Matern Child Health J (2012) 16:1180–1187
DOI 10.1007/s10995-011-0883-9

Low-Income African American Women's Beliefs Regarding Exercise during Pregnancy

Elizabeth E. Krans · Judy C. Chang

Published online: 11 September 2011

Abstract Exercise may decrease the incidence of obesity and obesity related complications during pregnancy including gestational diabetes and preeclampsia. African American women are at higher risk for obesity and physical inactivity during pregnancy when compared to other patient groups. The purpose of this qualitative study was to describe in detail the unique beliefs and perspectives regarding exercise during pregnancy of African American women. A series of 6 focus groups discussions with pregnant African American women were audio-recorded and transcribed verbatim. Focus group transcripts were qualitatively analyzed for major themes and independently coded for beliefs regarding exercise during pregnancy. A total of 34 pregnant, African American women participated in 6 focus group discussions. The majority of women were single (94%), had only a high school education (67%), received Medicaid (100%) and had a mean BMI of 33 kg/m^2. Three major themes emerged regarding our subjects' beliefs about exercise during pregnancy: (1) women had a broad definition of what types of activities constituted exercise, (2) women believed exercise was generally beneficial during pregnancy and (3) women believed certain types of activities or movements could cause problems with pregnancy. African American women overwhelmingly believe that exercise positively impacts pregnancy. A lack of knowledge concerning the benefits of exercise during pregnancy was not found to be a major contributor to inactivity in African American women. However, health care providers should be aware of cultural myths that prevent many African American women from performing certain activities during pregnancy.

Keywords African American · Exercise · Pregnancy

E. E. Krans (✉)
Robert Wood Johnson Foundation Clinical Scholars Program, Department of Obstetrics and Gynecology, University of Michigan, 6312 Medical Science Bldg. 1, 1150 W. Medical Center Drive, Ann Arbor, MI 48109-5604, USA
e-mail: kransee@upmc.edu

J. C. Chang
Department of Obstetrics, Gynecology and Reproductive Sciences, University of Pittsburgh, Pittsburgh, PA, USA

Introduction

Maternal obesity is one of the leading causes of maternal and neonatal morbidity during pregnancy. Obese women have greater rates of gestational diabetes, gestational hypertension, preeclampsia, antepartum stillbirth, cesarean section and fetal macrosomia compared to women who have a body mass index (BMI) less than 30 kg/m^2 [1–4]. Exercise has the potential to reduce the incidence of obesity and obesity related complications during pregnancy. In a randomized controlled trial of exercise during pregnancy, women who adhered to an exercise program of aerobics and strength training had a significant reduction in gestational weight gain and postpartum weight retention [5]. Exercise during pregnancy has also been specifically correlated with a decrease in the incidence of gestational diabetes, particularly in morbidly obese women (BMI $>$ 33) [6, 7]. As a result, the American College of Obstetricians and Gynecologists (ACOG) recommends 30 min or more of moderate exercise on most days of the week during pregnancy [7].

However, despite these recommendations, rates of obesity and excessive gestational weight gain continue to rise. In 2009, approximately 53% of women in the United States were overweight prior to pregnancy and over 48% had a greater than ideal weight gain during pregnancy [8].

Among women of childbearing age, the rate of obesity is disproportionately represented among African American women [9–12]. In 2004, 31.5% of African American women were obese (BMI $\geq$ 30) immediately prior to pregnancy compared to 20.5% of Caucasian women [10].

Disproportionate increases in prepregnancy obesity among African American women have also been accompanied by excessive gestational weight gain. In an analysis of weight gain during pregnancy in African American women, 64% of women gained an excessive amount of weight during pregnancy based on Institute of Medicine (IOM) recommendations [13]. Women who were obese or overweight were also more likely to gain excessive weight than any of the other weight groups.

African American women also have higher rates of physical inactivity when compared to their Caucasian and Hispanic counterparts [14]. An evaluation of national patterns of physical activity among pregnant women indicates that the odds of meeting recommendations for physical activity was significantly higher among Caucasian women than among women of other racial and ethnic groups [15]. In an analysis of pregnant, low-income, African American women, over 35% reported no exercise and 56.1% reported only non-strenuous physical activity during pregnancy [16]. In response to disparate patterns of weight gain and inactivity among African American women, the IOM noted in their 2009 recommendations for weight gain during pregnancy that "special attention should be given to low-income and minority women who are more likely to be in higher BMI categories, consume diets of poor nutritional quality and get less exercise during pregnancy [17]."

