Published in final edited form as:

Midwifery. 2016 March ; 34: 211–220. doi:10.1016/j.midw.2015.11.005.

African American and White Women's Perceptions of Weight Gain, Physical Activity, and Nutrition During Pregnancy

Kara M. Whitaker, PhD, MPH^a, Sara Wilcox, PhD^{b,c}, Jihong Liu, ScD^d, Steven N. Blair, PED^{b,d}, and Russell R. Pate, PhD^b

Kara M. Whitaker: whitaker@umn.edu; Sara Wilcox: swilcox@mailbox.sc.edu; Jihong Liu: jliu@mailbox.sc.edu; Steven N. Blair: sblair@mailbox.sc.edu; Russell R. Pate: rpate@mailbox.sc.edu

^aDivision of Epidemiology and Community Health, University of Minnesota, Minneapolis, MN, USA

^bDepartment of Exercise Science, University of South Carolina, Columbia, SC, USA

^cPrevention Research Center, University of South Carolina, Columbia, SC, USA

^dDepartment of Epidemiology and Biostatistics, University of South Carolina, Columbia, SC, USA

Abstract

Objective—To describe African American and White women's perceptions of weight gain, physical activity, and nutrition during pregnancy and to explore differences in perceptions by race.

Design—Qualitative interview study.

Setting—Two Ob/Gyn clinics in South Carolina, USA.

Participants—Thirty pregnant women (15 African American, 15 White) between 20–30 weeks gestation, equally represented across pre-pregnancy BMI categories (10 normal weight, 10 overweight, and 10 obese).

Findings—White women more frequently described intentions to meet weight gain, physical activity, and dietary guidelines in pregnancy than African American women. African American women were more concerned with inadequate weight gain while White women more commonly expressed concerns about excessive weight gain. More White women discussed the importance of physical activity for weight management. Regardless of race, few women described risks of excessive weight gain or benefits of physical activity as it relates to the baby's health. The primary cited barrier of healthy eating was the high cost of fresh produce.

Key conclusions and implications for practice—Several knowledge gaps as well as race differences were identified in women's perceptions and intentions toward weight gain, physical activity, and nutrition during pregnancy. Future interventions should seek to educate women about

Corresponding author: Kara M. Whitaker, 1300 S 2nd Street, Minneapolis, MN 55415 USA, Telephone: 1-612-626-2273, whitaker@umn.edu.

Note: Kara Whitaker was at the University of South Carolina at the time the research was conducted.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

common misperceptions. It may be necessary to culturally tailor gestational weight gain interventions to optimize health outcomes.

Keywords

pregnancy; weight gain; physical activity; nutrition

Introduction

The high and increasing prevalence of women who enter pregnancy overweight or obese is a major public health concern. Approximately 75% of Non-Hispanic Black women and 50% of Non-Hispanic White women of childbearing age are overweight or obese (Flegal et al., 2012). The increasing trend in pre-pregnancy BMI seems to parallel the increasing trend of excessive gestational weight gain, with up to 50% of women exceeding the Institute of Medicine (IOM) weight gain guidelines during pregnancy (National Research Council and Institute of Medicine, 2007; Olson, 2008; Simas et al., 2011).

Excessive gestational weight gain is associated with many adverse health outcomes, including an increased risk of gestational diabetes, preeclampsia, cesarean delivery, macrosomia, and overweight or obesity in the mother (Guelinckx et al., 2008; Hernandez, 2012; Nehring et al., 2011). Evidence also suggests an association between excessive gestational weight gain and future overweight and obesity in the offspring (Lau et al., 2014). Given the high prevalence of excessive weight gain and the adverse health implications for both mother and child, there is a clear need for effective gestational weight gain interventions.

A growing body of literature has examined the efficacy of interventions to limit gestational weight gain. Interventions have included dietary counseling, physical activity promotion, weight gain tracking charts, as well as behavioral change strategies (Muktabhant et al., 2012; Thangaratinam et al., 2012). Overall, results have been modest and there is substantial heterogeneity across studies. A Cochrane review including 27 randomized controlled trials and semi-randomized trials concluded there was insufficient evidence to recommend any intervention for preventing excessive pregnancy weight gain in part due to the small observed effect sizes (Muktabhant et al., 2012). In order to develop more effective gestational weight gain interventions, it is first necessary to better understand women's perceptions of weight gain and related behaviors during pregnancy.

Few studies have examined women's attitudes toward weight gain, physical activity, or nutrition in pregnancy. Some evidence suggests that there is a general lack of knowledge of the risks of excessive weight gain (Brooten et al., 2012; Groth & Kearney, 2009; Groth et al., 2012). Other studies have identified misperceptions about the risks and benefits of exercise during pregnancy (Evenson & Bradley, 2010; Goodrich et al., 2013; Padmanabhan et al., 2015). While it appears the health benefits of proper nutrition are better understood, women consistently cite many barriers to healthy eating, including lack of self-control in response to cravings (Goodrich et al., 2013; Padmanabhan et al., 2015; Sui et al., 2013). Some data also suggest there may be racial or ethnic differences in how women view these topics, particularly for weight gain and exercise (Brooten et al., 2012; Evenson & Bradley,

2010; Groth & Kearney, 2009; Groth et al., 2012; Sui et al., 2013). However, research examining race differences in women's perceptions is limited and warrants further investigation.

The Theory of Planned Behavior (TPB) was developed to predict and explain behaviors and serves as a framework for behavior change interventions (Ajzen, 1985, 1991). This theory posits that attitudes, subjective norms, and perceived behavioral control influence behavioral intentions and thus behaviors. This theory has been used extensively in research examining health behaviors such as physical activity and diet (McEachan et al., 2011; Symons Downs & Hausenblas, 2005), and has also been used in pregnant populations (Downs & Hausenblas, 2003). The TPB is therefore well suited to guide the exploration of women's perceptions of weight-related behaviors in pregnancy.

The aim of the current study is to use the TPB framework to describe African American and White women's perceptions of weight gain, physical activity, and nutrition during pregnancy using qualitative methods and to explore differences in perceptions by race. Findings may facilitate the development of more effective gestational weight gain interventions.

