Original Article

Federally Qualified Health Centers, Health Center Controlled Network affiliation and performance

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Background: Federally Qualified Health Centers (FQHCs) provide comprehensive primary care for low-income and uninsured individuals, often partnering with other FQHCs and health services organizations through Health Center Controlled Networks (HCCNs) to improve capacity for providing efficient and effective healthcare. These partnerships allow FQHCs to benefit from sharing data and resources that can improve health outcomes for their underserved patient populations. This study examines the relationship between FQHCs and HCCN affiliation and reported clinical and financial performance. Although the Department of Health Resources and Services Administration has encouraged FQHCs/HCCNs strategic collaborations, there has been limited empirical research evaluating the efficacy of the HCCN/FQHC relationship. This is the first study examining the impact of FQHC voluntary affiliations with HCCNs, thus providing new information to guide FQHC administrators' and policy makers' decision-making.

Methods: The study employed a cross-sectional design for the FY 2018 grant year under HRSA 16-010. Descriptive statistics, chi-square tests, and analysis of variances (ANOVAs) were used to examine differences between the characteristics of the three HCCN affiliation groups. We employed logistic regression to predict the association between top quartile (25%) performance for six clinical performance measures by FQHC/HCCN affiliation, controlling for organizational characteristics and county-level market factors. We also examined the association among the three HCCN affiliation groups and financial performance using a linear regression model controlling for organizational characteristics and market factors.

Results: Freestanding affiliated FQHCs were more likely to achieve top quartile clinical performance ranking as compared to FQHCs without a HCCN affiliation. Similarly, health centers affiliated with both freestanding and Primary Care Associations (PCAs) HCCNs reported higher reported total margin.

Conclusions: Even though we only found partial support at the statistically significant level for the FQHC freestanding HCCN affiliation, half the clinical measures were in the top quartile rankings. Also, compared to no HCCN affiliation, FQHCs affiliated with either a freestanding or PCA network reported higher total margin. Evidence suggests it would be valuable for continued encouragement of HCCN collaborations to assist FQHCs in improving their performance and provide support for continued funding of this collaborative program and FQHCs' managers' decisions to participate in this inter-organizational collaboration.

Keywords: Federally Qualified Health Centers (FQHCs); Health Center Controlled Networks (HCCNs); inter-organizational collaboration

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Introduction

With more than 34 million people living in poverty, one in 11 individuals relies upon Federally Qualified Health Centers (FQHCs) and look-alike community health centers for comprehensive primary care (1,2). FQHCs provide comprehensive primary care for low-income and uninsured individuals. To accomplish this goal, FQHCs can partner with other FQHCs and health services organizations through Health Center Controlled Networks (HCCNs) to improve capacity for providing efficient and effective healthcare (3). Collaborating with a federally funded network of health centers allows member centers to benefit from economies of scale to share data and resources that can improve health outcomes for their underserved patient populations (4,5).

The number of FQHCs participating in an HCCN has increased as a result of changes Health Resources & Services Administration (HRSA) made to eligibility requirements for funding [i.e., allowing Primary Care Associations (PCAs) to participate and increasing the minimum number of HCCN FQHC members from 3 to 10]. As a result, FQHC membership in a network grew from 70% in 2015 to 83% by 2020. Concurrently, HCCN aims have also morphed over time, from adoption and implementation of electronic health records (EHRs) to increasing participation in value-based care by leveraging health information technology (HIT).

Highlight box

Key findings

- Freestanding affiliated Federally Qualified Health Centers (FQHCs) were more likely to achieve top quartile clinical performance ranking as compared to FQHCs without a Health Center Controlled Networks (HCCNs) affiliation.
- FQHCs affiliated with both freestanding and Primary Care Associations (PCAs) HCCNs reported higher reported total margin.

What is known and what is new?

- This study examines the relationship between FQHCs and HCCN affiliation and reported clinical and financial performance.
- This is the first study examining the impact of FQHC voluntary affiliations with HCCNs, providing new information to guide FQHC administrators' and policy makers' decision-making.

What is the implication, and what should change now?

- For performance improvement evidence suggests continued encouragement with the necessary funding of the HCCN/FQHC voluntary inter-organizational collaborative program.