African American women are at high-risk for obesity and inactivity during pregnancy and an in-depth evaluation of their unique beliefs is essential to design effective, targeted interventions. The current study is a qualitative description of African American women's own ideas and beliefs about physical activity during pregnancy. This assessment will enable health care providers provide tailored counseling, education and ultimately, more effective exercise interventions for pregnant African American women.

Methods

Study Design

This qualitative study elicited African American women's perspectives and beliefs regarding exercise during pregnancy through a series of focus group interviews and utilized a grounded theory approach. Grounded theory focuses on generating theory or hypotheses from emerging concepts in contrast to theory generated by logical deduction from a priori assumptions [18]. Focus group discussions were chosen to facilitate a dynamic exchange of ideas, experiences, beliefs and concerns. The study was reviewed and approved by the Institutional Review Board at the University of Pittsburgh prior to the start of the study.

Sampling

We used a purposeful sampling strategy to identify African American pregnant women eligible for focus group interviews. We chose a purposeful sampling strategy to intentionally select "information-rich cases" that would provide us with an in-depth understanding of the beliefs of African American women [18]. Study participants were recruited from three community health clinics in low socioeconomic status, urban neighborhoods in Pittsburgh, Pennsylvania. The clinics in these neighborhoods provide services for traditionally underserved patient populations and enabled us to recruit women from predominantly low-income, African American backgrounds. Community health workers approached African American patients presenting for prenatal care visits at all three community health clinics over a 4 month period of time. Community health workers briefly described the content of the focus group discussion, information about the time and date of the focus group session and outlined the incentives offered with participation. Women interested in participating and who were determined eligible to participate by community health workers were scheduled for the next, prearranged focus group session. Participants were contacted 2 days prior to the focus group session by the principal investigator to confirm participation. Women who did not attend were unable to be contacted or simply chose not to attend. Women were offered lunch and a 25-dollar gift card to a local grocery store chain for participating in a focus group session.

Individuals were eligible to participate if they were pregnant at any gestational age, African American, at least 18 years old and had a low-risk pregnancy at the time of the focus group discussion. A low-risk pregnancy was defined as a pregnancy that was not complicated by any maternal morbidities such as chronic hypertension, any fetal morbidities such as intrauterine growth restriction (IUGR) or any other pregnancy complications such as preeclampsia, gestational diabetes or preterm labor.

Data Collection

We conducted 6 focus groups with 2–8 participants in each group; a total of 34 women participated. One focus group session had less than four participants. However, the major themes expressed during this focus group session were consistent with the larger focus group sessions and

therefore, were included in our analysis. Each focus group was conducted at the community health clinic where the participants were originally recruited and received their prenatal care. At the start of each focus group session, verbal informed consent was taken from each of the participants. Participants then filled out a short, anonymous participant information questionnaire. The questionnaire collected sociodemographic information including age, prepregnancy weight and height to calculate BMI (kg/m^2), marital status, education, employment, annual household income, gravity, parity, insurance status and presence or absence of prepregnancy and pregnancy exercise. Because we asked each participant to define "exercise" at the start of the focus group sessions, we did not use a standard definition of exercise in the questionnaire.

Focus group sessions were led by one of two moderators (EK) and (JC), who had received training in qualitative research methods and focus group methodology and each moderator was accompanied by a note-taker who was trained in qualitative note taking. We used a discussion guide with open-ended, semi-structured questions to elicit ideas, perspectives and beliefs regarding exercise during pregnancy and to stimulate discussion (Appendix). The questions utilized in our discussion guide were pilot tested with pregnant African American women and reviewed by health care providers in obstetrics. Each focus group was digitally audio-recorded and lasted approximately 60–90 min. The note-taker recorded the non-verbal actions (i.e. head nodding) that could not be recorded on audio-recording.

