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Perceptions of Barriers and Facilitators During Implementation of a Complex Model of Group Prenatal Care in Six Urban Sites

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Abstract

Group prenatal care improves perinatal outcomes, but implementing this complex model places substantial demands on settings designed for individual care. To describe perceived barriers and facilitators to implementing and sustaining Centering Pregnancy Plus (CP+) group prenatal care, 24 in-depth interviews were conducted with 22 clinicians, staff, administrators, and study personnel in six of the 14 sites of a randomized trial of the model. All sites served low-income, minority women. Sites for the present evaluation were selected for variation in location, study arm, and initial implementation response. Implementing CP+ was challenging in all sites, requiring substantial adaptations of clinical systems. All sites had barriers to meeting the model's demands, but how sites responded to these barriers affected whether implementation thrived or struggled. Thriving sites had organizational cultures that supported innovation, champions who

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Declaration of Conflicting Interests

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advocated for CP+, and staff who viewed logistical demands as manageable hurdles. Struggling sites had bureaucratic organizational structures and lacked buy-in and financial resources, and staff were overwhelmed by the model's challenges. Findings suggested that implementing and sustaining health care innovation requires new practices and different ways of thinking, and health systems may not fully recognize the magnitude of change required. Consequently, evidence-based practices are modified or discontinued, and outcomes may differ from those in the original controlled studies. Before implementing new models of care, clinical settings should anticipate model demands and assess capacity for adapting to the disruptions of innovation.

Keywords

pregnancy; health care delivery; prenatal care; health systems; system change; implementation science; translational research

Health care service innovations are often studied under controlled research conditions and then implemented in complicated clinical settings (Aarons, Hurlburt, & Horowitz, 2011; Damschroder et al., 2009). These settings may present substantial barriers to implementation, leading to model modification, incomplete implementation, or failure to successfully embed interventions within health care systems (May, 2006). When evidence-based interventions become “vulnerable to erosion,” they may not achieve desired outcomes (Stirman et al., 2012).

Centering Pregnancy™ is an example of this broader problem. Although this innovative model of group prenatal care was shown to be efficacious in research, anecdotal evidence and limited research data indicate that significant challenges are often encountered to implementing it in real-life clinical settings. Little is known, however, about these barriers and facilitators to implementation of Centering Pregnancy. Therefore, the purpose of this study was to examine in depth in six urban clinical settings the features of those settings that served as barriers and facilitators to providing and sustaining Centering Pregnancy, and the response of clinicians and settings to these challenges.

Improved Perinatal Outcomes With Centering Pregnancy

Centering Pregnancy, described in detail elsewhere (Novick, 2004; Novick et al., 2011; Rising, 1998), consists of 10 two-hour sessions provided to groups of 8–12 pregnant women of similar gestational age and their significant others. A group prenatal care series is conducted by a prenatal health care provider and another staff member (clinician, nurse, medical assistant, or community health worker) in a dedicated space designed to accommodate group activities, which include self-care (e.g. taking blood pressure and weight), extensive perinatal health education, and facilitated peer group discussion. Prenatal physical examinations also take place in the group space, with visual privacy (Novick, 2004; Rising, 1998).

Centering Pregnancy produces perinatal outcomes and experiences of care comparable with—or superior to— individual care (Ickovics et al., 2003, 2007, 2009; Kennedy et al., 2011; Picklesimer, Billings, Hale, Blackhurst, & Convington-Kolb, 2012; Tanner-Smith, Steinka-

Fry, & Lipsey, 2013). Women receiving Centering Pregnancy care are less likely to experience preterm birth and fetal demise, while being more likely to experience longer gestations, higher birth weights, breastfeeding, and improved psychosocial outcomes (Ickovics et al., 2003, 2007, 2011; Kennedy et al., 2011; Picklesimer et al., 2012; Tanner-Smith et al., 2013). In a large randomized controlled trial (RCT) conducted in two urban sites by members of our research team, Centering Pregnancy demonstrated a 33% reduction of likelihood of preterm birth, greater likelihood of improved utilization of care and breastfeeding initiation, reductions in sexually transmitted infections, improved psychological and social outcomes, and increased satisfaction with care (Ickovics et al., 2007; Kershaw, Magriples, Westdahl, Rising, & Ickovics, 2009). Centering Pregnancy is being widely adopted both nationally and internationally (Centering Healthcare Institute, 2015; Centers for Medicare & Medicaid Services, 2013; Novick et al., 2011).

