Reducing Barriers for Pregnant Women in Rural or Remote First Nations Communities to Participate in Prenatal Nutrition and Exercise Programs

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Abstract

Objective: To promote a community based prenatal lifestyle program for reducing the risk of obesity and diabetes in women and children in First Nations (FN) rural and remote communities in Manitoba, Canada.

Methods: Open ended surveys, interviews, and focus group meetings were conducted with pregnant women, traditional elders, and healthcare workers in four rural or remote FN communities to identify barriers to the participation of prenatal women in a prenatal exercise and nutrition program. A collaborative forum was held for multi community residents and healthcare workers to identify both common and community specific barriers and potential solutions. Community specific approaches were developed to reduce identified barriers.

Results: Participants in the targeted communities identified a number of community specific participation barriers including the lack of program advertising, availability of local transportation, and the absence of childcare facilities. Targeted program and environmental improvements, implemented in collaboration with community partners, resulted in a 3 fold enrolment increase of pregnant women in the prenatal program compared to prior enrolments.

Conclusions: A community-based approach helped identify barriers, improve the environment, and increase participation of FN pregnant women in a prenatal lifestyle intervention program in rural and remote communities. The long term impact on pregnancy outcomes for participating FN communities remains to be determined.

INTRODUCTION

Obesity and Type 2 Diabetes (T2D) are considered two of the most common chronic diseases among First Nations (FN) people in Canada [1, 2]. T2D in children in Manitoba is eight times higher than the national average with the majority of the disease being detected in rural and remote FN communities [3].

The prevalence of Gestational Diabetes Mellitus (GDM), also referred to as diabetes first diagnosed during pregnancy, is two to three times higher in FN women than non-FN women in Manitoba [4]. GDM increases the risk for cesarean section, pre eclampsia, post partum complications, macrosomia, future obesity and the risk of T2D in mothers and offspring [5-8]. Prevention of obesity and GDM during pregnancy may greatly benefit the long term health of both mothers and offspring.

Previous studies have demonstrated that the promotion of prenatal lifestyle programs improved the health outcomes in women and children [9-12]. Our research group developed a community based physical activity and nutrition program for pregnant women [13]. The program was first applied in a...
randomized controlled trial in urban Winnipeg, Manitoba. The lifestyle intervention program, which included increased physical activity and improved dietary habits, effectively reduced excessive gestational weight gain in urban living pregnant women [14]. We then introduced this program to pregnant women in four rural or remote Manitoba FN communities in a pilot study. Preliminary results indicated that the participation rate of pregnant women in the pilot study in remote FN communities was low (4% to 5% of total pregnancies).

Our study aimed to identify barriers to pregnant women living in rural and remote communities participating in a lifestyle intervention program, as well as the potential solutions to these barriers. Community based participatory approaches that included surveys, interviews, and focus group meetings were completed to identify the everyday obstacles that prenatal women were facing in rural areas. Community and program partner participation in a cross community forum resulted in suggestions that enhanced both the study program and the potential for pregnant women to participate in a prenatal program in rural environments. Enrolment and attendance in the prenatal program were compared before and after barrier identification and reduction.

METHODOLOGY

Community participant profiles

Four rural and remote FN communities in Manitoba: Sandy Bay Ojibway FN, Sagkeeng Ojibway FN, Brokenhead Ojibway FN, and Garden Hill Oji-Cree FN participated in the present study. Sandy Bay, Sagkeeng, and Brokenhead are located in Southern Manitoba, one to two and a half hours’ driving distance from a major city. Garden Hill is an isolated community in Northern Manitoba. Road access to Garden Hill is only available during winter by ice road; otherwise it is reached by air. Residents in Garden Hill take a boat ride to shop for groceries in the absence of the ice road. Populations of these communities range from 1,661 to 5,761 residents [15,16].

Barrier and solution identification

Qualitative study methods were used to collect information from community residents on possible barriers to pregnant women participating in the prenatal research program. Open ended surveys, in depth one-on-one interviews, focus group meetings and a cross community forum were utilized for information collection.

Surveys

Fifty surveys were randomly distributed and collected from pregnant women in the participating communities. These were conducted on a voluntary basis and required the women to answer questions about their opinions and knowledge of the prenatal lifestyle program in their communities.