Methods

Participants

A total of 30 patients were recruited to take part in qualitative interviews from June-August, 2014 at two clinics in South Carolina; a medium sized obstetrics and gynecology (Ob/Gyn) university clinic and a large women's health clinic that primarily serves uninsured and underinsured patients. Patients were recruited using flyers posted in the clinics and via in-person recruitment during a prenatal visit. Eligibility criteria for patients include: African American or White women, 20–30 weeks gestation, singleton pregnancy, pre-pregnancy BMI of 18.5–45.0 kg/m², 18–44 years old, and initiated prenatal care 16 weeks gestation. Women were screened for eligibility over the telephone or in-person. Five African American and five White women were purposively recruited who were normal weight, overweight, and obese, respectively, in order to better represent the views of women resembling the general population. Underweight women were not included in this study due to the small percentage of underweight women in South Carolina. We continued to recruit participants until five women had completed interviews in each category based on race and BMI.

Interview Guide

An interview guide was developed using the TPB to assess women's perceptions of weight gain, physical activity, and healthy eating during pregnancy. The guide addressed the following areas: (1) weight gain, physical activity, and dietary intentions during pregnancy; (2) personal beliefs toward weight gain, physical activity, and healthy eating during pregnancy, including perceived advantages and disadvantages (attitudes); (3) beliefs of important others about weight gain, physical activity, and healthy eating during pregnancy (subjective norm), and (4) perceptions of current weight gain, physical activity, and nutrition guidelines during pregnancy, including barriers and facilitators to meeting guidelines

(perceived behavioral control). Sample questions are included in Table 1. If needed, participants were prompted to expand on their answers and provide additional details.

Behavioral intentions were assessed before women were informed of guidelines to limit social desirability bias. Women were then provided with a verbal and written description of the current weight gain, physical activity, and nutrition guidelines during pregnancy in order to assess perceptions of these guidelines. Weight gain recommendations were based on the 2009 IOM guidelines and were tailored based on the woman's pre-pregnancy body mass index (BMI). It is recommended that normal weight women (BMI 18.5–24.9 kg/m²) gain 25–35 pounds (11.3–15.9 kg) in pregnancy, overweight women (BMI 25.0–29.9 kg/m²) gain 15–25 pounds (6.8–11.3 kg), and obese women (BMI ≥ 30.0 kg/m²) gain 11–20 pounds (5.0–9.1 kg) (Institute of Medicine and National Research Council, 2009). Physical activity recommendations during pregnancy were based on the 2008 Physical Activity Guidelines for Americans, or 150 minutes of moderate to vigorous intensity physical activity per week (U.S. Department of Health and Human Services, 2008). Nutrition recommendations were based on the 2010 Dietary Guidelines for Americans (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2010). Specifically, women were told that a healthy diet includes plenty of fruits and vegetables, low fat dairy products, protein, fiber, and whole wheat breads and pastas instead of refined grains like white bread, rice, and pasta. It also recommended women to watch portion sizes and to avoid eating too much of very sugary or fatty foods.

Additional Measures

Participants completed an interviewer-administered survey following the interview. Sociodemographic measures included: age, highest grade or years of education, income level, employment status, marital status, and parity. Self-rated health, fruit and vegetable consumption (cups/day), smoking status, and major chronic health conditions were also assessed. Physical activity was measured using the validated short form of the International Physical Activity Questionnaire (IPAQ) (Craig et al., 2003; Ekelund et al., 2006). Respondents were categorized as inactive, minimally active, or exceeding public health recommendations, as recommended by the IPAQ short form guidelines for data processing and analysis, (IPAQ Research Committee, 2004).

Data Collection and Analysis

All interviews were conducted at the two Ob/Gyn clinics or the participants' home by the primary investigator. Interviews were audio-recorded and transcribed using a professional transcription service. A study investigator verified accuracy of transcription. Content analysis techniques were used for data analysis, including both qualitative and quantitative strategies. Content analysis is a systematic research method used to make inferences about written, verbal or visual data in order to describe and quantify a phenomenon (Downe-Wamboldt, 1992). First, a deductive content analysis approach was used to create overarching categories for coding based on the TPB framework (Elo & Kyngas, 2007). For each outcome of interest (weight gain, physical activity, and nutrition), transcript text was coded using the following categories: behavioral intentions; attitudes (advantages and disadvantages); subjective norms (influential others); and perceived behavioral control

(barriers and enablers). After this first pass of coding was complete, subcategories were created within the existing framework using the inductive analysis approach of open coding (Elo & Kyngas, 2007; Strauss & Corbin, 1998).

To increase validity, the primary investigator (KW) and a research assistant, both with experience in qualitative data coding, independently read and coded two transcripts, then met to compare and discuss similarities and differences in definitions and codes. A code list was developed and organized to form an initial codebook draft. The codebook was entered into QRS NVivo 10 for computer assisted qualitative data management. To promote consistency, the primary investigator coded the manuscripts and the research assistant reviewed the codes to verify they were correctly applied. The codebook was revised as additional data were collected, and all transcripts were recoded to reflect these changes. Further code refinement occurred after recursive interactions with the data. Data saturation was defined as the point in category development at which no new properties, dimensions, or relationships emerged during analysis (Strauss & Corbin, 1998). It appeared that data saturation occurred by the 24th interview, as few new codes were added after that time. However, all 30 interviews were completed in order to have equal representation across race and BMI categories. After all transcripts were coded, responses were counted to determine frequencies. A theme was defined as 20% or more of participants addressing a topic (6 patients). Differences by race were also examined across themes, and noted when there was a 20% response difference (n=3). Palmetto Health and the University of South Carolina Institutional Review Boards approved all study protocols.

Findings

Patient characteristics—Patient characteristics can be found in Table 2. A total of 30 patients were interviewed (15 African American, 15 White) with equal representation across pre-pregnancy BMI categories (10 normal weight, 10 overweight, 10 obese). Participants averaged 26.6 ± 5.7 years of age (range 18.0–41.0). Approximately 50% of patients had a high school education or less, reported a household income below \$15,000 per year, and were currently unemployed. White women were more likely to report their health as excellent or very good as compared to African American women ($p=0.027$). There were no other race differences in participant characteristics. Patient interviews averaged 38.5 ± 8.8 minutes (range 28.0–65.0).

Perceptions of Pregnancy Weight Gain—As seen in Table 3, 43% of women reported an intended weight gain within the IOM guidelines (n=13; 5 African American, 8 White), 37% above recommendations (n=11; 5 African American, 6 White), and 17% below recommendations (n=5; 4 African American, 1 White). One African American participant stated she did not have a target weight gain. When examining weight gain intentions by pre-pregnancy BMI category, more overweight (n=6) and obese women (n=5) cited an intended weight gain above guidelines as compared to normal weight women (n=0).

