facility has fully adopted BHCC best practices. This was determined using seven dichotomous variables indicating whether a facility serves all age groups and provides each

of the following six services: emergency psychiatric walk-ins, crisis intervention teams, onsite stabilization, mobile crisis responses, suicide prevention, and peer support specialists. A summated scale (0-7) was created from these dichotomous variables, with a 7 indicating that the facility has adopted all BHCC best practices included in this measure. The selected services were chosen to reflect SAMHSA's requirements for BHCC best practices.[2] Additionally, the selected services are routinely reported on by mental health treatment facilities to the N-MHSS and represented in the Locator data.[35]

Data from the Locator tool includes a range of facility characteristics captured by the N-MHSS. Facility characteristics for which data were available included facility operation (private non-profit, private for-profit, public), facility type (outpatient facility, community mental health center, psychiatric hospital, general hospital, partial hospital, certified behavioral health clinic, multi-setting facility), licensure (licensed mental health clinic, federally qualified health center), payment methods accepted (Medicaid, self-pay, private insurance, Medicare), payment options (sliding fee scale, payment assistance), grant funding received (yes/no), special groups (e.g., LGBTQ+ clients, veterans, clients with HIV, etc.) served (yes/no), pharmaceuticals prescribed (yes/no), and multiple languages offered (yes/no).[35] In order to capture geographic area, the SAMHSA data was merged by zip code with 2010 Rural-Urban Commuting Area codes from the U.S. Department of Agriculture, which were aggregated into four categories (metropolitan, micropolitan, small town, rural).[36]

Analyses. Descriptive statistics were used to understand characteristics of mental health treatment facilities represented in the Locator data. Logistic regressions were used to identify characteristics of facilities associated with BHCC best practices as well as each

separate service. All analyses were conducted in SPSS version 27. Further, the locations of BHCC best practice facilities were geocoded using ArcGIS software.[37] Because SAMHSA data is publicly available and this research was conducted at the organizational level, this study did not constitute human subject research.

Results

A total of 9385 mental health treatment facilities were included in the analyses. Overall sample characteristics, including organizational characteristics and crisis care service availability, are summarized in Table 1. Almost two-thirds of facilities were private non-profits (62.2%, n=5837), and one-half were outpatient facilities (50.1%, n=4705). Most facilities were located in metropolitan counties (75.5%, n=7087), accepted Medicaid (92.7%, n=8703), self-payment (90.5%, n=8492), private insurance (86.6%, n=8132), and Medicare (75.3%, n=7066). However, less than half received any grant funding (42.2%, n=3963).

Of the 9385 facilities represented, only 6% (n=564) have adopted all of the BHCC best practices examined. The map (see Figure 1) pinpoints the exact locations of these BHCC best practice facilities across the country. BHCC best practice facilities appear to be concentrated in certain states, while other states have few to no BHCC best practice facilities. Among the BHCC services examined, suicide prevention services were the most common, offered by 69.8% (n=6554) of facilities. As for the other BHCC services, each type of service was offered by less than one-half of the facilities. Mobile/offsite response was the least common, offered by 22.4% (n=2101) of facilities. Approximately 7 percent (n=603) of facilities offered no BHCC services. Table 2 presents cross-tabulations of how frequently facilities that offered a particular service offered each of the additional BHCC

services, providing insight into the relationship between services offered. For example, among facilities that offered walk-in services (n=3164), 75 percent (n=2391) also have a crisis team. However, among facilities that have a crisis team (n=4473), only 40 percent (n=1868) offer mobile services, and only 52 percent (n=2328) offer peer support.

Several organizational characteristics were significantly associated with BHCC best practices adoption (see Table 3). Publicly owned facilities had higher odds (AOR=1.95, CI=1.57-2.41) of adopting BHCC best practices, relative to privately owned non-profits. Community mental health centers (AOR=2.54, CI=2.01-3.21), certified behavioral health clinics (AOR= 3.94, CI=2.77-5.61), and multi-setting facilities (AOR=2.08, CI=1.22-3.54) had higher odds of adopting BHCC best practices relative to outpatient facilities. General hospitals had lower odds (AOR=0.24, CI=0.09-0.60) of adopting BHCC best practices compared to outpatient facilities. Furthermore, facilities licensed as federally qualified health centers had lower odds (AOR=0.36, CI=0.24-0.54) of adopting BHCC best practices relative to non-federally qualified health centers.

Several types of payment mechanisms were associated with higher odds of BHCC best practices adoption compared to facilities not accepting that payment type. Specifically, facilities accepting self-pay (AOR=3.18, CI=1.60-6.29) and Medicare (AOR=2.68, CI=1.75-4.08) had higher odds of BHCC best practices adoption. Additionally, facilities receiving any grant funding had higher odds (AOR=2.45, CI=1.91-3.13) of adopting BHCC best practices relative to facilities without any grant funding. In terms of other facility characteristics, facilities that serve special groups (AOR=2.06, CI=1.46-2.91) and facilities that prescribe pharmaceuticals (AOR=3.27, CI=2.34-4.57) had higher odds of BHCC best practices adoption. Finally, facilities located in a micropolitan area

(AOR=2.31, CI=1.83-2.91), a small town (AOR=2.40, CI=1.85-3.09), or a rural area (AOR=2.05, CI=1.40-3.00) had higher odds of BHCC best practices adoption, relative to facilities located in metropolitan counties.

Discussion

This study sought to examine the adoption of the SAMHSA-recommended BHCC services across the US using secondary data obtained from SAMHSA's Locator tool. We found that only a small fraction of facilities have fully adopted BHCC best practices, despite SAMHSA's call for widespread national adoption.[2] There were more mental health treatment facilities with no BHCC services at all than there were facilities that have fully adopted best practices. Furthermore, we observed considerable variation in the adoption of each individual BHCC service type among mental health treatment facilities. Given that we used 2022 data only two years after the SAMHSA guidelines were published (2020), it is possible that more facilities will adopt BHCC best practices over time.

By pinpointing the locations of BHCC best practice facilities, we can visually examine the distribution of services and identify geographic disparities in access to BHCC. Given the observed geographic variation, we hypothesize that state and local regulations likely play a role in the adoption of BHCC services. These findings underscore the need for additional research comparing state and local policy differences that facilitate or prevent the adoption of BHCC services at the county level. Mental health experts have recently noted the division between the responsibility of states and the federal government and how it influences a largely decentralized, state-managed behavioral health system.[38] While SAMHSA guidelines for best practices apply nationwide, our finding that BHCC

best practices adoption is varied across states further highlights the absence of a national approach to implementing a complete BHCC system.

Our findings on the availability of walk-in services, crisis intervention teams, onsite services, and suicide prevention services are similar to previous reported availability from 2010-2018,[31,32] suggesting there has been little progress towards increasing the adoption of these services in more recent years. Notably, we found a higher percentage of facilities offering peer support services relative to 2017.[32] Thus, more facilities have adopted peer support services since the release of SAMHSA's 2020 guidelines.[2] Additional research is needed to further understand factors that influence the adoption of each key service as well as comprehensive BHCC best practices.

We found that a mobile/offsite response was the least common of the six BHCC services, adopted by roughly one in five mental health treatment facilities. Even when looking specifically among mental health treatment facilities that have adopted other types of BHCC services, mobile/offsite response has not been widely adopted. Notably, the availability of a mobile/offsite response team that can be dispatched to meet community members wherever they are is a critical component of BHCC best practices.[2] However, delivering mobile/offsite services may be more resource-intensive (e.g., personnel, equipment, etc.) than other BHCC services. As such, many facilities may lack the capacity to implement mobile/offsite response teams. Future studies should examine barriers and facilitators of mobile/offsite response adoption and identify challenges facilities may face when implementing this service.

We also found that types of payment methods accepted, including Medicare and self-payment, were significant predictors of BHCC best practices adoption. Further, having

any grant funding significantly increased the odds of a facility fully adopting BHCC best practices. These findings highlight the importance of reimbursement for BHCC services in encouraging their adoption by mental health treatment facilities. In previous qualitative research, organizational leaders reported funding as a barrier to adopting BHCC services,[9] indicating the need for adequate reimbursement to sustain BHCC services. Thus, additional research is needed to understand how different payment and reimbursement models facilitate versus impede the adoption of BHCC services.

Finally, there were significant differences in adopting BHCC best practices by geographic area. Micropolitan, small towns, and rural areas all had higher odds of adopting BHCC best practices than metropolitan areas. While this may seem counterintuitive, previous research has reported similar findings when examining the distribution of suicide prevention services.[39] It is plausible that the direction of grant funding to increase access for underserved populations in rural areas has influenced adoption of BHCC. Our understanding of how the external environment, or factors outside of the organization, influence the adoption of BHCC services is still limited. Hence, future research should examine county-level characteristics (e.g., available resources, social determinants of health) associated with BHCC best practice facility locations.

These findings are subject to limitations. First, this study examines six BHCC services that are among those required by SAMHSA to be fully aligned with best practice BHCC. However, this does not represent an exhaustive list of all services and expectations outlined by SAMHSA, as there are additional requirements that cannot be measured through publicly available data used in this study. Second, while this study used the most recent data available, as the Locator tool relies on facilities to report any changes in service

offerings to keep the information up-to-date, it is not possible to verify whether facilities are actively providing the services indicated. Additionally, the N-MHSS is a voluntary survey. While responses are solicited from all known mental health treatment facilities, 11% of eligible facilities did not respond.[35] Finally, facility listings in the Locator tool are optional. When completing the N-MHSS, facilities may opt out of having their information included in the Locator tool. As such, a small percentage of facilities represented in N-MHSS data are not represented in the Locator tool, which may result in differences in frequencies of services reported across data sources.

Conclusion

In many communities, the crisis care system is fragmented, inadequate, or non-existent. Despite SAMHSA guidelines calling for comprehensive BHCC services, only a fraction of facilities have fully adopted BHCC best practices. Efforts are needed to encourage widespread uptake of BHCC best practices and increase access to resources for patients experiencing a behavioral health crisis.

Figure 1: Comprehensive behavioral health crisis care locations

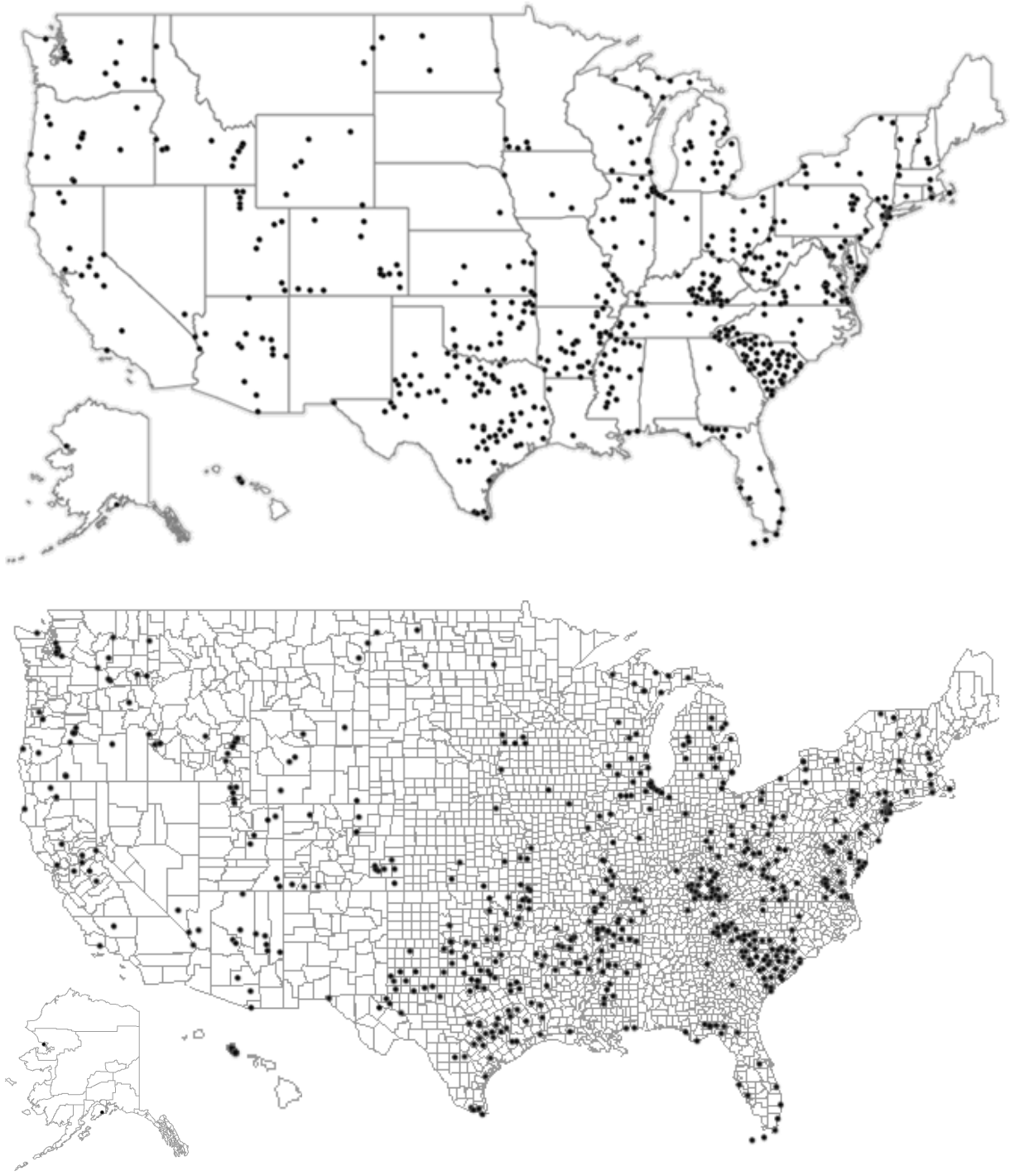


Table 1: Organizational characteristics of mental health treatment facilities (n=9385)

