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Scaling Up Group Prenatal Care: Analysis of the Current Situation and Recommendations for
Future Research and Policy Actions

Thesis

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Abstract

The United States consistently spends more on healthcare than other developed nations, but continues to suffer from inferior outcomes in maternal and infant morbidity and mortality. Innovation is needed within maternal and child healthcare to address these adverse outcomes. One identified innovative approach to tackle these issues is group prenatal care (GPNC). Women who participate in GPNC experience individual clinical care checks to monitor weight, blood pressure, and gestational age in addition to interactive learning and community-building activities and discussions. When compared to those who receive individual prenatal care, GPNC recipients have lower rates of preterm birth, fewer small for gestational age infants, less incident of sexually transmitted infections, and fewer depressive symptoms as well as increased patient satisfaction with care. GPNC has also shown to be cost-saving and is well received by patients and providers. Despite these positive outcomes, GPNC has yet to be widely adapted and utilized. This manuscript describes the challenges that are acting as barriers to a large-scale acceptance of GPNC, including logistical challenges, unsustainable financing mechanisms, and a mixed evidence-base and presents recommendations for future research and policy actions that could help overcome these challenges.

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Introduction

There are about 4 million infants born in the United States (US) per year, making birth one of the most common reasons for visiting a hospital (Pfundner, Wier, & Stocks, 2006). Birth is a top expenditure for payers resulting in payments of approximately \$87 billion annually to cover pregnancy, birth, and postpartum care. Despite spending more on health services, rates of preterm birth and other adverse maternal and child outcomes in the US are consistently worse than in other developed countries (Bradley, Elkins, Herrin, & Elbel, 2011). According to a recent systematic review on global levels of preterm birth, in 2014 the preterm birth rate in the US was 9.56%, which was higher than our neighboring countries of Canada and Mexico whose rates were 8.15% and 7.04% respectively (Chawanpaiboon et al., 2019). According to the 2018 March of Dimes Premature Birth Report Card, the premature birth rate in the US had risen for a third year to 9.93% (March of Dimes, 2018). In 2013, 36.1% of infant mortality in the US was due to preterm-related causes. These rates varied considerably by race as the preterm-related infant mortality rate for black women was three times higher than that of white women (Mathews, MacDorman, & Thoma, 2015). Additionally, the birth rate of small for gestational age (SGA) infants is increasing in the US. Between 2002 and 2011, the number of term newborns that were coded as SGA increased by 29.9% to 15 per 1,000 newborns (Ewing, Ellington, Shapiro-Mendoza, Barfield, & Kourtis, 2017). Consequently, these newborns had a longer mean length of stay, higher mean hospital charges, and higher odds of in-hospital death. Innovation is needed within obstetrical care that can improve these outcomes while also reducing high levels of spending.

Throughout history, many cultures have practiced gathering in groups or circles to discuss common concerns with the hope of creating bonds and common histories between communities

and individuals (Ten Hoop-Bender, Kearns, Caglia, Tunçalp, & Langer, 2014). This practice when combined with education and clinical care form the basis of group medical care. Group medical care typically includes all aspects of an individual medical visit—providing private or semi-private physical assessments and consultations, coupled with education and skill-building within a larger group of similar patients who are either diagnosed with the same disease or experiencing similar changes in their healthcare needs (Jaber, Braksmajer, & Trilling, 2006). Group prenatal care (GPNC) is an exemplary program that utilizes this approach to improve outcomes for pregnant women and their families. March of Dimes has identified GPNC as a key strategy through which substantial improvements in preterm birth may be achieved (March of Dimes, 2015). Recent findings by Woo and colleagues (2017) likewise suggest that, in conjunction with providing long-acting reversible contraception immediately after birth, creating hospital-affiliated integrated outpatient birth, and creating hospital-affiliated integrated birth centers as the planned place of birth for low-risk women, tailoring prenatal care according to women’s unique medical and psychosocial needs by offering more efficient models such as fewer in-person visits or group care could reduce US spending on maternity care by as much as 28% (Woo, Lundeen, Matula, & Milstein, 2017).

GPNC brings together women who are of similar gestational age to engage in prenatal and postpartum sessions that include interactive learning, community building, and clinical care following the American College of Obstetricians and Gynecologists (ACOG) guidelines. The care is provided in a way that emphasizes building relationships and making meaningful connections with the provider, other women, and their family/birth partner. Women are empowered to engage with their charts and medical data, so that they understand what is happening with their bodies through every step of the process. As a group, the women grow and

learn together as they undergo their pregnancy journey (Rising & Quimby, 2016). More information on how GPNC is administered can be found in Appendix A. Randomized controlled trials and matched cohort studies have documented that, compared to standard individual care, GPNC results in lower rates of preterm and small for gestational age babies, less incident of sexually transmitted infections, fewer depressive symptoms, as well as increased patient satisfaction with care (Catling et al., 2015; Ickovics et al., 2007; Kershaw, Magriples, Westdahl, Rising, & Ickovics, 2009; Picklesimer, Billings, Hale, Blackhurst, & Covington-Kolb, 2012). Evidence suggests that, if given a choice, approximately 50% of women would choose to participate in group care (McDonald et al., 2016). Yet, group prenatal care is currently available to an estimated 3% of pregnant women in the US (Declercq, Sakala, Corry, Applebaum, & Herrlich, 2013).

