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Provider advice and women's intentions to meet weight gain, physical activity, and nutrition guidelines during pregnancy

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Abstract

Objectives—To determine the prevalence and accuracy of patient-reported provider advice on weight gain, physical activity, and nutrition during prenatal visits and to examine the associations of provider advice with women's behavioral intentions toward weight gain, physical activity, and nutrition.

Methods—A mixed-methods study design was used to assess patient-report of provider advice and health intentions in women between 20–30 weeks gestation (n=188). Bivariate analyses examined patient-reported provider advice on weight gain, physical activity, and nutrition with women's behavioral intentions. Linear and logistic regression models examined associations of provider weight gain recommendations with women's intended weight gain.

Results—Approximately 52% of women reported provider advice on weight gain, 63% on physical activity, and 56% on nutrition. Of those who reported weight gain advice, 79% cited provider recommendations within the Institute of Medicine guidelines, 9% below, and 11% above. Patient-report of provider advice on physical activity and nutrition were consistent with guidelines, but limited in scope. Provider advice (yes/no) was significantly associated with women's intentions to meet physical activity (p=0.01) and nutrition (p=0.02), but not weight gain guidelines (p=0.86). Provider recommended weight gain (pounds) was significantly associated with women's intended weight gain in linear and logistic regression models.

Conclusions for Practice—A large percentage of women report receiving no advice from providers on weight gain, physical activity or nutrition during pregnancy. Of those who receive advice, most report recommendations consistent with current guidelines. Provider advice was associated with women's weight gain, physical activity, and nutrition intentions in pregnancy.

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

Keywords

Pregnancy; Provider advice; Weight gain; Physical activity; Nutrition

Introduction

The Institute of Medicine (IOM) gestational weight gain guidelines were developed to optimize health outcomes for mother and child (1). However, the majority of women do not gain appropriate weight in pregnancy, with up to 50% exceeding recommendations (2-4). Excessive pregnancy weight gain is associated with many adverse health outcomes for both mother and child, including an increased risk of cesarean delivery, postpartum weight retention, and future overweight and obesity in the child (3).

The American College of Obstetricians and Gynecologists (ACOG) released a committee opinion report in 2013, recommending that providers determine a woman's body mass index (BMI) at the initial prenatal visit, and counsel her on the benefits of appropriate weight gain, physical activity, and nutrition, with emphasis placed on the need to limit excessive weight gain to achieve optimal pregnancy outcomes (5). The implication of this report is that providers are well positioned to help women gain appropriate weight in pregnancy. However, few studies have examined provider compliance with the ACOG counseling recommendations, or the extent to which provider advice influences women's intended behaviors during pregnancy.

Evidence suggests that patient-provider communication on weight gain, physical activity, and nutrition is inadequate in the prenatal care setting. Approximately 30-50% of women report no advice from a provider on weight gain in pregnancy, and accuracy of reported advice varies (6-11). Less is known about provider advice on physical activity or nutrition in prenatal care. Qualitative studies have found that pregnant women receive limited advice on physical activity and nutrition (12, 13). Women report that advice on physical activity is generally vague and largely limited to being told to walk, while advice on dietary intake is overwhelming, not individualized, and constantly changing (13). In light of the recent release of the ACOG committee opinion report, it is important to reassess patient-provider communication on weight gain, physical activity, and nutrition.

It is also important to assess if provider advice is associated with women's weight gain, physical activity, and nutrition intentions during pregnancy. Behavioral intention is the strongest predictor of actual behavior across a variety of populations and behaviors, including physical activity and healthy eating (14, 15), and intended pregnancy weight gain is strongly associated with actual weight gain (7). Limited research has examined provider weight gain advice with women's intended or actual pregnancy weight gain, with mixed results (6-8, 11, 16). To our knowledge, no studies have examined associations of provider advice with pregnant women's intentions to meet physical activity or nutrition guidelines.