Organizational characteristics	**N**	**%**
Facility operation		
Private non-profit	5837	62.2
Private for-profit	2241	23.9
Public	1307	13.9
Facility type		
Outpatient facility	4705	50.1
Community mental health center	2332	24.8
Psychiatric hospital	838	8.9
General hospital	508	5.4
Partial hospital	391	4.2
Certified Behavioral Health Clinic	306	3.3
Multi-setting facility	305	3.2
Geographic area		
Metropolitan county	7087	75.5
Urban county	2035	21.7
Rural county	263	2.8
Licensed mental health clinic	1027	10.9
Federally qualified health center	821	8.7
Medicaid	8703	92.7
Self-pay	8492	90.5
Private insurance	8132	86.6
Medicare	7066	75.3
Sliding fee scale	3912	41.7
Payment assistance	2330	24.8
Any grant funding received	3963	42.2
Serves special groups	7889	84.1
Prescribes pharmaceuticals	6534	69.6
Provides services in other languages	1093	11.6
Adoption of behavioral health crisis care (BHCC) services		
Offers suicide prevention services	6554	69.8
Offers crisis intervention team	4473	47.7
Offers peer support services	3554	37.9
Offers onsite emergency services	3383	36.0
Offers emergency walk-ins	3164	33.7
Offers mobile/offsite services	2101	22.4
Accepts patients of all ages	5751	61.3
Comprehensive BHCC services (Offers all 6 services and serves all ages)	**564**	**6.0**

Table 2: Cross-tabulations of best practice behavioral health crisis care services

BHCC Services Offered	Suicide Prevention		Crisis Team		Peer Support		Onsite		Mobile/ Offsite		Walk-Ins	
	N	%	N	%	N	%	N	%	N	%	N	%
Suicide Prevention (n=6554)	-	-	3717	56.7	2921	44.6	2849	43.5	1807	27.6	2832	43.2
Crisis Team (n=4473)	3717	83.1	-	-	2328	52.0	2488	55.6	1868	41.8	2391	53.5
Peer Support (n=3554)	2921	82.2	2328	65.5	-	-	1669	47.0	1313	37.0	1757	49.4
Onsite (n=3383)	2849	84.2	2488	73.5	1669	49.3	-	-	1381	40.8	2246	66.4
Mobile/Offsite (n=2101)	1807	86.0	1868	88.9	1313	62.5	1381	65.7	-	-	1252	59.6
Walk-Ins (n=3164)	2832	89.5	2391	75.6	1757	55.5	2246	71.0	1252	39.6	-	-

Note: Table 2 demonstrates how often additional BHCC services are offered among mental health treatment facilities that offer a specific type of BHCC service.

Table 3: Multivariate relationships between organizational characteristics and adoption of behavioral health crisis care services

Organizational Characteristics	Suicide Prevention	Crisis Team	Peer Support	Onsite	Mobile/ Offsite	Walk-Ins	All Services
Facility operation (reference: private non-profit)							
Private for-profit	0.84**	1.00	0.91	1.26**	1.06	1.27**	1.34
Public	1.29**	1.53***	1.65***	1.46***	1.77***	1.87***	1.95***
Facility type (reference: outpatient facility)							
Community mental health center	1.38***	2.80***	1.55***	2.24***	2.41***	2.28***	2.54***
Psychiatric hospital	1.69***	2.27***	0.66***	10.23***	0.65***	4.76***	0.66
General hospital	1.87***	2.43***	0.66***	15.26***	0.37***	4.88***	0.24**
Partial hospital	1.20	1.25	0.66**	1.07	0.58***	0.36***	0.30
Certified Behavioral Health Clinic	2.12***	5.62***	4.44***	2.20***	3.34***	1.72***	3.94***
Multi-setting facility	0.80	1.81***	1.97***	2.42***	1.97***	1.03	2.08**
Geographic area (reference: metropolitan)							
Micropolitan	1.27**	1.44***	1.20**	1.55***	1.37***	1.42***	2.31***
Small town	1.49***	1.89***	1.07	1.52***	1.62***	1.45***	2.40***
Rural	1.87***	2.04***	1.20	1.47**	1.70***	1.73***	2.05***
Licensed mental health clinic	0.95	1.10	0.97	0.87	0.89	0.88	0.67
Federally qualified health center	1.11	0.74***	0.76**	0.76**	0.58***	0.91	0.36***
Medicaid	1.42***	1.63***	1.01	1.24	2.05***	1.08	0.82
Self-pay	0.97	0.69***	0.79*	1.12	0.71**	1.85***	3.18**
Private insurance	1.37***	1.03	0.66***	1.02	0.92	1.04	0.90
Medicare	1.09	1.18**	1.42***	1..65***	1.29**	2.11***	2.68***
Sliding fee scale	1.05	1.15*	1.19**	1.17**	1.35***	1.06	0.92
Payment assistance	1.15*	1.28***	1.13*	1.36***	0.97	1.37***	1.31*
Any grant funding received	1.56***	1.98***	2.02***	1.66***	1.82***	2.06***	2.45***
Serves special groups	1.55***	1.78***	2.11***	1.45***	1.46***	1.96***	2.06***
Prescribes pharmaceuticals	2.26***	1.88***	2.07***	2.77***	2.32***	2.76***	3.27***
Provides services in other languages	1.25*	1.02	1.34***	0.91	0.85	1.14	0.94
Note: Exp(B) presented *=p<0.05, **=p<0.01, ***=p<.001							

CHAPTER 3: MARKET FACTORS ASSOCIATED WITH COMPREHENSIVE BEHAVIORAL HEALTH CRISIS CARE AVAILABILITY

Introduction

Behavioral health crisis care (BHCC) is a care delivery model designed to meet the needs of individuals experiencing acute distress related to a mental health (MH) and/or substance use disorder.[2,9,29] As defined by the Substance Abuse and Mental Health Services Administration (SAMHSA), BHCC includes emergency behavioral health services available on a 24/7 walk-in basis to all patients, regardless of ability to pay.[2] Additionally, BHCC best practice guidelines from SAMHSA state that facilities should provide comprehensive services, including the following: emergency psychiatric walk-ins, crisis intervention teams, onsite stabilization, mobile crisis responses, suicide prevention, and peer support specialists.[2] BHCC offers a promising alternative to the ED for individuals experiencing a behavioral health crisis and an opportunity to increase access to more appropriate, specialized care.[2,9,29]

Despite SAMHSA recommendations, most MH treatment facilities have not fully adopted these BHCC best practices.[31,32,40,41] As of 2022, only 1 in 20 MH treatment facilities have adopted comprehensive BHCC best practices.[40] While there is a large body of literature examining availability of behavioral health services,[42–45] only a handful of studies have focused on BHCC.[31,32,40,41,46] As a result, our understanding of the drivers and barriers to BHCC adoption is limited. For example, of those that focus on BHCC, only two studies have examined county-level characteristics associated with access to services, including one study that specifically examined access to crisis intervention teams[41] and one study that specifically examined access to mobile crisis response services.[46] These studies

identified geographic disparities in access to crisis intervention teams and mobile crisis response services, with rural counties being less likely to have services.[41] Without a better understanding of the factors associated with adoption of comprehensive BHCC best practices, policy makers are unable to formulate policies that encourage service adoption in counties with the greatest need.[41]

The current study aims to examine market factors associated with adoption of BHCC best practices by MH treatment facilities in the US. We apply resource dependence theory to guide the conceptualization of the market for BHCC best practices, expanding the application of this theory to a new health care setting. Policymakers and funding bodies may use our findings to inform the distribution of resources to underserved communities and ensure equitable access to care.

Conceptual Framework

Resource dependence theory (RDT) argues that organizations acquire resources from their external environments through various strategies to reduce uncertainty and increase their chances for survival.[33,34] From this perspective, organizational survival depends on how well an organization functions within its external environment,[47] and organizations face the threat of closure if they cannot secure enough resources.[48] RDT has been applied to study the adoption of various services, such as IT adoption, emergency services, and community assessments by hospitals, health departments, nursing homes, and medical practices.[34] Thus, RDT is well-suited for examining the adoption of BHCC best practices by MH treatment facilities. Three constructs encompass the resources and uncertainty in an organization's environment: munificence, dynamism, and complexity.[49]

Munificence. Munificence represents resource abundance in the environment. Organizations operating in munificent environments are able to adopt a wider range of tactics in pursuit of goals,[48] and are more likely to adopt innovative strategies.[50] In the context of MH treatment facilities, resources may be conceptualized as patients, providers, and payments which drive demand for services and influence the organization's survival. Thus, thinking of patients as a resource, MH treatment facilities may be more likely to adopt BHCC best practices in communities with high rates of patients with unmet behavioral health needs as this translates to greater demand for services. One way of capturing unmet patient needs is through assessment of mental distress, a quality-of-life measure that indicates individuals with unmet behavioral health needs who are at risk of experiencing a crisis, in the community.[51] Not only do MH treatment facilities need patients, they rely on their patients' ability to pay for services. As a proxy for ability to pay for health care services, previous studies have used income levels and insurance rates when operationalizing resources essential to a munificent environment.[34,48,52] Given that MH treatment facilities need mental health providers (MHPs) on site to provide services, MHPs are another valuable resource. Finally, urban vs. rural geographic area serves as a measure of munificence, as organizations in urban areas may have access to more environmental resources than those available to facilities in rural areas.[34]

Hypothesis 1: *Mental health treatment facilities operating in more munificent environments are more likely to adopt behavioral health crisis care best practices compared to those operating in less munificent environments.*

Dynamism. Dynamism represents how much change is taking place in that environment, or how stable the environment is. Dynamism is typically operationalized as

the degree of instability and uncertainty in the external environment.[34] An environment that constantly changes results in greater uncertainty for decision-makers.[34] Thus, decision-makers in environments with high levels of uncertainty may be less likely to take risks or adopt new strategies.[53] A key characteristic of BHCC is providing services to anyone, anywhere, at any time.[2] The uncertainty around adopting and offering BHCC best practices can pose a challenge for MH treatment facilities as it can be difficult to maintain the necessary infrastructure and capacity to offer services. Thus, MH treatment facilities may be more likely to adopt BHCC best practices in communities where the environment is stable, and subsequently more predictable. Changes in population size and unemployment rates, commonly operationalized as measures of instability or dynamism in the environment, are used similarly in this study.[48,54]

Hypothesis 2: *Mental health treatment facilities operating in more dynamic environments are less likely to adopt behavioral health crisis care best practices than those operating in less dynamic environments.*

Complexity. Complexity represents environmental characteristics that complicate decision making or access to resources in the environment.[34] In the context of MH treatment facilities, barriers that reduce access to services or policies that influence payment amounts may be operationalized as complexity, as such barriers make it more challenging for MH treatment facilities to acquire patients. For example, stigma towards behavioral health disorders is a well-established phenomenon,[55] which can deter individuals from seeking care (reducing demand for services) and impede efforts to direct government funding towards behavioral health services.[56–59] Previous studies have demonstrated that political liberals are less likely to hold stigmatizing attitudes and are

more likely to support policies that increase funding for behavioral health treatment than conservatives.[59] Thus, the political affiliation of the community that MH treatment facilities are located in can be operationalized as a measure of complexity.

Additionally, previous research has demonstrated that minority racial groups face greater stigma associated with utilizing behavioral health services.[60,61] Cultural and contextual factors, such as racial discrimination, may act as barriers and may reduce willingness to receive treatment.[61,62] Furthermore, serving a diverse population in an effective and sustainable way requires that MHPs adapt and learn about cultural beliefs, values, and practices in order to provide culturally competent care.[63–65] Thus, racial and ethnic diversity within the county is operationalized as a measure of complexity for this study.