Though GPNC has shown positive outcomes and is well-received by patients, its low availability makes it hard to achieve a population-level impact. Scale-up of GPNC is needed to provide quality, patient-centered care to high-risk women and improve national maternal and infant outcomes. The purpose of this paper is to examine challenges associated with widespread adoption of group prenatal care as a standard of care in the US and to present recommendations for future research and policy that could facilitate scale-up and sustainability of the program.

The History of GPNC Research

Sharon Rising, a nurse midwife, created the first model of GPNC, called CenteringPregnancy (CP), in the late 1990s and published her first paper about CP in 1998 (Rising & Quimby, 2016). In this paper she discusses the outcomes of the first CP pilot program which resulted in high patient and provider satisfaction and less third trimester emergency room visits compared to a control group receiving individual prenatal care (IPNC) (Rising, 1998). After implementing

GPNC at her own clinical practices in Minnesota and Connecticut, Rising created the Centering Healthcare Institute in 2001 to implement GPNC at additional sites across the nation (Rising & Quimby, 2016). CenteringPregnancy+ (CP+) is an extension of the CP model that includes HIV prevention. From 2001-2004, an RCT comparing CP, CP+, and individual prenatal care (IPNC) was conducted and found that both Centering groups had a 33% risk reduction for preterm birth (Ickovics et al., 2007). African American women, specifically, experienced a 41% risk reduction. Higher health-related knowledge, breastfeeding initiation rates, and satisfaction with care were also observed in both Centering groups. At 6 months postpartum, the CP+ group reported greater condom use and fewer rapid repeat pregnancies (Ickovics et al., 2007). An additional evaluation of CP was performed between 2008-2010 in Tennessee and found that participants had slightly longer gestational ages, lower odds of having very low birth weight babies, were more likely to attend postpartum follow-up visits, and were more likely to breastfeed (Tanner-Smith, Steinka-Fry, & Lipsey, 2012).

In addition to promising health outcomes, implementation of CP could also provide cost savings. The BlueChoice Health Plan South Carolina Medicaid managed care organization gave \$175 per patient to obstetric practices offering CP (Crockett et al., 2017). A total of \$14,875 was invested in 85 patients which resulted in a net savings of \$67,293 in NICU costs. South Carolina also recently conducted a retrospective five-year cohort study after implementing group prenatal care among Medicaid-insured women, 1,262 of whom received CP prenatal care and 5,066 of whom received IPNC (Gareau et al., 2016). Results showed that there was a reduced risk of low birthweight by 44%, premature birth by 36%, and neonatal ICU stays by 28%. Researchers project that these reductions saved \$25,000 in newborn care payments and \$2.3 million was returned on the \$1.7 million investment (Gareau et al., 2016). Additionally, the CRADLE study

is currently being conducted in Greenville, South Carolina to assess racial disparities that exist in CP birth outcomes (Chen et al., 2017). This study is an RCT that randomized women into either GPNC or IPNC, stratified by race. Those receiving GPNC will attend 2-hour sessions that follow the CP curriculum. This study is particularly interested in supplying evidence on the role of GPNC reducing preterm birth rates and the disparities that exist within this outcome (Chen et al., 2017).

Expect With Me (EWM) is another model of group prenatal care that incorporates an innovative information technology system aimed at improving the efficiency and effectiveness of care. This model was launched in 2013 with a HIPAA-secure platform that facilitates scheduling, data collection, training, education, and social networking (Shayna D. Cunningham, Lewis, Thomas, Grilo, & Ickovics, 2017). Vanderbilt University Medical Center has implemented both CP and EWM. A recent analysis of both programs found that compared to women who had received individual care only, women who received either type of GPNC had a significantly lower risk of having a preterm birth and low birth weight baby (Shayna D Cunningham et al., 2019).

Within the last five years, two additional models of GPNC were created: Pregnancy & Parenting Partners (P³) and Supportive Pregnancy Care. P³ has been implemented in a handful of states in the US. Its methods and curriculum stem from the Nurse Family Partnership (NFP), an evidence-based maternal child health program. Similarly to CP and EWM, prenatal medical care, social and emotional support, and group based education are utilized, but P³ has the specific aim of decreasing health disparities in the highest risk populations (Berman, Weber Yorga, & Sheeder, 2018). One P³ study has been conducted thus far and it assess demographics and likelihood of participation. This study found that 86% of women reported moderate to high

levels of likelihood of participation, but no health outcomes data was collected or assessed (Berman et al., 2018). In 2016, the March of Dimes announced a partnership with UnitedHealth Group to launch Supportive Pregnancy Care, but to date, no studies have been published that discuss any data findings collected from this program. As of November of 2018, Cigna Health Foundation is also investing in Supportive Pregnancy Care. Both models follow ACOG guidelines for prenatal care.

