Understanding Prenatal Weight Gain in First Nations Women

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ABSTRACT

OBJECTIVE

This qualitative study examined the determinants of excessive prenatal weight gain in First Nations women living on a reserve.

METHODS

Thirteen women participated: 6 with recommended prenatal weight gain and 7 with excessive prenatal weight gain. Individual, semi-structured interviews were used to understand facilitators of and barriers to healthy weight gain in pregnancy.

RESULTS

There were multiple, interrelated influences on prenatal weight gain including personal factors (beliefs, individual characteristics, desire, motivation), social environment (advice, support for action, feedback), and economic and physical environment (income, access). Women who gained weight within the recommended range for pregnancy were more likely to have appropriate information about weight gain and eating in pregnancy compared to those who gained in excess. Women with recommended prenatal weight gain also had more social support, which was an instrumental or tangible aid that helped women to adopt health behaviours. Women, irrespective of weight gain in pregnancy, described

RÉSUMÉ

OBJECTIF

Cette étude qualitative a examiné les facteurs qui contribuent au gain pondéral excessif pendant la grossesse chez les femmes des Premières nations qui habitent dans une réserve.

MÉTHODES

Treize femmes ont participé à l'étude, dont six avaient pris le poids recommandé et sept avaient pris un poids excessif pendant la grossesse. Pour comprendre les facteurs qui contribuent au gain de poids excessif et les obstacles à un gain pondéral sain pendant la grossesse, nous avons mené des entrevues individuelles semi-structurées.

RÉSULTATS

De nombreux facteurs interdépendants influent sur le gain pondéral pendant la grossesse, dont des facteurs personnels (croyances, caractéristiques individuelles, désir et motivation), le milieu social (conseils, appui pour les mesures à prendre, commentaires) et le milieu économique et physique (revenu et accès). Les femmes dont le gain pondéral était dans l'écart recommandé étaient plus susceptibles d'avoir été bien informées au sujet de la prise de poids et de l'alimentation que les femmes dont le gain pondéral était excessif. Les femmes dont le gain pondéral était dans l'écart recommandé avaient aussi reçu plus d'appui social, ce qui était un facteur déterminant et tangible pour l'adoption de comportements sains. Qu'elles aient pris du poids ou non, les femmes ont dit que la difficulté de se procurer des aliments sains était un obstacle à une alimentation et à un gain pondéral sains.

CONCLUSIONS

Pour promouvoir l'importance d'un gain pondéral sain pendant la grossesse chez les femmes des Premières nations, il faut aller au-delà de l'échelon individuel et tenir compte des contextes social, communautaire et économique des femmes.

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the lack of access to healthy foods as a barrier to healthy eating and healthy weight gain.

CONCLUSIONS

Efforts to promote healthy prenatal weight gain in First Nations women must go beyond the individual level and include women's social, community and economic contexts.

KEYWORDS

Native American Indians, pregnancy, social determinants of health, weight gain

MOTS CLÉS

Amérindiens, grossesse, déterminants sociaux de la santé, gain pondéral

INTRODUCTION

Health Canada's recommendations for appropriate weight gain in pregnancy are based on the Institute of Medicine (IOM) guidelines (1), which vary depending on a woman's prenatal body mass index (BMI): 12.5 to 18 kg (27 to 40 lbs) for underweight women; 11.5 to 16 kg (25 to 35 lbs) for normal weight women; and 7 to 11.5 kg (15 to 25 lbs) for overweight and obese women (2). Women from diverse ethnic groups in North America gain weight excessively in pregnancy (3-5). Studies that have examined fetal and maternal outcomes related to the IOM's recommendations consistently indicate a greater risk of high infant birth weight (macrosomia), cesarean delivery and post-partum weight retention with excessive prenatal weight gain (4).