Interviews

Semi-structured interviews with pregnant women and community health workers were held on a voluntary basis. Each interview lasted approximately twenty minutes and was held at local medical centres or nursing stations. The interviews explored barriers to pregnant women participating in community prenatal programs and sought potential solutions. Local assistants recruited from community residents attended the interviews with research staff for interpretation purposes. Thirty individual interviews were completed (Table 1).

Focus group meetings

Focus group meetings, held in each FN community with approximately six current or previously pregnant participants, were led by local healthcare workers (prenatal nurses or Canadian Prenatal Nutrition Program staff). A semi structured guide was used for discussion on barriers and potential solutions to the participation of pregnant women in the prenatal program (see examples of questions in (Table 2). The meetings were approximately 60 minutes in length with a total of 18 meetings held between the four communities (Table 1).

Multi-community forum

A multi-community forum was held in Winnipeg, Manitoba with over 30 participants including representatives of pregnant women, traditional elders, community health workers, partner prenatal or diabetes prevention programs, the Assembly of Manitoba Chiefs, provincial health authorities and researchers. The forum used panel and group discussion formats to collect suggestions and potential solutions for increased participation of pregnant women in the rural and remote community prenatal program. Collaborations between communities, partner programs and health authorities were also the subjects of discussion.

Verification of barriers and solutions

Barriers and potential solutions were verified through discussion with healthcare workers and partner programs in each community. Community specific barriers and solutions were thematically analyzed and are summarized in (Figure 1) and (Table 3).

Program and environmental improvement

Targeted community program and environmental improvements were implemented. For example, intra community prenatal program advertising was enhanced through mailing or existing radio and television broadcasting. Community-specific environmental improvements were implemented with community partner assistance; exercise space and facilities were expanded where required.

Recruitment of participants

Recruitment of participants from pregnant women in the

Table 1: Summary of Individual and Focus Group Interviews conducted in First Nations Communities.

<table>
<thead>
<tr>
<th>First Nation Communities</th>
<th>Individual Interviews</th>
<th>Focus Group Interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pregnant Women</td>
<td>Healthcare Professionals</td>
</tr>
<tr>
<td>Brokenhead</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Sagkeeng</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Sandy Bay</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Garden Hill</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 2: Questions for focus group meetings in FN communities.

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>How do you feel about this pregnancy?</td>
</tr>
<tr>
<td></td>
<td>Probes: Do you feel happy? Do you feel excited? Do you feel supported? Do you feel anxious?</td>
</tr>
<tr>
<td>2.</td>
<td>How do people around you feel about your pregnancy?</td>
</tr>
<tr>
<td></td>
<td>Probes: Are they happy? Are they controlling? Are they excited?</td>
</tr>
<tr>
<td>3.</td>
<td>Do you receive any advice on pregnancy from people around you?</td>
</tr>
<tr>
<td></td>
<td>Probes: Advice from family members, friends, prenatal nurses, etc.</td>
</tr>
<tr>
<td>4.</td>
<td>Are you trying to do anything differently during pregnancy for your baby? Can you tell me more about it?</td>
</tr>
<tr>
<td>5.</td>
<td>Do you attend the prenatal program in the community? If so, what do you like about it?</td>
</tr>
<tr>
<td>6.</td>
<td>What do you think should be changed to improve the prenatal class?</td>
</tr>
<tr>
<td>7.</td>
<td>Have you joined the Moms in Motion/IDEA Study program?</td>
</tr>
<tr>
<td></td>
<td>Probes: What do you like about it? What do you dislike about it? What do you think should be done to improve the program?</td>
</tr>
<tr>
<td>8.</td>
<td>What do you think about doing exercise during pregnancy?</td>
</tr>
<tr>
<td>9.</td>
<td>What things are necessary for you to be able to participate in exercise at the prenatal class?</td>
</tr>
<tr>
<td>10.</td>
<td>What are the things stopping you from participating in an exercise and nutrition program during pregnancy?</td>
</tr>
</tbody>
</table>

Table 3: Barriers and solutions raised by community residents and health care workers for improving a community based prenatal program.