The current study aims to: (1) determine the proportion of women who report provider advice on weight gain, physical activity, and nutrition during prenatal care visits, (2) determine the accuracy of patient-reported provider advice, and (3) examine if patient-

reported provider advice is associated with women's intentions to meet the weight gain, physical activity, and nutrition (i.e. weight-related) recommendations during pregnancy. We hypothesized that report of provider advice on weight gain, physical activity, and nutrition would be associated with more favorable weight-related intentions during pregnancy.

Materials and Methods

Participants were recruited through pregnancy-related Internet chat forums, blogs, and social media sites from April-August 2014. Advertisements placed on websites (e.g. babycenter.com, pregnantchicken.com, Facebook) included a brief description of the survey with a link to access the screening form. Inclusion criteria were: 20-30 weeks pregnant, 18-44 years old, pre-pregnancy body mass index (BMI) between 18.5-45.0 kg/m², singleton pregnancy, and attended first prenatal visit before 16 weeks gestation. If eligible, women were invited to complete an Internet-based survey to assess provider advice on weight gain, physical activity, and nutrition and women's intentions to meet the respective behavioral recommendations. Participants had the option to enter their contact information to enter into a drawing to win one of eight \$50 Amazon gift cards. The University of South Carolina Institutional Review Board approved all study protocols.

Report of Provider Advice

In three separate questions, women were asked if a health care provider discussed weight gain, exercise, and nutrition with them during their current pregnancy (yes/no for each). If women responded 'yes' to receiving weight gain advice, they were asked to report how many pounds their provider recommended they gain (open-ended response). The 2009 IOM guidelines were used to define whether providers' advice was below, within, or above these guidelines. If women reported advice on exercise or nutrition, they were asked what recommendations were given for each outcome (open-ended response).

Women's Weight Gain, Physical Activity, and Nutrition Intentions

Weight gain intentions were assessed using two different methods. First, women were asked to report how much total weight they plan on gaining during their pregnancy in pounds (open-ended response). The 2009 IOM guidelines were used to define whether women's intended weight gain was below, within, or above these guidelines. Second, intentions to meet the 2009 IOM weight gain guidelines were assessed with the statement "I plan on gaining between [recommended weight gain range] total pounds during this pregnancy," using a seven-point Likert scale ranging from -3 (strongly disagree) to 3 (strongly agree). The survey was designed to automatically populate the recommended IOM weight gain range (i.e. 25-35, 15-25, or 11-20 pounds) (1) based on the woman's self-reported pre-pregnancy BMI. Report of provider recommended weight gain and women's intended weight gain in pounds were both assessed before informing women of the recommended weight gain ranges to reduce social desirability bias.

Intentions to meet the guidelines for physical activity (17) and nutrition (18) were assessed using the statements "I plan on exercising at a moderate intensity for 150 minutes per week (e.g. 30 minutes per day, 5 days per week) during my pregnancy," and "I plan on eating a

healthy diet during my pregnancy,” using the same seven-point Likert scale. Women first read a short description explaining the terms ‘moderate intensity’ (i.e., any activity that noticeably increases heart and breathing rate, like brisk walking) and ‘healthy diet’ (i.e., including 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, watching portion sizes, and avoiding eating too much of very sugary and fatty food) before answering these questions. Intentions were assessed using the score on the 1-item question with a possible range of –3 to 3 for each health behavior. This scale is a recommended and commonly used method for measuring behavioral intentions (19, 20). Higher scores indicate stronger intentions to meet weight gain, physical activity, and nutrition recommendations in pregnancy.

Personal history questionnaire

Self-reported height and pre-pregnancy weight were assessed and used to calculate prepregnancy BMI. While underreporting of weight has been previously cited in the literature, particularly among non-pregnant overweight and obese women (21), self-reported weight is the most commonly used measure of pre-pregnancy weight. Furthermore, evidence suggests self-reported pre-pregnancy weight during pregnancy is both reliable and valid (22, 23). Additional measures included race, age, gestational age, highest grade or years of education, annual household income, employment status, marital status, parity, smoking status before and during pregnancy (every day, some days, not at all), and perceived health (excellent, very good, good, or fair).