Implementation Challenges

Despite these favorable outcomes, implementing Centering Pregnancy can be difficult, because it represents a substantial paradigm shift from traditional individual prenatal care visits (Rising, Kennedy, & Klima et al., 2004). Reported challenges, which include difficulties with space, scheduling, recruitment, and staffing (Hackley, Applebaum, Wilcox, & Arevalo, 2009; Klima, 2009; Phillippi & Myers, 2013; Picklesimer et al., 2012; Tanner-Smith, Steinka-Fry, & Lipsey, 2012; Teate, Leap, & Homer, 2012; Tilden, Hersh, Emeis, Weinstein, & Caughey, 2014; Vonderheid, Carrie, Norr, Grady, & Westdahl, 2013), may create barriers to implementing and sustaining the full model as originally designed (Lathrop & Pritham, 2014; McDonald et al., 2015; Novick, Sadler, Knafl, Groce, & Kennedy, 2013).

Our prior research has demonstrated that model fidelity was associated with improved outcomes under research circumstances, such as in our earlier RCT (Ickovics et al., 2007), in which materials and staff were provided via research funding (Novick et al., 2013). It is unclear, however, whether these improved outcomes can be sustained in real-life clinical settings. To explore this question, our research team conducted a translational RCT of Centering Pregnancy in 14 urban community health centers and hospitals, with less implementation support than in the earlier RCT. The purpose of this concurrent qualitative study was to identify perceived barriers and facilitators to implementing and sustaining Centering Pregnancy in six of the 14 sites and to explore in depth how these barriers and facilitators influenced implementation in these real-life clinical settings.

Methods

Parent Study

The parent study was a cluster randomized controlled trial to assess the effectiveness of an evidence-based model of group prenatal care, Centering Pregnancy Plus, compared to individual prenatal care, on birth, neonatal, and sexual risk outcomes in real-world practice settings. Centering-Pregnancy Plus (CP+) is a modification of Centering Pregnancy, in which group prenatal care is bundled with an HIV/sexually transmitted infection prevention intervention (Kershaw et al., 2009). The study was conducted in 14 community health centers and hospitals in New York City between 2008 and 2012 (Ickovics et al., in review).

Study sites were randomized to the intervention arm or to the control arm (Fig. 1). In phase 1, intervention sites implemented CP+ group prenatal care, and control sites provided traditional, individual care. During phase 2, sites initially randomized to implement CP+ continued providing it, and sites randomized to individual care began implementing CP+ for the first time. Intervention sites are referred to as immediate implementation sites and control condition sites as delayed implementation sites. During phase 1, individual-patient-level outcome data were collected and have been reported elsewhere (Ickovics et al., 2015). Phase 1 lasted a mean of 16.7 months over all 14 sites (range: 9–31 months). Site level data were collected in phase 2.

As the parent study aim was to examine the challenges encountered implementing CP+ in real-life clinical settings, implementation support from the study approximated support that might be available to clinical sites not involved in a research project. In phase 1, immediate implementation sites received CP+ training workshops, some consultation, in-services and grand rounds, and some material resources over approximately three months; this support was comparable to resources that might be available to clinical settings through existing start-up grants, such as those granted by the March of Dimes (<http://www.marchofdimes.org/>). Study staff were not directly involved with running prenatal care groups or monitoring intervention fidelity.

In phase 2, immediate implementation sites were expected to assume primary responsibility for continuing implementation, as would occur in settings seeking to sustain CP+ on their own. Therefore, support from study staff to the immediate implementation sites was substantially decreased in phase 2 and consisted of limited ongoing consultation.

Delayed implementation sites received no training in phase 1 and continued to provide individual care (as the control arm for individual patient data). In phase 2, delayed implementation sites received training workshops and in-services over 3 months but minimal consultation or material resources. This minimal support over 3 months was provided to even more closely approximate the circumstances in which sites often introduced CP+ in the absence of a study.

Present Study

Design—The approach for this in-depth, qualitative study was interpretive description, which involves exploring similarities and differences, seeking patterns, and uncovering relationships between phenomena. It allows for inquiry into complex clinical situations, capturing distinctive features of experience across participant types, and can lead to developing understandings that have practical implications (Thorne, 2008). The unit of analysis was the clinical site.

Setting—Women's health outpatient practices in six large hospitals were purposively selected (Patton, 2015) from the 14 study sites for variation in study condition and location. Two sites were in municipal hospitals, 2 sites were in independent hospitals, and 2 sites were affiliated with a large university hospital system. Three sites were selected from each study arm. As our purpose was to develop an in-depth understanding of barriers and facilitators during implementation in phase 2, we also sought sites with varied responses to

the CP+ model or implementation success. Site selection for the present study was based on study staff impressions of how the immediate implementation arm sites had reacted to implementation in phase 1 and the apparent level of interest of sites in either the immediate or delayed implementation arm in providing CP+ in phase 2.