Data Analysis

A professional transcriptionist transcribed all digital audiocassette recordings verbatim and the moderator reviewed each transcript for accuracy. During the initial phase of analysis, a coding team composed of three coders created a series of preliminary codes from phrases of similar meaning that emerged in the first two focus group transcripts in an inductive fashion. The coding team then independently analyzed each transcript and assigned codes to individual words, phrases, and sentences. Using an iterative process of content analysis, the coding team met periodically to arbitrate any differences in interpretation and refine and expand codes as novel themes and concepts emerged until a final coding scheme was defined. The final coding scheme was then used to recode all of the transcripts. ATLAS.ti 5.0 qualitative data analysis software was used to assist in organizing data transcribed from focus group sessions into codes and themes. Major themes representing participant's beliefs were evaluated according to frequency of mention throughout all 6 focus group sessions. Thematic saturation of the major themes was reached by the fourth focus group.

Results

A total of 34 African American pregnant women participated in 6 focus group sessions (Table 1). On average, 5 women participated in each focus group session (range 2–8). Focus group participants ranged in age from 18 to 30 and BMI's ranged from 22 to 46 kg/m^2. The majority of participants were unmarried, had only a high school education, earned an annual household income of <$10,000 and received Medicaid. The majority of participants were also nulliparous and classified as obese (BMI > 30 kg/m^2) based on their pre-pregnancy body mass index. The majority of women also self-reported exercise prior to

Table 1 Focus group participant characteristics

Focus group participant characteristics (n = 34)	
Age in years	
Mean (range)	23 (18–30)
Pre-pregnancy BMI (kg/m^2)	
Mean (range)	33 (22–46)
Annual household income (%)	
<$10,000	52
$10,000–19,000	31
$20,000–29,000	7
$30,000–39,000	3
>$40,000	7
Insurance (%)	
Medicaid	100
Employment (%)	
Working outside of home	55
Unemployed, laid off, looking for work	23
Enrolled in school	22
Education completed (%)	
High school/GED	67
Community college/trade school (≤2 years)	29
Undergraduate college (>2 years)	4
Marital status (%)	
Single	94
Married	6
Gravity (%)	
Nulliparous	53
Multiparous	47
Gestational age (%)	
First trimester	15
Second trimester	38
Third trimester	47
Exercise habits (%)	
Exercised before pregnancy	64
Exercised during pregnancy	55

pregnancy and although less frequently, the majority of women also self-reported exercise during pregnancy.

We identified three major themes regarding our subjects' beliefs about exercise during pregnancy: (1) women had a broad definition of what types of activities constituted exercise, (2) women perceived exercise was generally beneficial during pregnancy and (3) women believed certain types of activity or movements could cause problems with the pregnancy. In the following sections, we provide additional details regarding these perspectives and have included illustrative quotations.

Defining Exercise: Exercise as an Activity of Daily Living

Throughout the focus group sessions, women believed that many of the routine activities of daily living that they performed on a regular basis constituted exercise. Many women had jobs that were labor intensive or physically demanding while other women did not own a car or live close to public transportation and had to walk to work. Both walking as a form of transportation and the physical demands of employment were how many women incorporated exercise into their day.

> "I said the hills when you don't have a car…Going up a hill…Without a car, that's exercise."

Another woman noted:

> "I don't exercise in the gym, but I do at work. I'm forced to [exercise] actually [as a nurse's aid]—like lifting and pulling and pushing and never get to sit down…And after that it's just like call bells, call bells all day."

Another woman agreed discussing the physical demands at her job:

> "I'm always on my feet because I'm a sales associate… So I'm constantly moving. And then doing displays. So, I'm not working just lower part, but upper body as well."

Women also discussed that they exercised by taking care of their children and performing household chores. Cooking, cleaning and doing the laundry were seen as "exhausting" and just as significant as going to the gym.

> "I think society, when it comes to exercise, they think that you have to be like on this time schedule to do it. Okay. Monday, Wednesday and Friday I'm going to work out…To me, being a mother…you exercising. By the time you get up, walking around your house, making breakfast, getting your kids ready for school, packing lunches. That's all exercise."

Another woman noted:

> "I have four kids. I would think like running around the house behind them is like exercise. And even cleaning my house to me is exercise. I don't know if there's any rule on what exercise is."