It is also interesting to note that GPNC has been adapted and studied across the globe in countries including, Australia, Canada, India, the Netherlands, Malawi and Tanzania, and Sweden. The studies in Australia and Sweden both focused on provider satisfaction and found that midwives quite enjoyed providing care in a group format (Andersson, Christensson, & Hildingsson, 2012; Maier, 2013; Teate, Leap, & Homer, 2013). This is important to note as one of Rising's initial concerns was hesitation of midwives to move away from individual care when it is something so central to their education and practice (Rising, 1998). Further maternal health provider and patient satisfaction have been observed in the Netherlands (Rijnders, Van der Pal, & Aalhuizen, 2012) and Canada (McNeil et al., 2013). In addition to observing provider and patient satisfaction, the pilot programs of GPNC in Malawi and Tanzania show that successful implementation can still take place in a resource-constrained, low literacy, high HIV setting (Patil et al., 2013). Despite low education levels, women were still able and excited to engage with their own health measurements and information. In India, women were recruited to engage with participatory women's group over a three-year period (Tripathy et al., 2010). Women in these long-term groups showed a 32% reduction in the neonatal mortality rate and a 57% reduction in moderate depression by the third year.

These identified benefits in outcomes and cost savings, combined with patient and provider satisfaction, affirm the huge potential for impact if GPNC could be scaled and delivered with fidelity; however, implementation challenges exist that need to be further researched to facilitate the scale-up of GPNC. Addressing these challenges will allow for the creation and execution of appropriate research and policy aiming to improve maternal and infant outcomes, especially in high risk populations.

Implementation Challenges: Logistics

Transforming a health system from individual to group care is a challenging task that requires an organizational culture that supports innovation. Buy-in is needed by healthcare administration, clinicians, and staff. Leadership within healthcare must be motivated to implement GPNC and be adaptable to change. The GNPC model has a few logistical challenges that could be inhibiting scale-up. In its current format, GPNC sessions need to be facilitated by two individuals, one of whom must be a clinical provider. There are concerns that having providers facilitate GPNC could cause operational issues within clinics by being unavailable to provide more high-level or specialized care for 1.5-2 hours while they are conducting sessions. Outside of session time, creative thinking and preparatory time are needed for facilitators to adapt the program to their specific patients in addition to time to enter data and notes into electronic health record systems or other files. Other medical care models like the Diabetes Prevention Program have the mobility of facilitating groups in community centers or faith-based organizations. Conducting groups remotely takes the provider away from their practice for even longer and does not give facilitators readable access to some clinical monitoring techniques like ultrasounds and lab work for patients who show signs of risk factors during sessions. The type of

provider utilized can also impact costs associated with care delivery as an OB/GYN attending physician would have a higher salary rate than a nurse practitioner or nurse midwife.

Scheduling, spacing, and clinical volume can also pose logistical barriers. Organizations need access to a space that is large enough to facilitate a group of about 10 women, two facilitators, and potentially the women's birth partners. They must also recruit a sufficient amount of patient volume to fill the groups. It is difficult to recruit large groups who are all of similar gestational age and who can all attend the same appointment times. Scheduling these appointments requires different mechanisms within a system than scheduling individual appointments. This can be further complicated when women do not adhere to all of their group sessions and need to schedule make-up sessions individually. It is expected for there to be conflicts from time to time, but Rowley and colleagues determined in their analysis that each group needs to consist of 10.652 or more patients on average in order to break even on costs (Rowley et al., 2016). Most groups allow for birth partners to also attend which adds additional schedules for which conflicts can arise. Availability becomes more constrained for individuals who are in need of child care during their appointment. Children are not usually allowed to attend GPNC sessions, and affordable child care can be hard to find.

Implementation Challenges: Financing

Implementing GPNC requires initial and continuing expenditures. Initially, financial investments are needed to redesign the delivery system, train health care professionals, and launch group care. Further financing is needed for licensing fees, staff trainings, GPNC curriculum materials, and, if desired, food for groups. A financial paradox exists whereby the health care delivery system bears the burden of transformation to provide group care, yet is often not the financial beneficiary of outcome improvements. Often, prenatal care clinics provide start

up (e.g., training) and ongoing (e.g., materials, accreditation) costs to deliver group care.

However, much of the costs savings come from averted (or shorter) neonatal intensive care unit stays or reduced emergency department visits. Those savings are not channeled back to prenatal clinics but rather are realized by other departments or payers. Financial incentives, in addition to more robust cost-effectiveness evidentiary data, may be needed to convince providers to implement GPNC.

These factors can make it difficult to sell GPNC implementation to providers and states. Enhanced coverage for group prenatal care is currently offered in South Carolina, Indiana, Montana, and Texas. Massachusetts has recently piloted CP and is considering enhanced reimbursement as well. Rowley et al. (2016) created a financial model to forecast costs and revenues of GPNC in urban underserved practices. Variables incorporated into the model include patient population, payer mix, patient show rates, staffing mix, supply usage, and overhead costs. This excel model can be used by providers to determine if providing GPNC is financially feasible given their unique situations. When testing the model, researchers found that adjusted revenue for GPNC was \$1080.69 per pregnancy compared to \$989.93 per pregnancy for IPNC (Rowley et al., 2016). Though this outcome of the model was positive, it cannot be universally applied since the model was designed for urban underserved practices.

Thus far, funding through grants has been able to support pilot programs of GPNC, but this model of financing is not sustainable. Over the past decade, March of Dimes has granted \$12 million to fund implementation of CP. March of Dimes was also granted \$700,000 for Supportive Pregnancy Care from UnitedHealth group. In 2013, the centers for Medicare and Medicaid services provided \$41.4 million in funding to the Strong Start for Mothers and Newborns initiative for three enhanced prenatal approaches, one of which was GPNC (Cross-

Barnet et al., 2014). Anthem funded 1.3 million to support Centering in 2014-2015. Additionally the United Health Foundation funded the EWM development and dissemination study. It is interesting to note that insurers (payers) are willing to fund research & development and implementation efforts, particularly in the form of their foundations, but buy-in is needed at the health system, state and/or federal level in order for funding to be sustained.