Sample—The study sample consisted of 22 interview participants. Participants included clinical site staff ($n = 14$); these consisted of 2 administrators, 4 obstetricians, 3 nurse-midwives, 1 registered nurse, 3 social workers, and 1 dietician. Six participants facilitated CP+ groups. Despite repeated attempts, no support staff (e.g. receptionists or medical assistants) responded to interview requests. Although site staff were recruited for this study equally across all sites and arms, participants were not evenly distributed by professional roles across arms, with greater representation among immediate implementation arm sites (Table 1).

Participants also included research staff actively engaged in implementation across all sites ($n = 8$); three of these were researchers involved in study design and implementation and had a comprehensive perspective on implementation challenges across all 14 parent study sites. The five others were research assistants, each of whom worked in several different study sites for varied amounts of time. No study staff worked as clinicians or provided care in any of the sites.

Data collection—Participants provided written informed consent; all procedures were approved by the university's institutional review boards, the Clinical Directors Network, and all clinical sites. Prior to conducting interviews, site visits were conducted to introduce the investigator (first author) to site staff members. At these meetings, individual outcome-level data from the first phase of the study were reported to staff.

In-depth, semi-structured telephone interviews were conducted with the 22 participants from April through December 2012 (Novick, 2008). Interview guides were adapted from prior research (Novick et al., 2011), tailored to respondent categories and study conditions. Questions were focused on participant reactions to the CP+ model, their perceptions of barriers and facilitators to CP+ implementation, their perceptions of colleagues' responses during implementation, and perceptions of changes in these factors over time. Interviews lasted 30–60 min and were digitally recorded.

We interviewed all interested site staff. Study staff interviews were conducted until we had achieved informational redundancy. In addition, a brief post-interview survey was sent to all six clinical sites 1 year later to inquire how many prenatal care groups were conducted per year (if any).

Data analysis—Interviews were transcribed and loaded into ATLAS.ti® qualitative software. Analysis began with a priori codes, and then an inductive coding scheme (Miles, Huberman, & Saldana, 2014) was developed by the first author.

A priori codes for examining implementation processes were derived from our prior implementation research (Novick et al., 2011; Novick, Sadler, Knafl, & Groce et al., 2012;

Novick et al., 2013) as well as from two implementation frameworks (Durlak & DuPre, 2008; May, 2013). These frameworks describe the complex factors and interactions of actors and settings that influence implementation, which should be examined when evaluating implementation. The second author co-coded several transcripts to validate the codes. The first author completed coding of all transcripts.

Final code categories (Miles et al., 2014) included participant job (e.g. dietician, social worker), study condition (immediate or delayed intervention), processes (e.g. addressing problems, convincing, meeting), structural features (e.g. space, staffing, recruitment), attitudes (e.g. positive, apathetic, try it), and evaluative factors (e.g. effect on women, having fun, robust program). Memoing throughout analysis was used to capture patterns and important concepts.

Code content was compared across different types of study participants, e.g. site staff (clinicians, administrators, and support staff), research assistants, and administrative study staff; code content was also compared across all 6 sites.

Site profiles were constructed and compared, leading to an understanding of the six sites as falling along a spectrum of implementation success from thriving to struggling. This was not in itself unanticipated, as we had selected sites for their apparent initial variation in response to the CP+ program. Features of sites that served as barriers or facilitators to implementation were then compared across sites and intervention arms, and between thriving and struggling sites.

Rigor—Six sites and 22 varied types of participants balanced variation in sampling and settings with having a sample size small enough to permit in-depth qualitative analysis of interview data, yielding a detailed understanding of the process of implementing a complicated biobehavioral intervention into complex clinical settings (Bernard, 2002; Patton, 2015). There was considerable convergence between respondents with diverse roles and perspectives, increasing data trustworthiness (Creswell, 1998; Patton). Data collection and analysis procedures for this study were developed and tested in prior research and modified throughout the study, consistent with emergent design of qualitative research (Patton). Interpersonal validity, or the capacity to relate meaningfully to participants (Patton), was enhanced by having interviews conducted by a clinician-researcher with extensive experience working in and conducting research on providing care and group prenatal care in complex urban settings.

Results

Implementing and sustaining CP+ was extremely challenging in all six sites. CP+ created new demands on health systems, requiring substantial adaptations. The capacity to respond to these demands depended on the specific features of each site, which served as either barriers or facilitators to implementation. All sites had barriers, but our analysis revealed that it was primarily the ability to respond productively to these barriers that influenced both implementation and sustainability.

Three study sites (two immediate, one delayed implementation) were viewed as thriving, and three (one immediate, two delayed implementation) were struggling. We considered sites to have thriving programs if they were initiating a minimum of one new CP+ group care series per month or if at the time of interviews they clearly had planning and infrastructure in place to fully implement and sustain CP+. Sites were considered struggling if they had no/infrequent group care series, with no clear plan for more robust implementation. Our brief post-interview survey conducted a year later also confirmed that the thriving sites had succeeded in implementing and sustaining robust CP+ programs in the study's second phase and that the other three struggled with and ultimately discontinued group prenatal care.