Despite the negative consequences of excessive weight gain in pregnancy, only a small number of studies have examined its determinants. A study of Canadian women interviewed towards the end of their pregnancy found that those who gained excessive weight had "a higher pre-pregnancy BMI, gained more weight during the first, second and third trimesters, had a less favourable attitude towards their weight gain and were less knowledgeable about the importance of not gaining excessive weight during pregnancy" compared with women who did not gain excessive weight (6). In contrast, women who gained weight within the recommended range were more likely to perceive that gaining appropriate weight would allow them to have a healthy baby of normal weight, to return more easily to their pre-pregnancy weight and to feel fit. As well, they were more likely to perceive that dietary habits, physical activity and stress levels have an influence on weight gain during pregnancy (6). Low income has been associated with poorer health behaviours during pregnancy; compared to women with higher incomes, women with low family incomes are more likely to gain more weight than recommended (7).

In Canada, the negative health implications of excessive prenatal weight gain are particularly worrisome for First Nations women in view of the high prevalence of obesity in First Nations (8). Excessive prenatal weight gain may worsen long-term weight status of First Nations women who are overweight or obese, and may cause women of normal pre-pregnancy weight to become overweight or obese (5). Obesity is a risk factor for the development of gestational diabetes and type 2 diabetes (9,10), and the prevalence of both types of diabetes is high among First Nations women (5,8). The rate of infant macrosomia in First Nations women is often reported to be higher than in the general population (5,11-13). For example, 37% of Cree infants in northern Quebec have been reported as macrosomic at birth (5), considerably higher than the rate of 10% in the North American population (14). Considering the high rates of macrosomia in First Nations infants, the association between excessive prenatal weight gain and elevated infant birth weight is important (5). Macrosomic infants may be predisposed to obesity and type 2 diabetes as adults (15,16). For all these reasons, the prevention of excessive weight gain in pregnancy is imperative in First Nations women.

First Nations tend to have poorer health and socioeconomic conditions compared to the general Canadian population (8). There were 427,080 registered First Nations estimated to be living on reserves in 2004 (17). Conditions on reserves are such that there is often inadequate housing, limited economic opportunities, high food costs and limited food choice (18). Lone females head many households and are particularly vulnerable to poverty (19). Many of the conditions uniquely experienced by First Nations women may predispose them to high weight gain in pregnancy; yet, there is a paucity of literature examining the determinants of prenatal weight gain in these women. One study carried out in remote communities established that First Nations women were aware that gaining excessive weight had negative implications for their health, but generally found it difficult to control weight gain during pregnancy (20). The findings indicated that individual, family and community-level factors all influenced women's abilities to control their weight, and these factors interacted, acting as barriers to healthy eating and physical activity in pregnancy.

To develop interventions that enable First Nations women living on reserves to gain appropriate weight in pregnancy, a more thorough understanding of the experiences and challenges related to prenatal weight gain is required. For this reason, we undertook an ethnographic qualitative study on a

reserve to understand the factors that contribute to prenatal weight gain. The objectives of the study were to describe the characteristics (if any) that distinguish women who gain recommended weight from those who gain excessive weight during pregnancy and to understand women's perspectives on the facilitators and/or barriers to appropriate prenatal weight gain. We implicitly used a health promotion perspective that placed excessive weight gain within its broad socio-environmental determinants. In addition, an asset-based approach was applied to enable the identification of factors that support appropriate weight gain on the First Nations reserve. Asset-based approaches aim to uncover a community's capacities, assets and strengths, rather than deficiencies (21). The focus is on the resources a community already has that can be drawn upon to improve health (22).

METHODS

Setting

The study took place on a rural prairie reserve that encompasses a single small town site. Many individuals on the reserve did not own a vehicle and had limited access to the town site and surrounding communities. The median income for families living on the reserve in 2001 was almost two-times lower than the provincial average and approximately one-quarter of women were unemployed. At the time of the study in 2003, the town site had 1 small grocery store with a limited selection of nutritious foods and 3 small convenience stores that offered mainly foods of low nutritional quality. A small restaurant offered take-out food, including mainly fried foods. Recreational facilities were limited and most roads were unpaved and without sidewalks.

Methodological approach

Staff at the prenatal clinic on the reserve, many of whom were First Nations, identified excessive weight gain in pregnancy as a health concern, recognized a need to understand the issue and approached the researchers for assistance. The researchers and community collaboratively chose a qualitative, naturalistic research design as most appropriate. Naturalistic inquiry examines phenomena in their natural contexts without a researcher's control or manipulation of the setting (23), and the qualitative approach is valuable to investigate phenomena that are poorly understood (24). The specific design used was a focused ethnography to elicit the insider's perspective of a specific topic or shared experience (25). Ethnography provides descriptions of the beliefs, practices, values and behaviours embedded within a cultural group (25).