> **Hypothesis 3:** *Mental health treatment facilities operating in more complex environments are less likely to adopt behavioral health crisis care best practices than those operating in less complex environments.*

Methods

Sample and Design

This study uses a cross-sectional design to analyze the relationship between market characteristics and adoption of BHCC best practices. Secondary data were obtained from the following sources: SAMHSA's National Mental Health Services Survey (N-MHSS), County Health Rankings (CHR), Area Health Resources File (AHRF), U.S. Department of Agriculture (USDA), and Presidential Election Returns (PER). The MH treatment facilities included in this study were identified using a list from SAMHSA's Behavioral Health Treatment Services Locator tool, which was downloaded on January 8, 2022. Residential

treatment facilities, facilities owned by the U.S. Department of Veterans Affairs, and facilities outside of the U.S. were excluded.

Dependent Variables

The 2021 N-MHSS data for MH treatment facilities across the U.S. were obtained from SAMHSA's Behavioral Health Treatment Services Locator tool, which can be accessed at https://findtreatment.samhsa.gov/. This online, searchable database includes information on MH treatment facilities surveyed as part of the N-MHSS, which includes nearly all public and private U.S. facilities offering MH services. Importantly, while this database is informed by the N-MHSS, it is also updated on a weekly basis when facilities notify SAMHSA of changes in services, making it the most up-to-date source of information on service availability.[66]

The main dependent variable, adoption of comprehensive BHCC best practices at the county-level, was calculated using 2021 N-MHSS data. Adoption of comprehensive BHCC best practices was determined by a MH treatment facility in the county indicating that they serve all age groups and provide all of the following services: emergency psychiatric walk-ins, crisis intervention teams, onsite stabilization, mobile crisis responses, suicide prevention, and peer support specialists. Consistent with a previously published methodology,[40] a binary composite outcome indicated whether a facility has comprehensively adopted all BHCC best practices. These services were selected as SAMHSA recommends them as critical components of a comprehensive crisis response system in order to prevent gaps in access to care. Additionally, information on whether MH treatment facilities offer each of these services is captured in the N-MHSS and represented in the Locator data.[2] In addition to examining adoption of comprehensive

BHCC best practices as a composite outcome, we also examine adoption of each of the aforementioned individual services.

Independent Variables

The independent variables used to operationalize RDT constructs in this study are presented in **Table 1**. Data on variables representing county-level munificence were extracted from the 2021 CHR, including reported rate of mental distress, median household income, percent insured, and the number of MHPs per capita. Geographic location was measured using the most recently available 2010 Rural-Urban Commuting Area (RUCA) Codes from the USDA. To represent dynamism, data on county-level unemployment and population size were obtained from the 2021 AHRF. Change in unemployment and change in population size were both calculated by taking the absolute value of the percent change over a 5-year period from 2016 to 2021. Variables representing complexity include political affiliation and county diversity. Political affiliation is measured as the percent of individuals who voted republican in the county, obtained from the 2020 Presidential Election Returns.[67] County diversity is measured using the Entropy Index, a score that measures diversity across the following racial groups: African Americans, American Indians or Alaskan Natives, Asians, Native Hawaiians or other Pacific Islanders, Hispanics, and non-Hispanic Whites.[61,68,69]

During exploratory data analyses examining independent variables as continuous predictors, we identified concerns about a lack of linearity in the logit model and multicollinearity between variables. Thus, we transformed most of the independent variables into categorical variables coded 1-4 based on corresponding quartiles (Quartile 1=1, Quartile 2=2, Quartile 3=3, Quartile 4=4). Additionally, we transformed geographic

area into a categorical variable using pre-defined RUCA classifications, with 4 indicating metropolitan, 3 indicating micropolitan, 2 indicating urban, and 1 indicating frontier (rural).

In addition to examining each individual independent variables, we also generated three composite variables representing munificence, dynamism, and complexity using a methodology employed by Spaulding et al. (2018).[70] The purpose of creating composite scores for munificence, dynamism, and complexity was to move beyond examination of individual variables and advance theory by examining the relationship between each collective construct and adoption of BHCC. We summed the respective quartile indicators for all variables operationalizing a given construct, creating three composite scores. This resulted in a munificence variable with a range of 5-20, a dynamism variable with a range of 2-8, and a complexity variable with a range of 2-8. After calculating the composite score, each construct variable was also recoded into four categories based on quartiles.

Statistical Analyses

We used bivariate analyses (chi-squares) to examine associations between each independent variable and adoption of comprehensive BHCC best practices. A series of logistic regression models described the adjusted association between each independent variable and adoption of BHCC best practices as well as the associations between each RDT composite construct and adoption of BHCC best practices. Given the nesting of MH treatment facilities within states in our dataset, we adjusted our regression models to account for clustering by state. Statistical analyses were conducted using Stata SE17.0.

Results

All 3,142 counties across the U.S. were included in analyses (**Table 2**). About two-thirds of all U.S. counties (66.1%, n=2,078) have a MH treatment facility that serves all age groups. Suicide prevention was the most commonly adopted type of BHCC service, offered by MH treatment facilities in 64.9% of counties (n=2,040), followed by crisis intervention teams (60.1%, n=1,887). Just under half of all U.S. counties have a MH treatment facility that has adopted emergency walk-in services (49.7%, n=1,561), onsite crisis stabilization services (48.9%, n=1,538), and peer support specialists (48.0%, n=1,507). Finally, 39.6% (n=1,245) of counties have a MH treatment facility that offers mobile/offsite services, making this the least adopted type of BHCC best practice.

Bivariate associations between all independent variables and adoption of comprehensive BHCC best practices are presented in **Table 3.** Counties with a MH treatment facility that has adopted comprehensive BHCC best practices were more likely to be metropolitan ($p<0.001$), have higher rates of reported mental distress ($p=0.006$), have lower median household income ($p<0.001$), and have more MHPs per capita ($p<0.001$). Counties with comprehensive BHCC were also more likely to have lower rates of change in unemployment ($p<0.001$), higher scores on the entropy index indicating higher diversity ($p<0.001$), and a lower percentage of individuals voting Republican ($p<0.001$). In terms of RDT constructs, counties with comprehensive BHCC were more likely to have a higher environmental munificence score ($p<0.001$).

Multivariate associations between individual independent variables representing market characteristics and adoption of BHCC best practices are presented in **Table 4.** Among variables representing munificence, counties with the highest levels of reported

mental distress had higher odds of adopting suicide prevention services (Adjusted Odds Ratio=2.76, CI=1.53-4.98), crisis teams (AOR=2.17, CI=1.08-4.39), walk-in services (AOR=2.42, CI=1.40-4.17), onsite crisis stabilization (AOR=2.62, CI=1.46-4.70), and peer support specialists (AOR=2.26, CI=1.25-4.09) compared to counties with the lowest levels of mental distress. Counties with the most MHPs per capita had higher odds of adopting comprehensive BHCC best practices (AOR=2.26, CI=1.32-3.86) and higher odds of adopting each individual service examined (AOR range: 2.43-5.23). Urban, micropolitan, and metropolitan areas had higher odds of adopting comprehensive BHCC best practices (AORs= 3.06, 3.63, 3.26, respectively) and all individual services compared to frontier (rural) counties. Among variables representing dynamism, counties with the highest change in population size had lower odds of adopting suicide prevention services (AOR=0.69, CI=0.54-0.88), crisis teams (AOR=0.68, CI=0.52-0.88), walk-in services (AOR=0.68, CI=0.49-0.93), and onsite crisis stabilization services (AOR=0.62, CI=0.45-0.86). Among variables representing complexity, counties with the highest score on the entropy index had higher odds of adopting walk-in services (AOR=1.79, CI=1.15-2.81), onsite services (AOR=0.62, CI=0.45-0.86), and mobile/offsite services (AOR=2.17, CI=1.26-3.76). Counties with the highest percent of individuals voting Republican had lower odds of adopting suicide prevention services (AOR=0.52, CI=0.32-0.85) and crisis teams (AOR=0.60, CI=0.38-0.95).

Multivariate associations between RDT composite constructs and adoption of BHCC best practices are presented in **Table 5**. We found strong support for hypothesis 1, which predicted that MH treatment facilities in munificent environments would be more likely to adopt BHCC best practices. Counties with the highest level of munificence had

significantly higher odds (AOR=2.02, CI=1.03-3.99) of adopting comprehensive BHCC best practices compared to counties with the lowest level of munificence. Increasing levels of munificence were also associated with increasingly higher odds of adoption across all individual BHCC services examined (AOR range: 1.88-11.08). We found weak support for hypothesis 2, which predicted that MH treatment facilities in dynamic environments would be less likely to adopt BHCC best practices. Counties with the highest level of dynamism had lower odds of adopting onsite crisis stabilization services (AOR=0.66, CI=0.48-0.91), but dynamism was not significantly related to the other services examined. Hypothesis 3, which predicted that MH treatment facilities in complex environments would be less likely to adopt BHCC best practices, was not supported. Contrary to our hypothesis, counties with the highest level of complexity had higher odds of adopting onsite crisis stabilization services (AOR=1.72, CI=1.15-2.58) and higher odds of adopting mobile/offsite services (AOR=1.96, CI= 1.17-3.26).

Discussion

Despite SAMHSA recommendations that MH treatment facilities adopt comprehensive services,[2] few facilities have fully adopted BHCC best practices. As efforts to implement 988 (the national mental health crisis lifeline) are underway,[41] understanding characteristics that influence adoption of BHCC best practices is particularly salient to ensure access to high-quality, patient-centered care.[40] The current study contributes to how environmental munificence, dynamism, and complexity are associated with adoption of BHCC best practices, filling an important gap in the BHCC literature. We found partial support for the use of RDT constructs to explain the influence of environmental market characteristics on adoption of BHCC best practices. The hypothesis pertaining to

munificence was most strongly supported by our findings, whereas we found limited support for the hypotheses pertaining to dynamism and complexity. Previous studies applying RDT to other health care settings have reported similar findings.[48,71]

Our results suggest that MH treatment facilities located in more munificent counties are more likely to adopt BHCC best practices. Our examination of individual independent variables suggests individuals experiencing mental distress and MHPs are indeed important resources for MH treatment facilities, as higher rates of reported mental distress and higher numbers of MHPs were associated with higher odds of adoption across several BHCC services. Additionally, our findings highlight disparities in access to BHCC in rural counties, further supporting previous literature and suggesting that existing MH treatment facilities located in rural areas may be lacking the environmental resources needed to adopt comprehensive services.[9,40,41,46] Overall, from a RDT perspective, our findings related to munificence are aligned with the theory as organizations need to be in an environment with sufficient resources to ensure sustainability of services.[33,34] One limitation to note is that there may be additional variables that could be used to operationalize unmet behavioral health needs, such as overdose rates and suicide rates.[41] However, due to large amounts of missing data in publicly available data sources, we did not include these variables in our study.

Overall, we did not find statistically significant relationships between dynamism variables and adoption of services. There may be a number of factors that influenced this finding. We operationalized dynamism using variables that are commonly used by studies that employ RDT;[34] however, it is possible that these variables are not sufficient to fully capture environmental dynamism.[71] Furthermore, the timeframe of this study overlaps with

the COVID-19 pandemic, a time during which all communities experienced instability and unexpected changes. In particular, as dramatic changes in unemployment have occurred since the onset of the COVID-19 pandemic, which may have influenced our findings related to dynamism and is a noted limitation of our study.

Counties with the highest levels of complexity had higher odds of adopting two types of BHCC best practices, in opposition to our prediction. In examining individual variables, findings for the Entropy Index were similarly in the opposite direction, suggesting that counties with the highest levels of diversity actually have higher odds of adopting three types of BHCC best practices. However, just because services are available in racially diverse counties does not mean that these services are accessible to all populations.[41] Further research is needed to examine realized access to services among racially diverse populations. We also found that counties with a higher percentage of individuals voting Republican had lower odds of adopting several BHCC services. Given that the Entropy Index and percent voting Republican variables had associations with several services in different directions, it is possible that the composite variable we created was not a representative measure of complexity. Moving forward, additional variables for complexity such as state policies and regulations may be needed. More complex regulatory environments may impose barriers to implementing new services, particularly if regulations are inconsistent with BHCC best practice guidelines. However, comprehensive data on all policies specifically regulating BHCC services were not available at the time of this study. Future research should examine state policies regulating BHCC services and assess alignment with BHCC best practice guidelines.