Implementation Challenges: Evidence Base

A Cochrane systematic review performed in 2015 showed no statistically significant differences between the outcomes of INPC and GPNC. This review looked at primary outcomes (preterm birth, low birth rate, small-for-gestational age, and perinatal mortality) and secondary outcomes (patient satisfaction, neonatal intensive care admission, initiation of breastfeeding, and spontaneous vaginal birth) and concluded that GPNC showed no evidence of reduced risk, but recognized that GPNC did not result in any adverse outcomes (Catling et al., 2015). A 2016 meta-analysis also found no differences between the rates of preterm birth, NICU admissions, and breastfeeding initiation. This analysis did find, however, that GPNC was associated with lower rates of low birth weight overall across nine studies, but not among RCTs (Carter et al., 2016). It also reported that high-quality studies concluded lower preterm birth rates for African American women. In response to this meta-analysis, individuals from the research groups that conducted the RCTs that were analyzed noted that there were significant findings in lower rates of incident sexually transmitted infections, fewer depressive symptoms, healthier weight trajectories, and extended birth intervals that the meta-analysis left out (Laube, James, Rickell, & Rickell, 2017).

These same individuals stated that studies are currently underway to test the hypothesis that GPNC increases social support, reduces stress, maintains cervical length, and thereby lengthens

gestation and increases birth weight (Laube et al., 2017). The results from these types of studies will be an important addition to the evidence base. There is currently no consensus on the mechanisms that underlie why GPNC may result in improved outcomes. Explorations of these mechanisms will better inform further research hypotheses. For example, stress has recently been linked to maternal mortality. If GPNC shows to reduce stress, there would be basis to explore the effect of GPNC on stress-related outcomes, like high blood pressure, that cause maternal mortality.

An expert review of GPNC states that the program is more beneficial in reducing the primary outcome of preterm birth among African American women (Mazzoni & Carter, 2017). This result is notable given that African American women are twice as likely as white women to experience preterm birth. The authors also concluded that studies have shown mixed results on almost all secondary birth outcomes, except improved postpartum family planning, when analyzing results more broadly, but notes that many secondary outcomes were improved for adolescents (Mazzoni & Carter, 2017). Most notably, the reduction of rapid repeat pregnancy, which impacts 1 in 5 pregnancies in 15-19 year olds. An additional study mentioned in this review found that women with gestational diabetes in GPNC progressed to requiring medication control less frequently (Mazzoni, Hill, Webster, Heinrichs, & Hoffman, 2016). The literature states that there may be some mental health benefits to utilizing GPNC in the military, but that not enough studies have been conducted to reach definitive conclusions (Mazzoni & Carter, 2017). Most recently, a systematic review and meta-analysis was conducted to assess the relationship between GPNC and gestational weight gain. Among the nine studies analyzed, there was no significant differences in gestational weight gain in group compared to traditional prenatal care (Kominiarek, Lewkowitz, Carter, Fowler, & Simon, 2019).

These analyses show that there is mixed evidence on improved outcomes of GPNC compared to IPNC overall; however, there is strong evidence for improved outcomes in various subgroups, including adolescents, minority women, and women with preexisting conditions. Given that these populations benefit from GPNC the most, pilot programs and future research should focus on serving these populations. Addressing adverse outcomes in these populations will in turn benefit overall maternal and infant outcomes at a population level. The evidence base is also currently lacking a systematic review of cost-effectiveness data that analyzes GPNC in a variety of settings and populations.

Recommendations for Future Research

While various studies on GPNC have been conducted, there are still gaps in the evidence base that need to be filled. Long-term follow-up studies are needed to determine the more holistic impact that GPNC may have on individuals and health systems. There also needs to be more research on the different reimbursement models. Reimbursement could come from the Center for Medicare and Medicaid Services, individual states, and/or other insurers, and research needs to determine the pros and cons of each of these avenues. Additionally, enhanced reimbursement can be provided with or without outcomes-based incentives for the delivery of GPNC. The effectiveness of value-based payments still needs to be tested and analyzed. As other states begin to emulate the actions of South Carolina, different value-based payment models should be rolled-out and compared.

Scale-up of GPNC may be facilitated by the use of virtual or telemedicine models. A nutrition-focused telehealth start-up, Fruit Street, began delivering the CDC's National Diabetes Prevention Program in 2017. This program could be further analyzed to draw parallels in using telemedicine for GPNC. Telemedicine could be an efficient way to engage hard-to-reach

populations, though telemedicine would lack some of the benefits of building in-person relationships. Maternal/infant outcomes, patient/provider feedback, and cost-effectiveness of these models would need to be assessed. Having providers go out into communities and providing GPNC in remote locations would allow for the utilization of larger spaces that already exist within communities and increase access to vulnerable populations who are most likely to benefit from GPNC. Remote locations may not experience enough patients of similar gestational age, but there is a possibility of pooling patients from sites with lower clinical volume in similar areas. As mentioned above, this may produce operational problems if providers spend an extended period of time out of their practice, but research could look into confirming or denying this suggestion. The use of nurse midwives as opposed to OBGYNs in these scenarios may reduce these hesitations of having providers unavailable at practices for too long.