Although we had intentionally selected sites with different responses to implementation, our in-depth analysis enabled us to develop a deeper understanding of the specific features of sites that contributed to thriving or struggling. Findings are represented schematically in Figure 2 and discussed in the three sections that follow, with verbatim language of participants indicated by quotation marks.

Model Demands

Participants described demands that the CP+ model placed on health systems. These demands, which included requirements of space, supplies, staffing, and systems for patient recruitment and retention, are detailed in Table 2. Some demands occurred in both study phases (e.g. obtaining space), whereas others were only present in the second phase (e.g. purchasing supplies).

Barriers and Facilitators to Implementation

Features of the sites that hindered the ability to meet model demands (Table 2) were considered barriers; those that enhanced implementation were facilitators. These features of sites were identified as structural (e.g. space, materials, or staffing) or attitudinal (e.g. organizational culture, climate and leadership).

Structural features of sites—Structural features were material resources and environmental features affecting implementation of CP+. These included space, resources, staffing, patient volume, and sociodemographic aspects of the broader community.

Space: Finding and scheduling space were the most frequently reported barriers. Respondents described “battles” for scheduling space, being relegated to space “in the middle of nowhere” or to space that was so “ridiculously small” and “congested” that it limited group enrollment, reducing productivity. Easier access to space, especially dedicated space, enabled scheduling of more frequent groups.

Resources: The majority of sites reported that they experienced severe financial challenges and staffing cuts, attributed to the 2008 global financial crisis, costs of caring for uninsured women, or organizational instability. These challenges limited funding for supplies and training. In 2012, the Centering Healthcare Institute began requiring site approval for purchasing educational supplies such as “Mom’s Notebooks” (Centering Healthcare

Institute, 2014b). Therefore, although these Notebooks were considered essential, many sites could not afford them after phase 1 when they had been provided for free. Furthermore, sites that lacked funding to train providers who were hired after the initial study-provided trainings sometimes had to train clinicians themselves.

Every site applied for grants to support implementation, indicating their commitment to sustaining group prenatal care. Funding was sought (but not always obtained) from March of Dimes, the Center for Medicare and Medicaid Services Strong Start program, private foundations, or in-house grants.

Staffing: Financial challenges also affected the allocation of staffing for CP+. Although two trained leaders are recommended for running groups, staffing did not always meet these recommendations because staff needed to provide individual patient visits could not always be spared for over 2 hr. Consequently, while some groups had two trained leaders, some had only one trained leader and another staff member, and some had only one leader. It was exceptionally challenging for a single leader to conduct the many group activities simultaneously.

Administrative time was sometimes allocated for group-related tasks and program coordination. A designated program coordinator, when present, assured that groups were scheduled and other logistical demands addressed. When administrative time was not allocated, tasks were completed whenever possible—for example, while on-call at the hospital or during personal time.

In several sites, understaffing had significant ramifications. Because staff were already “stretched thin,” or “boggled down with so much things to do [sic],” implementing innovation was not necessarily a priority. When sites were understaffed, group care adversely affected regular clinical work flow: clinicians occupied for several hours with groups were unavailable for other clinical responsibilities or providing gynecological care. Productivity also could be reduced. One physician typically conducted 65 individual patient visits per day, and although she loved providing CP+, which she compared favorably with her two- to three-minute cursory individual prenatal visits, she struggled to justify time spent in groups:

I need time to set up the room with the nurse, make sure that everything is together, make sure that all of my information is together and when they leave, make sure that it's all in the computer. And so it's not just the 2 hours that I need with them. So now, they're not only missing me for 2 hours, they're missing me for, like, 3 or 4 hours.

Patient volume: High patient volume facilitated enrollment, enhancing group process and clinician productivity. High enrollment allowed sites to run more group series and engage more staff members, enabling the model to gain a “foothold.”

Community: The health centers were located in impoverished and sometimes unsafe neighborhoods. One respondent suggested that low group attendance might be related to the

challenges women faced in traveling freely in that community. She suggested a hierarchy of needs, in which safety took precedence over the luxury of attending groups:

On Halloween somebody said to me in the elevator to the subway, “Be careful this weekend; the gangs are out and they’re supposed to slice 100 women in the face.” You know, [given] the lack of safety in the area, going to a clinic and being a part of this nice group setting may not be a top priority for people in that area.

Attitudinal features of sites—Attitudinal features included reactions to the CP+ model, and organizational culture and climate intrinsic to the sites. These included motivation, leadership, buy-in, anticipating changes and tackling problems, climate, and communication.

Motivation: Participants’ enthusiasm for CP+ was a powerful motivation for addressing implementation challenges. Although many staff were initially wary, attending trainings helped the model “click,” and enabled skeptics to get “their brains wrapped around” the unfamiliar group care model. Social workers with experience in group processes were able to quickly recognize benefits of group care.