Practice Implications

Considering that facilities in counties with higher rates of reported mental distress have higher odds of adopting BHCC best practices, this suggests that MH treatment facilities may be more likely to adopt services in communities with unmet behavioral health needs. However, that does not mean there is a sufficient amount of services to cover demand. In fact, this finding brings up an important question regarding other community level characteristics that may be influencing MH and contributing to the need for BHCC services. For example, limited access to outpatient behavioral health services may contribute to unmet behavioral health needs in the community.[72] Previous literature has found that office-based practices of MH professionals are more likely to be located in higher-income communities, limiting access to office-based MH services in lower-income communities.[44] While increasing access to BHCC best practices is important to ensure that individuals who are in crisis can receive the most appropriate care,[2,40] decision makers should also consider ways that may increase access to resources for earlier intervention to promote MH in the community.[72] Addressing upstream factors may reduce the number of individuals who require BHCC services by preventing a crisis from occurring in the first place, improving quality of life for individuals with MH and substance use disorders while reducing the burden on a system that frequently cannot keep up with demand.

Our findings also highlight the importance of MHPs as a resource to MH treatment facilities. Workforce shortages that limit access to affordable behavioral health care have been a recognized challenge for decades,[72] and BHCC services are no exception. BHCC models often rely on a mix of providers, including licensed MHPs and peer support specialists.[9] In areas that have a shortage of MHPs, MH treatment facilities may struggle

to recruit and retain staff needed to adopt BHCC services. In order to increase adoption of services, policymakers may want to consider strategies for training more MHPs and building a stronger workforce.[9,72] Future research should further explore workforce challenges faced by MH treatment facilities that may influence adoption and implementation of BHCC best practices.

Finally, we found that metropolitan, micropolitan, and urban geographic areas have higher odds of adopting all services, highlighting disparities in rural areas and suggesting that rural communities may lack resources needed to adopt services. While rural areas may differ from urban areas in a variety of ways, a lack of organizations to partner with in rural areas may be one factor contributing to this disparity.[9] Strong community partnerships, including law enforcement, first responders, jails, and schools, are needed to divert individuals from less appropriate settings and successfully implement BHCC.[9] It is also possible that MH treatment facilities in rural areas may face additional challenges when recruiting MHPs. Policy makers and grant funding bodies may be able to mitigate disparities in access to BHCC by directing resources to help foster community partnerships and support adoption of services in rural communities.[40,41] Future research should further explore differences in adoption and implementation challenges faced in rural communities.

Table 4: Variables and data sources used to operationalize resource dependence theory

Construct	Measurement	Data source	Year
Dependent Variable			
BHCC Services	Serves patients of all ages	SAMHSA	2022
	Suicide prevention services	SAMHSA	2022
	Crisis intervention teams	SAMHSA	2022
	Emergency walk-in services	SAMHSA	2022
	Onsite emergency services	SAMHSA	2022
	Peer support services	SAMHSA	2022
	Mobile/offsite services	SAMHSA	2022
Independent Variables			
Munificence	Reported rate of mental distress	CHR	2021
	Median household income	CHR	2021
	Mental health providers per capita	CHR	2021
	Percent insured	CHR	2021
	Rural location	USDA	2013
Dynamism	Percent change in unemployment	AHRF	2016-2021
	Percent change in population size	AHRF	2016-2021
Complexity	Entropy index	CHR	2021
	Percent voting republican	PER	2020

Note: All variables are measured at the county-level (n=3142). BHCC= Behavioral Health Crisis Care; SAMHSA= Substance Abuse and Mental Health Services Administration; CHR= County Health Rankings; AHRF= Area Health Resource File; USDA= United States Department of Agriculture; PER= Presidential Election Returns.

Table 5: County-level adoption of behavioral health crisis care (BHCC) best practices and environmental market characteristics (n=3,142)

Environmental Market Characteristics	**Mean**	**(SD)**
Reported mental distress	16.0	(2.6)
Median household income	57,455	(14,578)
Mental health providers per capita	0.002	(0.002)
Percent insured	88.1	(5.1)
Percent change in unemployment	20.3	(14.5)
Percent change in population size	5.0	(18.8)
Entropy index	0.6	(0.3)
Percent voting republican	64.9	(16.1)
Geographic Area	**n**	**%**
Metropolitan	1,166	37.1
Micropolitan	306	9.7
Urban	1,026	32.7
Frontier (rural)	644	20.5
Adoption of BHCC Best Practices	**n**	**%**
Serves all ages	2,078	66.1
Suicide prevention services	2,040	64.9
Crisis intervention teams	1,887	60.1
Emergency walk-in services	1,561	49.7
Onsite crisis stabilization	1,538	48.9
Peer support services	1,507	48.0
Mobile/offsite services	1,245	39.6
All BHCC best practices	**468**	**14.9**

Note: All variables are measured at the county-level. Adoption of BHCC best practices is defined as having at least one mental health treatment facility in the county that offers the specified service. Adoption of "all BHCC best practices" is defined as having a mental health treatment facility in the county that offers all BHCC services and serves all ages.

Table 6: Bivariate associations between county-level environmental market characteristics and adoption of all behavioral health crisis care best practices (n=3,142)

	Adoption of all BHCC best practices		
	Yes (n=468)	No (n=2674)	
Environmental Market Characteristics	**n (%)**	**n (%)**	**p-value**
Reported Mental Distress			0.006
Quartile 1 (<14%)	87 (19)	678 (25)	
Quartile 2 (14.-16%)	139 (30)	658 (25)	
Quartile 3 (16%-18%)	124 (26)	652(25)	
Quartile 4 (>18%)	118 (25)	686 (25)	
Median household income			<0.001
Quartile 1 (<47,825)	152 (32)	633 (24)	
Quartile 2 (47,825-55,150)	97 (21)	689 (26)	
Quartile 3 (55,150-64,039)	100 (21)	685 (26)	
Quartile 4 (>64,039)	119 (25)	667 (25)	
Mental health providers per capita			<0.001
Quartile 1 (<0.0006)	66 (14)	719 (27)	
Quartile 2 (0.0006-0.001)	126 (27)	661 (25)	
Quartile 3 (0.001-0.002)	111 (24)	674 (25)	
Quartile 4 (>0.002)	165 (35)	620 (23)	
Percent insured			0.058
Quartile 1 (<85%)	133 (28)	653 (24)	
Quartile 2 (85-89%)	102 (22)	683 (26)	
Quartile 3 (89-92%)	128 (27)	657 (25)	
Quartile 4 (>92%)	105 (22)	681 (25)	
Geographic Area			<0.001
Metropolitan	203 (43)	963 (36)	
Micropolitan	61 (13)	245 (9)	
Urban	168 (36)	858 (32)	
Frontier (rural)	36 (8)	608 (23)	
Percent change in unemployment			<0.001
Quartile 1 (<9%)	124 (26)	668 (25)	
Quartile 2 (9-18%)	138 (29)	636 (24)	
Quartile 3 (18-29%)	127 (27)	666 (25)	
Quartile 4 (>29%)	79 (17)	704 (26)	
Percent change in population size			0.256
Quartile 1 (<2%)	100 (21)	685 (26)	
Quartile 2 (2-3%)	119 (25)	667 (24)	
Quartile 3 (3-6%)	125 (27)	660 (25)	
Quartile 4 (>6%)	124 (26)	662 (26)	
Entropy index			<0.001
Quartile 1 (<0.33)	75 (16)	710 (27)	
Quartile 2 (0.33-0.59)	91 (19)	695 (26)	
Quartile 3 (0.59-0.85)	140 (30)	646 (24)	

Quartile 4 (>0.85)	162 (35)	623 (23)	
Percent voting republican			<0.001
Quartile 1 (<56%)	164 (35)	621 (23)	
Quartile 2 (56-68%)	110 (24)	676 (25)	
Quartile 3 (68-77%)	102 (22)	683 (26)	
Quartile 4 (>77%)	92 (20)	694 (26)	
Resource Dependence Theory Composite Construct Variables			
Environmental munificence			<0.001
Quartile 1 (5-10)	82 (18)	693 (26)	
Quartile 2 (11-12)	122 (26)	611 (23)	
Quartile 3 (13-14)	111 (24)	652 (24)	
Quartile 4 (15-20)	153 (33)	718 (27)	
Environmental dynamism			0.482
Quartile 1 (2-3)	96 (21)	515 (19)	
Quartile 2 (4)	95 (20)	484 (18)	
Quartile 3 (5)	104 (22)	660 (25)	
Quartile 4 (6-8)	173 (37)	1015 (38)	
Environmental complexity			0.127
Quartile 1 (2-3)	37 (8)	282 (11)	
Quartile 2 (4)	101 (22)	636 (24)	
Quartile 3 (5)	183 (39)	930 (35)	
Quartile 4 (6-8)	147 (31)	826 (31)	

Note: All independent variables (except geographic area) were transformed into quartiles. Adoption of "all BHCC best practices" is defined as having a mental health treatment facility in the county that serves all ages and offers suicide prevention services, crisis intervention teams, walk-in services, onsite crisis stabilization, peer support specialists, and mobile/offsite services.

Table 7: Multivariate associations between county-level market characteristics and adoption of behavioral health crisis care (BHCC) best practices (N=3,142)

	All Services		Suicide Prevention		Crisis Teams		Walk Ins		Onsite		Offsite		Peers	
	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Reported mental distress														
Quartile 2	**1.54**	**1.07-2.21**	**1.68**	**1.11-2.54**	**1.57**	**1.14-2.17**	**1.61**	**1.12-2.30**	**1.43**	**1.07-1.92**	**1.44**	**1.06-1.96**	**1.80**	**1.26-2.57**
Quartile 3	1.28	0.81-2.02	**1.78**	**1.14-2.76**	**1.72**	**1.16-2.55**	**2.09**	**1.32-3.32**	**2.06**	**1.40-3.04**	**1.49**	**1.01-2.19**	**2.08**	**1.36-3.18**
Quartile 4	0.97	0.45-2.09	**2.76**	**1.53-4.98**	**2.17**	**1.08-4.39**	**2.42**	**1.40-4.17**	**2.62**	**1.46-4.70**	1.79	0.90-3.54	**2.26**	**1.25-4.09**
Median household income														
Quartile 2	**0.49**	**0.33-0.73**	0.93	0.66-1.31	**1.57**	**1.14-2.17**	0.79	0.56-1.11	**0.71**	**0.55-0.92**	0.71	0.49-1.02	0.87	0.59-1.29
Quartile 3	**0.46**	**0.23-0.89**	1.23	0.71-2.11	**1.72**	**1.16-2.55**	1.02	0.65-1.61	0.85	0.56-1.31	0.83	0.49-1.42	0.93	0.54-1.62
Quartile 4	0.49	0.23-1.06	1.66	0.98-2.80	**2.17**	**1.08-4.39**	1.36	0.81-2.29	1.11	0.67-1.82	1.10	0.61-1.96	1.28	0.73-2.24
Mental health providers per capita														
Quartile 2	**1.94**	**1.37-2.75**	**1.97**	**1.56-2.50**	**2.19**	**1.72-2.80**	**2.20**	**1.81-2.68**	**1.86**	**1.49-2.33**	**1.46**	**1.12-1.92**	**1.85**	**1.51-2.26**
Quartile 3	**1.70**	**1.10-2.63**	**1.86**	**1.35-2.55**	**1.98**	**1.46-2.68**	**2.20**	**1.70-2.84**	**2.21**	**1.64-2.97**	**1.54**	**1.17-2.01**	**1.94**	**1.41-2.66**
Quartile 4	**2.26**	**1.32-3.86**	**5.16**	**3.40-7.84**	**4.49**	**3.01-6.71**	**3.92**	**2.88-5.32**	**4.70**	**3.23-6.84**	**2.43**	**1.62-3.64**	**5.23**	**3.54-7.74**
Percent insured														
Quartile 2	0.77	0.35-1.71	1.21	0.78-1.87	1.37	0.83-2.27	1.14	0.79-1.66	1.19	0.75-1.91	1.45	0.82-2.56	0.96	0.61-1.52
Quartile 3	1.09	0.57-2.08	**1.75**	**1.02-2.98**	1.78	0.97-3.25	1.43	0.93-2.19	1.45	0.87-2.43	1.58	0.79-3.17	1.17	0.72-1.89
Quartile 4	0.92	0.46-1.81	1.48	0.92-2.39	1.40	0.83-2.38	1.23	0.75-2.02	1.48	0.90-2.45	1.79	0.90-3.55	1.00	0.58-1.73
Geographic area														
Urban	**3.06**	**1.95-4.80**	**4.20**	**3.20-5.50**	**3.36**	**2.58-4.37**	**3.02**	**2.32-3.93**	**3.09**	**2.38-4.03**	**2.28**	**1.62-3.21**	**3.15**	**2.31-4.29**
Micropolitan	**3.63**	**2.13-6.23**	**6.43**	**4.00-10.34**	**5.19**	**3.43-7.87**	**4.71**	**3.12-7.10**	**5.20**	**3.41-7.94**	**3.08**	**2.05-4.64**	**3.96**	**2.68-5.86**
Metropolitan	**3.26**	**1.95-5.43**	**4.77**	**3.50-6.50**	**4.26**	**3.23-5.60**	**4.02**	**3.05-5.32**	**5.12**	**3.84-6.84**	**2.95**	**2.10-4.15**	**4.33**	**3.24-5.78**
Percent change in unemployment														
Quartile 2	1.23	0.83-1.82	0.96	0.74-1.26	1.11	0.82-1.49	1.09	0.88-1.36	0.95	0.77-1.15	1.09	0.86-1.39	0.98	0.76-1.26
Quartile 3	1.13	0.73-1.74	1.05	0.80-1.37	1.06	0.76-1.49	1.01	0.78-1.32	0.93	0.69-1.25	0.96	0.67-1.38	0.93	0.70-1.23
Quartile 4	0.69	0.40-1.20	0.93	0.65-1.33	0.82	0.51-1.34	0.98	0.71-1.35	0.87	0.59-1.28	0.75	0.43-1.33	0.76	0.51-1.14
Percent change in population size														
Quartile 2	1.19	0.69-1.78	0.97	0.77-1.21	0.96	0.77-1.21	0.96	0.77-1.20	0.98	0.77-1.25	0.99	0.79-1.25	1.01	0.79-1.28
Quartile 3	1.23	0.92-2.93	0.95	0.75-1.22	0.90	0.67-1.21	0.85	0.63-1.15	0.82	0.60-1.12	0.94	0.70-1.27	1.02	0.78-1.33
Quartile 4	1.24	0.87-1.76	**0.69**	**0.54-0.88**	**0.68**	**0.52-0.88**	**0.68**	**0.49-0.93**	**0.62**	**0.45-0.86**	0.87	0.71-1.08	0.83	0.66-1.05
Entropy index														
Quartile 2	1.11	0.69-1.78	1.13	0.85-1.51	1.20	0.85-1.70	1.02	0.79-1.32	0.99	0.75-1.31	1.28	0.97-1.69	1.04	0.81-1.35
Quartile 3	1.64	0.92-2.93	0.99	0.60-1.63	1.11	0.68-1.83	1.14	0.72-1.78	1.26	0.83-1.92	**1.73**	**1.08-2.76**	1.17	0.79-1.73
Quartile 4	1.77	0.90-3.50	1.16	0.62-2.17	1.24	0.71-2.19	**1.79**	**1.15-2.81**	**1.75**	**1.07-2.85**	**2.17**	**1.26-3.76**	1.38	0.87-2.20
Percent voting republican														
Quartile 2	0.77	0.56-1.08	**0.58**	**0.45-0.75**	**0.55**	**0.45-0.68**	**0.63**	**0.53-0.76**	0.81	0.63-1.02	**0.74**	**0.62-0.89**	**0.65**	**0.50-0.84**
Quartile 3	0.91	0.58-1.43	**0.60**	**0.41-0.88**	**0.60**	**0.43-0.84**	0.69	0.46-1.03	0.78	0.53-1.16	0.86	0.62-1.19	**0.68**	**0.48-0.95**