Although case studies and performance improvement demonstrations have been published highlighting FQHCs and HCCNs affiliations' operational outcomes, limited empirical research exists that evaluates the effectiveness of HCCNs in achieving stated goals at the patient level. Research from other settings suggests strategic collaboration and technology solutions improve performance but little is known about the impact of voluntary participation in HCCNs on FQHC operational performance, despite HRSA infrastructural investments of over 160 million dollars into HCCNs (6,7).

Background

Overview of the creation of FQHCs

President Johnson's administration is notably remembered by public health advocates for advancements in social justice and poverty. Specifically, Johnson's War on Poverty resulted in policies to provide economic relief to populations impacted by poverty (8). In 1964, the Economic Opportunity Act to fund neighborhood health centers for under-resourced communities targeting uninsured and underprivileged populations was signed into law (9). In 1975, the federal government passed the Community Health Center Program, which was authorized under Section 330 of the Public Health Service Act to enable grant funding (8). In 1989, Congress created the FQHC Program to serve as safety net public health providers to ensure the delivery of a significant level of health care and other needed services to uninsured, Medicaid and other vulnerable populations (10).

FQHCs have evolved and established themselves as an integral part of the U.S. health delivery system for ensuring access to preventative care and primary care service for uninsured and low-income populations. Currently, there are more than 24 million people who access care through more than 1,400 health centers in the United States, District of Columbia, Puerto Rico, the Virgin Islands, and the Pacific Basin (11,12).

A goal of FQHCs, as a safety-net healthcare organization, is to increase access to primary care for individuals who, due to factors like lack of insurance or financial resources, could not otherwise access health care (13). Limited access to care over many years can increase the probability of developing chronic diseases. Medically underserved populations have disproportionately poorer health outcomes and less access to quality, affordable healthcare (11).

Organizational characteristics of FQHCs

FQHCs are not-for-profit ambulatory healthcare centers providing comprehensive primary care services, referrals, and other needed services to vulnerable populations. FQHCs are in medically underserved areas or serve federally designated medically underserved populations of individuals between 100% and 400% of the federal poverty limit at a sliding scale rate (14). According to the National Association of Community Health Centers (NACHC), the term "medically underserved population" represents the population of an urban or rural area designated to have a shortage of personal health services or a population group having a lack of such services (15,16).

FQHCs include community health centers, migrant health centers, health care for the homeless centers, public housing primary care centers, outpatient health programs or facilities operated by a tribe, and health center program "Look-Alikes" (17). FQHCs collaborate with other safety net organizations, community organizations, social services organizations, and specialty care providers to enable access to high-quality primary care (18). Many health centers also offer dental, pharmacy, substance abuse, and other specialty care services for communities with inadequate access (11).

FQHCs are financed primarily through grant funding from the federal government under Section 330 of the Public Service Act (1,12) as well as patient fees, Medicaid and Medicare reimbursement, and other funding sources including state grants and subsidizes (1,12). FQHCs generally operate with a low-profit margin limiting the availability of financial resources to obtain technology and other practice management improvement tools.

FQHC quality reporting

HRSA requires healthcare quality performance reporting for FQHCs identified by the Institute of Medicine (IOM) as needing national action for advancing improved health outcomes (14,19). These quality indicators are a set of core clinical measures (CCMs) that target complex health conditions found among vulnerable populations and communities (14,19). CCMs include but are not limited to, cancer screenings, prenatal care, HIV screening, age-appropriate immunizations, and specific chronic disease parameters (14,19).

In 2015, HRSA began ranking and comparing FQHCs' CCM performance. HRSA uses adjusted quartiles to evaluate FQHCs' improvement in clinical performance measures after adjusting for differences in selected organizational characteristic factors such as percent of uninsured patients, minorities, and special populations (18). Improved clinical performance is ranked from quartile 1 (highest 25% of reporting health centers) to quartile 4 (lowest 25% of reporting health centers) (14,19). Using the National Uniform Data System (UDS) clinical measures, the objective of CCM performance rankings is to provide FQHCs with information on their performance relative to peer organizations (18,20).