Sample

Non-probability, purposive sampling (26) was used to obtain a sample of women who gained either excessive or recommended weight in pregnancy based on Canadian guidelines (2). Women in the study met the following inclusion criteria: gained appropriate or excessive weight during pregnancy; had a singleton pregnancy; delivered after September 2002 (i.e., not more than 1 year prior to the start of data collection); had a live birth; delivered at term; and participated in the community's prenatal program. Participants also had to be 18 years of age or older because younger teenagers have unique challenges and experiences that were beyond the scope of this research. No restrictions were made with respect to the number of previous births.

Data collection and analysis

Women's prenatal clinic charts were reviewed for pregnancy information, including weight gain. The main data collection method involved individual, semi-structured interviews, which are appropriate for focused ethnographic research (25). The interview guide contained mainly open-ended questions and planned probes, developed by the research team and reviewed by community members (Table 1). Initial and follow-up interviews were conducted with each participant, lasting an average of 75 and 30 minutes, respectively.

A dietitian with training in qualitative research conducted all interviews in women's homes or at the prenatal clinic, depending on each woman's preference. Participants were interviewed twice. An interview guide with mainly open-ended questions with planned and unplanned probes was used. All interviews were tape-recorded and transcribed verbatim. Data were collected until saturation occurred (27);

Table 1. Interview guide

1.	How did you feel about your body during your pregnancy? Probe: What influenced this?
2.	What do you think about weight gain during pregnancy? Probe: What do you think is a healthy amount of weight to gain during pregnancy? Why?
3.	Do you think you gained a healthy amount of weight during your last pregnancy? Probe: Why/why not?
4.	Tell me what you think about physical activity during pregnancy. Probe: What were your experiences with physical activity during your pregnancy?
5.	Tell me what you think about eating habits during pregnancy. Probe: What were your experiences with eating when you were pregnant?
6.	Tell me about any stress that you experienced when you were pregnant, if any. Probe: What influenced your stress level?
7.	Tell me about any support or help from others that you had during your pregnancy, if any.
8.	Tell me about any advice that was given to you related to weight gain during your pregnancy. Probe: Who did you get advice from about your weight gain?
9.	What do you think helps women to gain healthy weight during pregnancy?
10.	What do you think makes it hard for women to gain healthy weight during pregnancy?

that is, when no new themes or issues arose from the data. Analysis of the interview data occurred concurrently with data collection and was based on Mayan's procedures for latent content analysis (27), which is the process of identifying, coding and categorizing primary patterns in the data.

Measures were taken to ensure trustworthiness of the research process based on Lincoln and Guba's (28) proposed criteria specific to naturalistic inquiry. Member checks (verifying preliminary interpretations of women's narratives during second interviews), peer debriefing (discussing analysis and interpretation among members of the research team) and audit trails (documenting decisions and data analysis progress) were all used.

Institutional ethics approval was received for the study as well as from the community's health department. Written, informed consent was obtained from each participant. The results of the study were shared and discussed with community members and the community health department. We do not report the name of the community to ensure anonymity of the participants.

RESULTS

Participant characteristics

Thirteen women participated in the study: 6 with recommended prenatal weight gain and 7 with excessive prenatal weight gain. The general characteristics of participants are shown in Table 2. None of the women were underweight prior to pregnancy; however, 5 women with excessive weight gain and 3 women with recommended weight gain began pregnancy obese. Three women in each group were living in poverty (i.e., below the low-income cut-off). A primary difference between groups was that only 1 of the 7 women with excessive weight gain had been pregnant before, whereas all 6 of the women with recommended weight gain had had previous pregnancies. In addition, 4 women with excessive weight gain were single compared to only 1 woman with recommended weight gain.

Themes

A number of themes that related to healthy eating, physical activity and prenatal weight gain became apparent through analysis of the interview data and are presented using the following categories: personal factors; social environment; and economic and physical environment.

