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Perspectives of Latina and Non-Latina White Women on Barriers and Facilitators to Exercise in Pregnancy

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Abstract

Exercise during pregnancy has been associated with reduced risk of gestational diabetes mellitus (GDM);, however, twice as many women are sedentary during pregnancy as compared to when they are not pregnant. We conducted 3 focus groups among 20 pregnant Latina and non-Latina white women to identify barriers and facilitators to exercise in pregnancy to inform a GDM intervention study. Quantitative analyses of demographic data, and qualitative analyses of focus groups were conducted. Women identified physical limitations and restrictions, lack of resources, energy, and time as powerful exercise barriers. Social support, access to resources, information, proper diet, scheduling and the weather were identified as powerful facilitators. Intervention programs designed for pregnant women should facilitate social support, provide information and resources, as well as promote short-term and long-term benefits.

Introduction

Exercise during pregnancy has been associated with reduced risks of gestational diabetes mellitus (GDM), gestational weight gain, hypertensive disease, fetal growth, and preterm birth (ACOG Committee Opinion 2002; Gavard and Artal 2008). Women with a history of GDM are at high risk for future diabetes, with approximately 50% of women developing type 2 diabetes within five years of delivery (Kjos 2000). In some populations, women with a history of GDM may account for up to one-third of diabetes cases among parous women (Kim, Newton, and Knopp 2002). Accordingly, the American College of Obstetricians and Gynecologists

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(ACOG) 2002 guidelines recommend that pregnant women without medical or obstetric complications accumulate 30 minutes or more of moderate intensity exercise on most, if not all, days of the week (ACOG Committee Opinion 2002). However, according to national surveys, nearly twice as many U.S. women are sedentary during pregnancy compared to the national average (Zhang and Savitz 1996).

Among minority women, pregnancy exercise levels are even lower (Evenson, Savitz, and Huston 2004; Petersen, Leet, and Brownson 2005). For example, based on recent data from the Behavioral Risk Factor Surveillance System, Latinas were approximately 40% less likely to meet the ACOG recommendation for moderate activity in pregnancy as compared to non-Latina whites (Petersen, Leet, and Brownson 2005). Promoting exercise among pregnant Latinas is particularly important, given that Latinas are projected to have the highest birthrates for any minority group in the United States by the year 2009 (Simpson 1998) and are the largest minority group in the United States (U.S. Census Bureau 2008). In addition, substantial health disparities exist between Latinas and non-Latina whites. For example, obese Latinas are more likely to develop gestational diabetes and macrosomia than their obese African American and white counterparts (Steinfeld et al. 2000). Moreover, Latinas of Puerto Rican descent have an elevated risk of low birth weight and poor neonatal health outcomes as compared to other Latina groups (Rosenberg et al. 2005).

Effective promotion of exercise among pregnant women relies on the identification of exercise barriers and facilitators. However, qualitative studies designed to identify such factors among pregnant Latinas are sparse (Kieffer et al. 2002; Pearce 1998; Thornton et al. 2006), and studies have often failed to assess the relative importance of barriers and facilitators (Kieffer et al. 2002; Pearce 1998). Only one exercise study to date has been conducted among pregnant Puerto Rican and Dominican women (Pearce 1998). Such studies including a range of Latino groups are critical as health status varies widely among Latino subgroups, with rates of adverse birth outcomes highest for Puerto Rican women (Averbach et al. 2001). In addition, exercise patterns vary markedly among US Latina women by country of origin, with 56.7% of Puerto Rican women reporting no leisure time physical activity, and rates ranging from 50.2% of Mexican American women to 71.2% of Cuban women reporting no leisure time physical activity, respectively (Neighbors, Marquez, and Marcus 2008). Barriers and facilitators that may be unique to pregnant women, in particular pregnant Latina women, are critical to target when designing exercise interventions for these population groups (Godin et al. 1994; Symons Downs and Hausenblas 2004). Identification of those barriers and faciliators perceived as most powerful could enable the design of a more targeted intervention.

In a study among 22 pregnant Mexican women in Detroit, Kieffer and colleagues (Kieffer et al. 2002) found that exercise barriers included physical complaints and concerns, lack of knowledge about how to exercise safely while pregnant, and unsafe streets. However, this study was limited in that all women included had recently emigrated from Mexico. In addition, recruitment was conducted via telephone, and thus low-income women without telephone service were unable to participate. Similar findings regarding physical complaints and concerns were observed by Pearce et al. (Pearce 1998) in focus groups among 21 pregnant Puerto Rican and Dominican women. Thornton and colleagues (Thornton et al. 2006) performed additional in-depth semi-structured interviews among five pregnant Mexican women in Detroit and found that pregnancy-related physical limitations and restrictions by family members impeded exercise, as did social isolation, a lack of social support from husbands or friends with whom to exercise, and lack of childcare.