FQHC organizational challenges

Health centers operate with a low profit margin which can limit the organization's ability to obtain technology, practice management tools, and internal expertise needed to support value-based care practices (21). According to the American Medical Association, the goal of practice management systems is to leverage healthcare software that manages the day-to-day operations of a clinic, such as appointments, scheduling and billing to enhance efficacy. Acquiring and implementing technology-based practice management tools to increase reimbursement, improve operating efficiencies, and support care coordination in health centers is challenging (22). Barriers to technology adoption in health centers have remained consistent over the years. For example, in a recent study, Lin *et al.* [2018] identified technology cost, Medicaid reimbursement policies, and technical issues such as the lack of community connectivity as significant barriers to HIT adoption in health centers (22). This is concerning considering that leveraging technology-related collaborations for care coordination has shown promising results in improving health outcomes among vulnerable and complex populations (7,23).

In the absence of technology solutions, coordinating care across many providers and services can be challenging and may contribute to decreases in care quality, patient experience, and health outcomes. As such, in 1994, HRSA announced funding for HCCNs to support FQHCs' collaboration and technology-based practice management support services (1,18). HCCNs were and continue to be part of a larger HRSA goal to help health centers overcome organizational gaps through learning health system networks (14,19). The attributes of these learning networks and partnerships include access to shared expertise, training, aligned interest and improved value and care outcomes (14,19). HCCNs are one example of strategic collaboration for health centers with a goal of supporting technology enabled improvements in performance (1).

History of HCCNs

During the mid-1960s, the neighborhood health center program was initiated under the Office of Economic Opportunity to provide access to primary care in medically underserved communities in response to our nation's poverty rates (24). During the late 1970s, due to limited resources, health centers realized they could do more and be more effective if they collaborated with each other regarding operational efficacy and political lobbying than if each center attempted to do so independently. The health centers initially created informal local networks to achieve stated goals of sharing best practices and increasing political strength in advocating for sustainable funding. Due to challenges posed by environmental threats [i.e., Medicaid managed care organizations (MCOs)], in the 1980s, the various health centers then referred to as FQHCs, networks' informal collaborations changed their focus to leveraging shared services and resources. The health center model of care demonstrated that locally governed healthcare could improve health outcomes while lowering costs (15).

HRSA became interested in formally leveraging FQHC collaborations and began funding demonstration grants for network collaboration in 1994 (25). These collaborations, referred to as integrated services networks (ISNs), were established to facilitate cooperation among FQHCs to negotiate contracts with MCOs, centralize certain practice management services, such as billing, and pool data for improving clinical and financial performance. With the 2002 authorization of Public Health Act's Section 330e(1)(C), the ISNs were renamed HCCNs. The goals of the HCCNs have evolved to ensure alignment with HRSA priorities aimed at supporting FQHCs as the healthcare environment changed.

One of HRSA's goals during the early 2010s was to encourage health centers to join HCCNs to benefit from shared services and expertise. To accomplish this goal, HRSA made two changes to its network funding eligibility requirements. First, PCAs were able to participate, and second each HCCN grantee was required to have a minimum of 10 collaborating health center partners (prior requirement was three). HRSA achieved its goal. By 2015, approximately 70% of FQHCs participated in a network and this grew to approximately 83% of FQHCs by 2020. Funding of the networks has also increased over time. In 1994, HSRA's annual funding for the Integrated Services Network Development Initiative (ISNDI) was $4.5 million, allocated among 29 ISNs. By 2019, HRSA's annual award under Grant 19-011 was $42 million across 49 networks (14).

Despite HRSA's significant investment in HCCNs, little is known about the impact of this voluntary collaboration on FQHCs' reported operational performance. The purpose of this study is to compare the clinical and financial performances of those FQHCs participating with federally-funded HCCNs to those FQHCs choosing not to participate.

Methods

Study design

The study employed a cross-sectional design for the FY 2018 grant year under HRSA 16-010. The unit of analysis was the FQHC, and the study's population consists of all FQHCs that met both federal requirements and received grants under Section 330 (n=1,383). The primary outcomes of interest were adjusted quartile rankings of clinical health outcomes and financial performance. The main independent variable was the type of FQHC affiliation with a federally-funded HCCN: no affiliation, free-standing HCCN affiliation, or PCA/HCCN affiliation. Freestanding HCCNs are entities that are majority owned and governed by FQHCs with member FQHCs that may be located in one or multiple states. Whereas freestanding HCCNs are established to focus primarily on supporting HRSA established HCCN priorities, PCAs are state specific organizations that have several core functions such as operating a HCCN program, and providing support (i.e., development, training, operations enhancement, human capital strategies) and technical assistance to current and potential health centers and other safety-net providers (26).

