



### Research Article

## Understanding of Care Coordination by Healthcare Providers and Staff at Federally Qualified Health Centers: A Qualitative Analysis

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### Abstract

**Background:** Care coordination in Patient-Centered or Family-Centered Medical Home (PCMH/FCMH) models is one evidence-based strategy to better manage childhood chronic diseases. Although many Federally Qualified Health Centers (FQHCs) incorporate PCMH/FCMH care coordination models, few studies have investigated FQHC personnel understanding of care coordination, and the effect of FQHC location (rural versus urban) on care coordination for childhood diseases has not been well documented.

**Objective:** To investigate FQHC personnel understanding of care coordination for pediatric patients.

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**Subject:** Thirty providers and staff from 1 urban and 1 rural FQHCs.

**Measures:** Interviews and reports were analyzed using content analysis to determine participants understanding of care coordination facilitators and barriers for pediatric patients.

**Results:** Seven categories of facilitators were identified: teamwork, integrated services, one-stop shop, dedicated referral coordinator, effective and open communication, technology, and culture. There were 3 levels of barriers to care coordination: individual, organizational, and systems. Many facilitators and barriers were universal to both urban and rural FQHCs, but some were distinct for only the urban or rural FQHC. For example, lack of pediatric specialty care happened more often in the rural FQHC.

**Conclusion:** FQHC personnel consider teamwork with all stakeholders and integration of services to be facilitators of care coordination. Urban and rural FQHCs had similar barriers to care coordination. To improve outcomes associated with care coordination, a solid working definition of care coordination is necessary, and reimbursing care coordination activities should be explored by FQHCs, other healthcare systems and healthcare policy.

**Keywords:** Care coordination; Family-centered medical home; Federally qualified health centers; Patient-centered medical home; Pediatric patients; Rural; Urban

### Introduction

In the past few decades, the number of children with chronic diseases has increased rapidly in the United States [1], and around 27% of children have at least one chronic health condition requiring continual medical attention and contributing to missing school and their parents missing work [2]. Many of these chronic diseases are costly but preventable or manageable. Multiple barriers, such as insufficient patient education, fragmented care, stress, health beliefs and cultural beliefs, environmental effects and financial burden, hinder quality of pediatric care [3-8], and children in low-income or minority families are especially vulnerable [9]. People, including children with complex chronic conditions can use more health and social services than the rest of the population [10]. Care coordination is an evidence-based strategy for addressing barriers and improving care [11,12].

Care coordination in Patient-Centered or Family-Centered Medical Homes (PCMH/FCMH) can be used to manage diseases. Patients receive multiple services in one location, and healthcare teams coordinate care throughout the healthcare system, social services, and the community [13,14]. However, providers have different definitions about care coordination, and more than 40 have been identified [15,16]. Thus, consensus on care coordination is lacking and necessary [17].

Federally Qualified Health Center (FQHCs) is local, nonprofit, community-based healthcare clinics serving low-income and medically underserved communities. They provide primary and preventive care across a range of health and social services [15,18]. Many FQHCs have established or are working to establish PCMH/FCMHs

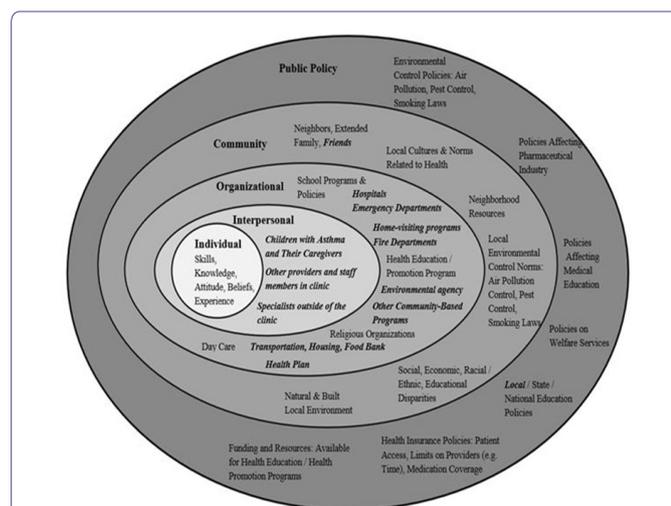
and implemented care coordination [19], but successful care coordination is affected by multiple factors. Further, rural FQHCs generally have fewer resources than urban FQHCs [20].