Recently Mudd and colleagues (Mudd et al. 2009) conducted a survey study among a diverse sample of 296 pregnant women (20.6% of whom were Latina, country of origin not reported) and found that Latina ethnicity was related to feeling unsafe/unsure about moderate and

vigorous physical activity. Among Latina women as well as African American and non-Latina white women, tiredness, concern with pregnancy complications, lack of time, low motivation, lack of social support, conflicting information, and neighborhood/environmental issues (e.g., weather) were reported to be exercise barriers (Evenson et al. 2009). Among Latina women in particular, social isolation, fear of safety, and lack of transportation were additional barriers, particularly among newly immigrated women (Evenson et al. 2009).

We conducted focus groups among pregnant Puerto Rican and Dominican (hereafter referred to as Latina) women and non-Latina white women to determine the relative importance of identified barriers and facilitators to exercise in pregnancy. Focus groups enable researchers to ground an intervention on expressed preferences obtained from the targeted group of participants. The group setting of focus groups enables an exchange of ideas and stimulation of thought which results in the generation of additional preferences that may not emerge from individual interviews or surveys (Mancini Billson 2004). Therefore, the goal in our focus groups was to learn how our target audience of pregnant Latina women perceived, understood, and valued exercise to inform a physical activity intervention designed to increase exercise among a diverse population of pregnant women with the goal of reducing GDM.

Method

Study Setting, Participants, and Recruitment

Focus groups were conducted at the public Obstetrics and Gynecology Clinic and Midwifery Practice of Baystate Medical Center. Baystate has the 25th largest obstetrical service in the United States and serves an ethnically and socio-economically diverse population with approximately 4,500 deliveries per year. Women were recruited from January-April, 2007 in the waiting room at the time of their prenatal care appointments by bilingual (Spanish and English)/bicultural interviewers. Recruiters pre-screened patients using demographic (i.e., Latina/Hispanic ethnicity, date of birth) and medical characteristics (i.e., date of last menstrual period) provided on a daily roster of scheduled patients to generate a list of potential participants. The recruiters then targeted their efforts to locate these potentially eligible participants at the time of their first prenatal care visit. Recruiters approached such women in the waiting room and briefly explained the aims and procedures of the study. For those patients who were eligible and interested, the recruiters obtained signed, written informed consent and scheduled the women for a focus group. The University of Massachusetts and Baystate Medical Center Institutional Review Boards approved all aspects of the study.

Participants in the focus groups met the following criteria: 1) aged 18-40 years, 2) singleton pregnancy, 3) < 28 weeks gestation, 4) without chronic diseases (i.e., diabetes, hypertension, heart disease, chronic renal disease), and 5) able to speak English. In our screening we asked the women “Do you participate in more than 30 minutes per day of moderate or vigorous intensity *exercise* on 3 or more days of the week? Exercise is activity that is done to improve health or fitness. For example, aerobics, jogging. Exercise does NOT include caring for children, housework, walking at job, etc.” Moderate and vigorous intensity were defined according to perceived intensity. Women who reported exercising at a moderate or vigorous intensity for more than 30 minutes per day on two or more days per week were excluded, as the study was concerned with exercise barriers and facilitators among sedentary/low-active women. The Latina focus groups were limited to those who spoke English and self-identified as either Puerto Rican or Dominican, the predominant Latino subgroups in Massachusetts.

A total of 127 potential participants were approached in the waiting room. Of these women, 29 did not meet inclusion criteria (e.g., due to ethnicity, pregnancy status, or activity level). Of the remaining women, 38 (39%) refused to participate. For the 60 women who indicated interest in participation, follow-up reminder calls were made. In all, 20 (33%) women attended the 3

focus groups. Women who did not attend either had disconnected numbers, indicated a scheduling conflict, or simply chose not to attend. Women were offered dinner, provided childcare and were given a $50 gift card for participating in the focus group. Data regarding nonparticipants were not available due to HIPAA privacy regulations.

Procedures and Data Collection

Three focus groups were conducted including two groups of pregnant Latina women (n = 13) and one group of non-Latina whites (n = 7). We combined the data from the two Latina groups as they noted common barriers and facilitators and independent samples t-tests indicated that the groups did not differ statistically in terms of socio-demographic factors.

We utilized well-established qualitative methods (Rounsaville, Carroll, and Onken 2001; Ayala et al. 2001) to conduct the focus groups. A trained, bilingual Latina woman moderated the sessions using a moderator guide based on previous research with multiethnic populations. Exercise was explicitly defined as purposeful activity with the goal of, for example, improving health, feeling better, or losing weight. During the focus groups the moderator attended to contextual factors that affect exercise behavior or that would make an intervention more appealing. Flip boards were used to record and have participants assign priorities to identified barriers and facilitators. At the end of the session, women completed a self-administered questionnaire. The questionnaire took approximately 5-10 minutes to complete and information was requested about age, height, weight before pregnancy, marital status, education, income, and standard questions regarding amount of moderate and vigorous physical activity done in a usual week (CDC 2004).