<table>
<thead>
<tr>
<th>Identified barriers by pregnant women to participate in an intervention lifestyle program</th>
<th>Interview Quotes</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transportation</td>
<td>“Transportation seems to be a big barrier for the moms to come in”</td>
<td>FN Communities added transportation or appointed a medical van to pick up study participants</td>
</tr>
<tr>
<td>Study advertisement</td>
<td>“People know the study is there but they don’t know what it is about”</td>
<td>A study assistant was hired to help with study advertisement, including flyer distribution, radio station announcements, signs, health events, and Facebook posts</td>
</tr>
<tr>
<td>Doctor’s approval</td>
<td>&quot;Well that’s the big one that’s holding everything up because everything else they can fill it out like while they are sitting there. It’s just a matter of that paper (Doctor’s approval) saying go ahead&quot;</td>
<td>Study investigators provided continuing education to local physicians and prenatal care workers who, in turn, provided prenatal care for the FN communities</td>
</tr>
<tr>
<td>Child care for participants</td>
<td>&quot;If you already have kids then you need a baby sitter to allow the mom to participate&quot;</td>
<td>Provided child friendly space with supervision during prenatal class</td>
</tr>
<tr>
<td>Staff engagement and extra preparation work</td>
<td>&quot;And you know as much as I am supportive of the program. We do not have time to fulfill that role you know, like we need somebody in that role.&quot; &quot;Our home visitors (staffs) all have little children. Most of them have their own families and their very reluctant to take out another task. Yeah because it is busy for them.”</td>
<td>Hired community assistants in Garden Hill and Sagkeeng First Nation</td>
</tr>
</tbody>
</table>

Communities was conducted prior to and after the program and environmental improvement. Participant demographic characteristics included women of FN descent, age 15-30 (or child bearing age), with less than or equal to a high school education level. Before the program and environmental improvement, program information was delivered to pregnant women through prenatal nurses, local study assistants and poster advertising in public areas. In addition to classic poster advertisements and the spread of program information by word of mouth, program advertising was enhanced and delivered through postal mailings to every family in the communities and through radio or local television broadcasting. Participants were enrolled to the program on a voluntary basis after signing an informed consent form approved by the Research Ethics Board of the University of Manitoba and the Health Information Research Governance Committee of the Assembly of Manitoba Chiefs. The informed consent form was explained to the participants, with an interpreter if required, and the women signed the form prior to participation. The exercise program was only provided to pregnant women who received physician approval for exercise during pregnancy and were less than 30 weeks gestational age. Pregnant women who had contra indications for exercise during pregnancy or who were late in pregnancy were not enrolled in the study, however were still encouraged to attend the nutritional classes provided by prenatal nutritionists and licensed dieticians which were open to all prenatal women in the communities.
Data collection and analysis

All interviews and focus group meetings were digitally recorded with participant consent. The recorded information was then collected through verbatim transcription. Qualitative data from the surveys, interviews, and focus group session interviews were entered in NVivo 9 software for thematic analysis. Enrollment and attendance rates for the prenatal program before and after the program and environment improvement were recorded and collected from each community and analyzed based on total live births in the participating communities during the same period. Birth data was collected from community medical centers or nursing stations. Categorical data was analyzed using Chi-square test. Statistical significance level was pre-set at p<0.05.

RESULTS

Barriers to participation in pre-natal programs in rural and remote communities

Pregnant women, elders and healthcare workers in the four FN communities identified barriers to participation in the prenatal lifestyle intervention program through qualitative approaches including surveys, interviews, focus group meetings and a multi-community forum. The results of thematic analysis identified six major themes of common barriers as presented in the bar graph (Figure 1). Each row represents common barriers raised by the communities. The heights of the bars represent the frequency that residents from a community raised a particular barrier. The barriers raised by individual residents from single communities have not been included.

Lack of proper childcare was one of the top obstacles to participation in group exercise sessions or prenatal nutrition classes, as many participating women frequently had three or more children. Access to program advertising and information was identified as a common barrier to recruitment and participation in all of the communities, possibly due to the wide geographical distribution of residents. Although program posters and newsletters were distributed to all families in the participating communities, some pregnant women, particularly those living in homes far away from community centers, did not have sufficient or prompt information about the prenatal program. Lack of intra-community transportation was identified as one of the most common barriers to participation in group exercise or nutritional educational sessions. Many pregnant women did not have functional self-transportation, which affected their participation as there was no access to public transportation. A lack of participation incentives provided by the prenatal program was also raised as a barrier. Residents from two communities, but especially those from the Sagkeeng FN,
identified delayed physician approval for physical activity (<30 weeks of pregnancy) as a participation obstacle. A PARMed-X for Pregnancy Form is an exercise safety form for pregnancy that requires completion and signature by a doctor or pre-natal nurse [17]. This form was required in order for women to participate in the exercise component of the present study. Lastly, a lack of exercise space was a barrier in both Sagkeeng and Brokenhead FN communities.