Benefits of Exercise in Pregnancy: Exercise Prevents Weight Gain and Eases Labor

All of the women who participated in each of our focus group sessions believed that exercise was beneficial during pregnancy.

> "I think the bottom line is as far as exercising, I think it's like the best thing for the baby—I mean to do while you're pregnant."

Family members also believed that exercise was beneficial during pregnancy and encouraged our participants to exercise.

> "Well, my mom, she says it's very important because if you don't move around, you'll get sore and achy. And she said that you just have a better pregnancy when you do exercise."

Many women in the focus group sessions were self-conscious about the physical changes that occurred with increased weight gain during pregnancy. Participants also astutely recognized that excess weight gained during pregnancy is difficult to lose postpartum and can initiate a lifelong struggle with obesity. As one woman explained:

> "So it's like I be trying to do whatever because I know it's so hard to get rid of, you know, the excess weight after you have the baby. So I try to, I try to do as much [exercise] as I could."

Another woman noted:

> "I mean just basically you don't want to gain too much weight. You know what I mean? Because it's really hard to lose it. And so you could have a good pregnancy, you know."

Another woman commented:

> "I mean when I look at myself, I see more fat on my legs. And I'll be like dang, I need to do something."

In addition to preventing excess weight gain during pregnancy, the overwhelming majority of women believed that exercise would help make the labor and delivery process easier, faster and less painful. The desire to avoid having a "hard labor" became a strong motivator to exercise during pregnancy. Many women stated that they learned about how exercise can help the labor and delivery

process through advice and encouragement from their family members and partners. One woman stated:

> "Because they say if you're not active during pregnancy, when it does come time for you to have the baby, you're going to have a hard labor."

Another woman agreed:

> "It would help with the birth…That's what they say. And afterward it's supposed to make it easier to tighten back up."

One woman noted the physiological benefits from exercise:

> "I would just think that maybe it would help your blood pressure or like your heart as you're going—you know, because everything gets a little faster when you're actually having the baby. I would just think that it would make your body a little bit stronger for that. More relaxed…"

Another woman mentioned that exercise also helped her relieve stress:

> "I think it pretty much all goes back to making your pregnancy less stressful, you know. Make it easier to have the baby."

Concerns About Exercise During Pregnancy

While participants believed that exercise in general was beneficial during pregnancy, several women had concerns that too much exercise could harm the pregnancy. Concerns about "overdoing it" while exercising created fears about having a miscarriage.

> "I just been afraid of having a miscarriage, you know. Just putting too much stress on the baby. That's all."

Another woman also expressed concerns noting:

> "If you're overactive, then like you go on bed rest [and if] the baby comes early and then you'll have problems."

A lack of knowledge concerning the type, duration and frequency of exercise that was safe during pregnancy was evident by the comments of several participants. One woman noted:

> "[I'm] scared that I'm doing the wrong thing and something is going to go wrong. You know what I mean? Something is going to go wrong with my baby."

In addition to expressing concerns about overexertion, many participants believed certain movements could be harmful to the baby. One of the most common beliefs expressed was that if a pregnant woman raised her arms above the head, this would lead to the umbilical cord getting wrapped around the fetal neck, and risk strangling the fetus. This particular belief was perpetuated by family members and prevented many of the women from participating in a variety of activities including housework and from a variety of exercises including yoga and stretching.

> "Don't be stretching your arms. You're going to choke the baby. I was so scared to do it with my son. I kept going like this like oh damn. I can't even stretch."

Another woman commented:

> "…this one woman who was doing a yoga class and one of the instructions was where they put their arms over their head and bring their arms—I mean I guess it would be okay, you know what I mean, if you seen them doing it. But from what my family's telling me, you're not supposed to do it. Don't reach over your head. Don't open up no cabinets. If you can't reach it, get us to get it."

One woman even stopped braiding her hair because she was afraid that raising her arms above her head would result in fetal strangulation:

> "I've heard don't raise your arms up too much because you can get the cord wrapped around the neck. Because I do my own hair and … my boyfriend's sister is like no you can't. Like after so many months you can't do it because the cord will get wrapped around…I don't know if that's true or not, but that's what she said."