Data sources

This study used data from various publicly available sources to capture FQHC organizational characteristics and county-level market factors. First, administrative data from the UDS were used to obtain FQHCs' patient demographic information, health outcomes, as well as organizational characteristics including HIT usage and adoption information (i.e., health center's implementation of an EHR), certification of systems, HIT capability and how widely adopted the system is throughout the health center and its providers.

HRSA's Health Center Adjusted Quartile Rankings (AQRs) were obtained from the UDS to capture FQHC clinical performance. The following reported AQR clinical performance measures were included: (I) diabetes control;

(II) depression screening and follow-up (age 12+); (III) adults (age 18+) receiving weight screening and follow-up; (IV) colorectal cancer screening (ages 51–74); (V) pap test/ cervical cancer screening; and (VI) hypertension control. These measures represent the programs and services that the majority of FQHCs provide for their patient populations. Clinical performance is adjusted for patient demographics (percent of patients that are uninsured, minority, homeless and farmworker patients) and EHR status and categorized by HRSA into quartiles (i.e., quartile 1 = top performers and quartile 4 = lowest performers) (27).

Second, additional variables related to technology were extracted from HRSA's Health Center, UDS' HIT Capabilities Report. Specifically, FQHCs' reported responses to question 10: "How does your health center utilize HIT and EHR data beyond direct patient care? Health centers can select "all that apply" from six options: quality improvement, population health management, program evaluation, research, other and "we do not utilize HIT or EHR data beyond direct patient care." HIT capabilities were coded as: 0, no HIT Usage/adoption (not beyond patient care); 1, low HIT usage/adoption (any other 1–2 responses); and 2, high HIT Usage/ adoption (more than 2 responses). The 2018 HRSA Area Health Resource File (AHRF) was used to obtain county-level FQHC market factors that may impact health centers' operations: (I) physician supply (rate per 100,000 population); (II) percent of population older than 65; and (III) per capita income. Finally, Internal Revenue Service (IRS) Form 990 data extracted from GuideStar was used to calculate FQHCs' total margin, as measured by net income divided by total revenue, for reporting year 2018.

Analysis

Descriptive statistics, chi-square tests, and analysis of variances (ANOVAs) were used to examine differences between the characteristics of the three HCCN affiliation groups. We employed logistic regression to predict the association between top quartile (25%) performance for six clinical performance measures by FQHC/HCCN affiliation. In the six models, a dichotomous variable was created to indicate if the FQHC was in the top 25% quartile ranking for each of the clinical performance measures (1= yes, 0= no). The multivariate models controlled for organizational characteristics and market-level factors. Finally, linear regression analysis was used to evaluate the relationship between HCCN affiliation and reported total margin. The data were analyzed using Stata Version 18.

Results

Descriptive statistics are reported in *Table 1*. Freestanding and PCA/HCCN affiliated FQHCs have a significantly higher total margin (total margin × 100 =5.04 and 4.69, respectively) relative to FQHCs with no HCCN affiliation (total margin × 100 =2.95, χ^2=3.03, P<0.05). FQHCs associated with freestanding HCCN affiliation see more patients on average (mean =27,289.16) and a greater proportion is located in urban areas (64%) relative to PCA/HCCN affiliated FQHCs (mean =18,147.91, 53%) and FQHCS with no affiliation (mean =19,404.47, 58%; F=16.93, P<0.01; χ^2=11.71, P<0.01; respectively). PCA/ HCCN affiliated FQHCs had a significantly higher percentage of patients aged 65 and older (11.62%), higher percentage of female patients (45.22%), the highest HIT usage (74.21% with ≥3), and highest percentage of privately insured patients (23.64%) compared to FQHCs associated with freestanding HCCN affiliation and FQHCs with no affiliation (F=5.95, P<0.01; F=9.68, P<0.01; χ^2=16.92, P<0.05; χ^2=25.0, P<0.01; respectively). FQHCs associated with freestanding HCCN affiliation had a significantly higher percentage of patients at or below the 100% federal poverty level (48.67%) with Medicaid and CHIP (Children's Health Insurance Program) as their major payers (46.34%) compared to FQHCs with a PCA/HCCN affiliation (43.51% and 39.81%) or no HCCN affiliation (46.99% and 45.08%; F=6.68, P<0.01). FQHCs with no affiliation were located in higher per capita income geographic locations, on average (mean =$55,625.30) compared to FQHCs associated with freestanding HCCN affiliation (mean =$54,829.60) and FQHCs with a PCA/HCCN affiliation (mean =$50,247.60; F=8.06, P<0.01).

