

Linking Postpartum and Parenting Women With a National Diabetes Prevention Program: Recruitment Efforts, Challenges, and Recommendations

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■ **IN BRIEF** Women with a history of gestational diabetes mellitus (GDM) are at higher risk for type 2 diabetes. This project piloted the National Diabetes Prevention Program lifestyle change program in cohorts of women with a history of GDM. The article describes recruitment efforts, challenges, and study participation and provides recommendations for future program implementation.

Gestational diabetes mellitus (GDM), a type of diabetes first recognized during pregnancy, affects up to 16.2% of pregnant women worldwide, with a prevalence in the United States as high as 9.2% (1,2). Risk factors for GDM include being overweight or having obesity; physical inactivity; a history of previous GDM, polycystic ovarian syndrome, hypertension, or heart disease; and a family history of type 2 diabetes (3). The risk of developing GDM is highest among Hispanic, Asian, African-American, and American-Indian women, although the reasons attributed to these higher risks are not well understood (4–7). Significant health disparities exist between Hispanic and non-Hispanic women, with GDM prevalence estimates at 12.1 and 6.8%, respectively (1).

A history of GDM increases a woman's risk for type 2 diabetes by 40–60% (8). Systematic literature reviews indicate that the highest risk period for developing type 2 diabetes is within the first 5 years after a pregnancy with GDM (9–11), and 50% of Hispanic women who have had GDM develop type 2 diabetes within that time frame (9).

Scientific evidence demonstrates that type 2 diabetes can be prevented or delayed in those at high risk through improvement in lifestyle habits (12–15). In the United States, the Diabetes Prevention Program research study resulted in a 58% reduction in type 2 diabetes with intensive lifestyle intervention and a 31% reduction with metformin therapy compared to placebo (12).

Based on the increasing incidence of type 2 diabetes and the evidence supporting type 2 diabetes prevention, the Centers for Disease Control and Prevention (CDC) established the National Diabetes Prevention Program (National DPP) to achieve implementation of a structured, long-term (across 12 months) lifestyle change program (LCP) modeled on that of the DPP research study in communities across America. The CDC provides leadership and some funding for implementation of the National DPP. The intervention to promote modest lifestyle changes, such as healthful eating, physical activity, and behavior change strategies that result in modest weight loss, has proven successful (13).

Although several studies have focused on type 2 diabetes interventions during pregnancy, there has

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been little research on type 2 diabetes prevention among high-risk postpartum and parenting women with a history of GDM (9). Implementing diabetes prevention interventions in postpartum and parenting women is difficult; data suggest that women's adherence to healthy behaviors is challenging after pregnancy due to the new responsibilities in their lives (16), particularly within their infant's first year of life. One study compared enrollment, attendance, and weight loss for women 18–39 years of age compared to women ≥ 40 years of age and found that women of child-bearing age were less likely than older women to engage in the National DPP LCP but were equally likely to benefit from weight loss when they did attend (17).

The objectives of our study were to 1) pilot-test a type 2 diabetes prevention program in a cohort of Hispanic and non-Hispanic women with a history of GDM, 2) describe recruitment efforts, challenges, and study participation, and 3) provide recommendations for future program implementation.

Methods

Program Description and Setting

This study was part of a larger National DPP project conducted by the University of Kentucky College of Nursing and the University of Kentucky HealthCare Barnstable Brown Diabetes Center. The study was approved by the university medical institutional review board (IRB) and conducted between October 2015 and June 2017. The purpose was to guide participants to make lifestyle changes to reduce their risk for type 2 diabetes.

This pilot study used the CDC's 2012 National DPP curriculum over a series of approximately 22 sessions in a 12-month period, during which participants were guided by trained lifestyle coaches to reduce their risk of type 2 diabetes (18). Session content focused on healthful eating,

increasing physical activity, building self-efficacy, developing social support systems for maintaining lifestyle changes, and establishing problem-solving strategies for overcoming the common challenges of sustaining weight loss.