Discussion

Our qualitative study addresses the beliefs regarding exercise during pregnancy of African American pregnant women. Our findings indicate that African American women often define exercise as an activity of daily living such as housework and childcare in contrast to an activity performed outside of their daily routine. Many of the women in our study were single moms who were the primary caregivers for their children as well as the sole source of income for their families. Exercise outside of their daily routine was often not a viable option due to lack of social support and financial constraints. These findings support previous qualitative studies of low-income Latina women who also often considered exercise to be synonymous with activities of daily living such as housekeeping, childcare and work related physical activity [19]. Our qualitative findings also support

quantitative evaluations of physical activity patterns during pregnancy. The highest levels of energy expenditure during all three trimesters have been found to be due to performing household chores and caregiving activities [20].

The women in our study also overwhelmingly believed that exercise positively impacts pregnancy. This finding suggests that a lack of knowledge concerning the benefits of exercise during pregnancy is not a major contributor to inactivity in African American women. This finding also corroborates the findings of qualitative assessments of other minority populations. Kieffer and colleagues described the beliefs regarding exercise during pregnancy of low-income Latina, predominantly Spanish speaking women in inner city Detroit. Latina women also believed that exercise was safe and beneficial during pregnancy and would make their labor "easier" and "less painful [19]." Our participant's beliefs were also positively influenced by family members. Mothers, partners and siblings often were the primary source of information for participants on the benefits of exercise during pregnancy. Positive social support from family members on weight-related issues has also been demonstrated among Latina women [21].

Many women were also acutely aware that weight gain during pregnancy is often a precursor to a lifelong battle with obesity. Many women believed that exercise would help them avoid excessive weight gain during pregnancy. Studies of non-pregnant women also confirm this perception [22]. In a qualitative evaluation of obese African American women, participants often attributed their obesity to excess weight gained during pregnancy that they were unable to lose after delivery [23]. An evaluation of postpartum African American women similarly concluded that women had a strong desire to lose weight after delivery and reported serious concerns about "the negative impact of excess weight on their general health [24]."

Despite the perceived benefits of exercise during pregnancy, several participants expressed concerns about performing too much exercise during pregnancy. A lack of detailed information about the type, frequency and duration of exercise that is safe to perform during pregnancy prevented some women from exercising. In addition, participants also described several cultural myths regarding certain types of activity during pregnancy. Women in each focus group described concern and hesitation to perform activities that would require them to place their arms over their heads. Across all focus groups, women believed that if their arms were raised, the umbilical cord would wrap around the baby's neck resulting in the strangulation and death of the fetus. The pervasive nature of this myth throughout each one of our focus group sessions illustrates a well-established cultural belief that has also been described in the social sciences literature in women of African descent [25]. In a qualitative evaluation of African American women, mothers warned that lifting both arms overhead would result in the elevation of the umbilical cord to the level of the baby's neck possibly resulting in strangulation [26]. While this belief may not initially seem medically relevant, the resulting fear prevented many women from performing exercises such as stretching and yoga.

Limitations

This study utilized qualitative methods and purposive sampling and its results cannot be generalized to patient populations that are not African American, are not pregnant and that do not live in low-income communities. The majority of participants in our study were also single mothers and our results may not necessarily reflect the perspectives of all low-income African American women with alternative family structures or support systems.

The majority of our sample population also performed some degree of exercise prior to pregnancy. As a result, our participants may have been positively biased towards positive beliefs about exercise during pregnancy and these results may not be similar in more sedentary populations. We also did not define "exercise" for participants in order to avoid bias when eliciting participants own definition of exercise. Consequently, our results may not be comparable to studies utilizing a standardized definition of exercise. While our participant's mean BMI was obese (33 kg/m^2), all participants were not obese and our results may not be transferable to an exclusively obese population. We also did not correlate weight and self-reported physical activity with responses and were not able to determine associations between BMI, self-reported exercise and beliefs.

Conclusions

Our in-depth assessment of the perceptions and beliefs of African American women will enable the healthcare community to develop educational initiatives and design exercise interventions that can address the unique needs of African American women. A growing body of community based participatory research indicates that intervention strategies that reflect the cultural preferences and environmental context of participants are much more likely to succeed in modifying health related behavior [27].