Quartile 4	1.07	0.61-1.89	**0.52**	**0.32-0.85**	**0.60**	**0.38-0.95**	0.65	0.39-1.08	0.80	0.49-1.31	0.94	0.58-1.52	0.72	0.48-1.07

Note: AOR= Adjusted odds ratio. Reference group for geographic area is frontier (rural). For all other variables, Quartile 1 is used as the reference group. Adoption of "all best practices" is defined as having a mental health treatment facility in the county that serves all ages and offers suicide prevention services, crisis intervention teams, walk-in services, onsite crisis stabilization, peer support specialists, and mobile/offsite services. Bolded values indicate statistical significance at the $p<0.05$ level.

Table 8: Multivariate associations between resource dependence theory constructs and adoption of behavioral health crisis care (BHCC) best practices (N=3,142)

	All Best Practices		Suicide Prevention		Crisis Teams		Walk Ins		Onsite		Offsite		Peers	
	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI	AOR	95% CI
Environmental Munificence														
Quartile 2	1.75	0.97-3.18	**2.33**	**1.73-3.14**	**2.25**	**1.68-3.01**	**2.18**	**1.60-2.97**	**2.07**	**1.52-2.82**	**1.88**	**1.37-2.58**	**2.02**	**1.54-2.65**
Quartile 3	1.55	0.94-2.54	**4.00**	**2.83-5.65**	**3.43**	**2.39-4.92**	**3.35**	**2.35-4.77**	**3.13**	**2.17-4.53**	**2.23**	**1.54-3.22**	**2.91**	**2.07-4.10**
Quartile 4	**2.02**	**1.03-3.99**	**11.08**	**7.02-17.50**	**8.11**	**5.29-12.43**	**7.50**	**4.81-11.70**	**8.53**	**5.38-13.53**	**5.01**	**3.2-7.86**	**6.57**	**4.11-10.49**
Environmental Dynamism														
Quartile 2	1.07	0.81-1.42	**1.34**	**1.08-1.66**	**1.39**	**1.13-1.72**	1.19	0.96-1.48	0.97	0.79-1.20	1.15	0.91-1.47	1.08	0.82-1.42
Quartile 3	0.85	0.63-1.14	1.01	0.84-1.22	1.09	0.90-1.32	0.87	0.69-1.11	0.82	0.63-1.07	1.01	0.77-1.34	0.85	0.68-1.05
Quartile 4	0.91	0.63-1.30	0.82	0.63-1.06	0.80	0.59-1.07	0.80	0.59-1.07	**0.66**	**0.48-0.91**	0.80	0.56-1.12	0.78	0.59-1.04
Environmental Complexity														
Quartile 2	1.25	0.77-2.02	1.17	0.85-1.60	1.20	0.78-1.86	1.07	0.76-1.52	1.19	0.86-1.63	**1.47**	**1.05-2.05**	1.14	0.77-1.69
Quartile 3	1.66	0.96-2.85	1.11	0.74-1.68	1.50	0.91-2.48	1.51	0.97-2.35	**1.69**	**1.18-2.42**	**1.92**	**1.25-2.95**	1.45	0.91-2.31
Quartile 4	1.73	0.92-3.27	1.18	0.77-1.81	1.26	0.71-2.23	1.59	0.98-2.60	**1.72**	**1.15-2.58**	**1.96**	**1.17-3.26**	1.50	0.91-2.47

Note: Analyses conducted at the county-level. Quartile 1 is used as the reference group for all three construct variables. Bolded values indicate statistical significance at the $p<0.05$ level. Environmental munifience is derived from a composite score representing reported mental distress, median household income, mental health providers per capita, percent insured, and geographic area. Environmental dynamism is derived from percent change in unemployment and percent change in population size. Environmental complexity is derived from entropy index and percent voting republican. Adoption of "All best practices" is defined as having a mental health treatment facility in the county that serves all ages and offers suicide prevention services, crisis intervention teams, walk-in services, onsite crisis stabilization, peer support specialists, and mobile/offsite services.

CHAPTER 4: CHANGES IN EMERGENCY DEPARTMENT UTILIZATION ASSOCIATED WITH BEHAVIORAL HEALTH CRISIS CARE AVAILABILITY

Introduction

With one in eight patients seeking care in the ED suffering from a behavioral health crisis, untreated behavioral health needs contribute to a large portion of potentially preventable ED utilization.[1,14,24,25] Behavioral health-related utilization poses unique challenges for EDs, as a majority of EDs lack the space, personnel, and training needed to provide timely care and address the unique needs of patients with a behavioral health crisis.[27] Importantly, behavioral health crises are increasing[1,2] at a much higher rate than overall ED utilization.[3,4] With the increase in anxiety and depression during the COVID-19 pandemic, it is more important than ever to ensure access to behavioral health care, as untreated behavioral health conditions could lead to more severe outcomes, such as suicide.[5]

Behavioral health crisis care (BHCC), an alternative care delivery model, offers a promising solution to ED overcrowding and an opportunity to increase access to more appropriate, specialized services.[2,9,29] As defined by the Substance Abuse and Mental Health Services Administration (SAMHSA), BHCC includes emergency behavioral health services available on a 24/7 walk-in basis to all patients, regardless of ability to pay.[2] BHCC best practices include emergency psychiatric walk-in services, crisis intervention teams, suicide prevention services, and peer support specialists.[2] BHCC services may be offered by various organizations (e.g., hospitals, fire departments, etc.), but are most commonly delivered by mental health treatment facilities.[2] One goal of increasing access to BHCC is to reduce inappropriate ED utilization.[2,30] Treating patients with behavioral

health needs in BHCC facilities instead of EDs may simultaneously lower health care costs while improving the quality of care patients receive as these facilities offer more specialized services appropriate for their unique needs. However, additional evidence is needed to quantify the relationship between BHCC availability and ED utilization.

The purpose of this study is to assess changes in ED utilization associated with availability of BHCC services. To learn more about this relationship, we linked data on mental health treatment facility locations and BHCC services from SAMHSA with data on ED utilization from the State Emergency Department Database (SEDD). Findings from this study will provide insight into the relationship between access to BHCC and ED utilization on a national level. As efforts are underway to develop comprehensive crisis response systems, this information may help inform decisions made by policy makers, hospital managers, and behavioral health stakeholders.

Methods

This study used a longitudinal panel analysis to examine the relationship between availability of BHCC services and ED utilization.

Data. We compiled a dataset on mental health treatment facility characteristics and availability of behavioral health services between 2016-2021 by utilizing SAMHSA's National Directories of Mental Health Treatment Facilities (hereafter, the National Directories). The National Directories are annual listings of federal, state, and local government facilities and private facilities that provide mental health treatment services and are publicly available at https://www.samhsa.gov/data/report/national-directory-mental-health-treatment-facilities. The National Directories include information on facilities that responded to the National Mental Health Services Survey (N-MHSS), an

annual survey conducted by SAMHSA. One member of the research team manually extracted information on facilities and services from the National Directories to create a longitudinal, facility-level dataset (n=14,726 facility-years). The characteristics we extracted for each facility included ownership (private or public), setting (community mental health center, inpatient, outpatient, partial hospital, residential), payment methods (Medicare, Medicaid, private insurance, payment assistance, sliding fee scale) and services offered (crisis intervention teams, walk in crisis stabilization, suicide prevention services, peer support specialists).

We merged our dataset on BHCC services with data on ED utilization obtained from the Agency for Healthcare Research & Quality's (AHRQ) SEDD for five states: Arizona (AZ), Florida (FL), Kentucky (KY), Maryland (MD), and Wisconsin (WI). These data contain visit-level information on ED visits (n=101,360,483) that do not result in hospitalization, also known as "treat and release" encounters. The included states participated in the SEDD for all years between 2016-2021 and were purposively selected to ensure representativeness from different geographic regions of the US. Since we were interested in measuring changes in ED utilization at the population-level, all facility- and visit-level data were aggregated to the zip code-level based on a list of zip codes obtained from the US Census Bureau.[73] ED visits for patients residing in zip codes outside of the five selected states were excluded because they could not be merged with our dataset on BHCC services. We also excluded zip codes without a mental health treatment facility, as these zip codes do not have BHCC services by definition, and thus are not a fair comparison group. All other zip codes from the five selected states with at least one ED visit in each year of the study period were included in our study (n=6,012 zip-years). Zip code-level

population size and 5-year demographic estimates (2016-2021) were obtained from the Census data.

Missing Data. One limitation we faced in extracting information to build our BHCC dataset was that SAMHSA does not provide a unique facility identifier in the National Directories that can be used to link facility-level data across years. In building our dataset, we used the facility address listed in the National Directories to assign facility numbers and link data on individual facilities across years. If a facility's name changed, but the address remained the same, we assumed that the facility likely experienced a change in ownership or rebranded but considered this as the same facility in our dataset. However, if a facility was not represented in a given year, it was impossible for us to tell from the National Directories alone whether a facility was closed at the time or simply did not respond to the N-MHSS that year. When a facility was missing from the directory in one year but reported services in both the prior year and following year, we assumed the facility did not report services and replaced the missing value with the value from the prior year. If a facility did not report for two or more years in a row, we assumed the facility closed.