Researchers should also consider GPNC interventions that target women with comorbid conditions and social risks. The presence of comorbid conditions often deem women as medically high-risk and excludes them from being eligible to participate in studies. Mazzoni et al. provides an example of this by assessing the success of GPNC for women with preexisting and gestational diabetes (Mazzoni et al., 2016). The research conducted thus far, has shown positive outcomes for particular subgroups, including adolescents, minority women, and women who have pre-diagnosed depression or anxiety. Future research should focus on studies that analyze these populations in addition to women who are medically high risk and are more in need of innovative ways to improve adverse outcomes. GPNC models do not currently have tailored curriculums for different subsets of women. If these research studies were to take place, it could be beneficial to create tailored curriculums to cut down on preparation time for the facilitators and further enhance outcomes.

Additional research needs to be conducted on incentivizing providers and patients to implement and participate in GPNC with services like childcare or transportation vouchers. Recruitment could also be improved by testing different feeder models that direct individuals to GPNC. This would be particularly useful for high-risk patients who could be directed to GPNC by their providers. Once enough capacity is built, “opt out” models could be tested as a mechanism to increase recruitment into the program.

Mercer et al. (2010) provides analysis and recommendations on translating evidence into policy by conducting a case study on lowering the legal blood limit for drivers. While this topic is not directly related, important lessons have been learned from this case study. Specifically, the authors conclude that successful translation of evidence into policy was related to a multitude of factors, including: use of systematic review methods to synthesize the full body of evidence, use of recognized and credible processes for assessing the evidence, development of evidence-based policy recommendations by an independent body, active participation of key stakeholders throughout all stages of the process, use of personalized channels and compelling graphics to disseminate evidence, and attention paid to sustainability (Mercer et al., 2010). It cannot be inferred that these key lessons could be directly translated to GPNC, but the study provides a great example for research that needs to be done to understand how evidence is turned into policy. Conducting similar research on other group medical care models, like the Diabetes Prevention Program, could provide key insights for improving the scale-up of GPNC.

Recommendations for Future Action

Scaling-up GPNC will be most successful if an improved evidence base is complimented by the appropriate policy and advocacy actions. Advocacy and social movements help achieve health equity by changing the way in which evidence is generated, interpreted and used to

achieve healthier policies and practices. Movements are most successful when utilizing a bottom-up approach to engage communities and individuals experiencing health inequities and then engaging researchers and practitioners in politics and advocacy for legitimacy (Kapilashrami et al., 2016). Individuals and providers who experience the disparities in maternal and infant outcomes can speak first hand to issue and share stories that ignite a call to action aimed at legislators to finance and implement GPNC programs at a state or federal level. Advocacy and movement efforts are also most successful when clear and appropriately targeted policy proposals are generated through ongoing processes of dialogue with various stakeholders, community mobilizing, and action research (Kapilashrami et al., 2016). The most successful policies are those in which all stakeholders can provide positive testimony and there is little push-back from complimentary sectors. Moving forward, as more variations of GPNC begin to emerge, patients, providers, payers, researchers, advocacy groups, and politicians should be engaged in reforming and implementing GPNC. In 2016, the March of Dimes launched a new National Council on Financing Group Prenatal Care that convened these stakeholders to review different financing models. This is an important step in generating payer innovation and establishing more sustainable financing streams for GPNC. A high level discussion on the logistical challenges is definitely needed. Upon creating CP, Rising identified a lot of the logistical challenges previously discussed (Rising, 1998). Now, after more than 20 years, many of the challenges still exist with no concrete direction on how to overcome them. The March of Dimes is a key actor that could also convene stakeholders to discuss the logistical challenges and the evidence base while in addition to having the capacity to lead policy and advocacy work.

Engaging the community can be done by creating and supporting a patient-lead advocacy group. A survey conducted by Keller et al. (2014) of 79 patient groups found that more than half

interact with both Congress and at least one federal agency. The majority of funding for these groups comes from individual gifts followed by fundraising. Groups have websites that explain the importance of the issue and opportunities for civic engagement/advocacy (e.g. guidelines for raising public awareness of an issue and discussing relevant bills). These organizations establish goals, which most frequently include: providing services to members, changing public attitudes, increasing research funds, changing professional attitudes, applying for grants, conferences on the issue for the public, working with government agencies, working with academic researchers, work with congress, change research directions, and develop new technologies (Keller & Packel, 2014). Many of these groups are disease-related and while pregnancy is not a disease, individuals who have been pregnant have similar experiences biologically and with how they have engaged with the healthcare system. Individuals who have been pregnant and have utilized GPNC and their family members that have seen the benefit have the potential to be the best advocates. Forming groups that adapt these best practices is an important facilitating mechanism to impact policy at the state and/or federal level.

The advocacy group needs to work together with one or more policy entrepreneurs who will lead change efforts. Policy entrepreneurs are individuals who possess readiness, connectivity, and flexibility. Rather than being a sole agent, this individual works with others across multiple levels to draw actors and policy communities together and align perceptions to formulate common goals and interests (Oborn, Barrett, & Exworthy, 2011). Policy entrepreneurs can stem from invested agencies like the Centering Healthcare Institute or March of Dimes, from clinical leadership, and from the communities being most impacted by GPNC. These larger agencies have the connections, expertise and resources to develop favorable, comprehensive plans and policies for wider adoption of GPNC. Clinical leadership can tap into clinical area

networks to mobilize the reform process. Communities on the ground can testify and lobby for GPNC based on their personal needs and lived experiences. It is also important to identify and enroll state, regional, or national actors (Oborn et al., 2011). Policy entrepreneurs exist in South Carolina, as seen by the adaption of CP. Other states need to determine individuals within their health and political systems that will drive state-wide adaption of GPNC.