Qualitative Analyses

Responses from open-ended questions assessing women’s report of provider advice on physical activity and nutrition were entered into NVivo 10 for computer-assisted qualitative data management. A content analysis approach was used to identify common recommendations for physical activity and nutrition (24). To increase the validity of the analysis, the first author (KW) and a second rater independently read and coded the response data. Discussion and consensus between the two raters guided the organization of the responses; frequencies and percentages were estimated.

Statistical Analyses

Differences between those who reported provider advice and those who did not were examined using t-tests, chi-square or fisher’s exact tests, as appropriate. Bivariate associations between women’s report of provider advice on weight gain, physical activity, or nutrition (yes/no for each) with women’s intentions (seven-point Likert scale for each) were assessed using Wilcoxon Exact Tests. A sub-analysis was conducted in those who responded ‘yes’ to weight gain advice and then specified the amount of provider recommended weight gain. Linear regression models examined associations between provider recommended weight gain in pounds and women’s intended weight gain in pounds (continuous variables). Categorical models initially assessed associations of provider recommended weight gain and women’s intended weight gain (below, within, or above IOM guidelines for each). Due to the small percentage of women who reported weight gain recommendations and weight gain intentions below or above IOM guidelines, the model failed to converge and therefore we

further categorized recommendations and intentions as meeting or not meeting IOM guidelines. All models controlled for maternal race, age, education, parity, and pre-pregnancy BMI. All analyses were conducted using SAS version 9.3.

Results

Participant Characteristics

Of the 724 women who accessed the web-link, 549 completed the screening form and 197 women were excluded for the following reasons: not pregnant (n=20), first prenatal visit after 16 weeks gestation (n=19), not between 20-30 weeks gestation (n=130), outside the age range of 18-44 years (n=3), or body mass index outside inclusion criteria (n=25). A total of 352 women were deemed eligible to participate (64.1%), and of which, 199 women completed the survey (56.5%). Participants primarily resided in the U.S. (90.5%) and Canada (7.5%). Those with IP addresses outside the U.S. or Canada (n=4), who did not report a pre-pregnancy weight (n=1), or who later reported values inconsistent with eligibility criteria (n=6) were excluded from analyses, resulting in a final sample of 188 women. When examining survey completion by U.S. geographical region, approximately 37% of women resided in the South, 27% in the Midwest, 23% in the West, and 13% in the Northeast. Participant characteristics are located in **Table 1**.

Report of Provider Advice

Approximately 52% of women reported provider advice on pregnancy weight gain, 63% on physical activity, and 56% on nutrition. As seen in **Table 2**, there were differences in provider advice by parity, race, education, perceived health, and pre-pregnancy BMI. Nulliparous women were more likely to report advice on weight gain and physical activity than multiparous women. White women were more likely to report advice on physical activity than non-White women. Physical activity advice was also associated with higher education, income, and rating of perceived health. Obese women were more likely to report provider advice on nutrition, followed by normal weight and overweight women.

When using the 2009 IOM guidelines to categorize provider weight gain advice, 79% of women reported provider recommendations within the guidelines, 9% below guidelines, and 11% above guidelines (see **Table 3**). While not statistically significant, a higher percentage of normal weight women reported advice within guidelines (86.7%), compared with overweight (64.3%) and obese (64.8%) women.

Women's report of provider advice on physical activity and nutrition are summarized in **Table 4**. For physical activity, women most commonly reported recommendations to continue their previous exercise routine (36%). Providers also discussed type (32%), intensity (22%), and duration or frequency of activity (21%). According to the FITT principle (i.e. frequency, intensity, time, and type) of exercise (25), approximately 75% of women reported one physical activity recommendation from their provider (e.g. recommended walking as type of exercise), 17% reported two recommendations, and 8% reported three. Overall, providers were encouraging of women to exercise during pregnancy.

When listing nutrition recommendations, women reported provider advice to eat plenty of fruits and vegetables (45%), increase protein intake (34%), and consume a well-balanced or healthy diet (33%). Approximately 30% of women reported one dietary recommendation from their provider, 34% reported two recommendations, and 38% reported three or more recommendations. While advice on nutrition was limited in detail, 67% of women reported provider recommendations consistent with the USDA dietary guidelines for pregnant women (18).