Data Management and Analysis

The three focus groups lasted 61, 96, and 78 minutes, respectively, thus the mean duration was 78 minutes. All focus groups were audio-taped and transcribed verbatim. A content analysis was conducted to generate themes (Krueger and Casey 2000; Berger and Motl 2000) using a two-step process. Software was not used for the study. Instead, we used a traditional approach recommended by Mancini Billson (Mancini Billson 2004). In the first step, two investigators independently used a deductive process to identify themes among the participants in the context of theoretical constructs (e.g., self-efficacy) and cultural factors (e.g., family obligations). This was followed by an inductive process in which the investigators independently identified other themes that arose spontaneously. The investigators then agreed upon a set of codes/labels and definitions to identify the themes. In the second step, transcripts were independently coded for themes by two investigators. Coding was then compared between investigators, and inconsistencies were discussed until consensus was achieved. Inter-coding reliability was 81% for the non-Latina white focus groups and 68% for the Latina focus groups. Consensus was then obtained on 100% of the statements. Twenty-six total themes (i.e., 13 barrier themes, 13 facilitator themes) were obtained.

Barriers and facilitators to exercise were evaluated according to frequency of mention and perceived power. To assess frequency, we counted the number of mentions of each barrier and facilitator in the transcripts. To assess perceived power, participants were asked, “Of all things that prevent you from exercising, which are the most powerful ones?” and, “Of all things that would help you to exercise, which ones are the most powerful?”

Quantitative analyses were conducted using SPSS v15 statistical software. Comparisons of demographic variables between Latinas and non-Latina whites were made using independent samples t-tests with the significance defined as $p<.05$.

Results

Participants were, on average, relatively young and in good health. As compared to the non-Latina white group, the Latina group was in general of higher weight, lower education and income level, and lower perceived health (Table 1). The Latinas were less likely to be married and have more children in the household.

Barriers to Exercise during Pregnancy

Physical Limitations/Restrictions—Physical limitations/restrictions on activity during pregnancy were perceived as a powerful barrier to exercise among both the Latina and non-Latina groups and were also the most frequently mentioned (Table 2). Physical limitations and restrictions included: 1) physical symptoms that inhibited activity (e.g., ankle edema) as well as 2) recommendations from family members or physicians to not exercise (Table 3).

Lack of Energy and Motivation—Lack of energy and motivation was perceived as a powerful barrier to exercise among both the Latina and non-Latina groups (Table 2). Whereas this barrier was the third most frequently mentioned barrier among Latinas, it was not among the most frequently mentioned barriers among non-Latina white women. Terms such as “fatigue,” “laziness,” “lack of energy,” and “motivation” were used interchangeably by the women (Table 3).

Lack of Resources—Lacking resources to engage in exercise was perceived as a powerful barrier to exercise among both the Latina and non-Latina groups (Table 2). However, this barrier was not among the most frequently mentioned barriers for either group. In their comments, Latinas focused on financial constraints and the lack of affordable exercise programs while non-Latina white women focused on the lack of adequate programs specifically designed for pregnant women (Table 3).

Lack of Time—Lack of time for exercise was identified as a powerful barrier to exercise by both groups and was the second most frequently mentioned barrier among non-Latina whites (Table 2). Lack of time was attributed to the multiple roles played by women as caretakers of their homes, children, and other family members and by some women as members of the workforce (Table 3). The non-Latina white women had an extensive discussion of whether lack of time was a genuine exercise barrier.

Lack of Information—Lack of information about appropriate exercises during pregnancy was identified as a powerful barrier by Latinas but was not included as a powerful barrier among the non-Latina white women (Table 2). Lack of information was also not among the most frequently mentioned barriers for either group. Discussions of this barrier were accompanied by a sense of fear that the wrong exercise could harm one's baby and were accompanied by the desire to be informed about what is safe (Table 3). Non-Latina white women commented that they had been given too much information, in contrast to the lack of information noted by the Latina women.

Weather, Physical Factors, Perceptions of Already Being Active Enough—Several barriers were frequently mentioned in the focus groups but were not identified as being powerful. These barriers included the weather, physical factors, and perceptions of already being active enough (Table 2 and 3). Finally, some barriers were discussed during the focus groups but were neither among the most frequent or powerful. These barriers included neighborhood safety, absence/inconvenience of childcare, dislike of exercise, and competing leisure activities (Table 3).

Facilitators of Exercise during Pregnancy

Social support—Social support was perceived as a powerful facilitator of exercise by both the Latina and non-Latina groups (Table 2). This facilitator was also the third most frequently mentioned among Latinas, but not among the non-Latina whites. Some women identified support from family as the most important source of support whereas others commented that they most desired a support network of other pregnant women (Table 4). All of the women expressed feeling overwhelmed and thus social support was actively discussed.