After viewing the IOM weight gain guidelines, the majority of women agreed with the recommendations for their pre-pregnancy BMI (n=19; 8 African American, 11 White). However, 11 women disagreed with the guidelines (7 African American, 4 White), with nine

stating the recommendations were too low and two stating they were too high. All women who said recommendations were too low were overweight (n=4) or obese (n=5). For example, after hearing the recommended weight gain was 11–20 pounds for her pre-pregnancy BMI, a participant said *“I disagree. I just feel like if you’re healthy and your baby is healthy it shouldn’t matter how much you weigh or how much you gain just as long as the baby’s healthy and you’re healthy too. I mean I hope that people don’t try to starve themselves while they’re pregnant, but if you’re okay and the baby is okay I think weight gain shouldn’t be an issue”* (African American, obese, age 27).

The most commonly cited advantages of appropriate pregnancy weight gain were discussed in relationship to benefits for the baby (n=26; 13 African American, 13 White). More specifically, women stated that appropriate weight gain would lead to a healthy baby (n=19; 9 African American, 10 White), positively influence the size of the baby (n=11; 6 African American, 5 White) and reduce the risk of complications for the infant (n=6; 4 African American, 2 White). For example, one participant stated healthy weight gain would lead to *“good birth weight for the baby. You don’t want a baby that’s underweight for the baby’s health, but you also don’t want a baby that’s too large, especially for concerns at delivery”* (White, normal weight, age 30). The majority of women also discussed personal benefits of appropriate weight gain (n=22; 11 African American, 11 White). For example, women said healthy weight gain would benefit their own health (n=7; 3 African American, 4 White), and many stated it would be easier to lose the weight after the baby was born (n=6; 2 African American, 4 White).

All women discussed how excessive pregnancy weight gain would negatively impact their personal health. Some women specifically discussed the risk of diabetes, high blood pressure, or heart disease (n=17; 8 African American, 9 White). Women also stated it would be difficult to lose the weight in the postpartum period (n=12; 5 African American, 7 White), and discussed how excessive weight gain makes it more challenging to maintain an active lifestyle (n=9; 2 African American, 7 White). Less than half of women discussed any negative outcomes for their child as a result of excessive pregnancy weight gain (n=12; 6 African American, 6 White). Of these, ten women specifically talked about how excess weight gain may increase the risk of health complications for the baby (5 African American, 5 White) and seven said high weight gain may lead to a larger baby (4 African American, 3 White). Without prompting, only eight women described negative outcomes for the baby as a result of excessive pregnancy weight gain. An additional four women discussed negative outcomes after prompting, and seven women stated they did not know of any disadvantages of high weight gain as it related to the baby’s health.

When asked who influences their pregnancy weight gain, women most commonly listed their doctor (n=14; 8 African American, 6 White), themselves (n=12; 3 African American, 9 White), partner (n=8; 3 African American, 5 White), and mother (n=7; 4 African American, 3 White). When asked whose advice they most value and trust about pregnancy weight gain, the majority of women stated their doctor (n=20; 10 African American, 10 White). For example, one participant stated she trusted her doctor’s advice on pregnancy weight gain because *“for one, they went to school for it. And also, I feel like they’ve been doing it for so long and they see a wide variety of cases, that ideally they know what to do, what not to do,*

and warning signs of what's too much, too little, or what's right. And they have tips, probably, of what to do to get you at your ideal weight" (White, overweight, age 21).

When discussing barriers to appropriate weight gain, the majority discussed factors that made it difficult to avoid excessive weight gain (n=22; 9 African American, 13 White). Poor dietary habits (n=7; 3 African American, 4 White) and cravings (n=6; 2 African American, 4 White) were commonly cited barriers to appropriate weight gain. Lack of exercise was discussed as a barrier to appropriate weight gain in White women only (n=5). Some women also cited factors that would make it difficult to gain adequate weight gain in pregnancy (n=9; 7 African American, 2 White), including nausea, food aversions, and lack of appetite. When discussing what would help them meet weight gain recommendations, the majority of women discussed factors that would keep them from gaining too much weight in pregnancy (n=26; 13 African American, 13 White), including: eating a healthy diet (n=17; 9 African American, 8 White), exercise (n=13; 5 African American, 8 White), and portion control (n=7; 5 African American, 2 White).

Perceptions of Physical Activity during Pregnancy—Women were asked to describe their plans for exercise during the rest of their pregnancy before viewing the current physical activity guidelines. Less than half of women described a plan sufficient to meet guidelines (n=13; 5 African American, 8 White). Half of women stated they intended to exercise during their pregnancy but reported insufficient duration to meet guidelines. For example, *"I plan to walk at least two to three days a week for a half an hour" (White, obese, age 32)*. Two African American participants said they had no intentions to exercise during their pregnancy. When examining intentions by pre-pregnancy BMI, more normal weight women discussed an exercise plan that met current guidelines (n=6) compared with overweight (n=3) or obese (n=4) women.

After viewing the physical activity guidelines, the majority of women thought the recommendations were reasonable (n=26; 13 African American, 13 White). For example, one participant stated *"That's something that anybody should be able to do" (African American, obese, age 18)*. Four women disagreed with the recommendations, citing that it was too much activity during pregnancy. For example, one participant said *"It could be healthy, but in a way it wouldn't be because too much work and too much activity while you're pregnant could put a strain on you" (African American, normal weight, age 22)*.

When discussing advantages of exercise, a large percentage of women said that exercise during pregnancy would help with labor and delivery (n=21; 10 African American, 11 White). For example, one participant said, *"Well I know they say if you walk a lot, it'll help you have a much easier labor. I'm for anything that's going to make it easy" (African American, obese, age 41)*. Women also discussed how exercise improves their personal health (n=11; 6 African American, 5 White), and the health of the baby (n=10; 5 African American, 5 White).

When discussing the risks or disadvantages of exercise, the majority cited risks to themselves (n=20; 7 African American, 13 White) and their baby (n=19; 9 African American, 10 White). When discussing personal risks, women talked about the possibility of

injury (n=9; 2 African American, 7 White) and how doing too much may strain your body (n=8; 3 African American, 5 White). *“You know that your joints and ligaments are stretching out and preparing for labor and delivery...so it’s definitely easier to strain muscles, to sprain things, to pull things”* (White, normal weight, age 28). Women also discussed how too much exercise might lead to preterm labor (n=11; 6 African American, 5 White). Seven women stated that exercise could hurt the baby (1 African American, 6 White).