Few studies have investigated understanding of care coordination by FQHC personnel. One study [21] suggested care coordination should be investigated in urban and rural FQHCs, but little research exists for urban versus rural location on care coordination, especially for children. The purpose of this study was to investigate FQHC personnel understanding of care coordination for pediatric patients, particularly those with complex chronic diseases. Specifically, we evaluated care coordination facilitators and barriers in an urban and a rural FQHC.

## Methods

### Study framework

This study used the ecological model as a framework for understanding the multiple and interacting determinants of health outcomes, including individual, family and interpersonal, organizational, community, physical environmental and policy interventions to enhance coordination and increase the impact of services (Figure 1) [22,23]. We used the definition of pediatric care coordination from Antonelli et al. [24] to guide our study, because it emphasizes a team-based approach that involves patients and families in a broad and interrelated environment to address medical issues and social needs [25,26]. Antonelli et al. define pediatric care coordination as “[a] patient- and family-centered, assessment-driven, team-based activity designed to meet the needs of children and youth while enhancing the care giving capabilities of families. Care co-ordination addresses inter-related medical, social, developmental, behavioral, educational and financial needs to achieve optimal health and wellness outcomes” [24].



**Figure 1:** Example of an ecological model for treating childhood asthma [22].

**Note:** The model illustrates the needs and opportunities for collaboration between healthcare providers, families, and communities. Modified components of the model that apply to the current study are in italics. Application of the ecological model to childhood disease management at FQHCs in urban and rural settings can highlight care coordination activities at FQHCs to manage childhood chronic diseases, connect children with chronic diseases to internal and external resources and potentially improve the management of childhood disease conditions.

### Study approach

This study explored and identified FQHC personnel’s understanding of care coordination related to addressing childhood diseases. Based on the context of the care coordination at FQHCs to be studied and the nature of the documents utilized for the analysis, the qualitative method was employed for the study.

### Study locations

The current study used a qualitative approach to evaluate care coordination understanding at one urban and one rural FQHC in the Southwest United States. Selection of the two FQHCs was largely for the following reasons: the study intended to compare care coordination understanding in urban versus rural areas. The urban FQHC had eight clinic sites in a single county and the rural FQHC had 13 clinic sites in a single county. Both continued to grow and serve diverse communities and had sufficiently large patient bases. Both provided a wide range of medical and nonmedical services, installed EHR, established PCMHs and implemented care coordination activities. Because of labor and logistical constraints, we did not interview all personnel who cared for children at the two FQHCs. Instead, two clinic sites were identified at each FQHC at which to conduct interviews. These clinic sites included three pediatric departments and one family medicine department.

### Participants

Potential participants had to provide services to pediatric patients, and convenience sampling was used based on willingness to be interviewed and availability. Our FQHC contacts helped identify participants. A few days at each FQHC were selected for interviews based on availability of participants. Participants included pediatricians, family practitioners, nurses, Behavioral Health Consultants (BHCs), care coordinators, referral coordinators, medical assistants, registered dietitians, and pharmacists. The local institutional review board approved the study. Participants provided informed consent before participating.

### Study protocol

Semi-structured interviews were used to evaluate understanding of care coordination facilitators and barriers. Organizational reports from both FQHCs were used to help identify any missing information, enrich results or validate the information gathered by interviews. Interview protocols were based on Thomas-Hemak’s Care Coordination Chart [27] and the study by O’Malley et al. [28]. There were six questions and some alternate or follow-up questions to determine the understanding of care coordination, particularly facilitators of and barriers to care coordination services (Supplemental Materials). Participants were asked for their definition of care coordination and about the role of care coordinators at their site. Staff satisfaction with care coordination was also assessed. Interviews took approximately 30 minutes and were recorded and transcribed.