Resources—Having resources to perform exercise was perceived as a powerful facilitator of exercise among both Latinas and non-Latina white women and was frequently mentioned as facilitator among Latinas but not among non-Latina white women (Table 2). For example, Latinas identified the accessibility of an affordable fitness facility as a means to help them regularly exercise whereas non-Latina white women identified tailored programs for pregnancy such as baby-mother exercise classes (Table 4).

Information—Information was identified as a powerful facilitator for Latinas and was a frequently mentioned facilitator among non-Latina white women (Table 2). Latinas felt that information was necessary to dispel fears they had about exercise harming their pregnancies (Table 4). Non-Latina white women commented that they had been given too much information and were concerned with stopping the distribution of outdated information.

Proper Diet, Scheduling, and Weather—Several other facilitators were identified as powerful only among Latinas (i.e., proper diet) or only among non-Latina white women (i.e., scheduling and weather) (Table 2). Latinas felt that a proper diet would help to energize them. Non-Latina white women identified scheduling exercise into their lives and good weather as facilitating exercise (Table 4).

Short-Term Benefits and Chance to Get Outside—Short-term benefits of exercise (immediate or within the next year) were not perceived as powerful facilitators to exercise among Latina or non-Latina white women, but were frequently mentioned among both groups (Table 2). Short-term benefits included having an easier labor/delivery and feeling better as a result of exercise (Table 4). Exercise as an opportunity to get outside was frequently mentioned among the non-Latina white women. Other facilitators were discussed (i.e., fun activities, long-term benefits, activities with children, easy activities, time for self) but were neither frequently mentioned nor powerful (Table 4).

Discussion

In this qualitative analysis of exercise in pregnancy, both Latina and non-Latina white women identified physical limitations and restrictions, lack of resources, lack of energy, and lack of time as powerful barriers to exercise, and social support and access to resources as powerful facilitators to exercise. Whereas Latinas additionally identified information and proper diet as powerful facilitators, non-Latina white women identified scheduling and good weather. Overall, the barriers and facilitators perceived as powerful were also frequently mentioned. This study adds to the sparse body of literature among pregnant Latina women and is unique in assessing the relative importance of barriers and facilitators among Puerto Rican and Dominican women, a group with higher rates of adverse birth outcomes as compared to other Latina groups (Averbach et al. 2001) and lower levels of sports/exercise activities during pregnancy as compared to the non-Latina white population (Evenson, Savitz, and Huston 2004).

Similar to our findings, prior focus groups from previous studies have identified physical limitations and restrictions due to pregnancy as important barriers to exercise during pregnancy, finding that pregnant women may be cautioned by physicians and family members to avoid strenuous activity (Kieffer et al. 2002; Pearce 1998; Thornton et al. 2006). Nausea and weight gain have also been identified as powerful barriers (Symons Downs and Hausenblas 2004). Lacking energy has been commonly reported as an exercise barrier for non-pregnant women (Yoshida, Allison, and Osborn 1988; Kieffer et al. 2002; Symons Downs and Hausenblas 2004) and was identified in our study as a powerful barrier. This barrier may only be due, in part, to the pregnancy but may also derive from the busy lives led by most of the focus group participants.

Lack of resources was perceived as a powerful barrier by both Latina and non-Latina white women. However, whereas the Latinas focused on the affordability of exercise programs, the non-Latina white women focused on the lack of programs specifically designed for pregnant women. Previous focus groups among pregnant Latinas have observed similar findings, identifying lack of exercise programs, distance from exercise facilities (Kieffer et al. 2002), and lack of childcare (Thornton et al. 2006) as barriers to exercise participation. We found that lack of time to exercise was perceived as a powerful barrier and participants expressed feeling overburdened. This finding is consistent with previous focus groups among pregnant non-Latina white women (Godin et al. 1994; Symons Downs and Hausenblas 2004) and pregnant Latinas who prioritized household/family responsibilities over recreation given limited time (Kieffer et al. 2002).

In addition to barriers identified by both the Latina and non-Latina white groups, physical factors, such as sweating and heavy breathing, were more frequently discussed as barriers to exercise in the Latina group as compared to the non-Latina white group. No studies to date have reported sweating as an exercise barrier, and only a recent study mentioned shortness of breath as a barrier among pregnant Latinas (Evenson et al. 2009). Similarly, lack of information about how to exercise safely while pregnant and the perception that they were already active enough due to housework and caregiving were identified as barriers only among the Latinas. These barriers have similarly been identified in prior focus groups from previous studies among Latina pregnant women (Kieffer et al. 2002).