Women's Intentions

Approximately 51% of women reported an intended weight gain within the IOM guidelines, 29% below, and 20% above. Weight gain intentions differed by pre-pregnancy BMI with overweight and obese women being more likely to report intended gains above IOM guidelines, while normal weight women were more likely to report intended weight gain below guidelines, $\chi^2(4, N=188)=21.4, p<0.001$.

Bivariate Analyses of Provider Advice and Women's Intentions

Women's report of provider advice on physical activity and nutrition (yes/no) was associated with women's intentions (7-point Likert Scale) to meet the guidelines for physical activity ($p=0.007$) and nutrition ($p=0.025$), but not weight gain during pregnancy ($p=0.860$).

Multivariable Analyses of Provider Advice and Women's Intentions

Women's report of provider recommended weight gain in pounds was significantly associated with women's intended weight gain in pounds before and after adjustment for race, age, education, parity, and pre-pregnancy BMI ($\beta = 1.10, p<.001$) (see **Table 5**). The crude and adjusted odds ratios for women's intended weight gain among those who reported provider advice within or outside of IOM guidelines is presented in **Table 6**. After adjustment, women who reported provider advice to gain less or more than the IOM guidelines were 6.68 (95% CI 1.87-23.94) times more likely to report an intended weight gain outside guidelines as compared to women who were advised to gain within the IOM guidelines.

Discussion

The first objective of this study was to assess the proportion of women reporting provider advice on weight gain, physical activity, and nutrition during prenatal visits. Approximately 52% of women reported advice on weight gain. This is largely consistent with the existing literature (9-11), although some studies have reported counseling rates on pregnancy weight gain closer to 70% (7, 8, 26). Of note, a large study of U.S. Obstetricians and Gynecologists found that over 85% of providers report discussing pregnancy weight gain with their patients (27), indicating a discrepancy in perceptions. For physical activity and nutrition, 63% and 56% of women reported provider advice, respectively. These findings are consistent with a study conducted in the San Francisco Bay area in a diverse sample of women, where 65% reported provider advice on exercise and 69% on nutrition (26).

We found multiple differences between those who reported advice on physical activity and those who did not. Women who were less educated, lower income, non-White, multiparous, and who reported poorer perceived health were less likely to report physical activity advice. Lack of provider advice, particularly among less educated and lower income women, may indicate differential counseling practices among providers. Alternately, this may reflect a problem with patient-provider communication, where advice is not given in a way that is meaningful or memorable. It is also possible that certain sub-groups are more likely to ask about physical activity, and therefore providers are prompted to initiate these discussions. The lower rate of physical activity advice reported by Non-White women is concerning as many ethnic minority populations are less active and experience obesity at greater rates than White women (28, 29).

The second objective of this study was to determine the accuracy of provider advice on weight gain, physical activity, and nutrition. Nearly 80% of women who received advice on weight gain reported provider recommendations within IOM guidelines. This is a higher percentage than previously found in the literature (8, 10), with the exception of a study published by Phelan and colleagues where 85% of women reported accurate provider advice (9). These findings may indicate that the IOM guidelines are becoming more widely known and utilized among prenatal care providers, or may reflect sampling differences.

When examining specific recommendations for physical activity, pregnant women generally reported that providers encouraged them to be active. However, few women recalled provider advice that described the duration, frequency, and intensity needed to meet current physical activity recommendations. These findings may indicate that some healthcare providers lack knowledge about the current physical activity recommendations for women in pregnancy, or do not advise women in such a way that they accurately recall recommendations.

Nutrition recommendations included advice consistent with the USDA dietary guidelines for pregnant women; however, there was a general lack of detail in participant report of provider advice. Nearly one-third of women simply reported provider recommendations to “eat healthy.” It is unclear if women received insufficient information from their providers or if detailed advice was provided and simply not reported in this survey. Future studies should match patients and providers in the prenatal care setting in order to directly compare report of advice across health behaviors. Qualitative study designs would also allow for further probing on the content of patient-provider communication.