### Data analysis

Content analysis, which groups words, themes, or concepts from interviews, was used for data analysis. Interview protocols established the theoretical coding structure and identified primary coding categories. Interview transcripts were reviewed and coded based on the coding structure and were organized into a formal codebook. ATLAS.ti (Berlin, Germany) was used for basic coding and analysis.

Two members of the research team evaluated transcripts to establish coding consensus and refine the coding schema. Each code/category was examined; and sub-codes/sub-categories were identified for better specificity. A second coding process was performed to assign coded text passages in each main code/category to defined sub-codes/sub-categories. For the definition of care coordination, key words were identified and grouped by word function and frequency. When counting word frequency, a word was counted as use done time even if it was used many times by one participant.

## Results

### Facilitators of care coordination

Thirty participants, including pediatricians, family practitioners when a site didn't have a pediatrician, nurses, BHCs, registered dietitians, care coordinators, referral coordinators, medical assistants, and pharmacists, were interviewed: 17 from the urban FQHC and 13 from the rural FQHC (Table 1). Table 2 presents seven facilitators of care coordination identified by participants. The facilitators included teamwork, integrated services, one-stop shop, dedicated referral coordinator, effective and open communication, technology, and culture. Many facilitators were universal to both urban and rural FQHCs. Dedicated referral coordinator and culture were mentioned by only the urban or rural FQHC. Most of the participants believed teamwork was a good facilitator. One participant said, "In order to have [a] good health outcome [for the patient], you need teamwork, a cohesive team. Nobody is less important in what you are doing. Everyone is for the benefit for this patient. So it is all coordination of every discipline, knowing that we work as a team". People worked together and collaborated with each other with effective and open communication verbally or via eClinical Works (ECW), an Electronic Health Record (EHR) system. Using ECW helped personnel share information and communicate. The FQHCs had access to EHRs of some hospitals, which facilitated follow up. At the rural FQHC, telemedicine was used at some of its remote clinic sites. Patients and families were considered team members. One participant said, "It is important to teach the family so that they can become the team and advocate for the kid's healthcare". Outside specialists were also considered team members.

Good teamwork requires integration. For the urban FQHC, every clinic site had BHCs to reinforce the care plan with patients and families and to connect patients with internal and external social services. For the rural FQHC, clinic sites either had onsite BHCs or used telemedicine. The urban FQHC had integrated nutrition services, and the rural FQHC was hiring a dietician. Both FQHCs were aware of integrating dental checkups and drug safety information and education into practice. The urban FQHC had dental department integration; the rural FQHC had dental hygienists at one site. The hygienist screened patients before primary care visit. The urban FQHC had onsite pharmacies with community and clinical pharmacists in most of its clinic sites, and the rural FQHC had pharmacies with community and clinical pharmacists in its large clinic sites.

For parents, integrated services were convenient and saved time. One parent said, "Having a dentist come into the room is so great. It would have taken me a lot longer to bring my son to the dentist if it weren't for the integrated dental program". For the FQHCs, integrated services helped retain patients and keep them on track. One participant said, "Having services here, we increase how much people follow up. So I think that having as many services as we can here help to keep [patients] at least that much healthier. It is called a one-stop shop. I think that makes a huge difference, especially since people are busy, when people are stretching for finance or when they have to bring all of their children in for the appointment".

### Barriers to care coordination

Barriers to care coordination were at individual, organizational, and systems levels. Individual barriers included patient-level and provider-level barriers. Table 3 presents participant understanding of barriers. Many barriers were universal, but some were specific to only the urban or rural FQHC.

For patient-level barriers, the family's education, awareness, and influence could be barriers. One participant stated, "I have a seven-year-old who is 200 pounds. But mom is 500 pounds. Mom doesn't see the problem of her daughter weighing 200 pounds".