We found that having social support and resources were powerful exercise facilitators. Prior studies have identified three major types of social support: emotional (e.g., feeling appreciated and valued); informational (e.g., advice or guidance); and instrumental (e.g., tangible assistance) (Dunkel-Schetter et al. 1996). For Latina women, social support may have particular application for health given that the extended family plays an integral role in daily life (Santiago-Rivera, Arredondo, and Gallardo-Cooper 2002). One prior focus group study among Latinas reported that husbands were the most important emotional, informational, and instrumental support by encouraging women to exercise and providing companionship (Thornton et al. 2006). Approximately 85% of the Latinas in the current study were unmarried, however, we did not have data on whether they were living with a partner. The attitudes and practices of family members have also been reported as important influences on the attitudes and practices of pregnant women in studies among both Latina and non-Latina white women (Kieffer et al. 2002; Symons Downs and Hausenblas 2004).

Our findings that resources, information, and short-term benefits were exercise facilitators are consistent with previous research. For example, prior focus groups from previous studies among pregnant Latinas have identified the availability of childcare at recreational facilities as an exercise facilitator (Kieffer et al. 2002). Latinas in the current study desired information on exercising safely, consistent with previous focus groups among Latinas which found that having a healthy baby was the primary goal of pregnancy (Pearce 1998). Prior focus groups

from previous studies have also identified short-term benefits of exercise such as an easier labor (Kieffer et al. 2002) and improved mood (Symons Downs and Hausenblas 2004) as exercise facilitators.

This study had several limitations. First, as with other qualitative studies (Heesch et al. 2005), the sample size was limited. However, we were able to identify important barriers and facilitators to exercise for pregnant women overall, as well as barriers and facilitators unique to the Latina and non-Latina white groups. Second, observed differences between the Latina and non-Latina white focus groups likely arose from a variety of differences between these two groups, including their cultural milieu, socioeconomic status, perceived health, as well as their ethnicity. Therefore, caution should be used in interpreting the results, as such factors may be potential confounders. Observed differences between the groups cannot necessarily be attributed to their ethnicity, but instead should be used to inform clinical guidance and public health interventions in each population. However, according to 2000 Census data, 18% of Latina women (U.S. Census Bureau 2000) in Springfield, Massachusetts were married (regardless of pregnancy status), comparable to our findings of 15% among pregnant Latina focus group participants. However, 35% of non-Latina white women in Springfield were married (U.S. Census Bureau 2000) as compared to 57% of our sample of pregnant non-Latina white women. This difference may have been due to their pregnancy status. Our findings that 85% of Latina and 0% of non-Latina white focus group participants had median family incomes of less than $15,000 are also comparable to Census data for non-pregnant women in the greater Springfield area showing median family incomes of $19,000 for Latina (U.S. Census Bureau 2000) and $45,000 for non-Latina white (U.S. Census Bureau 2000) women, respectively.

Another study limitation was that all focus groups were conducted in English, so the sample of Latina participants may not have been representative of all pregnant Latina women. The Latina population at Baystate Medical Center is highly acculturated, with 78% of Latina participants in a prior study either preferring the English language or having no preference between English and Spanish (Detjen et al. 2007). On a related note, selection and participation biases due to low participation and high refusal rates may have played a role in our findings, thus further limiting the generalizability of our findings. Women who participated may have differed from those who did not in important ways that may have had relevance to barriers and facilitators of physical activity. To the extent that these differences were related to perceptions regarding exercise, this may have affected our findings. Finally, our study was limited to the Latina subgroup of ‘Caribbean Islanders,’ which is defined as women of Puerto Rican or Dominican heritage given the predominance of these groups in New England. Approximately 90% of the Latino population at Baystate Medical Center is from Puerto Rico and 2.0% from the Dominican Republic (Gollenberg et al. 2008). Thus, we also had insufficient statistical power to stratify women by descent.

Implications for Exercise Intervention Programs

Findings gleaned from these focus groups can inform future exercise interventions among pregnant Latina and non-Latina white women. For example, our results suggest that approaches addressing aspects of the woman as well as the cultural and physical environment are needed to increase exercise participation during pregnancy. Such programs should facilitate social support for pregnant women, provide information and resources, as well as promote short-term (e.g., increases in energy) and long-term (e.g., improved maternal and fetal outcomes) benefits as a result of regular exercise. Creating a supportive environment for exercise in both the family and greater social environment has been found to help women initiate regular exercise (Kieffer et al. 2002). Consistent with this finding, and in light of concerns about safety, organized group activities in a convenient location which provide child care and instructions in exercising safely would facilitate engaging in exercise during pregnancy. Promotion of lifestyle physical activity

can also be promoted among pregnant women, as physical activity for many women occurs in the course of their daily lives (Chasan-Taber et al. 2007). For example, walking is an activity that does not require special equipment, can include children, and does not have to be specifically designed for pregnant women. Walking is also an activity that is low-cost and requires little skill. However, it is important to note that those women living in low-income, disadvantaged neighborhoods may have particular barriers to walking, including safety concerns as a result of crime, poor lighting, and other factors that make it difficult to walk for exercise. Alternatives include walking within shopping malls and other indoor venues. Indeed, walking has been noted to be one of the few activities that is culturally appropriate for Latina women (Cromwell and Berg 2006), and should be promoted. Finally, exercise interventions targeted to pregnant women should consider that women may not be aware of the recent clinical recommendations for exercise in pregnancy and that the recommendations may not be promulgated by their physicians.