The target population for this study was postpartum and parenting women (women with a child ≤ 5 years of age) with a history of GDM. Before program implementation, lifestyle coach facilitators completed the CDC's National DPP training conducted by the American Association of Diabetes Educators. Recruitment occurred at two primary health care facilities: a university-based health care clinic and a community federally qualified health center serving low-income and ethnically diverse women in urban Fayette County, Ky. (19). The number of women in the population served by the clinics varied, but the estimated number of women seeking prenatal services was ~ 100 women per week. The first 16 sessions were completed over the course of 26 weeks, and the final 6 sessions were completed in the subsequent 6 months.

Participants were required to attend sessions, complete a food diary, and record their physical activity. Overall participant objectives were to lose at least 5% of body weight and to increase physical activity to 150 min/week, with the ultimate goal of preventing or delaying type 2 diabetes.

Recruitment

A multimodal approach for recruitment included medical chart reviews, telephone calls, face-to-face invitations in the prenatal clinics, and approved program flyers. Medical records were reviewed to identify patients with a history of GDM within ≤ 5 years. Inclusion criteria were 1) ≥ 18 years of age, 2) BMI ≥ 24 kg/m², and 3) history of GDM or recent history of delivering a baby that weighed > 9 lb at birth. Of note, delivery of a baby weighing > 9 lb is no longer listed as an independent risk factor for

the development of prediabetes and type 2 diabetes (20).

Research staff conducted telephone calls from lists of prospective women with a history of GDM who had previously consented to research that were provided by the clinics' diabetes educator or outreach coordinator. Eligible women were contacted and invited to join the program. Approximately 100 women received invitation phone calls.

In-person recruitment included approaching women attending a pediatric, prenatal, or postpartum appointment. Research staff explained the program, reviewed eligibility, and invited women to participate. An approved flyer and contact numbers were provided to the prospective participants. Flyers were also posted in the clinics' waiting areas.

For each recruitment method, the research staff explained the study in a private room. Program goals were explained, emphasizing the health benefits of the target lifestyle changes. Any questions or concerns were addressed before participants signed a consent form.

Implementation

For non-English-speaking participants, translation of the consent form adhered to the IRB research protocols regarding content and health literacy when recruiting individuals with limited English proficiency for participation in research studies. All related study materials were translated from English to Spanish by a trained certified medical interpreter.

The research staff at the health care clinics included two perinatal nurses and a registered dietitian/licensed diabetes educator who were trained as lifestyle coaches, a public health educator, and a community outreach coordinator. Three members of the research staff, including one lifestyle coach, were bilingual/bicultural and fluent in English and Spanish.

The women in the Hispanic cohort spoke Spanish as their first

language. Therefore, the intervention and related materials for this group were delivered in Spanish; the CDC National DPP curriculum and materials are available in Spanish (18,21). English-speaking participants received all written materials and verbal content in English. Weight in pounds measured onsite and self-reported activity in minutes per week were recorded at each session.

Qualitative Interviews

Upon completion of the study, semi-structured qualitative interviews with two lifestyle coaches and the community outreach research personnel (assigned at each community health center) were conducted for feedback. Questions included their perceptions regarding barriers to and facilitators of program recruitment and retention, rewarding aspects of the program, and recommendations for future interventions. The public health researcher and community liaison team member conducted the interviews in June 2017. Interviews were conducted in a private office, lasted ~1.5 hours, and were recorded and transcribed for accuracy. Data were analyzed to identify common patterns and themes.

Results

A total of 145 women were identified as eligible based on the medical chart reviews from the health care clinics. Telephone calls were made to 101 women (70%), and ~50% of them expressed interest in the program (n = 50). A total of 16 women enrolled in the program (n = 8 non-Hispanic and n = 8 Hispanic women). Table 1 presents demographic characteristics of the 16 participants.

The age of participants ranged from 23 to 43 years (mean 32 years). Approximately 70% had prediabetes or a history of GDM, nearly 40% had a high school degree or general equivalency diploma (GED), and almost 40% had health insurance.