While not a primary objective of this study, it is worth noting that only 50% of women reported an intended weight gain within IOM guidelines. Among normal weight women, almost 40% stated an intended weight gain below guidelines. While weight gain below recommendations poses little risk to the mother, moderate to strong evidence suggests an association between inadequate weight gain and preterm delivery, low birth weight, small for gestational age infants, and failure to initiate breastfeeding (30). Among overweight and obese women, 28% and 35% reported an intended weight gain above guidelines, respectively. Excessive pregnancy weight gain is also associated with many adverse health outcomes for both mother and child (31). It is critical that women and their health care

providers understand the risks of both insufficient and excessive weight gain during pregnancy, and that providers clearly communicate these risks to their patients.

The final objective of this study was to examine if provider advice on weight gain, physical activity, and nutrition was associated with women's intentions to meet respective recommendations. Supporting our hypothesis, we found significant associations between report of provider advice and women's intentions to meet physical activity and nutrition recommendations. Report of provider advice on weight gain was not associated with weight gain intentions in bivariate analyses. However, the amount of weight gain recommended by providers was associated with women's intended weight gain in pounds. Furthermore, provider recommendations to gain weight outside of IOM guidelines were associated with an increased risk of intended weight gain outside of guidelines. Due to the small sample size we observed wide confidence intervals and therefore findings must be interpreted with caution. Together, these findings illustrate the potential role of the health care provider in guiding women's intentions to meet weight gain, physical activity, and nutrition recommendations.

Although healthcare providers are well positioned to discuss weight-related behaviors in pregnancy, there are also many barriers to patient-provider communication, including: lack of time, insufficient training, concern about the sensitivity of the topic, and the perception that advice is ineffective (32-34). If providers are to consistently and correctly advise patients, they must be given the appropriate intervention tools. Future studies should examine the efficacy of provider-based interventions aimed at increasing the rate and accuracy of provider counseling on weight gain, physical activity, and nutrition.

This study contributes to the existing literature in multiple ways. Assessment of patient-provider communication on physical activity and nutrition during prenatal care fills an existing gap in the literature. Furthermore, to our knowledge this is the first study to quantitatively examine the associations of provider advice on physical activity and nutrition with women's intentions to meet nutrition and physical activity recommendations. Findings provide evidence that healthcare providers influence women's weight-related intentions during pregnancy. However, further education and training for providers is needed to increase the percentage who discuss these topics and who do so accurately.

While this study contributes novel findings to the literature, multiple limitations must be noted. First, pre-pregnancy weight was self-reported and underreporting of weight may have occurred. This could have resulted in misclassification of pre-pregnancy BMI and therefore the weight recommendations populated in the survey would have been incorrect. Second, we used women's self-report of provider behavior and did not include provider assessments. Recall or social desirability bias may have led women to inaccurately report weight gain, physical activity, and dietary recommendations. Future studies should consider assessing patient report of provider advice early on and throughout pregnancy to limit recall bias. Furthermore, the study design did not allow for probing and follow up questions, which may have limited the depth of responses on physical activity and nutrition recommendations. However, in a different sample population, we found high levels of consistency between patient and provider report of counseling on weight gain, physical activity, and nutrition

(34). Third, we did not assess women's actual pregnancy weight gain, physical activity, or dietary intake during pregnancy, but rather focused on women's intentions to engage in these behaviors. Studies are needed that women over time to see if provider advice is associated with women's weight-related behaviors during pregnancy. Finally, respondents were primarily White Internet-users with higher levels of education and income and lower mean BMI than national averages, which limit the generalizability of study findings.

Overall rates of patient-reported provider advice on weight gain, physical activity, and nutrition are less than ideal. However, when advice is reported it is largely consistent with current guidelines. It appears that providers may play an important role in guiding women's weight gain, physical activity, and nutrition intentions in pregnancy. It is imperative that providers are knowledgeable about current guidelines. Interventions are needed to increase the percentage of healthcare providers who accurately advise women on weight gain and related behaviors during pregnancy.