Community-specific solutions to barriers identified by residents

Since every FN community has a specific culture and environment, community-specific solutions may be more effective in reducing identified barriers. The present study searched for solutions with community residents and health care workers through interviews, focus group meetings (see standard questions for focus group in Table 2) and a multi community forum. Barrier targeted solutions raised by pregnant women, elders and healthcare workers were identified and summarized in (Table 3).

Targeted barrier reduction

Based on identified barriers and suggested solutions, approaches to barrier reduction were discussed with community authorities, partners and local assistants. Since June, 2011, the following barrier targeted improvements to the program and the environment in the participating communities were made: 1) childcare was provided by local assistants to participants during group sessions or prenatal nutrition classes as needed; 2) advertising was expanded through radio, community television, and postal mailings to every family in the communities; 3) community vehicles and local assistants’ self transportation were provided to pick up pregnant women who had difficulty travelling to group sessions or classes; 4) door prices and small incentives were awarded to participants to encourage frequent attendance at both group exercise sessions and nutritional classes; 5) educational workshops were held for physicians and prenatal nurses working in the Sagkeeng and Sandy Bay FNsto enhance skills and emphasize the importance of approval for pregnant women to exercise during pregnancy; 6) exercise space was identified for pregnant women in Sagkeeng and Brokenhead FN in collaboration with community partners.

Participation levels of pregnant women in the prenatal program

Prior to environmental improvements, a total of 15 women were enrolled in the prenatal program in the four participating communities during a 19 month period from December 2009 to June 2011. During that period, 353 babies were delivered throughout the four communities. Thus, the participation rate was 4.25%. Another 18 women, or 5.1% of the study target group, attended the prenatal nutritional classes but were not enrolled in the exercise program due to not having received physician approval before 30 weeks of pregnancy or having medical contra indications to exercise during pregnancy.

After barrier reduction, a total of 51 women were enrolled in the prenatal program and 52 women attended the classes from July 2011 to January 2013. There were 430 births in the four FN communities during this period. The rates for enrolment (11.9%) and attendance (12.1%) for group exercise sessions or prenatal nutritional classes after barrier reduction were significantly increased compared to those during the similar period of time prior to the barrier reduction (p<0.001, (Table 4).

DISCUSSION

The findings from the present study indicate that identifying and addressing barriers in remote communities in Manitoba effectively increases the level of participation of pregnant FN women in community based lifestyle intervention programs. We learned that a close partner relationship with community band councils, key players, traditional elders, targeted populations and other prenatal programs in FN communities is essential to barrier reduction, environmental improvements and the implementation of a prenatal lifestyle intervention program for pregnant women in FN communities. In FN communities, traditional elders are seen as carriers of cultural knowledge, values and beliefs and hold high respect in their communities, thus including them in the cross community forum as well as the program and environmental changes was invaluable. The results of the present study also suggest that barrier reduction and lifestyle alteration for pregnant women in rural and remote FN communities requires community specific strategies for capacity building and improvements.

In the present study, qualitative approaches such as surveys, one-on-one interviews, and focus group meetings enabled information collection that identified barriers to prenatal women participating in the prenatal program in rural and remote FN communities. The multi community forum with community residents and healthcare workers with different expertise offered an opportunity to validate the barriers that were identified through the qualitative approaches. The collaborative forum provided an excellent environment for collecting opinions from FN community members and suggestions from various community members and stakeholders for sharing experience and identifying potential solutions. This approach was helpful for the program improvement in isolated communities. When a solution for specific barriers required collaboration, the attendees, including representatives of partner programs and health authorities, discussed the issues with community pregnant women and health care workers and a collaborative commitment to solving the problem was established in a time effective manner. The development of collaborative relationships with community research assistants for the program and prenatal nurses in the communities was critical for the recruitment of pregnant women into the prenatal program. Local assistants and healthcare workers were familiar with obstacles that pregnant women in the communities were facing. The process of interviews, focus group meetings, and the forum provided opportunities for training local assistants and community capacity building, which are crucial for long-term lifestyle improvement for residents of isolated FN communities. A close relationship between pregnant women and community assistants was important for maintaining a consistent and reliable program for the targeted population. Identifying cultural factors within the communities was also essential to increasing participation. For example, it was determined during the barrier identification stage that exercise