Independent Variables. This study's primary independent variables of interest were four indicators representing BHCC services (crisis intervention teams, walk in crisis stabilization, suicide prevention services, peer support specialists). Our dataset included an indicator for whether these services were offered each year, allowing us to identify when a facility started or stopped offering a service within the study period. We also aggregated facility characteristics to the zip code-level to control for the total number of mental health treatment facilities in the zip code, the percentage of facilities that were publicly vs. privately owned, the percentage of facilities accepting various payment methods

(Medicare, Medicaid, private insurance, payment assistance, sliding fee scale), and the percentage of facilities providing different settings of care (community mental health center, inpatient, outpatient, partial hospital, residential).

***Dependent Variables*.** ED utilization rates were our primary variables of interest. Given that we would expect BHCC services to reduce ED visits related to behavioral health crises, but not ED visits for other health needs, we created an indicator for the primary visit reason using the Clinical Classification Software Refined (CCSR) for ICD-10-CM from AHRQ's Healthcare Cost and Utilization Project.[74] The CCSR aggregates ICD-10-CM diagnosis codes into clinically meaningful categories across 22 body systems, providing a means to identify specific clinical conditions.[74] The body system category for mental, behavioral, and neurodevelopmental disorders ("MBD") contains 32 categories, including depressive disorders, alcohol-related disorders, and suicidal ideation/self-harm.[75] We applied the CCSR to the primary ICD-10-CM diagnosis code at discharge on each ED encounter in the SEDD dataset to distinguish between MBD-related and non-MBD-related ED visits. In doing so, we derived a binary variable indicating whether the encounter had an MBD diagnosis as the primary visit reason. To examine population-level changes in MBD-related ED utilization, we aggregated this indicator to the zip-code level, generating the total number of MBD-related ED visits per zip code. To adjust for population size, we converted the total number of MBD-related ED visits to a rate per 100,000 population. Finally, as the distribution of this outcome variable was skewed, we log-transformed the rate of ED visits per 100,000, approximating a normal distribution and minimizing the influence of outliers.

In addition to our primary outcome variable, we also constructed a control outcome. Control outcomes improve internal validity by assessing residual bias in effect estimates.[76] We used pregnancy-related ED utilization as a control outcome, as we do not expect access to BHCC services to influence ED utilization for pregnancy-related conditions. Following a similar process, we applied the CCSR to the primary ICD-10-CM diagnosis code on each ED encounter in the SEDD dataset to distinguish between pregnancy-related and non-pregnancy-related ED visits. In doing so, we derived a binary variable indicating whether the encounter had a pregnancy-related diagnosis as the primary visit reason. We then followed the same process to aggregate this indicator to the zip-code level, convert the total number of pregnancy-related ED visits to a rate per 100,000 population, and log-transformed this outcome.

Analyses. We used longitudinal panel data to examine the relationship between BHCC availability over time and the rate of MBD-related ED utilization at the zip code-level. To estimate the effect of BHCC availability on MBD-related ED utilization, we used a linear regression model with zip code and year fixed effects and standard errors accounting for clustering at the zip code-level. Zip code fixed effects control for time-invariant unobserved zip code attributes that may affect MBD-related ED utilization at the zip code-level, whereas year fixed effects control for time trends.

Results

A total of 1,002 unique zip codes (n=6,012 zip-years) from AZ, FL, KY, MD, and WI were included in our analysis. **Table 9** shows zip code-level summary statistics. The overall rate of MBD-related ED visits reported from included zip codes between 2016-2021 was 1,610 visits per 100,000 population. On average, zip codes had one mental health

treatment facility offering suicide prevention services and less than one facility offering the following services: crisis intervention teams, walk in crisis stabilization, and peer support specialists. The average total number of mental health treatment facilities per zip code was 2.5.

Figure 2 shows overall longitudinal trends in MBD-related ED utilization throughout the study period. Between 2016-2020, MBD-related ED utilization across all five states was trending downward (range: 1,829-1,430 visits per 100,000 population). However, between 2020-2021, rates of MBD-related ED utilization increased from 1,430 to 1,517 visits per 100,000 population. Meanwhile, access to BHCC services fluctuated throughout the study period **(Figure 3)**, with availability of some services increasing one year and decreasing the next. Availability of crisis intervention teams, walk in services, and suicide prevention services decreased from 2020 to 2021. In 2021, there were 2,452 mental health treatment facilities located in the 1,002 zip codes examined. Among these mental health treatment facilities, 455 (18.6%) offered walk in crisis stabilization services, 608 (24.8%) offered peer support services, 643 (26.2%) offered crisis intervention teams, and 1169 (47.7%) offered suicide prevention services.

Results from linear fixed effects regression analysis predicting the log transformed rate of MBD-related ED utilization per 100,000 are presented in **Table 10**. In our initial model examining walk-in crisis stabilization and year only, availability of walk in BHCC services was associated with reduced MBD-related ED utilization (coefficient= -.020, p= 0.036). This finding remained consistent across a second model controlling for other BHCC services (coefficient= -.028, p=0.009) and a third model controlling for additional zip-code level facility characteristics (coefficient= -.027, p=0.015). Availability of crisis

intervention teams, suicide prevention services, and peer support specialists were not significantly associated with changes in MBD-related ED utilization. Results from linear fixed effects regression analysis predicting the log transformed rate of pregnancy-related ED utilization per 100,000 are presented in **Table 11**. Availability of walk in BHCC services was not significantly associated with change in pregnancy-related ED utilization in any model.

Discussion

ED utilization for behavioral health crises is costly and inefficient for both hospitals and patients, necessitating alternative solutions for delivering care to individuals in crisis. This study builds on prior case studies on alternate models for delivering emergency behavioral health services by examining changes in MBD-related ED utilization at the population-level across a longitudinal panel.[29,77–79] We examined changes in MBD-related ED utilization associated with BHCC services. We found that availability of walk-in BHCC services was associated with decreases in MBD-related ED utilization. Our confidence in this finding was strengthened by a null finding when examining the relationship between availability of walk in BHCC services and pregnancy-related ED utilization as a control outcome. When communities have another site that serves walk in patients with urgent needs, it is possible that individuals may turn to these facilities for care instead of the ED. Overall, findings from this study provide additional support for claims that increasing access to BHCC services is a potential solution for diverting individuals from the ED, highlighting the importance of access to walk in BHCC services.

Similar to EDs, mental health treatment facilities that accept walk ins provide individuals in crisis a place where they can get help when they need it, without having to

wait for an appointment.[2] Walk in access is important for meeting the needs of patients in crisis, which require urgent attention. Notably, while we found that availability of walk in BHCC services by mental health treatment facilities was associated with reduced MBD-related ED utilization among the zip code population, we also found that many zip codes lack access to this service. In fact, we saw a 16% decline in the number of facilities offering walk in services from 2020 to 2021, overlapping with the onset of the COVID-19 pandemic. Previous studies of national availability of walk-in crisis services reported a 16% decrease in services from 2014 to 2018,[31] suggesting that service availability was already declining and took an even steeper drop in 2021. The continued decline in availability of these services is concerning, especially given our findings suggesting that these services have the potential to reduce ED utilization. As efforts to establish a national crisis system are underway, policies are needed to address disparities and ensure equitable access to BHCC services.

This study has strengths and weaknesses. Using the National Directories allowed us to identify the exact location of facilities and BHCC services offered in a given year, facilitating our ability to conduct more granular analyses than previous studies using N-MHSS data. However, because some facilities that complete the N-MHSS opt out of inclusion in the National Directories, such facilities are not represented in our dataset. Additionally, it is possible that some facilities may have offered services that were not reflected in reporting, particularly if they did not respond to the N-MHSS in a given year. Furthermore, we relied on the primary admission diagnosis on the ED visit record to determine whether the visit was MBD-related or not. However, it is possible that patients experiencing a behavioral health crisis may have initially presented with another symptom

(e.g., chest pain, trouble breathing) related to anxiety that was recorded by the physician under a different diagnostic code. This may have influenced overall rates of MBD-related ED utilization. Finally, our study period overlaps with the COVID-19 pandemic, which influenced overall ED utilization and may have influenced our findings.

Conclusion

We found that availability of walk-in crisis stabilization services was associated with reduced ED utilization for behavioral health crises. When people have another place that they can go to, or another way to reach out for help, this provides them with an alternative to the ED. These findings provide evidence supporting claims that walk-in crisis stabilization services offered by mental health treatment facilities are a promising alternative model for diverting patients experiencing a behavioral health crisis from the ED. Yet, availability of these services remains limited. As changes to the national crisis care delivery system are underway, ensuring access to walk in crisis stabilization services in critical to preventing ED utilization and delivering patient-centered care.

Table 9: Zip code-level summary statistics (n=1,002)

Summary Statistics	Mean	(SD)
Facilities with behavioral health crisis care services		
Walk-in crisis stabilization	0.49	(0.73)
Peer support specialists	0.46	(0.80)
Crisis intervention teams	0.69	(0.91)
Suicide prevention	1.04	(1.17)
Facility characteristics		
Total mental health treatment facilities	2.45	(2.15)
Percent publicly owned	63.24	(39.02)
Facility setting		
Percent outpatient	58.09	(39.84)
Percent community mental health center	13.88	(29.76)
Percent residential	10.77	(25.76)
Percent partial hospital	9.08	(23.11)
Percent inpatient	8.40	(22.03)
Payment methods accepted		
Percent accepting Medicaid	62.08	(39.18)
Percent accepting private insurance	58.80	(40.16)
Percent accepting Medicare	47.30	(40.76)
Percent with sliding pay scales	26.84	(36.87)
Percent providing payment assistance	12.67	(27.71)
Emergency department utilization		
MBD-related ED visits per 100,000	1,610	(4,462)
Pregnancy-related ED visits per 100,000	1,183	(905)

Note: MBD refers to a body systems category containing diagnoses related to mental, behavioral, and neurodevelopmental disorders, as defined by the Clinical Classification Software Refined (CCSR).[74]

Figure 2: Number of ED visits related to a mental, behavioral, or neurodevelopmental disorder per 100,000 population, 2016-2021

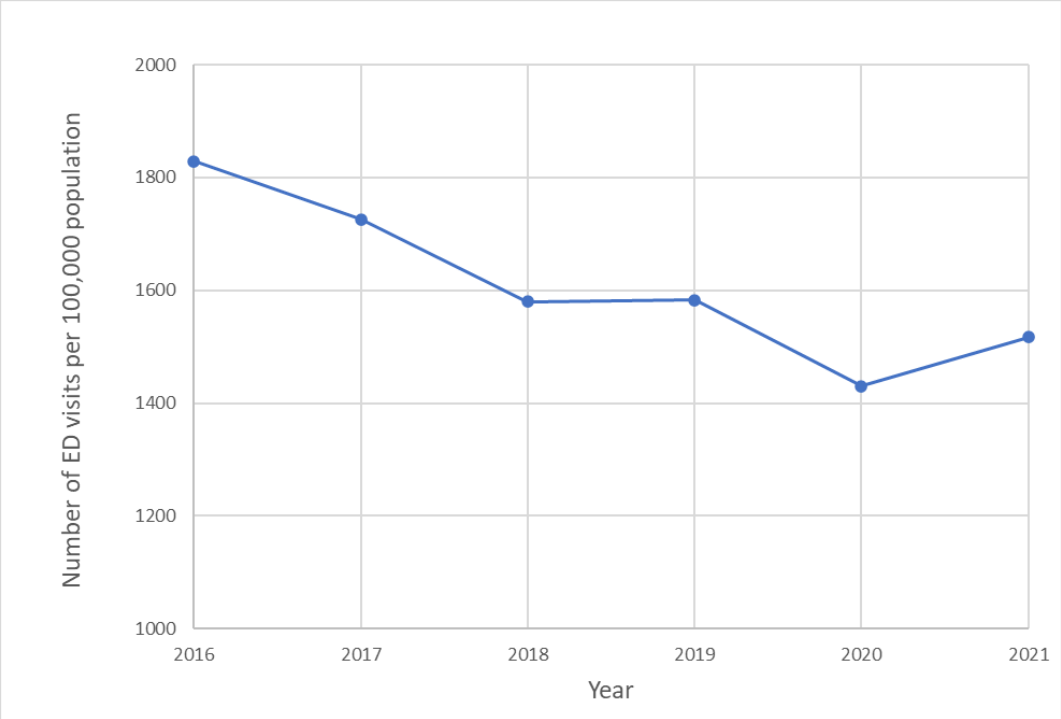
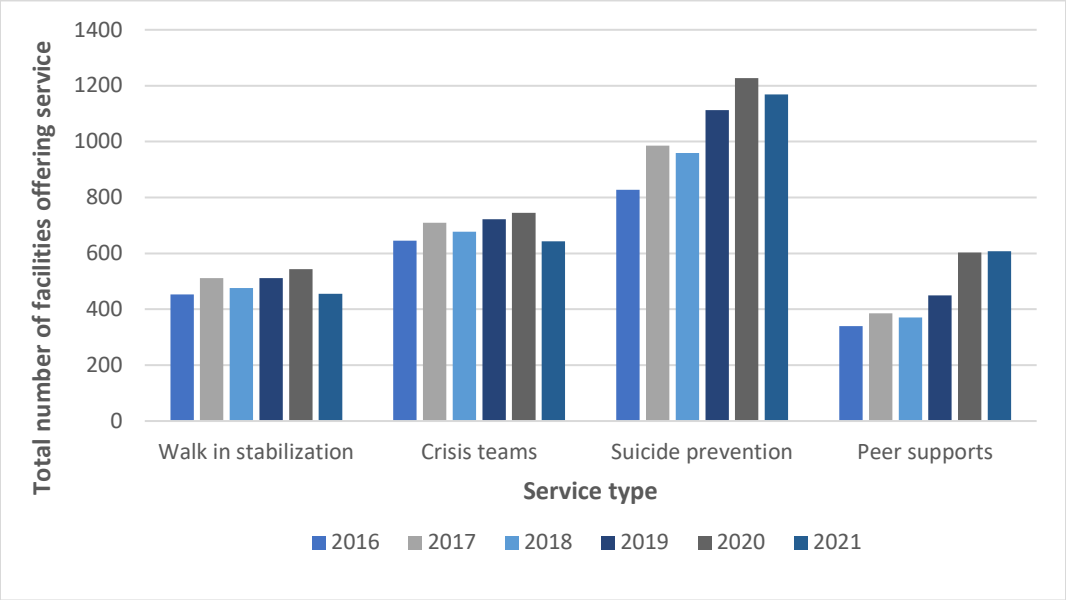