When asked who influences their exercise during pregnancy, almost half of women stated themselves (n=14; 4 African American, 10 White), followed by their partner (n=13; 7 African American, 6 White) and mother (n=7; 6 African American, 1 White). When asked whose exercise advice they most valued or trusted during pregnancy, twelve women cited their doctor (5 African American, 7 White).

The most commonly discussed barrier to exercise was the weather being too hot (n=8; 2 African American, 6 White), followed by lack of motivation (n=7; 6 African American, 1 White), and lack of time (n=6; 2 African American, 4 White). While not considered themes, many other barriers were discussed, including: existing health problems, not feeling well, swollen feet, fatigue, lack of access to facilities, and lack of social support. Women most commonly stated that social support would help them exercise regularly during pregnancy (n=14; 8 African American, 6 White). Other discussed enablers to exercise included having access to facilities, exercise classes for pregnant women, cooler weather, and more time.

Perceptions of Nutrition during Pregnancy—All participants stated that they wanted to eat a healthy diet during pregnancy. However, when asked to describe the types of foods they plan on eating during their pregnancy, one-third of women described a diet that did not meet dietary guidelines (n=10; 8 African American, 2 White), primarily due to the high reported consumption of unhealthy fast foods (n=7; 7 African American, 0 White). More obese women (n=6) described a diet that did not meet dietary guidelines as compared to normal weight (n=2) or overweight (n=2) women. Many women also described positive changes they had made in their diet since becoming pregnant, including increasing consumption of fruits and vegetables (n=29; 15 African American, 14 White), and eating less fried foods (n=9; 7 African American, 2 White).

After hearing a description of general healthy eating practices consistent with the USDA dietary guidelines, the majority of women said the recommendations were reasonable (n=26; 13 African American, 13 White). However, seven of the women who agreed with the recommendations also said these guidelines were hard to follow (4 African American, 3 White). For example, *“I think that’s a great diet for not being pregnant as well, and I think that’s perfect for me, if I could just do it all the time, but I do crave sweets”* (White, overweight, age 26).

When discussing advantages of healthy eating, all women discussed positive effects for their baby. Women commonly said healthy eating would lead to a healthy baby (n=21; 11 African American, 10 White) and help with the baby’s growth and development (n=11; 4 African American, 7 White). The majority of women also discussed how eating a healthy diet would

directly benefit themselves (n=28; 14 African American, 14 White). For example, women said a healthy diet would lead to a healthy mom (n=16; 9 African American, 7 White) and result in appropriate weight gain (n=11; 6 African American, 5 White).

When discussing disadvantages of unhealthy eating during pregnancy, almost all women discussed negative health consequences for themselves (n=29; 14 African American, 15 White). Women most commonly discussed how unhealthy eating practices would lead to excessive weight gain (n=14; 3 African American, 11 White), increase the risk of health complications (n=13; 6 African American, 7 White), and more generally make them unhealthy (n=11; 5 African American, 6 White). For example, *“You can gain way too much weight, which is going to make you unhappy and unhealthy. Can give you high blood pressure, the hypertension, preeclampsia. You can get the diabetes from it. It’s a very long list of things you can get from a really bad diet while you’re pregnant”* (White, obese, age 26). The majority of women also discussed disadvantages of unhealthy eating for the baby (n=25; 11 African American, 14 White). For example, women stated an unhealthy diet would lead to an unhealthy baby (n=10; 4 African American, 6 White) and have a negative impact on the baby’s weight (n=6; 3 African American, 3 White).

Women most commonly named themselves as having the biggest influence over their eating habits during pregnancy (n=16; 6 African American, 10 White), followed by their partner (n=13; 7 African American, 6 White), and doctor (n=11; 5 African American, 6 White). When asked whose advice women most value or trust, 60% cited their doctor (n=18; 10 African American, 8 White). While not considered a theme, five women stated they most valued the advice of their mother (4 African American, 1 White).

When asked to describe barriers to healthy eating, 10 women discussed cost or lack of access (4 African American, 6 White). *“In a perfect world this would be good for a family who has the financial income. But for a person that don’t have financial income to eat like this, that won’t happen. I mean it’s very expensive to eat healthy”* (African American, overweight, age 32). Other commonly cited barriers were the negative influence of others (n=8; 4 African American, 4 White), taste preference for unhealthy options (n=8; 5 African American, 3 White), and cravings (n=7; 3 African American, 4 White).

Factors that would help women meet dietary guidelines include having increased access to healthy foods (n=9; 5 African American, 4 White). Women also cited social support (n=8; 3 African American, 5 White), more knowledge about healthy foods (n=8; 4 African American, 4 White), and having motivation or willpower for the sake of their child (n=6; 4 African American, 2 White) as enablers to healthy eating. *“The reason why I say willpower is because right now I have willpower for my child, because like I said I want her to come into this world, at least have a fighting chance to come out and, you know, have her own eating habits instead of me killing her with mine”* (African American, obese, age 41).

Discussion

This study described African American and White women’s perceptions of weight gain, physical activity, and nutrition during pregnancy. The majority of women had positive

perceptions of weight-related guidelines during pregnancy, although fewer expressed intentions to meet these guidelines. Commonly discussed beliefs about physical activity and healthy eating were similar to those reported in non-pregnant populations (Downs & Hausenblas, 2005; Eikenberry & Smith, 2004; White et al., 2007), with some pregnancy specific beliefs. We found several notable differences in women's perceptions and intentions toward weight gain, physical activity, and nutrition by race.

White women more frequently described intentions to meet weight gain, physical activity, and dietary guidelines in pregnancy as compared to African American women. When discussing weight gain, African American women were more concerned with the risks of inadequate weight gain while White women more frequently expressed anxiety about excessive weight gain. These perceptions have merit, as several large U.S. studies have reported higher rates of inadequate weight gain in African American women as compared to White women (Headen et al., 2012). Greater concern of excessive weight gain in White women may reflect cultural differences in perceptions of the ideal body size (Kronenfeld et al., 2010). Consistent with existing research (Brooten et al., 2012), it appears that African American women in our study were aware of the risks of inadequate gain, but there was a knowledge gap regarding the risks of excessive weight gain. To address these gaps in knowledge, it is important for interventions to teach women about the risks of both inadequate and excessive pregnancy weight gain.