Urban FQHC		Rural FQHC	
Number	Title	Number	Title
4	Physician*	2	Physician***
2	Nurse	3	Nurse****
2	Behavioral Health Consultant	2	Behavioral Health Consultant
2	Registered Dietician		Registered Dietician*****
1	Care Coordinator	2	Referral Coordinator/Care Coordinator*****
2	Medical Assistant	2	Medical Assistant
2	Referral Coordinator		
2	Pharmacist**	2	Pharmacist
* This includes Chief Medical Officer (CMO), who is also a practicing physician, and Pediatric Head.		*** The Chief Medical Officer (CMO) is an OB/GYN. Therefore, the Medical Director was selected for the interview concerning the overall effort of care coordination. He was counted under the category of physician.	
** We did not interview any pharmacist at one clinic site because we were told that they did not have a pharmacist in its pediatric department. At another clinic site, two pharmacists came to interview together and one of these was the Pharmacy Manager.		**** The rural FQHC does not have a Pediatric Head. Therefore, the Director of Nursing was selected for the interview. One interview was a nurse practitioner.	
		***** The rural FQHC did not have a registered dietician on the care team during the interview time.	
		***** At the rural FQHC, the referral coordinator and care coordinator were the same position.	

Table 1: Number and type of participants interviewed.

Facilitator	Urban	Rural
Teamwork	✓	✓
Integrated services	✓	✓
One-stop shop	✓	✓
Dedicated referral coordinator		✓
Effective and open communication	✓	✓
Technology (ECW, EHR)	✓	✓
Culture	✓	

**Abbreviations:** ECW - eClinical Works; HER - Electronic Health Record.

**Table 2:** Reported facilitators of care coordination services by urban and rural federally qualified health center personnel.

At the provider level, communication between primary care and specialists was a barrier. One participant indicated, “We don’t get feedback from the specialist”. Lack of communication between the provider and patient was also common. For example, patients could have limited English proficiency or low health literacy, while providers lacked time or skill to provide adequate information. At the systems level, lack of reimbursement for care coordination was a barrier. One participant stated, “You don’t get paid for care coordination”.

The rural FQHC had other barriers like BHCs providing more services to adults than children. Because of specialist limitations, they had to refer patients to urban centers, which could also be a barrier.

### Definition of care coordination

Each participant in this study had provided their definition of care coordination based on their understanding. Some definitions were more comprehensive, while others were simple. Participants with the same occupational titles gave different definitions of care coordination. Words used to define care coordination are presented in Table 4. Fourteen keywords were used at least 3 times; the most common ones were patient(s), family/families, need(s) or needs met, make sure, provide, and take care. Other words considered important for care coordination-team, resources, multidisciplinary team/group, and PCMH were related to meeting patient and family needs and to teamwork.

### Roles of care coordinators

Care coordinators were located at different sites and had different roles. For the urban FQHC, they were based at headquarters and communicated with patients solely by telephone. Duties included following up with patients after referral appointments with specialists and collecting patient information from the ECW or other paperwork. They also helped patients and families connect with clinic personnel. One participant stated that the care coordinator “is responsible for closing gaps in care, and whether that be EPSDT visits for the children, or they’re lacking in immunizations.” Another participant indicated, “There are a lot of people fulfilling that role in this practice. It’s a pretty big practice. It’s not just one person to fulfill that role. It depends on what level of care coordination that child might need, and the nature of their needs where the services are. Certainly, there are people who have the title of care coordinator [here], but may be different for different things”. For the rural FQHC, the referral coordinator and care coordinator were the same person, and each clinic site had a least one coordinator. Duties included referring patients to specialty care, contacting insurance, and making patient appointments. One participant said, “They spend all their time to do the referrals.

I feel like that’s a better process. You can get people in faster and we track them better”.

Level	Barriers	Urban	Rural
Patient	Hard to reach patients because of address and phone number changes	✓	✓
	Difficult to communicate with patients and families because of limited health literacy and English proficiency	✓	✓
	Lack of patient compliance because of financial difficulty or insurance issue	✓	✓
	Patient fear because of immigration status in the United States	✓	✓
Provider	Lack of transportation for appointments	✓	✓
	Lack of time for appointments	✓	✓
	Parent(s) and the entire family lack education, awareness, and influence	✓	✓
	Patient’s belief system	✓	
	Provider	✓	
	Lack of time to see patients because of high volume of patients and reimbursement model	✓	✓
	Lack of knowledge about where to refer the patient to community resources	✓	
	Lack of communication between primary care provider and specialist	✓	✓
Organizational	Barriers from specialists who ask parents to bring their own interpreters, take a long time to book an appointment, do not spend enough time with patients, and do not explain things enough to patients	✓	✓
	Not enough care coordinators who at the point of care involved with care	✓	
	Limited space for other providers to see patients after primary care provider visit	✓	
Systems	Lack of communication between provider and patient	✓	✓
	A long time for the health plan to approve referrals	✓	✓
	No behavioral health specialists accept private insurance for behavior health problems in a small town		✓
	Lack of specialty care, particularly pediatric specialty care		✓
	Health plans claim a data lag of 2-3 months	✓	
	Information does not flow freely between systems because of different electronic health records systems or Health Insurance Portability and Accountability Act issues	✓	
	Lack of resources in the community	✓	✓
Systems	Care coordination activities are not reimbursed because it takes time to coordinate care	✓	
	Geographic barrier in the rural area		✓