For the 38% of women who completed the program (i.e., attended a minimum of 9 of 16 sessions in the

TABLE 1. Sociodemographic Characteristics of Participants at Baseline Assessment: Frequency and Percentage Distribution (n = 16)

	Frequency	Percentage
Age, years		
18–25	1	6.3
26–35	11	68.7
36–45	4	25.0
Living in Kentucky	16	100
Race/ethnicity		
Non-Hispanic white	7	43.7
Hispanic	8	50.0
Non-Hispanic Asian	1	6.3
Prediabetes diagnosis		
Yes	10	62.5
No	6	37.5
History of GDM		
Yes	11	68.7
No	5*	31.3
Educational level		
High school or GED	6	37.5
Associate’s degree	4	25.0
College	2	12.5
Missing data	4	25.0
Health insurance		
Yes	7	43.7
No	5	31.3
Missing data	4	25.0

*Recent delivery of infant >9 lb.

first 26 weeks and 3 of 6 sessions in the subsequent 26 weeks), the following was observed:

- Average number of sessions attended (goal 22): 20 (94%)
- Weight reduction (goal 5%): mean weight change 6.8%
- Average physical activity per week (goal 150 minutes): 122 minutes

Qualitative Interviews

The two lifestyle coaches and the community outreach research personnel reported that the most effective recruitment strategy was meeting face-to-face with potential participants. This strategy not only provided an opportunity for interactive discussion about the study, but also

allowed eligibility status and contact information to be validated for accuracy. Although telephone calls yielded some study interest, they were not as successful at facilitating recruitment because of inaccurate telephone numbers, unavailability of voicemail messaging, and unreturned phone calls. Lifestyle coaches indicated that having culturally trained and bilingual research personnel was essential for recruitment efforts (22). Common themes identified for lack of participation included work/school schedules, difficulty committing to a 12-month program, lack of motivation or confidence in ability to make significant lifestyle change, transpor-

tation issues, and being “too busy” with daily responsibilities to attend.

Early in the planning process, study personnel experienced difficulty in identifying a day and time to conduct sessions that accommodated both facilitators’ and participants’ schedules. As one life coach noted, “Some women would say ‘I can come in the morning, but I cannot in the afternoon’ or vice-versa, so getting a good time for the facilitators and the participants was somewhat of a barrier.”

The lifestyle coaches and research staff agreed that the commitment to attend 22 sessions over the course of 12 months was one of the most challenging barriers. Coaches recognized that, although participants were not initially overwhelmed, as time progressed they often had difficulty in trying to manage attending the sessions (particularly the weekly sessions) around work, school, and family obligations. As one noted, “Even though initially some people want to do it and believe they can do it, once they start the program, they become overwhelmed by the daily tracking and overall life changes they have to make . . . and then decide they might not be ready to commit to the program.” Another observed that, “Many women are busy with a newborn or other small children at home, which makes attending the sessions very difficult.” Lifestyle coaches agreed that allowing participants to bring babies who were <1 year of age would be acceptable, although bringing older children would cause too much distraction.

In addition, program facilitators noticed that, although patients initially had interest in losing weight, many potential candidates quickly declined or decreased participation after seeing the lifestyle changes they would have to make to do so (i.e., writing down their food and exercise daily and finding time to exercise).

Lifestyle coaches reported that the most rewarding aspects of the program were the opportunities to

encourage and motivate participants, provide support toward a healthy goal, get to know participants personally, and develop relationships of trust. They believed that the interactive discussions on food topics and the sharing of recipes were very beneficial to participants. In addition, the coaches reported that the small group size encouraged more intimate discussion and bonding among participants.

Discussion

This pilot project contributes to the limited body of research on implementing a type 2 diabetes prevention intervention in women with young children and a history of GDM of varying educational, cultural, and socioeconomic status. Results of our study provided insight into the barriers and strengths of program recruitment and retention efforts, as well as recommendations for the implementation of future programs.

To engage and retain participants, previous research has emphasized the importance of offering study materials and content in a manner that is both culturally and linguistically sensitive. This strategy was employed at various levels from recruitment through implementation in this pilot project and was found to be effective.

Recruitment efforts via telephone calls were not as effective as face-to-face recruitment. With a recruitment goal of 30 participants, we were 53% successful, recruiting 16 women. This trend is similar to other studies showing lower rates of recruitment of medically underserved, low-income pregnant and nonpregnant women in research studies (23–25). It has been reported in the literature that health care providers and public health educators face challenges in implementing interventions in this population of women of childbearing age (25), specifically if a considerable time commitment is required. Likewise, research has shown the difficulty of recruiting women with young children for interventional

programs for type 2 diabetes prevention due to competing demands and barriers such as household responsibilities, child care, and financial constraints (26).