Patient advocacy groups and policy entrepreneurs need to work together to drive scale-up of GPNC. These individuals should push for widespread implementation of GPNC models with low start-up and ongoing costs obtained through technology integration and higher patient volume. Implementation should include shared savings models and value-based payments for birth outcomes. Advocacy can also be done by patients and providers to persuade insurers to provide higher reimbursements for group care. As more and more states begin to introduce GPNC into their health system, advocacy needs to be performed at the state level to ensure that the program is being implemented with best practices and accounting for lessons learned in other states. A national patient advocacy group could develop these best practices and work with states to modify based on their unique contexts. Once long-term studies are conducted on the outcomes and cost-savings of individual states, positive results and aspects of the model can be used to advocate for a federally administered and supported program.

Actions to improve the facilitation of GPNC should also be considered. All facilitators must go through additional training in order to become familiarized with the standard curriculum and learn necessary skills that go beyond standard care. If more widely adapted, GPNC methods could be incorporated into the providers' primary education. As suggested in the research section, pilot programs should target high-risk populations and subgroups of women who have shown greater outcomes during GPNC. In doing this, specialized curriculums should be

developed that enhance the GPNC experience for specific groups. There are certain topics that would be beneficial to emphasize with certain subgroups. For example, for adolescents, it would be beneficial to include more information on contraception methods to reduce unwanted repeat pregnancies. For women with depression and anxiety, it would be beneficial to have one or two sessions to discuss maintaining mental wellness during pregnancy and postpartum. As an incentive to address the issue of attendance at sessions, one of the South Carolina studies only provided enhanced reimbursements to providers whose GPNC patients attended a minimum number of group sessions (Gareau et al., 2016). This strategy encourages practices and facilitators to improve their recruitment and retention methods, but does not address any of the potential structural barrier to attendance like lack of transportation, time off work, or childcare. In order to overcome the barrier of individuals needing childcare during GPNC sessions, programs could consider on-site childcare, but this would require funding and additional space. In order to overcome barriers of transportation, vouchers for public transportation or ride shares could be provided or participants could be provided with transportation via van or bus by provider staff.

Conclusion

Widespread adoption of GPNC has the potential to benefit women, their families, and the health systems they are a part of. Given the potential benefits and cost-savings, GPNC needs to become more widely accessible. The scale-up of GPNC is currently inhibited by logistical challenges, unsustainable financial streams, and a mixed evidence-base. To overcome these barriers, more research needs to be conducted on various ways of conducting and financing GPNC. Research needs to be prioritized on subgroups of women who are more at-risk that have seen better outcomes from GPNC thus far. Additional research needs to be paired with appropriate policy

and advocacy strategies that identify champions to lead scale-up of GPNC, engage and give a voice to all relevant stakeholders, and create an advocacy group that can disseminate information to the general public and politicians.

References

- Andersson, E., Christensson, K., & Hildingsson, I. (2012). Parents' experiences and perceptions of group-based antenatal care in four clinics in Sweden. *Midwifery*, 28(4), 502-508.
- Berman, R., Weber Yorga, K., & Sheeder, J. (2018). Intention to Participate in Group Prenatal Care: Moving Beyond Yes or No. *Health promotion practice*, 1524839918784943.
- Bradley, E. H., Elkins, B. R., Herrin, J., & Elbel, B. (2011). Health and social services expenditures: associations with health outcomes. *BMJ Qual saf*, 20(10), 826-831.
- Carter, E. B., Temming, L. A., Akin, J., Fowler, S., Macones, G. A., Colditz, G. A., & Tuuli, M. G. (2016). Group prenatal care compared with traditional prenatal care: a systematic review and meta-analysis. *Obstetrics and gynecology*, 128(3), 551.
- Catling, C. J., Medley, N., Foureur, M., Ryan, C., Leap, N., Teate, A., & Homer, C. S. (2015). Group versus conventional antenatal care for women. *Cochrane Database of Systematic Reviews*(2).
- Chawanpaiboon, S., Vogel, J. P., Moller, A.-B., Lumbiganon, P., Petzold, M., Hogan, D., . . . Laopaiboon, M. (2019). Global, regional, and national estimates of levels of preterm birth in 2014: a systematic review and modelling analysis. *The Lancet Global Health*, 7(1), e37-e46.
- Chen, L., Crockett, A. H., Covington-Kolb, S., Heberlein, E., Zhang, L., & Sun, X. (2017). Centering and Racial Disparities (CRADLE study): rationale and design of a randomized controlled trial of centeringpregnancy and birth outcomes. *BMC pregnancy and childbirth*, 17(1), 118.
- Crockett, A., Heberlein, E. C., Glasscock, L., Covington-Kolb, S., Shea, K., & Khan, I. A. (2017). Investing in CenteringPregnancy™ group prenatal care reduces newborn hospitalization costs. *Women's Health Issues*, 27(1), 60-66.
- Cross-Barnet, C., Clark, W., Hill, I., Benatar, S., Courtot, B., Blavin, F., . . . Palmer, A. (2014). Strong Start for Mothers and Newborns Evaluation.
- Cunningham, S. D., Lewis, J. B., Shebl, F. M., Boyd, L. M., Robinson, M. A., Grilo, S. A., . . . Ickovics, J. R. (2019). Group prenatal care reduces risk of preterm birth and low birth weight: A matched cohort study. *Journal of Women's Health*, 28(1), 17-22.
- Cunningham, S. D., Lewis, J. B., Thomas, J. L., Grilo, S. A., & Ickovics, J. R. (2017). Expect With Me: development and evaluation design for an innovative model of group prenatal care to improve perinatal outcomes. *BMC pregnancy and childbirth*, 17(1), 147. doi: 10.1186/s12884-017-1327-3
- Declercq, E. R., Sakala, C., Corry, M. P., Applebaum, S., & Herrlich, A. (2013). Listening to mothersSM III: New York, NY: Childbirth Connection.
- Ewing, A. C., Ellington, S. R., Shapiro-Mendoza, C. K., Barfield, W. D., & Kourtis, A. P. (2017). Full-term small-for-gestational-age newborns in the US: characteristics, trends, and morbidity. *Maternal and child health journal*, 21(4), 786-796.
- Gareau, S., Lòpez-De Fede, A., Loudermilk, B. L., Cummings, T. H., Hardin, J. W., Picklesimer, A. H., . . . Covington-Kolb, S. (2016). Group prenatal care results in Medicaid savings with better outcomes: a propensity score analysis of CenteringPregnancy participation in South Carolina. *Maternal and child health journal*, 20(7), 1384-1393.
- Ickovics, J. R., Kershaw, T. S., Westdahl, C., Magriples, U., Massey, Z., Reynolds, H., & Rising, S. S. (2007). Group prenatal care and perinatal outcomes: a randomized controlled trial. *Obstetrics and gynecology*, 110(2 Pt 1), 330.