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Significance

Weight gain, physical activity, and dietary intake all directly influence pregnancy outcomes and the health of mother and child. Providers are encouraged to discuss weight gain and related behaviors with pregnant patients; however, evidence suggests that provider advice is limited. In this study, a large percentage of women reported receiving no advice on weight gain, physical activity, or nutrition during pregnancy. However, report of provider recommendations was associated with women's intentions to engage in healthy weight-related behaviors. Further education and training of providers is necessary to increase communication on weight gain, physical activity, and nutrition during pregnancy.

Table 1**Participant Characteristics (N=188)**

Characteristic	%	n
Age		
18-25 years	11.2	21
25-29 years	32.5	61
30-34 years	41.0	77
35 years	13.8	26
Missing	1.6	3
Race		
White	81.9	154
African American	10.6	20
American Indian	2.7	5
Asian	2.7	5
Other	1.6	3
Missing	0.5	1
Education		
High School graduate	5.9	11
Some college or technical school	22.3	42
College graduate	71.8	135
Employment		
Employed for wages full time	56.4	106
Employed for wages part time	10.6	20
Self-employed	10.1	19
Student	3.2	6
Homemaker	18.1	34
Out of work	1.6	3
Household annual income		
Less than \$25,000	11.2	21
\$25,000-\$49,999	16.0	30
\$50,000-\$74,999	18.1	34
\$75,000 or more	54.8	103
Marital Status		
Single	5.3	10
Married/ unmarried couple	93.6	176
Divorced	1.1	2
Parity		
0	52.1	98
1	31.4	59
2+	16.5	31
Smoking		
Before pregnancy	8.5	16

Characteristic	%	n
During pregnancy	1.6	2
Prepregnancy BMI Category		
Normal weight	59.6	112
Overweight	19.2	36
Obese	21.3	40
Perceived Health		
Excellent	10.6	20
Very good	44.7	84
Good	35.6	67
Fair	8.5	16
Missing	0.5	1

Table 2

Proportion of Women Who Report Provider Advice on Weight Gain, Physical Activity, and Nutrition by Patient Characteristics (N=188)

Characteristic	Weight Gain				Physical Activity				Nutrition	
	Advised N=98	Not Advised N=90	p-value	Advised N=119	Not Advised N=69	p-value	Advised N=105	Not Advised N=83	p-value	
Age, years ^a	30.5 ± 4.4	30.1 ± 3.9	0.522	30.6 ± 4.2	29.9 ± 4.1	0.235	30.1 ± 4.3	30.7 ± 3.9	0.368	
Race ^b			0.910			0.021			0.093	
White	52.6	47.4		66.9	33.1		58.4	41.6		
Non-White	51.5	48.5		45.5	54.6		42.4	57.6		
Education ^b			0.394			0.011			0.648	
< College graduate	47.2	52.8		49.1	50.9		58.5	41.5		
College Graduate	54.1	45.9		68.9	31.1		54.8	45.2		
Employment ^b			0.213			0.129			0.722	
Not employed	60.5	39.5		53.5	46.5		53.5	46.5		
Employed	49.7	50.3		66.2	33.8		56.6	43.5		
Household income ^b			0.064			0.007			0.652	
< \$75,000	44.7	55.3		52.9	47.1		57.7	42.4		
\$75,000 or more	58.3	41.8		71.8	28.2		54.4	45.6		
Marital Status ^c			0.359			0.101			0.912	
Single	36.4	63.6		36.4	63.6		54.6	45.5		
Married/Couple	52.8	47.2		65.3	34.7		56.3	43.8		
Parity ^b			0.021			0.001			0.505	
0	60.2	39.8		74.5	25.5		58.2	41.8		
1	43.3	56.7		51.1	48.9		53.3	46.7		
Pregnancy smoking ^b	50.0	50.0	0.876	43.8	56.3	0.093	56.3	43.8	0.957	
Yes	52.1	48.0		64.9	35.1		55.6	44.4		
No										