Personal factors

There were differences between women who had recommended and excessive weight gain in terms of their knowledge of appropriate prenatal weight gain. When asked how much weight should be gained during pregnancy, 4 of the 6 women with recommended weight gain suggested appropriate weights for their pre-pregnancy BMI. Of the 7 women with excessive weight gain, only 1 woman suggested a weight gain range appropriate for her BMI. Four women who gained excessively suggested weights that were higher than the recommended ranges and 2 did not have knowledge about a healthy amount of weight to gain.

A striking contrast between the 2 groups was that all but 1 woman with excessive weight gain believed that they were eating for two during their pregnancy, whereas none of the women with recommended weight gain believed they needed to eat for two. A woman with excess weight gain

Table 2. Characteristics of women with recommended and excessive prenatal weight gain

Characteristic	*Recommended weight gain (n = 6)*	*Excessive weight gain (n = 7)*
Average age, years (range)	26 (19–36)	24 (19–32)
Average pre-pregnancy BMI, kg/m^2 (range)	30.2 (20.0–40.2)	32.4 (22.0–38.7)
First pregnancy, n	0	6
Attended prenatal classes, n	5	6
Prenatal classes attended,* %	87.5	90.0
Received dietitian counselling, n	2	3
Education, n		
Less than grade 10	1	1
Grade 10–12	3	4
College or university	2	2
Marital status, n		
Single	1	4
Married or common-law	5	3
Family income below low-income cut-off, n	3	3

*Average percentage of total number of prenatal classes attended

BMI = body mass index

discussed the belief about the need to eat for two: "I think that most pregnant ladies do have that in their head that they're eating for two now. And like that's what I, that's what I believe, that you're eating for two." She described what it means to eat for two: "It would just be a whole lot. Actually, it would be, if we were at a restaurant and we're ordering food, I would be ordering, let's say I'd have my meal, but then I'd order an appetizer on top of that and dessert. Like I'd have the full meal deal, I'd go for it all. 'Cause I did have it incorporated into my head that you're eating for two… It was basically that I wanna eat this, I wanna eat this much, so I'm gonna eat it 'cause I have another person inside of me that I have to eat for."

Another woman with excess weight gain thought that eating a lot was good for the baby, and she felt that it did not matter if weight gain was high because it was important for the baby to be full. She said, "Well what I experienced with my pregnancy like I would like I eat a lot and I think it's good for the baby you know to get full too." Women with appropriate weight gain did not share these beliefs about needing to consume more food. One woman said that women should eat how they normally would: "Eat the same food you always eat instead of eating more. Like just try to keep your plate the same."

Social environment

Whether or not a woman acted on her beliefs about the benefits of healthy eating and physical activity or her personal desire to eat healthy and be active depended partially on the support she received. More women with excessive weight gain had social influences that inhibited health behaviours and fewer influences that promoted such behaviour. The impact of the social environment was evident in relation to healthy eating. Despite their belief that "junk" food and fast food should be avoided during pregnancy, most women with excessive weight gain continued to eat relatively high amounts and discussed how others' eating negatively affected their efforts to follow a healthy diet. One woman described her experience with trying to eat healthy: "It was extremely hard… My family loves to eat, his family loves to eat, so when we get together all it is, is eating." Another woman said she would see her husband eating junk food, like chips and soda pop, and she would crave them. In contrast, women with appropriate weight gain were successfully able to limit their junk food consumption. This difference may lie in the fact that women with appropriate weight gain expressed having more support and fewer negative influences on eating. One woman who had appropriate weight gain referred to her husband as being "health conscious" and said that he helped her to eat healthy: "He really kept an eye on what I ate, so I was kind of leery about going astray, you know, too far. Especially, sometimes you have those cravings and you just can't get rid of them, so he'd be good about letting me have a treat, but he'd also be encouraging me to eat more yoghurt or more fruit or more of the healthier foods than the junk food."

All women discussed the benefits of physical activity, and many women increased their activity or personal desire to be active because of others' encouragement. However, it was evident that personal desire and advice alone were not sufficient to promote health behaviours. There was a distinct difference between the groups in terms of the availability of social support for engaging in physical activity. All women with recommended weight gain had support through having companions for physical activity, while only 1 woman with excessive gain had a companion. Women who had companions for physical activity mentioned how having a companion made it easier or more enjoyable to be active.