Less than half of participants intended to exercise at a level sufficient to meet current recommendations, with fewer African American women reporting intentions to meet recommendations as compared to White women. White women also discussed the importance of exercise in the context of weight management with greater frequency than African American women. Evenson and colleagues also identified race differences in how pregnant women perceive exercise, with White women being more likely to agree that moderate intensity exercise can benefit the health of the mother and should be done 3 or more times per week as compared to African American women (Evenson & Bradley, 2010). Educational materials and interventions targeting pregnant women should be very specific about physical activity recommendations, as few women in this study reported intentions to meet guidelines and may not know how much activity they should be getting. It may also be helpful to target health care providers and encourage them to discuss the benefits of physical activity with their pregnant patients.

When describing the diet they intended to eat during their pregnancy, African American women were less likely to report a diet consistent with dietary guidelines as they commonly reported consumption of unhealthy fast foods, specifically fried foods. This is consistent with a recent report using data from the National Health and Nutrition Examination Survey, where consumption of calories from fast food was significantly greater in non-Hispanic Blacks as compared to non-Hispanic Whites (Fryar & Ervin, 2013). This is concerning as frequent fast food intake is associated with higher energy and fat intake and lower intake of healthful nutrients (Bowman & Vinyard, 2004; Paeratakul et al., 2003). It may be particularly beneficial to emphasize the importance of limiting fast food intake in interventions with African American women.

Regardless of race, few women identified excessive weight gain as a risk factor to the baby. Other qualitative studies examining perceptions of excessive weight gain have also reported that knowledge of neonatal risks is low (Groth et al., 2012; Herring et al., 2012; Sui et al., 2013). Infants born to mothers with excessive weight gain are at increased risk for many health complications, including low 5-minute Apgar scores, hypoglycemia, large for gestational age, and future overweight or obesity as compared with women who gain within the recommended guidelines (Olson et al., 2009; Stotland et al., 2006; Vesco et al., 2011). It is critical that women understand how excessive pregnancy weight gain can adversely impact the short and long term health of their child.

Knowledge of the benefits of healthy eating for the infant was high; however, only one-third of women discussed health benefits of physical activity for the infant. Evidence suggests that physical activity has many positive health benefits to the fetus that extend into childhood and possibly adulthood via fetal programming (Barker et al., 1989). Physical activity in pregnancy enhances placental functional capacity, circulation, and gas exchange, all of which increase nutrient delivery to the fetus (Clapp et al., 2000). Women who are active during pregnancy are at lower risk of large-for-gestational age infants (Mudd et al., 2013) and these beneficial effects on the child's weight status persist into early childhood (Mattran et al., 2011). Interventions should seek to increase awareness about the benefits of physical activity for the baby.

Women discussed themselves as well as doctor, partner, and mother as influencing their weight gain, physical activity, and nutrition during pregnancy. More women discussed their doctor as influencing their weight gain, followed by their diet. Interestingly, few women discussed their doctor as influencing their exercise during pregnancy. This may indicate that providers are not discussing exercise with their prenatal patients, or not counseling women in a way that is meaningful. Other qualitative studies have also found women report insufficient or no provider counseling on exercise during pregnancy (Ferrari et al., 2013; Stengel et al., 2012). White women were more likely to cite themselves as influencing their weight gain and exercise, while African American women more frequently discussed their mothers as influencing their exercise and dietary behaviors. Regardless of race, social support was commonly stated as a factor that would enable regular exercise and consumption of a healthy diet. It may be especially beneficial for lifestyle interventions targeting women during pregnancy to involve close family members (e.g. mothers) or friends.

Study findings have important intervention implications. First, there appears to be a lack of awareness of the risks of excessive weight gain for the baby and benefits to the baby of physical activity. Data suggests that pregnant women are highly motivated to engage in behaviors that protect the fetus and avoid those that may cause harm (Groth & Kearney, 2009; McBride et al., 2003). Interventions should seek to increase women's understanding of how weight gain and physical activity can directly impact the health of the fetus. Second, it appears there are differences by race in women's perceptions and intentions toward weight gain, physical activity, and healthy eating. It may be necessary to develop culturally tailored gestational weight gain interventions to optimize outcomes.

A major strength of this study is the use of qualitative methods, which provides rich data that could not be captured through a quantitative survey. We also explored women's perceptions of three distinct topics: weight gain, physical activity, and nutrition. This contributes to the literature as few studies have examined women's perceptions of all three of these importantly related topics. Finally, we examined race differences in women's perceptions, something that is notably absent from the existing literature.

While this study contributes novel findings to the literature, several limitations must be noted. We recruited from two clinics in South Carolina, therefore the findings have limited generalizability to other geographical areas. It is possible that patients who took part in this study were more interested in weight gain and related topics. All information was self-reported and therefore subject to recall and social desirability bias. Furthermore, important data may have been lost when defining a theme as 20% or more of participants addressing a topic. However, it was not feasible to present all topics discussed and therefore we chose to focus on those topics that were addressed more frequently. Additionally, we had a relatively small sample size to examine differences in perceptions by race, thus study findings should be interpreted with caution. While not statistically significant, there were race differences with respect to education and income, and therefore the differences observed may have been due in part to educational background and financial status rather than race.

In summary, this study described women's perceptions of weight gain, physical activity, and nutrition during pregnancy. We identified several gaps in knowledge as well as race differences in perceptions and intentions toward weight-related behaviors. This may warrant the development of culturally tailored gestational weight gain interventions to better meet the specific needs of women during pregnancy. Future studies are needed using larger sample sizes to further investigate race differences in women's perceptions and behaviors related to weight gain, physical activity, and diet during pregnancy.

Acknowledgments

This work was partially supported by a SPARC Graduate Research Grant from the Office of the Vice President for Research at the University of South Carolina. The participation of KW in this research was supported in part by research training grant T32-GM081740 from the National Institutes of Health, National Institute of General Medical Sciences. The authors would like to thank all women and health care providers who participated in this study. The authors acknowledge and thank the contributions of Santiago Tovar-Diaz, who assisted with and qualitative data coding. No other financial disclosures were reported by authors of this paper.