Health care providers should inquire into the perceived level of activity that each woman has during work or during household and childcare activities. Women who are active at work or with their children may be reluctant to take additional time to perform more traditional types of exercises. During the first prenatal care visit, providers should routinely discuss physical activity, gestational weight gain

and nutrition recommendations and assist patients in finding ways to incorporate more physical activity into their busy daily routines. A list of approved exercises such as walking, aerobics and yoga and concrete recommendations regarding the duration and frequency of exercise such as "30 min/day on most days of the week" could help women modify their beliefs and improve health behavior [7].

In addition to promoting the benefits of exercise during pregnancy, health care providers should focus on providing specific recommendations regarding the type, frequency and duration of exercise that is safe to perform during pregnancy to dispel fears about "over exertion" and doing "too much" exercise. Specific guidance will help to dispel unsubstantiated fears and give women reassurance that their activity of choice is safe during pregnancy. Health care providers should also be acutely aware of cultural myths that prevent many African American women from performing certain activities during pregnancy. Inquiring about cultural beliefs and reassuring women about the safety of certain activities will increase the types of exercise available to African American women such as stretching and yoga after misperceptions are dispelled.

Acknowledgments This research was supported by The Amy Roberts Health Promotion Research Fund through the Magee Women's Hospital Research Institute, University of Pittsburgh. The efforts of Dr. Chang were supported by the Agency for Healthcare Research and Quality (AHRQ 1 K08 HS13913-01A1; PI-Chang). The efforts of Dr. Krans were supported by the Robert Wood Johnson Foundation Clinical Scholars Program. The authors thank Michelle Ondeck, RN for assistance with note taking during focus groups and Jill Enyeart, RN for her assistance with participant recruitment. The authors would also like to thank James M. Roberts, MD for his support and mentorship.

Appendix

See Table 2.

Table 2 Discussion guide

When you think of the word "exercise," what do you think about?
What activities do you consider to be exercise?
How would you define exercise?
What do you think about exercise during your pregnancy?
What have you heard about exercising during pregnancy?
Who has talked to you about exercise during pregnancy?
What are your worries about it?
How do you think it might hurt your pregnancy?
What do you think would be good about it?
How do you think it might help your pregnancy?
What kinds of exercises have you done during pregnancy?
What kinds of exercises have you not been able to do because of pregnancy?