- Jaber, R., Braksmajer, A., & Trilling, J. S. (2006). Group visits: a qualitative review of current research. *J Am Board Fam Med*, *19*(3), 276-290.
- Kapilashrami, A., Smith, K. E., Fustukian, S., Eltanani, M. K., Laughlin, S., Robertson, T., . . . Scandrett, E. (2016). Social movements and public health advocacy in action: the UK people's health movement. *Journal of Public Health*, *38*(3), 413-416.
- Keller, A. C., & Packel, L. (2014). Going for the cure: patient interest groups and health advocacy in the United States. *Journal of health politics, policy and law*, *39*(2), 331-367.
- Kershaw, T. S., Magriples, U., Westdahl, C., Rising, S. S., & Ickovics, J. (2009). Pregnancy as a window of opportunity for HIV prevention: effects of an HIV intervention delivered within prenatal care. *American journal of public health*, *99*(11), 2079-2086.
- Kominiarek, M. A., Lewkowitz, A. K., Carter, E., Fowler, S. A., & Simon, M. (2019). Gestational weight gain and group prenatal care: a systematic review and meta-analysis. *BMC pregnancy and childbirth*, *19*(1), 18. doi: 10.1186/s12884-018-2148-8
- Laube, D. W., James, A., Rickell, M., & Rickell, M. E. (2017). Group Prenatal Care Compared With Traditional Prenatal Care: A Systematic Review and Meta-analysis. *Obstetrics & Gynecology*, *129*(1), 204.
- Maier, B. J. (2013). Antenatal group care in a midwifery group practice—A midwife's perspective. *Women and birth*, *26*(1), 87-89.
- March of Dimes. (2015). Prematurity Prevention Conference: Quality Improvement, Evidence and Practice.
- March of Dimes. (2018). Premature Birth Report Cards.
- Mathews, T., MacDorman, M. F., & Thoma, M. E. (2015). Infant mortality statistics from the 2013 period linked birth/infant death data set.
- Mazzoni, S. E., & Carter, E. B. (2017). Group prenatal care. *American Journal of Obstetrics and Gynecology*, *216*(6), 552-556. doi: <https://doi.org/10.1016/j.ajog.2017.02.006>
- Mazzoni, S. E., Hill, P. K., Webster, K. W., Heinrichs, G. A., & Hoffman, M. C. (2016). Group prenatal care for women with gestational diabetes. *The Journal of Maternal-Fetal & Neonatal Medicine*, *29*(17), 2852-2856. doi: 10.3109/14767058.2015.1107541
- McDonald, S. D., Sword, W., Eryuzlu, L. N., Neupane, B., Beyene, J., & Biringer, A. B. (2016). Why Are Half of Women Interested in Participating in Group Prenatal Care? *Maternal and child health journal*, *20*(1), 97-105. doi: 10.1007/s10995-015-1807-x
- McNeil, D. A., Vekved, M., Dolan, S. M., Siever, J., Horn, S., & Tough, S. C. (2013). A qualitative study of the experience of CenteringPregnancy group prenatal care for physicians. *BMC pregnancy and childbirth*, *13*(1), S6.
- Mercer, S. L., Sleet, D. A., Elder, R. W., Cole, K. H., Shults, R. A., & Nichols, J. L. (2010). Translating Evidence into Policy: Lessons Learned from the Case of Lowering the Legal Blood Alcohol Limit for Drivers. *Annals of Epidemiology*, *20*(6), 412-420. doi: <https://doi.org/10.1016/j.annepidem.2010.03.005>
- Oborn, E., Barrett, M., & Exworthy, M. (2011). Policy Entrepreneurship in the Development of Public Sector Strategy: the Case of London Health Reform. *Public Administration*, *89*(2), 325-344. doi: 10.1111/j.1467-9299.2010.01889.x
- Patil, C. L., Abrams, E. T., Klima, C., Kaponda, C. P., Leshabari, S. C., Vonderheid, S. C., . . . Norr, K. F. (2013). CenteringPregnancy-Africa: a pilot of group antenatal care to address Millennium Development Goals. *Midwifery*, *29*(10), 1190-1198.