References

- Ajzen, I. From intentions to actions: A theory of planned behavior. In: Kuhl, J.; Beckmann, J., editors. Action control: from cognition to behavior. Springer; Berlin Heidelberg: 1985. p. 11-39.
- Ajzen I. The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes. 1991; 50:179–211.
- Barker DJ, Osmond C, Golding J, Kuh D, Wadsworth ME. Growth in utero, blood pressure in childhood and adult life, and mortality from cardiovascular disease. *BMJ*. 1989; 298(6673):564–567. [PubMed: 2495113]
- Bowman SA, Vinyard BT. Fast food consumption of U.S. adults: impact on energy and nutrient intakes and overweight status. *J Am Coll Nutr*. 2004; 23(2):163–168. [PubMed: 15047683]

- Brooten D, Youngblut JM, Golembeski S, Magnus MH, Hannan J. Perceived weight gain, risk, and nutrition in pregnancy in five racial groups. *J Am Acad Nurse Pract.* 2012; 24(1):32–42. [PubMed: 22243679]
- Clapp JF 3rd, Kim H, Burciu B, Lopez B. Beginning regular exercise in early pregnancy: effect on fetoplacental growth. *Am J Obstet Gynecol.* 2000; 183(6):1484–1488. [PubMed: 11120515]
- Craig CL, Marshall AL, Sjostrom M, Bauman AE, Booth ML, Ainsworth BE, Oja P. International physical activity questionnaire: 12-country reliability and validity. *Med Sci Sports Exerc.* 2003; 35(8):1381–1395. [PubMed: 12900694]
- Downe-Wamboldt B. Content analysis: method, applications, and issues. *Health Care Women Int.* 1992; 13(3):313–321. [PubMed: 1399871]
- Downs DS, Hausenblas HA. Exercising for two: examining pregnant women's second trimester exercise intention and behavior using the framework of the theory of planned behavior. *Womens Health Issues.* 2003; 13(6):222–228. [PubMed: 14675791]
- Downs DS, Hausenblas HA. Elicitation studies and the theory of planned behavior: a systematic review of exercise beliefs. *Psychology of Sport and Exercise.* 2005; 6(1):1–31.
- Eikenberry N, Smith C. Healthful eating: perceptions, motivations, barriers, and promoters in low-income Minnesota communities. *J Am Diet Assoc.* 2004; 104(7):1158–1161. [PubMed: 15215777]
- Ekelund U, Sepp H, Brage S, Becker W, Jakes R, Hennings M, Wareham NJ. Criterion-related validity of the last 7-day, short form of the International Physical Activity Questionnaire in Swedish adults. *Public Health Nutr.* 2006; 9(2):258–265. [PubMed: 16571181]
- Elo S, Kyngas H. The qualitative content analysis process. *Journal of Advanced Nursing.* 2007; 62(1):107–115. [PubMed: 18352969]
- Evenson KR, Bradley CB. Beliefs about exercise and physical activity among pregnant women. *Patient Educ Couns.* 2010; 79(1):124–129. [PubMed: 19699603]
- Ferrari RM, Siega-Riz AM, Evenson KR, Moos MK, Carrier KS. A qualitative study of women's perceptions of provider advice about diet and physical activity during pregnancy. *Patient Educ Couns.* 2013; 91(3):372–377. [PubMed: 23399436]
- Flegal KM, Carroll MD, Kit BK, Ogden CL. Prevalence of obesity and trends in the distribution of body mass index among US adults, 1999–2010. *JAMA.* 2012; 307(5):491–497. [PubMed: 22253363]
- Fryar, CD.; Ervin, RB. Caloric intake from fast food among adults: United States, 2007–2010. NCHS data brief, no 114. Hyattsville, MD: National Center for Health Statistics; 2013.
- Goodrich K, Cregger M, Wilcox S, Liu J. A qualitative study of factors affecting pregnancy weight gain in African American women. *Matern Child Health J.* 2013; 17(3):432–440. [PubMed: 22527762]
- Groth SW, Kearney MH. Diverse women's beliefs about weight gain in pregnancy. *J Midwifery Womens Health.* 2009; 54(6):452–457. [PubMed: 19879517]
- Groth SW, Morrison-Beedy D, Meng Y. How pregnant African American women view pregnancy weight gain. *J Obstet Gynecol Neonatal Nurs.* 2012; 41(6):798–808.
- Guelinckx I, Devlieger R, Beckers K, Vansant G. Maternal obesity: pregnancy complications, gestational weight gain and nutrition. *Obes Rev.* 2008; 9(2):140–150. [PubMed: 18221480]
- Headen IE, Davis EM, Mujahid MS, Abrams B. Racial-ethnic differences in pregnancy-related weight. *Adv Nutr.* 2012; 3(1):83–94. [PubMed: 22332106]
- Hernandez DC. Gestational weight gain as a predictor of longitudinal body mass index transitions among socioeconomically disadvantaged women. *J Womens Health (Larchmt).* 2012; 21(10):1082–1090. [PubMed: 22694763]
- Herring SJ, Henry TQ, Klotz AA, Foster GD, Whitaker RC. Perceptions of low-income African-American mothers about excessive gestational weight gain. *Matern Child Health J.* 2012; 16(9):1837–1843. [PubMed: 22160656]
- Institute of Medicine and National Research Council. *Weight Gain During Pregnancy: Reexamining the Guidelines.* Washington, DC: The National Academies Press; 2009.