References

1. ACOG. (2005). Obesity in pregnancy. ACOG Committee opinion no. 315. American college of obstetricians and gynecologists. *Obstetrics and Gynecology, 106*, 671–675.
2. Cedergren, M. I. (2004). Maternal morbid obesity and the risk of adverse pregnancy outcome. *Obstetrics and Gynecology, 103*, 219–224.
3. Weiss, J. L., Malone, F. D., Emig, D., et al. (2004). Obesity, obstetric complications and cesarean delivery rate—A population-based screening study. *American Journal of Obstetrics and Gynecology, 190*, 1091–1097.
4. Kabiru, W., & Raynor, B. D. (2004). Obstetric outcomes associated with increase in BMI category during pregnancy. *American Journal of Obstetrics and Gynecology, 191*, 928–932.
5. Haakstad, L. A., & Bo, K. (2011). Effect of regular exercise on prevention of excessive weight gain in pregnancy: A randomized controlled trial. *European Journal of Contraception, 16*, 116–125.
6. ACOG. (2001). Gestational diabetes. ACOG Practice Bulletin no. 30. American college of obstetricians and gynecologists. *Obstetrics and Gynecology, 98*, 525–538.
7. ACOG. (2002). Exercise during pregnancy and the postpartum period. ACOG Committee opinion no. 267. American college of obstetricians and gynecologists. *Obstetrics and Gynecology, 99*, 171–173.
8. CDC. (2009). *Pregnancy Nutrition Surveillance, Table 5D*. Division of Nutrition, Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion. Web. 10 October 2010. http://www.cdc.gov/PedNSS/pnss_tables/pdf/national_table5.pdf.
9. Ogden, C. L., Carroll, M. D., Curtin, L. R., McDowell, M. A., Tabak, C. J., & Flegal, K. M. (2006). Prevalence of overweight and obesity in the United States, 1999–2004. *Journal of American Medical Association, 295*, 1549–1555.
10. Kim, S. Y., Dietz, P. M., England, L., Morrow, B., & Callaghan, W. M. (2007). Trends in pre-pregnancy obesity in nine states, 1993–2003. *Obesity, 15*, 986–993.
11. Ehrenberg, H. M., Dierker, L., Milluzzi, C., & Mercer, B. M. (2002). Prevalence of maternal obesity in an urban center. *American Journal of Obstetrics Gynecology, 187*, 1189–1193.
12. Ogden, C. L., & Carroll, M. D. (2010). *Prevalence of overweight, obesity and extreme obesity among adults: United States, trends 1976–1980 through 2007–2008*. National Center for Health Statistics. Web. 1 June 2010. http://www.cdc.gov/nchs/data/hestat/obesity_adult_07_08.pdf.
13. Lederman, S. A., Alfasi, G., & Deckelbaum, R. J. (2002). Pregnancy-associated obesity in black women in New York City. *Maternal and Child Health Journal, 6*, 37–42.
14. Eyler, A. A., Baker, E., Cromer, L., King, A. C., Browson, R. C., & Donatelle, R. J. (1998). Physical activity and minority women: A qualitative study. *Health Education & Behavior, 25*, 640–652.
15. Evenson, K. R., & Wen, F. (2010). National trends in self-reported physical activity and sedentary behaviors among pregnant women: NHANES 1999–2006. *Preventive Medicine, 50*, 123–128.
16. Orr, S. T., James, S. A., Garry, J., Prince, C. B., & Newton, E. R. (2006). Exercise and pregnancy outcome among urban, low-income, black women. *Ethnicity and Disease, 16*, 933–937.
17. Rasmussen, K. M., & Yaktine, A. L. (Eds.). (2009). *Weight gain during pregnancy: Reexamining the guidelines*. Washington DC: The National Academies Press.
18. Patton, M. Q. (2002). *Qualitative research & evaluation methods* (3rd ed.). Thousand Oaks: Sage Publications.
19. Kieffer, E. L., Willis, S. K., Arellano, N., & Guzman, R. (2002). Perspectives of pregnant and postpartum Latino women on

diabetes, physical activity and health. *Health Education & Behavior, 29*, 542–556.
20. Schmidt, M. D., Pekow, P., Freedson, P. S., Markenson, G., & Chasan-Taber, L. (2006). Physical activity patterns during pregnancy in a diverse population of women. *Journal of Womens Health, 15*, 909–918.
21. Thornton, P. L., Kieffer, E. C., Salabarria-Pena, Y., Odoms-Young, A., Willis, S. K., Kim, H., et al. (2006). Weight, diet and physical activity-related beliefs and practices among pregnant and postpartum latino women: The role of social support. *Maternal and Child Health Journal, 10*, 95–104.
22. Chang, M., Nitzke, S., Guilford, E., Adair, C. H., & Hazard, D. L. (2008). Motivators and barriers to healthful eating and physical activity among low-income overweight and obese mothers. *Journal of American Dietetic Association, 108*, 1023–1028.
23. Befort, C. A., Thomas, J. L., Daley, C. M., Rhode, P. C., & Ahluwalia, J. S. (2008). Perceptions and beliefs about body size, weight and weight loss among obese African American women: A qualitative inquiry. *Health Education Behavior, 35*, 410–426.
24. Setse, R., Grogan, R., Cooper, L. A., Strobino, D., Powe, N. R., & Nicholson, W. (2008). Weight loss programs for urban-based, postpartum African-American women: Perceived barriers and preferred components. *Maternal and Child Health Journal, 12*, 119–127.
25. Allen-Davis, J. (2009). *A provider's handbook on culturally competent care. Women's Health* (1st ed.). Oakland: Kaiser Permanente National Diversity Counsel.
26. Phillips, W. (2005). Cravings, marks, and open pores: Acculturation and preservation of pregnancy related beliefs and practices among mothers of African descent in the United States. *Ethos, 33*, 231–255.
27. Israel, B. A., Eng, E., Schulz, A. J., & Parker, E. A. (Eds.). (2005). *Methods in community-based participatory research for health*. San Francisco: Jossey-Bass.