Centering Pregnancy Plus was universally perceived by study respondents as having enormous benefits for women. These included developing relationships with other women and clinicians, incorporating significant others, and empowering women to “find their own voice.” Some benefits were viewed as particularly important for the populations served. One administrator explained the importance of welcoming young fathers, who were at risk for limited involvement in their children’s lives, into the prenatal process. Social workers reported that women in their clinic communities were often wary about seeking help. This was particularly true for teens, “. . .because they’re familiar with the social workers in their school or foster care. So social work to them is not a supportive thing.” However, social workers noted that women in group care were more likely to approach them than women receiving routine individual care. Group participants were also reported by site staff to have improved prenatal care attendance and reduced emergency department use.

Participating in CP+ also had a powerful impact on clinicians and staff. Groups were “fun,” and brought “a lot of happiness” to challenging work sites. Clinicians compared the continuity of care with having “private” patients. Many respondents enjoyed the less hierarchical, facilitative group atmosphere. One physician discussed the value of involving young support staff with the young pregnant women: “Sometimes they would have discussions that I would just sit back and listen to.”

Leadership: Champions were program coordinators who advocated for CP+, performed tasks no one else would, and went “above and beyond and made it personal.” Champions were essential to successful implementation and were recognized as such by site staff and study staff across all types of participants; furthermore, the three champions (who also were interview participants) themselves recognized their own pivotal role. They “proselytized” about CP+, promoted teamwork, facilitated groups, lobbied administrators for funds, and wrote grants and received funding. They were “passionate,” “creative and resourceful,” and “held it together.” A champion was a charismatic leader who “kicked ass,” and was “a rock

star.” Their positive energy and dedication inspired colleagues to support them as individuals and to confront implementation challenges.

Without these visible, effective leaders, sites struggled to implement CP+. A study staff member stated, “It was like herding cats. They didn’t have any idea of how to pull this together or the ownership of doing it.” Lack of leadership co-occurred with poor site dynamics and less administrative support, although it was not possible to determine causation. One study staff member described these interactions:

They were stuck because [name] was saying, “Yeah the midwives need to take this over. Go!” And the midwives were saying, “Well, we need permission from the administration.” And the administration was saying, “Just do it, I’m telling you to do it.” So sort of a weird learned helplessness was going on since it was so top-down.

In sites that lacked strong leadership, there were nevertheless individuals deeply committed, doing any and all jobs, and using personal time to keep CP+ “alive.” When implementation faltered, they expressed great loss. They desperately hoped or “prayed” that this model would not “die.”

Buy-in: Buy-in was sometimes described using religious metaphors: people were said to “believe in it” or give CP+ their “blessing.” Although there were many enthusiasts, there was also considerable staff skepticism, “apprehension,” or general apathy about the model. Several site staff study participants reported that some colleagues felt group care disrupted regular clinical work flow or resulted in extra work. Most study respondents agreed that CP+ was extra work, but they also assessed the benefits as justifying the challenges. Site staff also reported that some colleagues believed that staff members assigned to groups weren’t really working. Some providers who were uncomfortable with group facilitation (despite receiving training) lacked buy-in. Support staff who did not receive training sometimes felt excluded or did not understand the model or its benefits. One medical assistant said, “That’s so stupid! You’re just celebrating teen pregnancy.” Ultimately, however, that same individual became involved with groups and became a strong advocate. Some staff complained that group prenatal care was “spoiling” women for individual care because they had “become used to coming in, doing whatever they have to do for themselves and getting everything done instead of just sitting and waiting.”

Buy-in had profound repercussions for implementation. When administrative and staff buy-in was present “on every level,” implementation flourished. In its absence, required resources were promised but not provided, or withdrawn, and CP+ was “pushed to the side,” rather than becoming integral to the practice. One study staff member captured the effect of buy-in from front desk staff whose job included recruiting women for CP+: “Either they become evangelist about [actively promoting] Centering, or they say, ‘Oh, yeah, we got that other thing that I could stick you in.’”

Anticipating change, tackling problems: When group care was seen as a paradigm shift that naturally entailed change, sites proactively developed practical administrative strategies. For example, when sites understood that new scheduling systems were required, templates

were developed; when the need for supplies was expected, purchasing routines were established. When more daunting challenges arose, these sites were resourceful in consulting study staff, the Centering Healthcare Institute, or other clinical sites that had implemented CP+. Sites with this mindset viewed logistical hurdles as “glitches” or “growing pains,” which were taken in stride.