FQHC/HCCN affiliation and clinical performance

In the logistic regression models 1–6 (*Table 2*) we examined the relationship between HCCN affiliation and odds of achieving top 25% quartile clinical performance for six clinical indicators as measured by the calculated AQR, controlling for certain organizational characteristics and county-level market factors. In general, FQHCS with a HCCN affiliation (freestanding or otherwise) were more likely to report higher odds in being in the top 25% performance quartile for three out of the six clinical indicators.

Table 1 Descriptive statistics of HCCN affiliated FQHCs

Variable	HCCN group affiliation				
	No affiliation (n=380)	Freestanding (n=464)	PCA/HCCN (n=539)	Total (n=1,383)	F/χ^2
Total margin (mean)	0.03	0.05	0.05	0.04	3.03, P<0.05
Total margin × 100	2.95	5.04	4.69	4.41	
HIT usage					16.92, P<0.05
Not beyond patient care	7 (1.84%)	3 (0.65%)	2 (0.37%)	12 (0.87%)	
1–2 other responses	124 (32.63%)	108 (23.28%)	137 (25.42%)	369 (26.68%)	
≥3 responses	249 (65.53%)	353 (76.08%)	400 (74.21%)	1,002 (72.45%)	
Organizational factors					
FQHC size (mean patients seen annually)	19,404.47	27,289.16	18,147.91	21,560.08	16.93, P<0.01
Patients ≥65 years (mean)	10.27%	10.53%	11.62%	10.88%	5.95, P<0.01
Female patients (mean)	40.58%	43.55%	45.22%	43.39%	9.68, P<0.01
FQHC location					11.71, P<0.01
Urban	220 (57.89%)	295 (63.58%)	285 (52.88%)	800 (57.85%)	
Rural	160 (42.11%)	169 (36.42%)	254 (47.12%)	583 (42.15%)	
Non-White (minority) (mean)	49.51%	48.64%	44.44%	47.24%	3.74
Insurance/payer (mean)					
Uninsured	25.78%	24.57%	24.34%	24.81%	0.79
Medicare	10.26%	10.52%	12.21%	11.11%	10.44, P<0.01
Private	18.88%	18.57%	23.64%	20.63%	25.0, P<0.01
Medicaid/CHIP	45.08%	46.34%	39.81%	43.45%	17.74, P<0.01
Market factors					
Per capita income (mean)	$55,625.30	$54,829.60	$50,247.60	$53,279.26	8.06, P<0.01
Patients at or below 100 FPL (mean)	46.99%	48.67%	43.51%	46.19%	6.68, P<0.01
Physicians per 100,000 populations (mean)	285.16	302.8	296.73	295.66	0.46

HCCN, Health Center Controlled Network; FQHC, Federally Qualified Health Center; PCA, Primary Care Association; HIT, health information technology; CHIP, Children's Health Insurance Program; FPL, federal poverty level.

FQHCs with a freestanding HCCN affiliation have 49% higher odds of being in the top performance quartile for diabetes control (OR: 1.49, 95% CI: 1.06–2.10, P<0.05), 60% higher odds of achieving the top quartile performance for colorectal cancer screening (OR: 1.60, 95% CI: 1.08–2.38, P<0.01), and 58% higher odds of being in the top performance quartile for hypertension control (OR: 1.58, 95% CI: 1.10–2.27, P<0.01).

A FQHC's patient characteristics are associated with that organization's clinical performance. Notably, FQHCs with higher percentages of female patients had small yet higher odds of being in the top performance quartile for depression screening and follow-up, cervical cancer screening, and adult weight screening and follow-up (OR: 1.01, 95% CI: 1.00–1.02, P<0.05; OR: 1.01, 95% CI: 1.00–1.02, P<0.05; OR: 1.01, 95% CI: 1.00–1.02, P<0.01, respectively). FQHCs of larger sizes were associated with lower odds of being in the top performance quartile for diabetes screening (OR: 0.92, 95% CI: 0.88–0.97, P<0.001). Having a higher proportion of patients over 65 was associated with lower