In summary, in this qualitative study among Latina and non-Latina white women, we found that lack of energy and motivation, physical limitations and restrictions on activity, lack of resources, and lack of time were powerful barriers to exercise among both Latina and non-Latina white women. Social support and other resources such as the accessibility of an affordable fitness facility were identified as powerful exercise facilitators to help overcome these barriers. Findings could influence health promotion interventions, especially for minority groups who have differential health experiences. Intervention studies using exercise to prevent GDM are sparse and largely reflect pilot studies or recently initiated trials. Consistent with this finding, evidence-based physical activity prevention programs for GDM among Latina women informed by data on perceived barriers and facilitators remain to be established. Ongoing and future well-controlled intervention studies in this area will inform programs designed to prevent the incidence of GDM in women at risk of this disorder.

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References

ACOG Committee Opinion. Exercise during pregnancy and the postpartum period. Obstet Gynecol 2002;99(1):171–3. [PubMed: 11777528]

Averbach, AR.; Judge, C.; Orejuela, M.; Nasca, PC.; Pekow, P.; Chasan-Taber, L.; Schmidt, MD.; Hoffman, D.; Ling, Q. Hispanic Births in Massachusetts 1996-1999. Commonwealth of Massachusetts, Department of Public Health, Bureau of Health Statistics, Research and Evaluation; 2001.

Ayala GX, Elder JP, Campbell NR, Engelberg M, Olson S, Moreno C, Serrano V. Nutrition communication for a Latino community: Formative research foundations. Fam Community Health 2001;24(3):72–87. [PubMed: 11563946]

Berger B, Motl RW. Exercise and mood: A selective review and synthesis of research employing the profile of mood states. J Appl Sport Psychol 2000;12(1):69–92.

CDC. Behavioral Risk Factor Surveillance System Survey Questionnaire. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2004.

Chasan-Taber L, Schmidt MD, Pekow P, Sternfeld B, Manson J, Markenson G. Correlates of physical activity in pregnancy among Latina women. Matern Child Health J 2007;11(4):353–63. [PubMed: 17345155]

Cromwell SL, Berg JA. Lifelong physical activity patterns of sedentary Mexican American women. Geriatr Nurs 2006;27(4):209–13. [PubMed: 16948201]

Detjen MG, Nieto FJ, Trentham-Dietz A, Fleming M, Chasan-Taber L. Acculturation and cigarette smoking among pregnant Hispanic women residing in the United States. Am J Public Health 2007;97 (11):2040–7. [PubMed: 17901446]

Dunkel-Schetter, C.; Sagrestano, L.; Feldman, P.; Killingsworth, C. Social support and pregnancy: A comprehensive review focusing on ethnicity and culture. In: Pierce, G.; Sarason, B.; Sarason, I., editors. Handbook of Social support and the family. New York: Plenum; 1996.

Evenson KR, Moos MK, Carrier K, Siega-Riz AM. Perceived barriers to physical activity among pregnant women. Matern Child Health J 2009;13(3):364–75. [PubMed: 18478322]

Evenson KR, Savitz DA, Huston SL. Leisure-time physical activity among pregnant women in the US. Paediatr Perinat Epidemiol 2004;18(6):400–7. [PubMed: 15535815]

Gavard JA, Artal R. Effect of exercise on pregnancy outcome. Clin Obstet Gynecol 2008;51(2):467–80. [PubMed: 18463475]

Godin G, Desharnais R, Valois P, Lepage L, Jobin J, Bradet R. Differences in perceived barriers to exercise between high and low intenders: Observations among different populations. American Journal of Health Promotion 1994;8(4):279–285.

Gollenberg A, Pekow P, Markenson G, Tucker KL, Chasan-Taber L. Dietary behaviors, physical activity, and cigarette smoking among pregnant Puerto Rican women. Am J Clin Nutr 2008;87(6):1844–51. [PubMed: 18541576]

Heesch KC, Dinger MK, McClary KR, Rice KR. Experiences of women in a minimal contact pedometer-based intervention: a qualitative study. Women Health 2005;41(2):97–116. [PubMed: 16219590]

Kieffer EC, Willis SK, Arellano N, Guzman R. Perspectives of pregnant and postpartum latino women on diabetes, physical activity, and health. Health Educ Behav 2002;29(5):542–56. [PubMed: 12238699]

Kim C, Newton KM, Knopp RH. Gestational diabetes and the incidence of type 2 diabetes: A systematic review. Diabetes Care 2002;25(10):1862–8. [PubMed: 12351492]

Kjos SL. Postpartum care of the woman with diabetes. Clinical Obstetrics Gynecology 2000;43(1):75–86.