Figure 3: Availability of behavioral health crisis care services by year, 2016-2021



Note: Graph shows the number of mental health treatment facilities offering each service by year. The total number of mental health treatment facilities in the included zip codes were as follows: **2016:** 2456, **2017:** 2455, **2018**: 2455, **2019:** 2454, **2020:** 2454, **2021:** 2452.

Table 10: Effect of adoption of behavioral health crisis care (BHCC) services on mental, behavioral, and neurodevelopmental-related emergency department utilization, 2016-2021 (n=1,002)

	Model 1		Model 2		Model 3	
Organizational Characteristics	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**
BHCC services						
Walk-in crisis stabilization	**-.020**	**0.036**	**-.028**	**0.009**	**-.027**	**0.015**
Crisis intervention teams	-	-	.010	0.168	.009	0.205
Suicide prevention	-	-	.007	0.237	.007	0.266
Peer support specialists	-	-	-.000	0.975	-.000	0.946
Year (reference= 2016*)*						
2017	-.011	0.245	-.012	0.207	-.013	0.195
2018	.009	0.163	.008	0.225	.008	0.249
2019	**.020**	**0.012**	**.018**	**0.034**	**.018**	**0.041**
2020	**-.091**	**<0.001**	**-.094**	**<0.001**	**-.095**	**<0.001**
2021	**-.021**	**0.015**	**-.024**	**0.013**	**-.025**	**0.01**
Zip code-level facility characteristics						
Total mental health treatment facilities	-	-	-	-	-.002	0.954
Percent publicly owned			-	-	.000	0.155
Percent outpatient	-	-	-	-	-.000	0.703
Percent community mental health center	-	-	-	-	-.000	0.357
Percent residential	-	-	-	-	.000	0.417
Percent partial hospital	-	-	-	-	-.000	0.580
Percent inpatient	-	-	-	-	.000	0.933
Percent accepting Medicaid	-	-	-	-	.000	0.934
Percent accepting private insurance	-	-	-	-	-.000	0.162
Percent accepting Medicare	-	-	-	-	-.000	0.747
Percent with sliding pay scales	-	-	-	-	-.000	0.426
Percent providing payment assistance	-	-	-	-	.000	0.253

Note: Bold text indicates statistically significant finding.

Table 11: Effect of adoption of behavioral health crisis care (BHCC) services on pregnancy-related emergency department utilization, 2016-2021 (n=1,002)

	Model 1		Model 2		Model 3	
Organizational Characteristics	**Coefficient**	**P-value**	**Coefficient**	**P-value**	**Coefficient**	**P-value**
BHCC services						
Walk-in crisis stabilization	.002	0.817	.003	0.760	.004	0.734
Crisis intervention teams	-	-	.004	0.587	.003	0.702
Suicide prevention	-	-	-.007	0.313	-.005	0.461
Peer support specialists	-	-	.003	0.683	.004	0.618
Year (reference= 2016*)*						
2017	.017	0.106	.018	0.100	.018	0.106
2018	**.060**	**<0.001**	**.061**	**<0.001**	**.060**	**<0.001**
2019	**.060**	**<0.001**	**.061**	**<0.001**	**.059**	**<0.001**
2020	**-.144**	**<0.001**	**-.142**	**<0.001**	**-.145**	**<0.001**
2021	-.006	0.589	-.005	0.692	-.008	0.521
Zip code-level facility characteristics						
Total mental health treatment facilities	-	-	-	-	-.006	0.871
Percent publicly owned			-	-	.000	0.747
Percent outpatient	-	-	-	-	-.000	0.913
Percent community mental health center	-	-	-	-	**-.000**	**0.043**
Percent residential	-	-	-	-	.000	0.292
Percent partial hospital	-	-	-	-	-.000	0.820
Percent inpatient	-	-	-	-	.000	0.601
Percent accepting Medicaid	-	-	-	-	.000	0.675
Percent accepting private insurance	-	-	-	-	**-.000**	**0.026**
Percent accepting Medicare	-	-	-	-	-.000	0.102
Percent with sliding pay scales	-	-	-	-	-.000	0.274
Percent providing payment assistance	-	-	-	-	**.001**	**0.028**

Note: Bold text indicates statistically significant finding.

CHAPTER 5: CONCLUSION

Given that behavioral health crisis care (BHCC) is a promising alternative to the emergency department (ED) for individuals experiencing a crisis, the purpose of this dissertation was to identify comprehensive BHCC facilities, examine market characteristics associated with their locations, and assess the relationship between BHCC services and ED utilization. More specifically, Chapter 2 mapped out access to all mental health treatment facilities that offer comprehensive BHCC in the United States and described their organizational characteristics. Chapter 3 examined market characteristics associated with comprehensive BHCC facility locations. Finally, Chapter 4 examined the relationship between BHCC services and behavioral health-related ED utilization.

While SAMHSA published best practice guidelines for BHCC services in 2020, not all mental health treatment facilities have implemented these life-saving services. Thus, the aim of Chapter 2 was to identify comprehensive BHCC facilities and determine organizational characteristics associated with offering comprehensive BHCC. We analyzed data from SAMHSA's Behavioral Health Treatment Locator tool. Using a cross-sectional analysis, we measured the association between organizational characteristics (such as facility type, ownership, and insurance accepted) and offering comprehensive BHCC. Overall, we observed that less than 10% of all mental health treatment facilities in the US offer comprehensive BHCC, despite SAMHSA recommendations that services be implemented comprehensively to reduce gaps in access to care. Among organizational characteristics, the strongest predictor of offering comprehensive BHCC was being a certified behavioral health clinic. Such facilities are required to offer BHCC services to obtain certification. Further, accepting self-pay, accepting Medicare, and receiving grant

funding were also important predictors of offering comprehensive BHCC. Mental health treatment facilities need sources of revenue to sustain and expand services. Grant funding may be particularly critical to supporting services that are not yet reimbursable through individual insurance. Findings from Chapter 2 demonstrated that very few communities have access to comprehensive BHCC, with significant variation in the number of facilities in each state. As implementation of the 988 Suicide and Crisis Lifeline is actively underway, these findings can help inform efforts to transform the crisis care system and ensure adequate infrastructure to respond to individuals in crisis.

Considering the variation in the distribution of comprehensive BHCC facilities across the US, examining market factors that may be driving service locations is an important step towards identifying and reducing disparities in access to BHCC. Therefore, the aim of Chapter 3 was to examine county-level market factors associated with offering comprehensive BHCC. Given that previous studies examining availability of BHCC services have been conducted at the state level, conducting a county-level analysis allowed us to generate more granular insights into factors driving access to comprehensive BHCC. Furthermore, this study contributed to theory development by applying resource dependence theory to mental health treatment facilities, which have been understudied compared to hospitals and other health care systems. In alignment with our hypothesis, we found that mental health treatment facilities located in more resourced (munificent) environments were more likely to offer comprehensive BHCC. Specifically, counties with more mental health providers and counties in metropolitan areas had higher odds of offering comprehensive BHCC. These findings highlight the importance of mental health providers as a resource to mental health treatment facilities. In areas with a limited number

of individuals trained to provide mental health services, it may be difficult for facilities to maintain their workforce, limiting their ability to offer additional services. Our findings also identified disparities in access to BHCC in rural counties. While findings from facility-level analyses in Chapter 2 showed that mental health treatment facilities in rural areas were more likely to offer comprehensive BHCC than those in metropolitan areas, findings from county-level analyses in Chapter 3 demonstrated that, overall, rural areas are less likely to have a comprehensive BHCC facility. This is because many rural counties do not even have a mental health treatment facility in the first place. Decision makers can use this information to address workforce shortages and allocate resources to increase access to BHCC in underserved communities.

Beyond mapping locations of BHCC facilities and associated market factors, we also explored whether BHCC services are an effective solution for reducing behavioral health-related ED utilization. BHCC services have been touted as a cost-effective, patient-centered alternative to the ED. Yet, previous evidence on their effectiveness for diverting people from the ED have been primarily based on case studies of pilot models. Therefore, the aim of Chapter 4 was to examine the relationship between BHCC services and behavioral health-related ED utilization through a population-level study. We combined data on BHCC services over a six-year period with data on ED utilization from 5 states to conduct a longitudinal panel analysis. We found that availability of walk-in crisis stabilization services and were associated with reduced ED utilization for behavioral health crises. When people have another place that they can go to seek care, this provides them with an alternative to the ED. These findings provide evidence supporting claims that walk-in crisis stabilization services offered by mental health treatment facilities are a promising

alternative model for diverting patients experiencing a behavioral health crisis from the ED.

Overall, these chapters contribute to a deeper understanding of factors driving the availability of BHCC services and the impact of BHCC services on ED utilization. By identifying locations of comprehensive BHCC facilities and examining associated county-level characteristics, these chapters identified underserved communities and factors contributing to the availability of BHCC services. Given the relationship between the number of mental health providers and availability of BHCC services, minimizing gaps in access to BHCC will likely require developing a stronger behavioral health workforce to ensure that facilities can secure the personnel needed to operate and expand services. There is also a need to address the lack of mental health treatment facilities and availability of BHCC services in rural communities. These are critical steps towards ensuring that all individuals experiencing a crisis have access to high-quality, best practice care. These findings also have implications for practitioners and policy makers looking to reduce inappropriate ED utilization. Given that adoption of walk-in BHCC services was associated with reduced ED utilization, addressing gaps in access to these services could ensure that patients have another option and help address this pressing public health concern.

While this dissertation makes a significant contribution to the evidence base on BHCC services, further work is needed to understand the process of implementing BHCC services and the relationship between this process and patient outcomes. The list of comprehensive BHCC facilities and locations identified by this dissertation may expedite national research studies examining BHCC implementation and effectiveness. Future

research should examine barriers and facilitators of offering BHCC services and factors that may influence quality of patient care.