Economic and physical environment

Access to healthy food options

Women, in general, described the prevalence and convenience of fast foods and junk foods, and the lack of availability of healthy foods as barriers to healthy eating as follows: "There's too much of the same, like the convenient, fast foods available. There's not enough places, especially on the reserve, that do provide the alternative healthy choice type of menu… You go over here and it's fried chicken, hamburger and fries, fries, fries all over the place you know. And I think it's really hard 'cause it is really tempting. It's easy to go astray if you're not, if you're not strong willed."

Two women in each group mentioned that the limited access to healthy foods affected their eating. A woman with excess gain, when asked what made it hard for her to follow a healthy diet, said: "I'd have to say the convenience of junk food at the store or fast food when you're in town. It's just more convenient because there's not really places that sell healthy food." One woman with recommended gain and 2 women with excessive gain said that living away from the town site on the prairies made it easier to eat healthy because fast food was not as accessible.

Income

For many women, income and the cost of food were limiting factors for being able to eat a healthy diet and purchase healthy foods. Almost all women in both groups (5 with acceptable and 6 with excessive weight gain) stated that healthy foods are more expensive. Three women with excessive weight gain and 2 with recommended weight gain personally experienced financial constraints, which affected their eating and ability to afford healthy foods. One woman with recommended weight gain described what made it hard for her to eat healthy: "Like just didn't have, like always have the money to have a healthy diet." When asked what would help women to be able to eat a healthy diet during pregnancy, a woman said: "Having lots of money is all I can say. And if you don't have the money you can't eat properly. And I found that out after I had the baby… we couldn't afford nothing but our bills."

Dogs and the weather

As there were limited facilities for indoor activity, dogs and the weather were important impediments to outside activity. Stray dogs were prevalent in the community, particularly in the town site, and dog bites were an important public health concern. Two women, both with normal weight, specifically mentioned dogs as barriers to activity. One woman summarized: "There's wicked dogs… just like wicked dogs. You can't jog or go run or dogs will attack you." Weather was mentioned as a barrier to physical activity by 5 women with normal weight gain and 2 with excessive weight gain. Both summer and winter presented challenges for doing physical activity; winter because of the cold, snow and ice, and summer because of the heat. A common concern about being active in the winter was the potential for slipping on ice when walking. More women with normal weight gain found the weather to be a barrier to healthy weight gain than women with excessive weight gain. It may be that these women were making more attempts to be active and, thus, were more likely to encounter weather as a barrier.

DISCUSSION

The findings from this study indicate that for First Nations women living on a reserve there are multiple, interconnected influences on eating, physical activity and, in turn, prenatal weight gain. Personal factors and the social environment both positively and negatively influenced eating and physical activity, whereas the economic and physical environment of the reserve negatively influenced eating and physical activity. Ideally, all the influences would have acted constructively in combination to promote health behaviours and enable women to achieve healthy weight gain. We found, however, that when aspects of 1 or more of these components were lacking or unconstructive, the likelihood of gaining excessive weight increased.

Women, irrespective of weight gain in pregnancy, described a lack of access to healthy foods as a barrier to healthy eating and healthy weight gain. On the reserve, the proximity and convenience of fast foods and foods of lower nutritional quality, the limited availability of healthy foods in local stores and the higher cost of healthy foods acted together in ways that impeded individuals' ability to eat a healthy diet. This type of environment, exposing individuals to inexpensive and highly accessible energy-dense foods, has been described as *obesogenic* (29).

Low income and the higher cost of healthy foods were both identified as barriers to healthy eating by the women. Following a healthy diet was clearly a difficult option on the reserve, considering that many women lived in poverty. Consistent with women's experiences regarding the relationship between income and the ability to eat a healthy diet, research has demonstrated that constrained food budgets have a direct impact on food choices and, in turn, diet quality (30). The price of food has been proposed as a reason for differences in the diets of individuals of lower and higher socioeconomic status (31).