Krueger, RA.; Casey, MA. Focus Groups: A Practical Guide for Applied Research. 3rd. Thousand Oaks, CA: Sage Publications; 2000.

Mancini Billson, J. The Power of Focus Groups: Focus on Health. Barrington, RI: Skywood Press; 2004.

Mudd LM, Nechuta S, Pivarnik JM, Paneth N. Factors associated with women's perceptions of physical activity safety during pregnancy. Prev Med. 2009

Neighbors C, Marquez DX, Marcus B. Leisure time physical activity disparities among Latino subgroups in the United States. American Journal of Public Health 2008;98:1460–1464. [PubMed: 18048795]

Pearce CW. Seeking a healthy baby: Hispanic women's views of pregnancy and prenatal care. Clin Excell Nurse Pract 1998;2(6):352–61. [PubMed: 12596838]

Petersen AM, Leet TL, Brownson RC. Correlates of physical activity among pregnant women in the United States. Med Sci Sports Exerc 2005;37(10):1748–53. [PubMed: 16260976]

Rosenberg TJ, Garbers S, Lipkind H, Chiasson MA. Maternal obesity and diabetes as risk factors for adverse pregnancy outcomes: differences among 4 racial/ethnic groups. Am J Public Health 2005;95 (9):1545–51. [PubMed: 16118366]

Rounsaville B, Carroll KM, Onken LS. A stage model of behavioral therapies research: Getting started and moving on from stage 1. Clin Psychol 2001;8(2):133–142.

Santiago-Rivera, AL.; Arredondo, P.; Gallardo-Cooper, M. Counseling Latinos and La Familia: A Practical Guide. Thousand Oaks, CA: Sage Publications; 2002.

Simpson, C. Closing the Gap. Washington DC: Public Health Service; 1998. Reaffirming our commitment to improving health services for Hispanics.

Steinfeld JD, Valentine S, Lerer T, Ingardia CJ, Wax JR, Curry SL. Obesity-related complications of pregnancy vary by race. J Matern Fetal Med 2000;9(4):238–41. [PubMed: 11048836]

Symons Downs D, Hausenblas HA. Women's exercise beliefs and behaviors during their pregnancy and postpartum. J Midwifery Womens Health 2004;49(2):138–44. [PubMed: 15010667]

Thornton PL, Kieffer EC, Salabarria-Pena Y, Odoms-Young A, Willis SK, Kim H, Salinas MA. Weight, diet, and physical activity-related beliefs and practices among pregnant and postpartum latino women: The role of social support. Matern Child Health J 2006;10(1):95–104. [PubMed: 16534660]

U.S. Census Bureau. Census 2000 Demographic Profile Highlights: Selected Population Group: Hispanic or Latino (of any race). 2000. [cited December 8, 2008. Available from http://factfinder.census.gov/servlet/SAFFIteratedFacts?_event=&geo_id=16000US2567000&_geoContext=01000US%7C04000US25%7C16000US2567000&_street=&_county=springfield&_cityTown=springfield&_state=04000US25&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_2&ds_name=DEC_2000_SAFF&_ci_nbr=400&qr_name=DEC_2000_SAFF_R1160&reg=DEC_2000_SAFF_R1160%3A400&_keyword=&_industry=.

U.S. Census Bureau. Census 2000 Demographic Profile Highlights: Selected Population Group: White alone. 2000. [cited December 8, 2008. Available from http://factfinder.census.gov/servlet/SAFFIteratedFacts?_event=&geo_id=16000US2567000&_geoContext=01000US%7C04000US25%7C16000US2567000&_street=&_county=springfield&_cityTown=springfield&_state=04000US25&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&pgsl=160&_submenuId=factsheet_2&ds_name=DEC_2000_SAFF&_ci_nbr=002&qr_name=DEC_2000_SAFF_R1160&reg=DEC_2000_SAFF_R1160%3A002&_keyword=&_industry

U.S. Census Bureau. Facts for Features. 2008. [cited August 20, 2008. Available from http://www.census.gov/Press-Release/www/releases/archives/population/011910.html

Yoshida KK, Allison KR, Osborn RW. Social factors influencing perceived barriers to physical exercise among women. Can J Public Health 1988;79(2):104–8. [PubMed: 3383056]

Zhang J, Savitz DA. Exercise during pregnancy among US women. Ann Epidemiol 1996;6(1):53–9. [PubMed: 8680626]

Table 1

Descriptive characteristics for study sample of pregnant Latina and non-Latina white women