In contrast, some clinical sites did not embrace innovation or were highly bureaucratic. These sites were described by one respondent as being part of “big, hulking systems that resisted change.” Some administrators were reluctant to invest in new programs without prior guarantees of success, leading to a tentative approach that failed to gain momentum: “They’re not diving in. They keep putting their toe in the water. Like, ‘We’re going to do one group; we’ll see what happens.’” These sites failed to anticipate the need for change or to develop concrete strategies for problem-solving: appointment templates were not developed or staff were not instructed in their use, electronic health records were not adapted for CP+, or space and supplies were not obtained. One physician said their system would take 3 months to introduce CP+ scheduling templates. In these sites, the model’s demands “threw their rhythm [off].” When these sites reached the study’s second phase, they were “in shock” and unprepared to implement or sustain group care independently—despite considerable preparatory groundwork.

Climate: Collaborative atmospheres, where people worked well together under stress, facilitated implementation. Hierarchical organizational structures and negative climate hindered implementation. Verbal and physical harassment of some study personnel were reported in one site with particularly challenging interpersonal dynamics; that same site was also struggling with implementation.

Communication: Sites with collaborative cultures also had communication patterns that facilitated implementation. Regular meetings fostered transparency and commitment to collective problem-solving, and actively promoting CP+ via educational forums helped to demystify the unfamiliar model. In sites with less cohesiveness or poor communication, however, people were sometimes confused about group care and implementation processes. A clinician described her bewildering experience when a delayed implementation site was supposed to implement CP+ in the second phase of the study:

I don’t know what happened. We were supposed to start like two weeks ago. All of a sudden, nobody knew the patients. Nobody knew what the template was. Nobody knew what time it was supposed to go on. No one knew which attendings were doing Centering. Nobody knew why we had to do Centering. Nobody knew if we had a room for Centering.

Portraits of Thriving and Struggling Sites

Although all six sites encountered substantial implementation barriers, when sites had the capacity to anticipate and respond proactively to these implementation barriers and CP+ model demands, implementation thrived. This capacity was demonstrated in two sites with flourishing programs, and in a third implementation site that was actively progressing toward robust implementation.

In contrast, when sites lacked structural and attitudinal resources to mount an adequate response, they struggled. This was seen in two sites in which groups were not being conducted, and in a third site where groups were being conducted sporadically. There was no infrastructure or explicit plan for implementation in these sites.

Thriving sites—The presence of a champion was the single most recognizable feature—and potent asset—of thriving sites. Respondents described these charismatic leaders vividly: they facilitated groups, solved logistical problems, did “everything” that needed to be done, aggressively recruited women, advocated and “tapped into every resource.” One champion had integrated CP+ so successfully that colleagues believed it could be sustained without her; however, in another site it was believed that if their champion left, the model would “fizzle.” One individual in a leadership role at the sole thriving delayed implementation site was in regular contact with another site that had recently implemented Centering successfully. This exposure may have contributed to the greater implementation success at the delayed implementation site, compared with the 2 other delayed sites, which both were struggling.

Another important feature was staffing, which typically allowed for the recommended group leader plus one other staff member in group sessions. Thriving sites also all had a social worker familiar with group processes actively involved with CP+.

The organizational cultures of thriving sites were open to change and promoted teamwork. The presence of a champion interacted with organizational culture, resulting in good collaboration, buy-in, and sustainability. One staff member described how mutual respect, communication, and teamwork enhanced morale:

It’s probably the best teamwork I’ve seen in years. We communicate, we’re respectful, we pick up the slack for each other. At the end of the day, they were like, “Wow, you did a good job today,” or “You really connected with that patient.” So, those kind of things really make you feel like: “Mission Accomplished.”

Thriving sites demonstrated entrepreneurial resourcefulness in addressing logistical challenges. Staff developed routines and held regular meetings for planning and troubleshooting. These sites demonstrated gritty resilience; challenges were “little logistical things” that caused “a problem” that staff then “overcame” or “tackled”—rather than daunting show-stopping hurdles. One respondent described her recognition that, although people felt “swept up” and inspired after a CP+ training workshop, they would now have to “address the reality of the many logistical demands.” Although this reality initially seemed formidable, she quickly pivoted into accepting the challenge, asking, “Okay, so how do we bring that back here?”

Despite their strengths, thriving sites also had skeptics and administrators who needed cajoling to provide promised resources. Obtaining space was difficult, and adequate time was not always allowed for group-related tasks. In some sites, these challenges led to modifications, such as having one rather than two facilitators, or conducting examinations in exam rooms rather than group space. However, several respondents indicated that they planned to restore model fidelity. Respondents in these sites conveyed excitement and were

forward-looking. They believed that implementation would take effort, and that change of this magnitude could not occur overnight, but they were up to the challenge.

Struggling sites—Struggling sites had inadequate structural and attitudinal resources to meet the demands of innovation. Despite the presence of deeply committed individuals, there were no champions or designated program coordinators. This resulted in an inability to create or disseminate successful administrative systems. Struggling sites reported serious budget and staffing problems. Staff and clinicians' regular clinical responsibilities could not be readily modified, productivity concerns were paramount, and groups were not fully staffed. Staff already overwhelmed by routine workloads often viewed CP+ as a burden, rather than an opportunity.