As noted by the research staff, time commitment was one of the main factors responsible for women not enrolling in the program and for program attrition. Because of the additional responsibilities of postpartum and parenting women, committing to a year-long research program can be a significant challenge. This challenge can be further intensified for Hispanic mothers, whose lives may be complicated by cultural, linguistic, and socioeconomic barriers (27,28).

The literature includes reports of a few studies that adapted various mechanisms to recruit and retain pregnant and parenting women in programs targeting lifestyle changes. A study conducted by Chasan-Taber et al. (29) found that GDM prevention education and lifestyle modifications implemented in Hispanic women during prenatal care visits can be successful using several strategies such as optimal collaboration from the clinical staff, research personnel from a similar cultural background, flexible recruitment, bilingual recruiters, and participant compensation. Ferrara et al. (30) implemented an intervention based on diet, exercise, and breast-feeding in women diagnosed with GDM during pregnancy that proved to be feasible continuing through 12 months postpartum. This intervention combined in-person sessions with dietitians, individual telephone counseling contacts, and follow-up telephone calls from a lactation consultant, thus removing the burden of frequently scheduled in-person sessions for busy women. A recently reported randomized trial (31) enrolled overweight or obese mothers of at least one preschool child at risk for being overweight into a lifestyle intervention. The intervention group received lifestyle intervention derived from the

DPP research study and implemented in the home setting. Researchers reported that weight loss outcomes were modest but clinically significant in these mothers of young children when compared to a usual-care group. Notwithstanding, research shows that some women do not continue positive behavioral changes that occurred during a pregnancy with GDM and are lost to follow-up and annual diabetes screening by 6 weeks postpartum (32,33). Thus, clear messaging about the consequences of GDM and the importance of follow-up should be emphasized throughout pregnancy (34).

More research is needed to address the needs of and thereby successfully prevent type 2 diabetes in this population. There is evidence that the National DPP's LCP is an effective model for reducing the risk of type 2 diabetes (13); however, few studies have tailored this model specifically for women of childbearing age with a history of GDM (32). Likewise, there is a consistent dose-response relationship between the amount of lifestyle intervention support a person is given and the magnitude of that person's risk reduction, and results are best when long-term maintenance is provided (32).

Limitations

The sample size for this pilot project was small. Recruitment efforts were initiated based on medical records; therefore, final enrollment was not as great as expected. Lack of participant input may also be considered a limitation of this pilot study. Limited funding did not allow for provision of childcare services for participants. The majority of Hispanic participants were from Mexico, which limits the findings to women from this country.

Recommendations for Future Program Implementation

Lifestyle coach recommendations for future National DPP LCPs for women of childbearing age include promoting/marketing the program earlier as part of clinics' services, pro-

moting the intervention before and during prenatal care, encouraging physicians' endorsements, creating an awareness of the availability of the National DPP LCP at the community level, developing collaborations with community partners, and offering more options (i.e., alternate dates and times) for sessions. Building trusting relationships, offering alternatives for program delivery (e.g., online or virtual delivery of content), and making childcare services available for participants also may be considered.

Conclusion

The National DPP's LCP has been tested and proven as an effective intervention to prevent or delay type 2 diabetes in high-risk populations. Nevertheless, tailoring effective behavioral modification programs for high-risk women with a history of GDM entails multidisciplinary collaboration among clinicians, diabetes educators, public health agencies, community-based organizations, and a trained workforce.

Diverse communities may face cultural and linguistic barriers to optimal health outcomes; therefore, the need to provide sensitive, culturally appropriate health services and interventions is paramount (28,35–37). Furthermore, ongoing efforts to conduct focus groups to collect participant input should be considered.

Behavioral programs for postpartum and parenting women are essential in the continuum of health care to decrease the burden of prediabetes and type 2 diabetes in women with a history of GDM.

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Duality of Interest

No potential conflicts of interest relevant to this article were reported.

Author Contributions

M.L.G. and L.B.H. researched the data and co-wrote the manuscript. K.B.A. and J.M.B.

researched the data and reviewed/edited the manuscript. T.A.R. reviewed/edited the manuscript. L.H.B. and K.B.A. are the guarantors of this work and, as such, had full access to these data in the study and take responsibility for the integrity of these data and the accuracy of data analysis.

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