Participant Characteristics	Latina (*n* = 13)	Non-Latina White (*n* = 7)
Age (years), mean (sd)	25.1 (4.8)	28.6 (5.7)
Body Mass Index (kg/m^2), mean (sd)	27.8 (7.8)	24.0 (4.1)
Education Level*		
High School Graduate or Less	69.2%	14.3%
Some College	23.1%	42.9%
College Graduate or Greater	7.7%	42.9%
Annual Household Income*		
Less than $15,000	84.6%	0%
$15,001 – 30,000	15.4%	0%
More than $30,001	0%	100%
Self-Rated Health		
Excellent	15.4%	28.6%
Very Good	30.8%	14.3%
Good	38.5%	28.6%
Fair	15.4%	28.6%
Poor	0%	0%
Married	15.4%	57.1%
# of Children in Household, mean (sd)	1.7 (2.1)	1.1 (1.1)

*$p < .05$

Table 2

Powerful and frequently mentioned exercise barriers and facilitators for study sample of pregnant Latina and non-Latina white women

Latina	Non-Latina White
Powerful barriers to exercise	
Physical limitation/restrictions	Physical limitations/restrictions
Lack of energy and motivation	Lack of energy and motivation
Lack of resources	Lack of resources
Lack of time	Lack of time
Lack of information	
Frequently mentioned barriers (in rank order)	
Physical limitations/restrictions	Physical limitations/restrictions
Weather	Lack of time
Lack of energy and motivation	Already active enough
Physical factors	
Powerful facilitators	
Social support	Social support
Resources	Resources
nformation	Scheduling
Proper diet	Good weather
Frequently mentioned facilitators (in rank order)	
Short-term benefits	Short-term benefits
Resources	Chance to get outside
Social support	Scheduling
Proper diet	Information

Table 3

Exercise barrier themes and sample comments of pregnant Latina and non-Latina white women

Exercise barrier theme	Sample Comments from Non-Latina White Women	Sample Comments from Latina Women
Physical limitations and restrictions	"… I wasn't allowed to lift more than five pounds."	"…there is a lot of exercises you cannot do, like sit-ups, ."
Lack of energy and motivation	"…I do my business all day, I don't have it left in me to do anymore than that."	"I work too much…so I come home, want to go to bed."
Lack of resources	"They don't have aerobics for pregnancy"	"If I had money to go to the Y I think I would go every day."
Lack of time	"… me being away from her (daughter)…it's a lot tougher."	"…Cause you're too busy trying to take care of the kids."
Lack of information	N/A	"…A lot of women are afraid, they don't know what exercise to do."
Weather	"It's hard to be pregnant this time of year because you can't get out and go for a walk.."	"The heat…won't let you do anything."
Physical factors	N/A	"Oh, I hate sweating."
Perception of being already active enough	"Me going to work and doing what I'm doing every day, that's my exercise."	"I have two little girls. That's my exercise, running around all day"
Social support	"Who wants to go to the gym alone?"	"…Someone hurting your feelings (with insults about your body)."
Neighborhood safety	N/A	"If you live in a bad neighborhood…it's not safe to exercise…You don't do that.."
Absence/inconvenience of childcare	"I don't have that option of saying, here, honey, take the baby because he's not there."	N/A
Dislike of exercise	"…structured exercise, most of us have said that we're not hugely into."	"I don't really like to do anything but sleep and eat."
Competing leisure activities	"… [If] I can get that time out I'd rather go to a movie,."	"…If there's nothing to do I'm going to chill out and watch TV."

Table 4

Exercise facilitator themes and sample comments of pregnant Latina and non-Latina white women

Exercise Facilitator Theme	Sample Comments from Non-Latina White Women	Sample Comments from Latina Women
Social support	"My family. My husband wants me to get out and go to the gym and stay active."	"You need support, like family support."
Resources	"If you could bring like your child with you to do exercise."	"…Transportation; some people don't want to go because of that."
Information	"There's so much information out there."	"Knowing the information about your body…what exercise is the best with the condition."
Proper diet	"Stay well hydrated and eating properly really helps your energy level."	"I think eating the right way."
Scheduling	"You have time for it all, you just have to prioritize."	"A plan, maybe setting a schedule [would help]."
Weather	"Yeah, good weather (would help me exercise)."	"If it were the summer, I'd be swimming or playing tennis."
Short-term benefits	"Well, it helps your delivery, exercise." "The feeling that you get is enjoyable."	"It helps with the pregnancy because…you are not in so much pain…because it helps open your cervix more."
Chance to get outside	"When it's sunny you just want to get out there and walk."	"I just like getting out of my house."
Fun activities	"…If it's fun you're more motivated to do it than if it's something boring like walking on the treadmill."	N/A
Long-term benefits	"…Knowing that my children won't suffer from me not being around to help them out."	N/A
Activities with children	"…I went out and threw snowballs with my daughter …I did get some exercise."	"…I'd like to walk …taking my kids to play."
Easy activities	N/A	"Walking's the easiest."
Time for self	"…I made a goal to set time aside for myself… So it's almost like selfish time."	N/A