**Table 3:** Reported barriers to care coordination services by urban and rural federally qualified health center personnel.

### Satisfaction with care coordination

Most participants were satisfied with care coordination at their clinic. One participant stated, “We have passionate staff loving to take care of our patients [and] make sure they are getting coordinated care. I think in-house, our coordination of care is great. We refer to each other. We are all in communication. We are able to discuss things with the patients”. Reasons care coordination functioned well included an existing tracking mechanism, help from BHCs, good communication among departments, and outreach and follow-up with patients. A couple of participants indicated that there was always room for

improvement; they, however, were satisfied with what they were doing because they were “progressing, not regressing”.

## Discussion

Participants from urban and rural FQHCs valued teamwork that included patients and families as a facilitator for care coordination. Involving patients and families in the care team is essential, particularly with pediatric patients [24,29,30]. Both FQHCs also integrated primary care and behavioral health and were working to integrate nutrition, dentistry, and pharmacy services. Previous research indicates coordinate care is easier when multiple services are together. Both FQHCs had similar barriers to care coordination. Lack of communication between the provider and patient or between the provider and specialist, emergency department, or hospital was common. To build good partnerships, specialty care should be part of the care team. Although technology may alleviate this problem, physicians believe EHRs negatively impact interactions [31] and only facilitate care coordination within a practice, not between practices and settings [28]. Our participants indicated the ECW helped with internal communication, but financial incentives for coordination were lacking.

To meet patient needs, partnerships must exist within and outside FQHCs. A constant relationship among patients, families, and health-care providers enhances care coordination [32,33] and positively impacts patient health [34]. Using resources outside the clinic is key for helping patients. Thus, FQHCs and other providers should build long-term partnerships with community organizations. Conceptual frameworks are one way to create partnerships [22,35]. The Ecological Model, served as this study’s framework, illustrates layers of partnerships and a medical neighborhood to address childhood health conditions. To implement care coordination activities, as was recommended by this study, multiple layers of partnerships should be built, and all partners should work together and influence each other, which is aligned with the Ecological Model. The partners can be internal or external, including providers and their staff members, patients and their families and social and community services. The team approach and integration of services are two facilitators of care coordination services identified by the interviewees in this study, and both of these facilitators require partnership building. One of the most important tasks for the care coordinator is to build partnerships with patients and their families and the services that the care coordinator refers them to. Definitions of care coordination were diverse and based on practice and experience. Based on their definitions, some participants had a better understanding of care coordination than others; however, occupational background of the participants was not a contributory factor in their defining care coordination. Previous studies also found different people had different definitions [15,16]. Common keys words of patient(s) need(s), and make sure aligned with facilitators to care coordination. However, family or team was rarely used.