Policy initiatives to ensure the adequate provision of healthy foods in the community at a reasonable price could help create a supportive economic and physical environment. Policy initiatives could also ensure adequate social assistance for women living in poverty, so they have sufficient income to afford healthy foods. Social assistance allowances have been found to be insufficient to purchase healthy foods in Canada, and often funds meant for food are spent on other essentials, because of insufficient allowances for other basic needs (32).

Community initiatives could enhance women's opportunities for physical activity. For instance, the community could prioritize the construction and maintenance of walking paths and address women's concerns about vicious dogs, a major barrier to walking in this community. Community-based interventions to promote healthy eating and physical activity have been successfully implemented in First Nations communities as part of diabetes prevention interventions (33).

Although many women had shared risk conditions for excessive weight gain in pregnancy, by using an asset-based approach, we were able to identify positive factors that promoted healthy weight gain. Women who gained weight within the recommended range were more likely to have appropriate information about weight gain and eating in pregnancy compared to those who gained in excess. The link between accurate information about healthy weight gain and actual weight gain is consistent with the literature. It has been found that when physicians informed women about a healthy weight range, they were more likely to gain within this range (3). Eating for two refers to the belief that women should eat more than usual during pregnancy because they are eating for their baby in addition to themselves. None of the women with recommended weight gain believed they needed to eat for two, whereas all but 1 woman with excess weight gain believed in eating for two. It appeared that the belief about the need to eat for two legitimized increased food intake despite medical guidelines that stipulate women should consume only slightly more calories than usual during pregnancy (34). Interventions at the individual level should, therefore, promote accurate knowledge about appropriate weight gain and clarification about eating for two.

The social environments of women with appropriate and excess prenatal weight gain were also different. Women with appropriate weight gain had more social support for action, which was an instrumental or tangible aid from others that helped women adopt health behaviours. Social support can facilitate behaviours, such as healthy eating and physical activity, that promote health (35). In this study, positive social support influenced women's beliefs, motivation and efforts to be active and eat healthy. Encouraging others to support pregnant women could help reinforce health-promoting behaviours. Small group interventions,

such as walking groups or community kitchens, would also be beneficial to create supportive social environments for women.

The study had some limitations, including self-report of eating and physical activity behaviours. More detail about women's eating habits and physical activity could have given greater insight into differences between the groups. The women who stated they did not receive advice from health professionals about appropriate prenatal weight gain may have received advice but not have recalled the information they were given. We did not ask prenatal staff if all women were routinely informed about healthy weight gain. Given the small sample size, the results may not be generalizable to all First Nations women living on reserves. The results should be interpreted in relation to other First Nations populations with awareness of the unique cultures, beliefs and traditions of different Aboriginal communities.

CONCLUSIONS

Pregravid overweight and excessive weight gain in pregnancy increase maternal and fetal morbidity (4,5,9-11). It is essential that all First Nations women receive preconception counselling about appropriate prenatal weight and weight loss before pregnancy for women who are obese. In addition, careful monitoring of prenatal weight gain and prenatal care that takes into account the unique circumstances of women living on reserves is required. Only 30 to 40% of women in general gain weight within the recommended range during pregnancy, and little is known about factors that may influence women to gain or not gain weight within the recommended range (36). The most appropriate prenatal care for First Nations women that maximizes the number achieving weight gain within the recommended range requires further study. First Nations women living on reserves have unique challenges to healthy living. Health promotion concepts that emphasize the importance of socio-environmental influences on individual health behaviours are required when developing interventions for healthy prenatal weight gain in reserve communities. Using an ecological framework (37), findings suggest that interventions to promote healthy prenatal weight gain should go beyond the individual level and target multiple levels including individual, interpersonal, community and policy levels. Prenatal programs also need to be based on inquiry into ideological (belief) structures related to appropriate food intake, food prescriptions and proscriptions, activity patterns, weight gain and body image during pregnancy, as well as the relation of these to household and community characteristics (36).

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AUTHOR DISCLOSURES

No dualities of interest declared.

AUTHOR CONTRIBUTIONS

TLB wrote the manuscript, which was critically revised by NDW and KR. TLB collected the data and completed the initial interpretation. NDW and KR aided in the interpretive process

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