These sites were characterized by respondents as having bureaucratic, hierarchical structures, with staff who were "set in their ways." Organizational dynamics were described in negative terms, such as "dysfunctional." Innovation was not a top priority, and although administrators had initially supported CP+, some wanted demonstrated success before fully committing resources. This led to a tentative, incremental approach. Furthermore, interaction between lack of leadership and unsupportive organizational cultures resulted in poor system-wide buy-in. As a result, many people failed to understand the model and its demands and there was limited capacity to anticipate challenges. Momentum flagged, and the model faltered.

These problems converged to create a limited capacity for running groups in the study's second phase, when implementation support was reduced. Respondents conveyed a sense of helpless dismay about logistics and were mystified that the model was not flourishing. This was illustrated in comments of one study staff member in an immediate implementation site that had had a vibrant program in the study's first phase; she described the failure to sustain CP+ without study resources:

All of a sudden, they were just very unprepared for it. They hadn't figured out a plan to continue enrolling patients or whatever we really talked about—how we would continue this—and all the [site staff] were just like, "oh, you [study] guys are done? Huh? Wait, what?" And it was very well known that we'd be done. It wasn't a secret.

Discussion

Implementing CP+ placed substantial demands on sites, which varied greatly in their capacity to anticipate and meet these demands. Specific features of sites served as barriers or facilitators, which moderated implementation success, allowing three sites to thrive and provide robust group prenatal care, whereas three sites struggled to implement or sustain the model. Thriving sites had organizational cultures that supported innovation, program champions who advocated actively for CP+, and staff who viewed logistical demands as small hurdles that they were equipped to "overcome." Struggling sites had bureaucratic organizational structures, lacked buy-in and financial resources for implementation, and had staff who were overwhelmed by the model's challenges.

To date, there has been little in-depth examination of barriers and facilitators to implementation in the group prenatal care literature. However, our findings are consistent with prior implementation research, which emphasizes the need for buy-in, champions, and organizational climate supportive of innovation (Durlak & DuPre, 2008; Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2004; Taylor, Cocklin, Brown, & Wilson-Evered, 2011). Implementing and sustaining innovation entails introducing “a new way of thinking, acting or organizing” into a system (May, 2013, p. 2), yet health care systems may not fully recognize the magnitude of change required. Consequently, models may be modified or discontinued—even when implementation was initially robust (Stirman et al., 2012). This pattern appears to hold for CP+; although group prenatal care is a promising innovation with potential to improve outcomes that has been adopted in hundreds of settings (Centering Healthcare Institute, 2015a; Novick et al., 2011), there is minimal recognition of its demands. Nor is there a full understanding of the possible impact of implementation challenges on how the model is implemented, and the effect of implementation on model sustainability or outcomes. Our findings add to the little research to date that has explored these challenges for providing group prenatal care, or how to address them.

Limitations and Strengths of this Study

Several limitations need to be acknowledged. Site staff who agreed to participate in interviews might have been more favorably disposed toward CP+ than non-respondents. Representation across disciplines was uneven, and no medical assistants responded to interview requests, despite repeated attempts. In addition, there were more respondents from immediate implementation than delayed implementation sites. Data were not collected prospectively, nor was there a structured investigation of the sites as organizations. Given the small sample size, and the large number of variables that can affect implementation, we did not examine differences between sites as they related to site-level institutional factors. We studied urban health centers and hospitals serving low income, predominantly minority women, limiting generalizability to other populations and settings. However, our rigorous, in-depth qualitative process, which used varied sites and participants, has elicited findings that may provide valuable insight into the challenges faced by settings providing care for women from vulnerable populations, at high risk for poor outcomes.

Implications for Practice and Policy

Introducing CP+ not only requires developing a different mindset about how prenatal care is provided; it also requires recognizing the many logistical demands of the model, and investing time and resources, as with a start-up business. Although it may be tempting to just try it out, putting a “toe in the water” to see how it works before making a more substantial financial investment, our findings indicate that CP+ should not be introduced tentatively. Rather, components of this complex model should be firmly in place before beginning a new clinical program. This includes conducting structured site readiness assessments, developing workforce skills and adaptability, developing plans to address all the CP+ model demands, and engaging staff on all levels to create buy-in. Long-range planning to embed group care as routine care, rather than as a novelty, should also start early in implementation. For sites seeking this kind of implementation planning and guidance, Centering Healthcare Institute now has formal implementation support services available, which include assessing site

readiness and providing training and consultation over two years (Centering Healthcare Institute, 2014a).