For one participant, care coordination was like case management because practice was driven by health plans. Thus, the term, care coordination, could be used differently by similar programs or agencies, causing confusion. Although defining case management is not in the scope of this research, it is worth discussing the similarities and differences between care coordination and case management to provide a better picture of care coordination in a primary care setting that cares for children with complex chronic diseases. It is also important to point out that different organizations/professions may look at case management and care coordination differently. Both care coordination and case management are intended to address fragmentation in healthcare delivery [16,36] and are strategies to manage chronic

Level	Key Word	Frequency
Noun	Patient(s)	20
	Family/families	7
	Team	3
	Need(s), needs met	15
	Resources	3
	Options	1
	Education	2
	Empowerment	1
	Communication	2
Modified noun	Multidisciplinary team/group	3
	Patient-centered medical home	3
	Best health outcome	1
	Best services	1
	Correct care	1
	Full cycle	1
	Good outcome	1
	Good understanding	1
	Holistic approach	1
	Quality care	1
	Whole health	1
Verb	Collaborate	1
	Connect	2
	Educate	1
	Empower	1
	Follow through	3
	Follow up	3
	Involve	3
	Interact	1
	Make sure	11
	Provide	5
	Take care	6
	Work together	2
	Adjective	Cost-effective
Internal/external		1
Physical, mental, emotional and spiritual		2
Quality-based		1
Whole		3
Adverb	Holistically	1
	Internally/externally	1
	Timely	1
	Together	1
Other phrase	Best experience in medicine	1
	Beyond the walls of clinics	1
	Close any gaps	1
	Close the loop	1
	Everyone is talking to everyone	1
	From top to bottom	1
	Medical and nonmedical needs	1
	Optimal health and wellbeing	2
Under one umbrella	1	

**Table 4:** Key words by function and frequency for definition of care coordination by urban and rural federally qualified health center personnel.

disease between primary care and other healthcare settings [16,37]. Care coordination is a process to deliberately organize patient care plans involving multidisciplinary teams and diverse services (including health and social services) to achieve appropriate healthcare delivery and optimal health outcomes, and communication is the key for teams and services to exchange information [16,38-40]. In a PCMH/FCMH setting, primary care providers play a vital role in the process of care coordination [38,40]. During the care coordination process, there are many interventions, and case management is one care coordination intervention that helps patients and their families determine their medical and social needs [16,38]. The Agency for Health and Research Quality adopted a definition for case management that “implicitly enhances care coordination through the designation of a case manager whose specific responsibility is to oversee and coordinate care delivery [targeted to] high-risk patients [with a] diverse combinations of health, functional, and social problems” [16]. Since care coordination is relatively new, FQHCs need to establish differences between care coordination and case management and adopt a working definition of care coordination. Training on care coordination may eliminate confusion and promote teamwork. One FQHC in our study had a chart where dental assistants discussed what care coordination meant to them. Other FQHCs could use similar activities.

Care coordinators in pediatric settings may reduce costs, so they are recommended for the care team [24,29,41,42]. Although both FQHCs had care coordinators, they were like case managers at the urban FQHC. At the rural FQHC, the referral coordinator and care coordinator were the same. Because health plans decide on reimbursement, care coordinator’s responsibilities will not change unless FQHCs find other payment methods or health plans change care coordination. Most health plans practice a fee-for-service model, but it creates barriers between primary care and other providers. A value-based payment model may be better for FQHCs [43]. More research is needed on this payment model for FQHCs.

The current study had several limitations. The two FQHCs may not be representative of other FQHCs. We focused only on FQHC personnel; patients and families may have different views about care coordination. Further, we did not collect clinic data or consider outcomes of care coordination. The rural FQHC in this study was in a county, which used to be a rural county. However, due to economic development and expansion, the county is centrally located between two metro areas. Debate has occurred on whether the county should be considered a rural county or rural-urban county. Although it is still known as a center of American agriculture, the County lacks a truly rural feature, and this possibly impacts findings. Future research should include studies with more FQHCs, and the effect of FQHC location on the family’s level of engagement should be investigated by the following study.

## Conclusions

Our findings suggested neither the personnel’s occupational title nor urban or rural FQHC location was a contributory factor to affect understanding of care coordination. In addition to behavioral health, both FQHCs were working to integrate nutrition, dentistry, and pharmacy services. To improve outcomes of care coordination, FQHCs should have a working definition of care coordination, build partnerships, and explore the feasibility to reimburse care coordination activities. To effectively treat pediatric patients from low-income or minority families, FQHCs need to also address nonmedical needs like

lifestyle changes and social and cultural needs. Such endeavors go beyond clinic walls. Teamwork between FQHC personnel and patients and families is necessary to improve pediatric health outcomes.

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