- IPAQ Research Committee. Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ) - Short Form. 2004. Retrieved January, 2014, from http://www.institutferran.org/documentos/scoring_short_ipaq_april04.pdf
- Kronenfeld LW, Reba-Harrelson L, Von Holle A, Reyes ML, Bulik CM. Ethnic and racial differences in body size perception and satisfaction. *Body Image*. 2010; 7(2):131–136. [PubMed: 20096656]
- Lau EY, Liu J, Archer E, McDonald SM, Liu J. Maternal weight gain in pregnancy and risk of obesity among offspring: a systematic review. *J Obes*. 2014; 2014:524939. [PubMed: 25371815]
- Mattran K, Mudd LM, Rudey RA, Kelly JS. Leisure-time physical activity during pregnancy and offspring size at 18 to 24 months. *J Phys Act Health*. 2011; 8(5):655–662. [PubMed: 21734310]
- McBride CM, Emmons KM, Lipkus IM. Understanding the potential of teachable moments: the case of smoking cessation. *Health Educ Res*. 2003; 18(2):156–170. [PubMed: 12729175]
- McEachan RRC, Conner M, Taylor NJ, Lawton RJ. Prospective prediction of health-related behaviours with the Theory of Planned Behaviour: a meta-analysis. *Health Psychology Review*. 2011; 5(2):97–144.
- Mudd LM, Owe KM, Mottola MF, Pivarnik JM. Health benefits of physical activity during pregnancy: an international perspective. *Med Sci Sports Exerc*. 2013; 45(2):268–277. [PubMed: 22895379]
- Muktabhant B, Lumbiganon P, Ngamjaras C, Dowswell T. Interventions for preventing excessive weight gain during pregnancy. *Cochrane Database Syst Rev*. 2012; 4:CD007145. [PubMed: 22513947]
- National Research Council and Institute of Medicine. Committee on the Impact of Pregnancy Weight on Maternal and Child Health. Board on Children, Youth, and Families, Division of Behavioral and Social Sciences and Education and Food and Nutrition Board, Institute of Medicine. Washington, DC: The National Academies Press; 2007. Influence of Pregnancy Weight on Maternal and Child Health: Workshop Report.
- Nehring I, Schmoll S, Beyerlein A, Hauner H, von Kries R. Gestational weight gain and long-term postpartum weight retention: a meta-analysis. *Am J Clin Nutr*. 2011; 94(5):1225–1231. [PubMed: 21918221]
- Olson CM. Achieving a healthy weight gain during pregnancy. *Annu Rev Nutr*. 2008; 28:411–423. [PubMed: 18422452]
- Olson CM, Strawderman MS, Dennison BA. Maternal weight gain during pregnancy and child weight at age 3 years. *Matern Child Health J*. 2009; 13(6):839–846. [PubMed: 18818995]
- Padmanabhan U, Summerbell CD, Heslehurst N. A qualitative study exploring pregnant women's weight-related attitudes and beliefs in UK: the BLOOM study. *BMC Pregnancy Childbirth*. 2015; 15:99. [PubMed: 25895679]
- Paeratakul S, Ferdinand DP, Champagne CM, Ryan DH, Bray GA. Fast-food consumption among US adults and children: dietary and nutrient intake profile. *J Am Diet Assoc*. 2003; 103(10):1332–1338. [PubMed: 14520253]
- Simas TA, Liao X, Garrison A, Sullivan GM, Howard AE, Hardy JR. Impact of updated Institute of Medicine guidelines on prepregnancy body mass index categorization, gestational weight gain recommendations, and needed counseling. *J Womens Health*. 2011; 20(6):837–844.
- Stengel MR, Kraschnewski JL, Hwang SW, Kjerulff KH, Chuang CH. “What my doctor didn't tell me”: examining health care provider advice to overweight and obese pregnant women on gestational weight gain and physical activity. *Womens Health Issues*. 2012; 22(6):e535–540. [PubMed: 23122213]
- Stotland NE, Cheng YW, Hopkins LM, Caughey AB. Gestational weight gain and adverse neonatal outcome among term infants. *Obstet Gynecol*. 2006; 108(3 Pt 1):635–643. [PubMed: 16946225]
- Strauss, A.; Corbin, J. Basics of qualitative research: techniques and procedures for developing grounded theory. 2. Thousand Oaks, CA: Sage; 1998.
- Sui Z, Turnbull DA, Dodd JM. Overweight and Obese Women's Perceptions About Making Healthy Change During Pregnancy: A Mixed Method Study. *Matern Child Health J*. 2013; 17(10):1879–1887. [PubMed: 23263891]
- Symons Downs D, Hausenblas H. The theories of reasoned action and planned behavior applied to exercise: a meta-analytic update. *J Phys Act Health*. 2005; 2:76–97.

- Thangaratinam S, Rogozinska E, Jolly K, Glinkowski S, Duda W, Borowiack E, Khan KS. Interventions to reduce or prevent obesity in pregnant women: a systematic review. *Health Technol Assess*. 2012; 16(31):iii–iv. 1–191. [PubMed: 22814301]
- U.S. Department of Agriculture and U.S. Department of Health and Human Services. *Dietary Guidelines for Americans*, 2010. 7. Washington, D.C: U.S. Government Printing Office; 2010.
- U.S. Department of Health and Human Services. 2008 Physical Activity Guidelines for Americans. 2008. Retrieved from <http://health.gov/PAGuidelines/>
- Vesco KK, Sharma AJ, Dietz PM, Rizzo JH, Callaghan WM, England L, Hornbrook MC. Newborn size among obese women with weight gain outside the 2009 Institute of Medicine recommendation. *Obstet Gynecol*. 2011; 117(4):812–818. [PubMed: 21422851]
- White KM, Terry DJ, Troup C, Rempel LA. Behavioral, normative and control beliefs underlying low-fat dietary and regular physical activity behaviors for adults diagnosed with type 2 diabetes and/or cardiovascular disease. *Psychol Health Med*. 2007; 12(4):485–494. [PubMed: 17620212]

Highlights

- Knowledge gaps exist in pregnant women's perceptions of weight-related behaviors
- Perceptions of weight-related behaviors during pregnancy differ by race
- Interventions should educate pregnant women about common misperceptions

Table 1

Sample Questions from Interview Guide

Topics	Sample questions
Weight Gain	
Intentions	How much total weight do you plan on gaining during this pregnancy?
Attitude	What are some good things that could happen if you gain a healthy amount of weight during pregnancy? What are some bad things that could happen if you gain too much weight during this pregnancy?
Subjective Norm	Who influences how you think about your pregnancy weight gain? Whose advice or opinion about pregnancy weight gain do you most value or trust?
Perceived Behavioral Control	What do you think about the weight gain guidelines? What could make it hard for you meet these guidelines during this pregnancy? What could help you meet these guidelines during this pregnancy?
Physical Activity	
Intentions	What plans do you have to exercise during the rest of your pregnancy, if any?
Attitude	What are some good things that could happen if you exercise during your pregnancy? What are some risks or bad things that could happen if you exercise during your pregnancy?
Subjective Norm	Who influences your exercise behaviors during pregnancy? Whose advice or opinion about exercise during pregnancy do you most value or trust?
Perceived Behavioral Control	What do you think about the exercise guidelines? What could make it hard for you meet these exercise guidelines during this pregnancy? What could help you meet these exercise guidelines during this pregnancy?
Nutrition	
Intentions	What type of diet do you plan on eating during this pregnancy?
Attitude	What are some good things that could happen if you eat a healthy diet during pregnancy? What are some bad things that could happen if you eat an unhealthy diet during pregnancy?
Subjective Norm	Who influences your nutrition behaviors during pregnancy? Whose advice or opinion about nutrition during pregnancy do you most value or trust?
Perceived Behavioral Control	What do you think about the nutrition guidelines? What could make it hard for you meet these nutrition guidelines during this pregnancy? What could help you meet these nutrition guidelines during this pregnancy?