Characteristic	Weight Gain			Physical Activity			Nutrition		
	Advised N=98	Not Advised N=90	p-value	Advised N=119	Not Advised N=69	p-value	Advised N=105	Not Advised N=83	p-value
Prepregnancy BMI ^b			0.376			0.305			0.017
Normal weight	54.5	45.5		67.0	33.0		58.0	42.0	
Overweight	41.7	58.3		52.8	47.2		36.1	63.9	
Obese	55.0	45.0		62.5	37.5		67.5	32.5	
Perceived Health ^b			0.659			0.001			0.634
Excellent/very good	53.9	46.2		74.0	26.0		57.7	42.3	
Good/fair	50.6	49.4		50.6	49.4		54.2	45.8	

Data presented as percentages unless otherwise specified

^aData are given as presented as mean $\pm$ SD, t-test;

^bChi-square test;

^cFisher's exact test

Table 3

Patient Report of Provider Recommended Weight Gain and Patient's Intended Weight Gain

Provider recommended weight gain N=96, % (n)			
Pre-pregnancy body mass index category	Within guidelines	Below guidelines	Above guidelines
Normal weight	86.7 (52)	13.3 (8)	0.0 (0)
Overweight	64.3 (9)	0.0 (0)	35.7 (5)
Obese	68.2 (15)	4.6 (1)	27.3 (6)
Total	79.2 (76)	9.4 (9)	11.5 (11)
Women's intended weight gain N=188, % (n)			
Normal weight	48.2 (54)	39.3 (44)	12.5 (14)
Overweight	63.9 (23)	8.3 (3)	27.8 (10)
Obese	47.5 (19)	17.5 (7)	35.0 (14)
Total	51.1 (96)	28.7 (54)	20.2 (38)

Table 4**Physical Activity and Nutrition Recommendations**

Physical Activity (n=119)	N	%
Maintain previous exercise routine	43	36.1
Recommended types of activities	38	31.9
Walking	31	26.1
Prenatal yoga	18	15.1
Swimming	11	9.2
Recommended intensity level	26	21.8
Moderate	17	14.3
Light	4	3.4
Recommended frequency/duration	25	21.0
Meeting recommendations (30 min, 5+ days/week)	15	12.6
Less than recommendations (<30 min, <5days/week)	5	4.2
Use caution	11	9.2
Do what feels comfortable	9	7.6
Exercises to avoid	8	6.7
Exercise regularly	7	5.9
Keep heart rate below 140 beats per minute	6	5.0
Nutrition (n=104)	N	%
Fruits and vegetables	47	45.2
High protein	35	33.7
Eat healthy, balanced diet	34	32.7
Low carbohydrate or sugar intake	17	16.3
Drink water	15	14.4
Foods to avoid	14	13.5
Whole grains	12	11.5
Small, frequent meals	11	10.6
Unhealthy foods in moderation	8	7.7
Increase iron intake	6	5.8
Dairy	6	5.8
Limit processed foods	5	4.8

Table 5

Linear Regression Analyses of Provider Recommended Weight Gain in Pounds (Independent Variable) and Women's Intended Weight Gain in Pounds (Dependent Variable)

	n	β	95% CI	t-value	p-value	Model R ²
Model 1	96	1.03	0.83-1.23	10.07	<0.001	0.52
Model 2	94	1.10	0.79-1.40	7.16	<0.001	0.53

Model 1 is the crude association

Model 2 adjusts for age, race, education, parity and pre-pregnancy BMI

Table 6

Logistic Regression Analyses of Provider Recommended Weight Gain (Independent Variable) and Women's Intended Weight Gain Within or Outside IOM Guidelines (Dependent Variable)

Provider Advice	Crude N= 96		Adjusted N=94	
	Odds Ratio	95% CI	Odds Ratio	95% CI
Within IOM guidelines	Referent		Referent	
Outside IOM guidelines	4.13	1.36-12.52	6.68	1.87-23.94

Adjusted for age, race, education, parity and pre-pregnancy BMI