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during pregnancy was not encouraged by some community elders. With the assistance of local assistants and partners, we communicated with influential community elders leading to agreement that activity for pregnant women is beneficial and a substantial improvement in the enrollment of pregnant women. Research study staff made every effort to understand and respect the cultures of the participating FN communities throughout the research process. Educational workshops for physicians, nurses, and other healthcare workers in rural medical centers who provide prenatal care to pregnant women focused on the importance of lifestyle intervention for prenatal care. In addition, procedures applied for reviewing the suitability of pregnant women to exercise facilitated increased participation of pregnant women in the program.

Solutions raised by community members were usually practical and feasible. Program advertising using local radio or television stations was suggested by community residents, greatly helping in the recruitment of participants and in updating program information. Providing intra community transportation for participants is a challenge. In collaboration with community medical centers, nursing stations and local assistants, this obstacle was substantially reduced. Most importantly, identifying barriers and implementing solutions allowed us to build trust with pregnant women and health care workers in the involved communities. These relationships were essential to empowering women to attend prenatal classes and help establish self-confidence for improving health through lifestyle intervention and the prevention of diabetes and obesity.

Several other groups conducted studies to identify barriers in rural communities to promote lifestyle intervention programs. Reddy et al [21] described certain factors that contributed to developing and implementing successful diabetes prevention programs in two rural areas: Montana and South Eastern Australia. The identified factors that served as barriers to a lifestyle intervention program included: securing funding early for the program; establishing support from community members and developing positive relationships with healthcare workers; creating a successful team with a passion for the program; and developing procedures for providing post intervention support to help participants maintain their success. Skinner et al [22] explored barriers and supports for healthy eating and physical activity for FN youth in Northern Canada. Empowerment of participants, trust, and resources were determined to be core issues for participation and were factors that needed to be addressed when designing public health interventions in remote sub-arctic communities. Fullerton et al [23] determined acculturation and the availability of social support networks to be the largest influence on participation in prenatal care for women in El Paso, Texas. Pregnancy is a special stage of a woman’s life. During pregnancy, maternal health directly influences the future growth of the fetus. Pregnant women often have stronger motivation to change their lifestyle for the healthy growth of the fetus than in other periods of their life.

Not only are FN people diagnosed with diabetes at a younger age than the general public, they also have higher rates of complications as a result of the disease [15]. Additionally, FN pregnant women in Manitoba have a substantially greater risk for development of GDM than non-FN pregnant women, with those living in rural communities having the highest incidence of GDM [4]. Obesity is one of the major contributing factors to the development of GDM with approximately 64% of FN women aged 19-30 being overweight or obese [2]. The contextual realities in FN communities resulting from detrimental colonial policies and the influence of social determinants of health on well-being must be considered in the high prevalence of GDM, T2D and obesity. FN women live in poverty, overcrowded and inadequate housing conditions and are dealing with present, chronic and historical stress derived from residential schools and child welfare policies. In addition, the health and social disparities between FN people and the general Canadian population are well known, compounded by inequitable access, distribution and availability of services that are sensitive to their unique needs, culture and histories [18]. The socio-economic disadvantages and unfavourable environments in rural and remote FN communities seriously affect dietary pattern and physical activity in pregnant women and in children [19, 20]. Improvement of the environment and programs for FN people in remote communities appears to be critical to increasing the participation of pregnant women in prenatal lifestyle intervention programs. The participation of pregnant women in rural or remote communities to the prenatal program was increased by only 11%-12% after collaborative efforts from community partners and researchers. Further studies on barrier identification, community involvement and social support systems are required to achieve a higher participation rate of pregnant women in the prenatal lifestyle intervention program.

CONCLUSION

The present research study demonstrated that developing, building, and maintaining relationships with community residents and key players in rural FN communities is crucial to implementing and maintaining a successful lifestyle intervention program in rural and remote FN communities. Identified barriers and environmental improvements helped capacity building and the implementation of a prenatal lifestyle intervention program for pregnant women in rural and remote FN communities. The long-term maternal and fetal health impact of the lifestyle intervention program for pregnant women in remote FN communities remains to be determined through subsequent studies.

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