The presence of a champion was the most distinctive asset of thriving sites. As has been demonstrated elsewhere, champions are persistent, inspirational role models (Howell & Boies, 2004; Taylor et al., 2011). They often have a multi-disciplinary approach and superior communication skills, and are catalysts for change. The contrast of the central importance of champions in thriving sites with the complete absence of champions in struggling sites prompts the question of whether champions could transform struggling to thriving sites. However, some organizations might not be fertile ground for the emergence of champions, and designating or growing champions might not be successful. Furthermore, a project champion often needs support from an administrative executive champion (Taylor et al., 2011) to sustain an innovation, and strategies are needed to sustain it if a champion leaves. As this study did not examine the institutional structures, budgets, and hierarchies of the large municipal and university hospital systems in which the 6 sites were situated, it is, therefore unclear what the impact of champions in struggling sites would have been. In addition, given the positive role of social workers in thriving sites, engaging social workers in implementation may foster teamwork and problem solving.

Finally, CP+ has financial costs that occur during the prenatal period. These include approximately \$20,000-\$30,000 for Centering Healthcare Institute model implementation consultation, training, and start-up supplies. Other costs, which may vary considerably with setting, include: staffing for running groups and for CP+ administration, appropriate decor, food for snacks, and educational materials. Yet potential cost savings (e.g. reduced neonatal intensive care costs) may only accrue subsequently. Given the siloed nature of US health care delivery and financing, some sites may be reluctant or unable to fund such a program. Policy initiatives to support financing will be critical in developing sustainable programs.

Implications for Future Research

Stirman and colleagues (2012) noted that few comprehensive, rigorous studies of effective health interventions are prospective or go beyond examining initial implementation to explore sustainability. Future research should include mixed-method longitudinal studies in which data are collected from adoption through implementation. Focus groups, document review, and participant observation would provide additional insight. Researchers should continue to examine the effect of site characteristics on model fidelity, sustainability, perinatal outcomes, and patient and clinician/staff experience. Furthermore, studies should be designed to directly examine the relationship of larger institutional structures, budgets, hierarchies, and communities on implementation. This proposed research will lead to developing more effective, evidence-based strategies for anticipating and reducing implementation barriers, and for improving procedures to implement innovative models of prenatal care. With this further work, Centering Pregnancy may live up to its promise of improving critical health outcomes while enhancing women's experience of care.

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**Immediate Implementation
(Intervention Arm)****Delayed Implementation
(Control Arm)****Phase 1**

Implementation of CP+
Some implementation support

Individual prenatal care
(No implementation support needed)

Phase 2

Continued provision of CP+
Minimal implementation support

Implementation of CP+
Minimal implementation support

Note: Individual level quantitative data were collected in Phase 1; site level qualitative data were collected in Phase 2

FIGURE 1.
Parent study design.

FIGURE 2.

Centering Pregnancy Plus implementation process. Features of settings serve as barriers or facilitators to implementation. As a result, sites either thrive or struggle with implementation.

Table 1

Interview Participants and Roles

	Immediate Implementation Site Staff (<i>n</i> = 8)	Delayed Implementation Site Staff (<i>n</i> = 6)	Study Staff (<i>n</i> = 8)
Administrative	1	1	3
Nurse- midwife	3	0	0
Dietician	1	0	0
Registered nurse	0	1	0
Social worker	2	1	0
Obstetrician	1	3	0
Research assistant	0	0	5

Table 2**Demands of Implementation of Centering Pregnancy Plus Model and Cost of Required Elements**

Type	Description
Space	Circular seating for 16–20 participants Areas for self-care Space for prenatal exams, with privacy Space for storing supplies
Supplies	Self-care instruments (e.g. automated blood pressure cuff, weight scale) Prenatal examination supplies (drapes, doppler, tapes) Computer for charting Educational materials Welcoming decor Snacks “Mom’s Notebooks” (\$22/book) ^a
Site Approval	Site approval and “Centering” designation (\$7,000) ^b
Training	Additional group leaders (\$6,500) and staff (\$850/person) ^c
Patient Recruitment and Retention	Recruitment procedures Patient reminder calls
Scheduling and Staffing	Additional schedule templates for clinicians working in groups Coverage for regular clinical practice hours Additional patient appointment templates Two group leaders/session (one prenatal care clinician, plus another health professional) Centering Pregnancy + coordination Administrative tasks (e.g. room scheduling and set up, purchasing supplies)

Note. Respondents in this study gave voice to many of these demands. Others were retrieved from published articles and from Centering Healthcare Institute publications (2014a) and are presented here for a full picture of demands.

^a Centering Healthcare Institute (2015b). The sites providing care were responsible to meet all demands of offering the program. In addition to these Institute-produced elements for which costs were fixed, all the other elements must be provided.

^b Centering Healthcare Institute (2014b).

^c Centering Healthcare Institute (2015a).