Table 2 Logistic regression, HCCN affiliation and clinical performance

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
HCCN affiliation						
No HCCN affiliation	(Referent)	(Referent)	(Referent)	(Referent)	(Referent)	(Referent)
Freestanding HCCN affiliation	1.49* (1.06–2.10)	1.60** (1.08–2.38)	1.10	1.58** (1.10–2.27)	1.17	1.44
PCA/HCCN affiliation	1.33	1.37	0.89	0.89	1.17	1.44
Organizational characteristics						
FQHC size per 10,000	0.92*** (0.88–0.97)	1.03	0.99	1.02	1.04	1.02
Patients ≥65 years, %	1.06	0.45	0.05* (0.01–0.57)	0.57	1.75	1.90
Female patients, %	1.00	1.01	1.01* (1.00–1.02)	1.00	1.01* (1.00–1.02)	1.01** (1.00–1.02)
FQHC location						
Urban	(Referent)	(Referent)	(Referent)	(Referent)	(Referent)	(Referent)
Rural	0.83	1.060	0.89	1.15	1.15	1.16
Insurance/payer, %						
Private	(Referent)	(Referent)	(Referent)	(Referent)	(Referent)	(Referent)
Medicare	1.01	1.03* (1.01–1.05)	0.99	0.99	0.98	1.02
Uninsured	1.00	1.01	0.99	1.00	1.00	1.02
Medicaid/CHIP	1.00	1.00	0.99	1.00	1.00	1.02
Market factors						
Per capita income	1.08* (1.02–1.14)	1.00	1.00	1.04	1.00	0.89* (0.81–0.98)
Physicians per 100,000 population	0.99	1.00*** (1.000–1.001)	0.99	1.00	1.00*** (1.000–1.002)	1.00
Pseudo R-squared	0.03	0.03	0.01	0.02	0.03	0.03

Data are presented as OR/OR (95% CI), unless otherwise indicated. *, P<0.05; **, P<0.01; ***, P<0.001. Model 1: diabetes control (N=1,349). Model 2: colorectal screening (N=1,349). Model 3: depression screening and follow-up (N=1,349). Model 4: hypertension control (N=1,349). Model 5: cervical cancer screening (N=1,349). Model 6: adult weight screening and follow-up/BMI (N=1,349). HCCN, Health Center Controlled Network; PCA, Primary Care Association; FQHC, Federally Qualified Health Center; CHIP, Children's Health Insurance Program.

odds of being a top performer for depression screening (OR: 0.05, 95% CI: 0.01–0.57, P<0.05). FQHCs with higher percentages of Medicare patients had lower odds of being in the top performance quartile for colorectal screening (OR: 1.03, 95% CI: 1.04–1.05, P<0.05).

FQHCs serving a market with higher per capita income are associated with higher odds of being in the top performance quartile for diabetes control (OR: 1.08, 95% CI: 1.02–1.14, P<0.05).

FQHC/HCCN affiliation and financial performance

We examined the association among the three HCCN affiliation groups and financial performance using a regression model controlling for organizational characteristics and market factors (*Table 3*). Relative to FQHCs with no affiliation, FQHCs with a freestanding HCCN affiliation and FQHCs with a PCA/HCCN affiliation were associated with 2.3 and 1.9 percentage points higher reported total margin, respectively (P<0.05). FQHCs with higher percentages of minority patients were associated with lower total margin (b=–0.03, P<0.05). FQHCs located in markets with higher per capita income are associated with lower % total margin. For each $10,000 increase in per capital income in the FQHC market, % total margin decreases by 3.4%.