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TEACHING EXPERIENCE

- **Instructor** (Fall 2023) Financial Management for Public Health Organizations (PBHL-H619), Richard M. Fairbanks School of Public Health
- **Instructor** (Spring 2023) Health Care Delivery in the US (PBHL-H120), Richard M. Fairbanks School of Public Health
- **Teaching Assistant** (Fall 2022) Population and Public Health (PBHL-H506), Richard M. Fairbanks School of Public Health (Primary Instructor: Dr. Joshua Vest)
- **Teaching Assistant** (Summer 2022) US Health Systems and Health Policy (PBHL-H501), Richard M. Fairbanks School of Public Health (Primary Instructor: Dr. Valerie Yeager)

- **Guest Lecturer** (Fall 2021, Fall 2022, & Fall 2023) Population and Public Health (PBHL-H506), Richard M. Fairbanks School of Public Health
    - Topics included health equity and health disparities, public health systems, and public health partnerships/cross-sector collaboration
- **Teaching Assistant** (Fall 2021) Population and Public Health (PBHL-H506), Richard M. Fairbanks School of Public Health (Primary Instructor: Dr. Joshua Vest)

GRANTS AND FUNDED RESEARCH

Project Title: *Changes in Emergency Department Utilization Associated with Access to Behavioral Health Crisis Care*. (September 2023-May 2024). PI: Ashlyn Burns. Funded by the Agency for Healthcare Research and Quality R36 Health Services Research Dissertation Program. (Total Funding: $43,188) Role: **Principal Investigator** (September 2023-Present)

Project Title: *WISE Indiana TO 042 Behavioral Health Commission*. (September 2023-September 2024). PI: Bernice Pescosolido. Funded by the Indiana Family & Social Services Administration, Division of Mental Health and Addiction. (Total Funding: $500,000) Role: **Co-Investigator** (September 2023-Present)

Project Title: *Consortium for Workforce Research in Public Health (CWORPH)*. (October 2022-September 2027) Coordinating Center PI: JP Leider. IU PI: Valerie Yeager. Jointly funded by Health Resources and Services Administration (HRSA) and the Centers for Disease and Control and Prevention (CDC) for the Health Workforce Research Center Cooperative Agreement Program. (Total CWORPH Funding: $2,250,000; IU-Specific Funding $540,000) Role: **Co-Investigator** (January 2023-Present)

Project Title: *Tobacco Cessation Systems Change Partnership Evaluation*. (July 2018-June 2025) PI: Valerie Yeager. Funded by the Indiana State Department of Health (Total Funding $660,000) Role: **Doctoral Research Assistant** (January 2022-July 2022)

Project Title: *Business Equity for Indy – Impediments to Health Playbooks*. (November 2021 – March 2022) PI: Nir Menachemi. Funded by the Indianapolis Chamber of Commerce (Total Funding: $77,660). Role: **Doctoral Research Assistant** (November 2021-March 2022)

Project Title: *Ending the HIV Epidemic Evaluation*. (March 2020-February 2025) PI: Valerie Yeager. Funded by the Marion County Public Health Department (Total Funding: $500,000) Role: **Doctoral Research Assistant** (August 2020-January 2023) / **Co-Investigator** (January 2023-September 2023)

Project Title: *Community Impact Investment Fund Evaluation Planning*. (July 2020-March 2025) PI: Valerie Yeager. Funded by Indiana University Health (Total Funding: $698,500). Role: **Doctoral Research Assistant** (August 2020-January 2023) / **Co-Investigator** (January 2023-September 2023)

PEER-REVIEWED PUBLICATIONS

13. **Burns A**, Menachemi N, Mazurenko O, Salyers M, Yeager VA. State policies associated with access to mobile crisis teams. *Administration and Policy in Mental Health and Mental Health Services Research.* In press.
12. Cronin CE, Singh S, **Burns A**, Yeager VA, Puro N, Santos T, Mathews A, Franz B. Ohio offers lessons for how hospitals can improve alignment with public health agencies. *Health Affairs.* In press.
11. **Burns A**, Yeager VA, Vest JR, Harle C, Madsen E, Cronin C, Singh S, Franz B. New insights about community benefit evaluation: Using the Community Health Implementation Evaluation Framework (CHIEF) to assess what hospitals are measuring. *Health Care Management Review.* In press.
10. Yeager VA, Demosthenidy M, **Burns A**. State laws governing the hiring of public health government employees, 2023. *Journal of Public Health Management and Practice.* In press.
9. Franz B, **Burns A**, Kueffner K, Bhardwaj M, Yeager VA, Singh S, Puro N, Cronin C. A national overview of nonprofit hospital programs to address the social determinants of health. *Health Affairs Scholar.* In press.
8. **Burns A**, Gutta J, Kooreman H, Spitznagle M, Yeager VA. Strategic use of tobacco treatment specialists as an innovation for tobacco cessation health systems change within health care organizations. *Health Care Management Review.* 2023;48(4):323-333. doi: 10.1097/HMR.0000000000000380
7. Yeager VA, **Burns A**, Lang B, Kronstadt J, Hughes MJ, Gutta J, Kirkland C, Orr J, Leider JP. What are public health agencies planning for workforce development? A content analysis of workforce development plans of accredited public health departments. *Journal of Public Health Management and Practice*. 2023. doi: 10.1097/PHH.0000000000001805
6. Yeager VA, **Burns A**, Singh S, Cronin C, Franz B. Evaluation of community benefit activities among nonprofit hospitals, 2018-2021 [published online ahead of print, 2023 Jul 26]. *Journal of Public Health Management and Practice*. 2023. doi: 10.1097/PHH.0000000000001794
5. **Burns A**, Menachemi N, Yeager VA, Vest JR, Mazurenko O. Adoption of best practices in behavioral health crisis care by mental health treatment facilities. *Psychiatric Services*. 2023. doi: 10.1176/appi.ps.20220427
4. **Burns A**, Yeager VA, Cronin CE, Franz B. Community engagement in nonprofit hospital community health needs assessments and implementation plans. *Journal of Public Health Management and Practice.* 2023; 29(2):E50-E57. doi: 10.1097/PHH.0000000000001663
3. Zinn C, Hopgood D, Cronin CE, **Burns A**, Lenhart M, Franz B. Comparison of nonprofit hospital community benefit substance abuse identification and practice implementation in Appalachian and non-Appalachian counties. *Journal of Public Health Management and Practice.* 2023; 29(2):E44-E49. doi: 10.1097/PHH.0000000000001646
2. Singh S, Cronin CE, Yeager VA, **Burns A**, Franz B. The role of local health departments in strengthening the alignment between nonprofit hospitals' community health needs assessments and their implementation strategies. *Journal*

of Public Health Management and Practice. 2022; 28(5):E764-E767. doi: 10.1097/PHH.0000000000001568

1. Franz B, Cronin CE, Yeager VA, **Burns A**, Singh S. Overview of the most commonly identified public health needs and strategies in a nationally representative sample of nonprofit hospitals. *Medical Care Research and Review.* 2022. doi: 10.1177/10775587221135365

PEER-REVIEWED CONFERENCE PROCEEDINGS, ABSTRACTS, & POSTERS

16. **Burns A,** Yeager VA, Vest JR, Harle C, Greene M. *Chief: A conceptual model for evaluating the implementation of community health strategies*. Poster presentation at the AcademyHealth Annual Conference on the Science of Dissemination and Implementation in Health. Arlington, VA, December 2023.
15. **Burns A**, Menachemi N, Mazurenko O, Vest JR, Yeager VA. *Community characteristics associated with adoption of behavioral health crisis care best practices*. Oral presentation at the American Public Health Association Annual Meeting. Atlanta, GA, November 2023.
14. Yeager VA, **Burns A**, Lang B, Kronstadt J, Leider JP. *Workforce development plans of accredited public health departments: What's included?* Oral presentation at the American Public Health Association Annual Meeting. Atlanta, GA, November 2023.
13. Franz B, **Burns A**, Kueffner K, Bhardwaj M, Yeager VA, Singh S, Puro N, Cronin C. *A National Overview of Nonprofit Hospital Programs to Address the Social Determinants of Health*. Oral presentation at the Interdisciplinary Association for Population Health Science Annual Meeting. Baltimore, MD, October 2023.
12. **Burns A**, Collins J, Bellman J. *Indiana's Regional Prevention System: Insights from a Statewide Health Equity Initiative.* Oral presentation at the Indiana Health Equity Summit. Indianapolis, IN, August 2023.
11. **Burns A**, Menachemi N, Mazurenko O, Vest JR, Yeager VA. *State-level treatment policies and adoption of behavioral health crisis care best practices*. Oral presentation at the AcademyHealth Annual Research Meeting. Seattle, WA, June 2023.
10. **Burns A**, Menachemi N, Yeager VA, Vest JR, Mazurenko O. *Adoption of behavioral health crisis care best practices by mental health treatment facilities in the US*. Poster presentation at the AcademyHealth Annual Research Meeting. Seattle, WA, June 2023.
9. Yeager VA, **Burns A**, Cronin C, Franz B. *Evaluation activities conducted by nonprofit hospitals in community health needs assessments.* Oral presentation at the AcademyHealth Annual Research Meeting. Seattle, WA, June 2023.
8. Cronin C, Franz B, Singh S, Puro N, Mathew A, **Burns A**, Yeager V. *Are Hospitals and Local Health Departments in Alignment with Identifying Community Health Needs in Ohio?* Oral presentation at the AcademyHealth Annual Research Meeting. Seattle, WA, June 2023.
7. Yeager VA, **Burns A**, Lang B, Kronstadt J, Leider JP. *A content analysis of workforce development plans of accredited public health departments.* Oral presentation at the AcademyHealth Annual Research Meeting. Seattle, WA, June 2023.

6. **Burns A**, Menachemi N, Yeager VA, Vest JR, Mazurenko O. *Access to best practice behavioral health crisis care services in the US*. Poster presentation at the Indiana State Epidemiological Outcomes Workgroup Symposium. Indianapolis, IN, May 2023.
5. Gutta J, **Burns A**, Yeager VA, Kooreman H, Smith R, and Spitznagle M. *Creating sustainable health systems change for tobacco cessation support within hospital and health care settings*. Poster presentation at the AcademyHealth Annual Conference on the Science of Dissemination and Implementation in Health. Washington DC, December 2022.
4. **Burns A**, Menachemi N, Yeager VA, Vest JR, Mazurenko O. *Behavioral health crisis care: Adoption of best practices by mental health treatment facilities in the United States*. Poster presentation at the AcademyHealth Annual Conference on the Science of Dissemination and Implementation in Health. Washington DC, December 2022.
3. Gutta J, Yeager VA, Kooreman H, **Burns A**, Smith R, Spitznagle M. *Sustainability of tobacco cessation and prevention health systems change initiatives*. Poster presentation at The National Conference on Tobacco or Health. New Orleans, LA, July 2022.
1. **Burns A**, Yeager VA, Cronin CE, Franz B. *Community engagement in nonprofit hospital community health needs assessments and implementation plans*. Oral presentation at AcademyHealth Annual Research Meeting. Washington DC, June 2022.
1. Yeager VA, Cronin CE**, Burns A**, Franz B. *Overview of the most commonly identified public health needs and strategies in a nationally representative sample of nonprofit hospitals, 2019-2021*. Oral presentation at AcademyHealth Annual Research Meeting. Washington DC, June 2022.

HONORS, AWARDS, & CERTIFICATES

- Sherry Queener Graduate Student Excellence Award (2024)
- Center for Service and Learning Jag Action Grant Award (Fall 2023)
- Patient Centered Outcomes Research Institute Ambassador Scholarship (2023)
- Graduate and Professional Education Grant Award (Fall 2023)
- Global Community-Engaged Learning Institute Fellowship (2023)
- AcademyHealth State Health Research and Policy Interest Group Student Award (2023)
- Graduate and Professional Education Grant Award (Spring 2023)
- NLM Population and Public Health Informatics Fellowship (Fall 2022)
- Indiana University Travel Fellowship Award (2022)
- Preparing Future Faculty and Professionals Certificate (2020-2023)
- Academy of Management Health Care Management Division Scholarship (2022)
- Indiana University Travel Fellowship Award (2021)
- Community Engaged Scholars Pathways Program Certificate (2021)
- Strategic Doing™ Practitioner Certificate (2019)
- Purdue University Service-Learning Grant Award (2018)
- Townsend Writing Excellence Award (2016)

SERVICE TO THE PROFESSION

- **Ad hoc Peer Reviewer**
  - *Journal of Public Health Management and Practice*, since 2022

- **Patient Centered Outcomes Research Institute (PCORI)**
  - Ambassador, since 2022
  - Merit Reviewer, since 2021

- **AcademyHealth**
  - Abstract Reviewer for the 2024 Annual Research Meeting
  - Public Health Services and Systems Research Advisory Committee, since 2023
  - Mental Health and Substance Use Research Advisory Committee, since 2023

SERVICE TO INDIANA UNIVERSITY

- **Wellness Ambassador,** Indiana University Indianapolis, since 2023
- **President**, AcademyHealth Student Chapter (2022-2023)
- **Vice President,** AcademyHealth Student Chapter (2021-2022)
- **Student Representative**, Dean's Student Leadership Council, since 2021

SERVICE TO THE COMMUNITY

- **Advisory Board Member,** Beech Grove Comprehensive Drug Free Coalition, since 2021
- **Emergency Room Assistant**, Franciscan Health Mooresville (March 2019-March 2020)
- **Accountable Care Intern,** Franciscan Health Crawfordsville (May 2018-August 2018)
- **Service-Learning Project,** Montgomery County (January 2018-May 2018)
- **Editor,** Indiana's Emergency Food Resource Network (December 2017-January 2019)

PROFESSIONAL ASSOCIATIONS

Member, American Public Health Association, since 2023
Member, Community Anti-Drug Coalitions of America, since 2023
Member, AcademyHealth, since 2022
Member, Academy of Management, since 2022
Member, American Medical Informatics Association, since 2022
Member, National Association of Emergency Medical Technicians, since 2022