- Pfuntner, A., Wier, L. M., & Stocks, C. (2006). *Most Frequent Conditions in U.S. Hospitals, 2010: Statistical Brief #148*: Agency for Healthcare Research and Quality (US), Rockville (MD).
- Picklesimer, A. H., Billings, D., Hale, N., Blackhurst, D., & Covington-Kolb, S. (2012). The effect of CenteringPregnancy group prenatal care on preterm birth in a low-income population. *American Journal of Obstetrics and Gynecology*, 206(5), 415.e411-415.e417. doi: <https://doi.org/10.1016/j.ajog.2012.01.040>
- Rijnders, M., Van der Pal, K., & Aalhuizen, I. (2012). CenteringPregnancy® offers pregnant women a central position in Dutch prenatal care [CenteringPregnancy® biedt zwangere centrale rol in Nederlandse verloskundige zorg]. *Tijdschrift voor gezondheidswetenschappen*, 90(8), 513-516.
- Rising, S. S. (1998). Centering pregnancy: an interdisciplinary model of empowerment. *Journal of Nurse-Midwifery*, 43(1), 46-54.
- Rising, S. S., & Quimby, C. H. (2016). *The CenteringPregnancy model: The power of group health care*: Springer Publishing Company.
- Rowley, R. A., Phillips, L. E., O'Dell, L., El Hussein, R., Carpino, S., & Hartman, S. (2016). Group prenatal care: a financial perspective. *Maternal and child health journal*, 20(1), 1-10.
- Tanner-Smith, E. E., Steinka-Fry, K. T., & Lipsey, M. W. (2012). A multi-site evaluation of the CenteringPregnancy® programs in Tennessee. *Nashville, TN: Vanderbilt University*.
- Teate, A., Leap, N., & Homer, C. S. (2013). Midwives' experiences of becoming CenteringPregnancy facilitators: A pilot study in Sydney, Australia. *Women and birth*, 26(1), e31-e36.
- Ten Hoope-Bender, P., Kearns, A., Caglia, J., Tunçalp, Ö., & Langer, A. (2014). Group Care: Alternative models of care delivery to increase women's access, engagement, and satisfaction. *Cambridge, Mass: Women and Health Initiative, Maternal Health Task Force, Harvard School of Public Health*.
- Tripathy, P., Nair, N., Barnett, S., Mahapatra, R., Borghi, J., Rath, S., . . . Sinha, R. (2010). Effect of a participatory intervention with women's groups on birth outcomes and maternal depression in Jharkhand and Orissa, India: a cluster-randomised controlled trial. *The Lancet*, 375(9721), 1182-1192.
- Woo, V. G., Lundeen, T., Matula, S., & Milstein, A. (2017). Achieving higher-value obstetrical care. *American Journal of Obstetrics and Gynecology*, 216(3), 250. e251-250. e214.

Appendix A: Administration of GPNC

<p>Characteristics of Group Members</p>	<p>Groups of made up of pregnant women who have all have similar gestational ages. In most groups, a partner or support person can join the women for their sessions. Group members sometimes share certain characteristics or risk factors like young age or development of gestational diabetes.</p>
<p>Characteristics of Group Facilitators</p>	<p>There are two group facilitators present at each group. One co-facilitators is a licensed provider (obstetrician, family practitioner, nurse midwife, or nurse practitioner) and the other co-facilitator is usually a medical assistant, nurse, social worker, health educator, dietician, or psychologist. All facilitators have undergone training on administering GPNC.</p>
<p>Group Care Setting</p>	<p>GPNC typically takes place in a health care center or clinic</p>
<p>Number of Group Members</p>	<p>Groups are usually conducted with 10 women, but this number can vary. Most success is seen with groups of 8-10 women, but providers can use their discretion when determining group size.</p>
<p>Frequency of Meetings</p>	<p>There are usually 10 meetings spread throughout pregnancy and postpartum that occur every 2-4 weeks. Each meeting can last from 90 minutes to two hours.</p>
<p>Clinical Care Provided</p>	<p>Belly checks are performed in a private setting with each individual and information on weight, blood pressure, and gestational age is recorded. This information is recorded by the women in their own chart that they always have access too. Additional information in the chart includes results from lab work and ultrasounds.</p>
<p>Educational Component</p>	<p>The 10 session curriculum focuses on personal empowerment through interactive group activities and discussions. The content of each session varies and emphasis on certain topics depends on the groups needs. Some examples of topics include nutrition, exercise, stress management, breastfeeding, preterm labor, gestational diabetes, and safe sex.</p>