Table 3 Ordinary least squares regression predicting percent total margin

	Coef.	St. Err.	Lower limit	Upper limit
HCCN affiliation				
No HCCN affiliation	(Referent)	(Referent)	(Referent)	(Referent)
Freestanding HCCN affiliation	2.30**	0.91	0.49	4.12
PCA/HCCN affiliation	1.85***	0.69	0.47	3.24
FQHC location				
Urban	(Referent)	(Referent)	(Referent)	(Referent)
Rural	0.43	0.91	−1.39	2.26
HIT usage				
0: not beyond patient care	(Referent)	(Referent)	(Referent)	(Referent)
1: 1–2 responses	3.73	2.55	−1.40	8.85
2: ≥3 responses	4.09	2.65	−1.22	9.41
Organizational factors				
Minority patients, %	−0.03*	0.02	−0.06	0.003
Female patients, %	−0.01	0.02	−0.04	0.02
Insurance				
Private	(Referent)	(Referent)	(Referent)	(Referent)
Medicare	−0.06	0.11	−0.29	0.17
None/uninsured	0.04	0.03	−0.03	0.11
Medicaid/CHIP	0.05	0.03	−0.02	0.11
FQHC size (per 10,000 patients seen annually)	−0.09	0.08	−0.24	0.07
Market factors				
Physician per 100,000 population	−0.001	0.001	−0.003	0.001
Population over 65 years (%)	8.9	9.32	−9.82	27.62
Per capita income per $10,000	−0.34***	0.10	−0.55	−0.13
Constant	−0.92	3.78	−8.52	6.68
R-squared[†]	0.020			

*, P<0.05; **, P<0.01; ***, P<0.001. [†], number of observations: 1,213. Some coefficients, such as FQHC size and per capita income, were divided by 10,000 to scale the regression coefficients and facilitate interpretability. HCCN, Health Center Controlled Network; PCA, Primary Care Association; FQHC, Federally Qualified Health Center; HIT, health information technology; CHIP, Children's Health Insurance Program.

Discussion

The purpose of this study was to examine the relationship between FQHCs and HCCN affiliation and reported clinical and financial performance. Although HRSA has encouraged FQHCs/HCCNs strategic collaborations, there has been limited empirical research evaluating the efficacy of the HCCN/FQHC relationship. This is the first study examining the impact of FQHC voluntary affiliations with HCCNs, thus providing new information to guide FQHC administrators' and policy makers' decision-making.

Our study evaluated the outcome of strategic HCCN affiliation by FQHCs in two areas: clinical performance as measured by the AQR and financial performance as measured by the organizations' total margin. We found that

relative to no HCCN affiliation, the Freestanding affiliated FQHCs were more likely to achieve top quartile clinical performance ranking as compared to FQHCs without a HCCN affiliation. Also, relative to no affiliation, health centers affiliated with both freestanding and PCA HCCNs reported higher reported total margin.

As with all studies, this research had limitations. Due to changes in reporting throughout the HCCN program lifecycle, this cross-sectional study was limited to the FY 2018 grant reporting period. HRSA grant requirements changed in 2010 increasing the number of required participating health centers to 10 to meet the HCCN grant funding requirements. As such, there are many operating HCCNs that did not meet this 10-member threshold or elected not to purse federal funding and therefore were not included in this study. It was also in 2010 when HRSA invited PCAs to compete for HCCN grants.

There are a number of areas for future research regarding HCCNs and FQHC affiliations. For example, although FQHCs voluntarily affiliate with HCCNs, health centers are afforded a great deal of organizational autonomy to determine and implement HCCN program objectives at the center level. As such, examining the impact of FQHC organizational culture related to HCCN affiliation may provide further insight as to how this inter-organizational collaboration might impact health center performance. In addition, the differences in PCA/HCCNs' and freestanding HCCNs' organizational structure and the relationship to performance is an area for researchers to explore. Another area of importance is gaining a better understanding of the impact of continuity of FQHC/HCCN affiliation. FQHCs, throughout a grant period, can move in and out of HCCNs nationally or have dual membership (i.e., heath centers can belong to more than one HCCN) but can only report affiliation to one HCCN program to meet the grant requirements.

Conclusions

Although each FQHC operates autonomously for the most part to achieve their organizational mission and strategic goals, networks facilitate the coordination of similar business operations, shared staff expertise, collaboration regarding best practices, and may in some situations leverage strategic partnerships with state and regional PCAs among the participating FQHCs. This study is one of the first to empirically evaluate FQHC/HCCN affiliation. Even though we only found partial support at the statistically significant level for the FQHC freestanding HCCN affiliation, overall, the majority of clinical measures were in the top 25% quartile rankings. Also, compared to no HCCN affiliation, FQHCs affiliated with either a freestanding or PCA network reported higher total margin. Evidence from this study suggests that it would be valuable for continued encouragement of HCCN collaborations to assist FQHCs in improving their performance. This evaluation of the FQHCs and HCCN affiliation provides support for continued funding of this collaborative program and FQHCs' managers' decisions to participate in this inter-organizational collaboration.

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Footnote

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Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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