Table 2

Participant Characteristics

Characteristic	All (N=30)		African American (N=15)		White (N=15)		p-value ^d
	N	%	N	%	N	%	
Marital Status							0.427
Single	21	70.0	12	80.0	9	60.0	
Married	9	30.0	3	20.0	6	40.0	
Education ^b							0.068
< HS graduate	5	16.7	4	26.7	1	6.7	
HS graduate or GED	10	33.3	6	40.0	4	26.7	
Some college	10	33.3	4	26.7	6	40.0	
College graduate	5	16.7	1	6.7	4	26.7	
Employment Status							0.464
Employed	14	46.7	6	40.0	8	53.3	
Unemployed	16	53.3	9	60.0	7	46.7	
Annual household income ^c							0.096
< \$15,000	15	50.0	9	64.3	5	33.3	
\$15,000–\$24,999	5	17.2	3	21.4	2	13.3	
\$25,000–\$49,999	4	13.8	0	0.0	4	26.7	
> \$50,000	6	20.7	2	14.3	4	26.7	
Parity ^d							0.717
0	17	56.7	8	53.3	9	60.0	
1	6	20.0	3	20.0	3	20.0	
2	7	23.3	4	26.7	3	20.0	
Self-Rated Health ^e							0.027
Excellent	2	6.7	0	0.0	2	13.3	
Very good	13	43.3	4	26.7	9	60.0	
Good	13	43.3	9	60.0	4	26.7	
Fair	2	6.7	2	13.3	0	0.0	
Physical Activity ^f							0.450

Characteristic	All (N=30)			African American (N=15)			White (N=15)			p-value ^d
	N	%		N	%		N	%		
Inactive	8	24.2		3	20.0		2	13.3		
Minimally Active	6	18.2		1	6.7		5	33.3		
Exceeding Recommendations	19	57.6		11	73.3		8	53.3		
Fruit & Vegetable Intake										0.456
< 5 cups/day	12	40.0		7	46.7		5	33.3		
5 cups/day	18	60.0		8	53.3		10	66.7		
Smoking										
Before pregnancy	15	50.0		7	46.7		8	53.3		0.715
During pregnancy	7	23.3		2	13.3		5	33.3		0.195
Chronic Health Conditions	5	16.7		4	26.7		1	6.7		0.330
	Mean (SD)			Mean (SD)			Mean (SD)			p-value
Age, years	26.6 (5.7)	18.0–41.0		25.9 (6.9)	18.0–41.0		27.2 (4.3)	20.0–34.0		0.551
Pre-pregnancy BMI, kg/m ²	28.2 (6.6)	19.0–45.2		28.6 (7.6)	19.0–45.2		27.8 (5.6)	19.0–39.9		0.747

Abbreviations: HS = High School, BMI = Body Mass Index

^aDifferences by race in participant characteristics were tested using chi-square, Fisher's exact tests, or t-tests as appropriate (p<.05).

^bFor statistical analyses, education was categorized as HS graduate or less and some college or more.

^cAnnual household income was categorized as <\$15,000 or ≥\$15,000.

^dParity was categorized as nulliparous or parous.

^eSelf-rated health was categorized as excellent/very good or good/fair.

^fPhysical activity was categorized as low/moderate or high.

Table 3

Women's Perceptions of Weight Gain, Physical Activity, and Nutrition during Pregnancy

Topic	Themes	Overall N=30	African American N=15	White N=15
Weight Gain				
Intentions	Below IOM guidelines *	5	4	1
	Within IOM guidelines *	13	5	8
	Above IOM guidelines	11	5	6
	Unsure	1	1	0
Advantages	Good for baby's health	19	9	10
	Good for baby's weight	11	6	5
	Good for mother's health	7	3	4
	Baby won't have health complications	6	4	2
Disadvantages	Easier to lose weight	6	2	4
	Health risks for mother	17	8	9
	Harder to lose the weight	12	5	7
	Health risks for baby	10	5	5
Influential others	Hard to be active *	9	2	7
	Large baby	7	4	3
	Doctor	14	8	6
	Self*	12	3	9
Barriers	Partner	8	3	5
	Mother	7	4	3
	Poor dietary habits	7	3	4
	Cravings	6	2	4
Enablers	Eating a healthy diet	17	9	8
	Exercise *	13	5	8
	Portion control *	7	5	2
Physical Activity				
Intentions	Meeting guidelines *	13	5	8
	Insufficiently active	15	8	7
	Inactive	2	2	0
Advantages	Labor and delivery benefits	21	10	11
	Healthy mother	11	6	5
	Less weight gain	11	7	4
	Healthy baby	10	5	5
Disadvantages	Preterm labor	11	6	5
	Risk of injury *	9	2	7
	Strain on your body	8	3	5
	May harm the baby *	7	1	6

Topic	Themes	Overall N=30	African American N=15	White N=15
Influential others	Self*	14	4	10
	Partner	13	7	6
	Mother*	7	6	1
Physical Activity				
Barriers	Hot weather*	8	2	6
	Lack of motivation*	7	6	1
	Lack of time	6	2	4
Enablers	Social support	14	8	6
Nutrition				
Intentions	Increase fruit & vegetable intake	29	15	14
	Meeting dietary guidelines*	19	7	12
	Not meeting dietary guidelines*	10	8	2
	Decrease fried foods*	9	7	2
	Unsure	1	0	1
Advantages	Healthy baby	21	11	10
	Healthy mother	16	9	7
	Helps with growth and development of baby*	11	4	7
	Healthy weight gain for mother	11	6	5
Disadvantages	Excessive weight gain*	14	3	11
	Increased risk of health complications for mother	13	6	7
	Unhealthy for mother	11	5	6
	Unhealthy for baby	10	4	6
	Negative impact on baby's weight	6	3	3
Influential others	Self*	16	6	10
	Partner	13	7	6
	Doctor	11	5	6
Barriers	Cost or access	10	4	6
	Negative influence of others	8	4	4
	Taste preference	8	5	3
	Cravings	7	3	4
Enablers	Increased access	9	5	4
	Social support	8	3	5
	Knowledge	8	4	4
	Motivation or willpower	6	4	2

Data presented as n;

* differences 3 in themes by race