

# Obstetrician/Gynecologists' Knowledge, Attitudes, and Practices Regarding Weight Gain During Pregnancy

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## Abstract

**Objective:** Assess obstetrician–gynecologists' knowledge and counseling practices regarding gestational weight gain (GWG).

**Materials and Methods:** Questionnaire studies were conducted in 2012 and 2014 sent to practicing obstetrician–gynecologists.

**Results:** Response rates were 111/236 (47%) and 206/474 (43.5%). The majority of respondents agreed (50.0%) or strongly agreed (26.6%) that excessive GWG is a major health concern, often or always calculate the body mass index (BMI) of their patients (79.1%), and use BMI to modify their weight gain recommendations (78.5%). The physicians reported that, on average, 7.8% of pregnant patients gained too little weight, 47.3% gained an appropriate amount, and 45.1% gained too much. A greater proportion of patients with private insurance was associated with physician perception of fewer gaining excessive weight ( $r=-0.205$ ,  $n=198$ ,  $p=0.004$ ), whereas high proportions with Medicaid or uninsured were positively correlated with a perception of excessive GWG ( $r=0.206$  and  $0.187$ ,  $n=198$ ,  $p=0.004$  and  $0.008$ , respectively). A majority of physicians (55.1%) were not confident in their ability to affect their patients' prenatal weight gain. Confident physicians exhibited more appropriate practice efforts (e.g., use prepregnancy BMI; 83.6% vs. 74.8%,  $p=0.009$ ) and were more likely to inform their patients about the increased risk of pregnancy complications (90.8% vs. 69.7%,  $p=0.001$ ) and possible harms to their baby (76.9% vs. 61.0%,  $p=0.001$ ) from excessive GWG.

**Conclusions:** Study participants perceived excessive GWG to be a significant problem, but had low confidence in their ability to address it.

**Keywords:** gestational weight gain, body mass index, guidelines

## Introduction

PREGNANCY CAN OFFER a critical window of opportunity for assessing and improving women's health. Pregnant women may be more receptive to advice concerning lifestyle choices, especially if phrased as being for the benefit of their baby. Thus, pregnancy has been suggested to represent a "teachable moment" in women's lives during which physician advice regarding healthy lifestyle behaviors may have lasting beneficial effects.<sup>1</sup>

Gaining an appropriate amount of weight during pregnancy is an important factor for neonatal and maternal health both immediately postpartum and well into the future. The American College of Obstetricians and Gynecologists (ACOG) has endorsed the 2009 Institute of Medicine (IOM) updated recommendations on weight gain during

pregnancy<sup>2</sup> modified by prepregnancy body mass index (BMI) (Table 1).<sup>3</sup> Excessive weight gain during pregnancy has become more prevalent than inadequate weight gain, as has the proportion of pregnant women who are overweight or obese prepregnancy. In 2011–2012, 58.5% of women in the U.S. between the ages of 20 and 39 years had a BMI greater than 25 kg/m<sup>2</sup>.<sup>4</sup> Published data from 46 states, the District of Columbia and New York city, indicate that in 2012 and 2013 about half (mean 47.5%, range 38.2–54.7%) of U.S. pregnant women gain weight in excess of the IOM recommendations,<sup>5,6</sup> with overweight and obese women the most likely to gain more than the IOM recommendations.<sup>5–7</sup> Data from 2015 on pregnant women in 48 states and the District of Columbia indicate no change, with 48% gaining excessive weight and a majority of overweight and obese women gaining above the IOM recommendations.<sup>8</sup> Excessive weight gain during pregnancy

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TABLE 1. THE INSTITUTE OF MEDICINE RECOMMENDATIONS FOR WEIGHT GAIN DURING PREGNANCY MODIFIED BY PREPREGNANCY BODY MASS INDEX

<i>Prepregnancy weight category</i>	<i>BMI (kg/m<sup>2</sup>)</i>	<i>Recommended total weight gain range (lb)</i>	<i>Second and third trimester mean (range) weekly weight gain in lb/week</i>
Underweight	Less than 18.5	28–40	1 (1–1.3)
Normal weight	18.5–24.9	25–35	1 (0.8–1)
Overweight	25.0–29.9	15–25	0.6 (0.5–0.7)
Obese	Above 30	11–20	0.5 (0.4–0.6)

Adapted From American College of Obstetricians and Gynecologists, 2013.  
BMI, body mass index.

is a risk factor for macrosomia, cesarean section, and postpartum weight retention,<sup>2</sup> as well as a significant risk factor for future obesity of both mother and child.<sup>9–11</sup>

Counseling on gestational weight gain (GWG) by health-care providers to increase patient understanding of the risks of excessive weight gain and the potential benefits of meeting the IOM recommendations may be an important component in efforts to reduce the prevalence of excessive GWG. However, it is not clear to what extent providers are effectively counseling patients on weight gain during pregnancy. In a study of normal weight and overweight women in early pregnancy (before 16 weeks gestation), although women who reported receiving weight gain advice from their providers generally received advice consistent with the IOM guidelines, a majority of the women (58.3%) reported they received no advice.<sup>12</sup> A qualitative study of providers (family physicians, obstetricians, and nurse midwives) found that providers did not place a priority on appropriate weight gain, had few resources for patients, and believed that any advice they gave was unlikely to be followed.<sup>13</sup> A study of obstetric and family medicine residents in 2010 found they had minimal knowledge of the 2009 IOM recommendations.<sup>14</sup> A study of 30 pregnant women and 11 providers in 2014 found that although all providers and most patients (87%) reported giving/receiving counseling regarding GWG, only about half (55% for providers and 47% for patients) reported giving/receiving a specific recommendation. Provider knowledge of the IOM recommendations was weak, with four of the eleven reporting they were not even familiar with them, and few being able to accurately give the recommendations for all BMI categories.<sup>15</sup>

To assess obstetrician–gynecologists' knowledge, counseling practices, and opinions regarding weight gain during pregnancy and to identify potential factors to explain variation in knowledge and practice, the ACOG Research Department conducted two questionnaire studies; one before (2012) and one after (2014) ACOG published ACOG Committee Opinion 548 on GWG.<sup>3</sup> A secondary goal was to assess whether ACOG Committee Opinion 548 endorsing the IOM recommendations affected knowledge and practice.

## Materials and Methods

In August of 2012, 3 years after the updated IOM guidance but before ACOG published Committee Opinion 548 on weight gain during pregnancy<sup>3</sup> endorsing the IOM guidance, a questionnaire focusing on knowledge, practice, and opinions regarding weight gain during pregnancy was sent to 300 members of the Collaborative Ambulatory

Research Network (CARN), a group of over 1000 Fellows of the College, who voluntarily participate in four to six surveys annually without compensation to facilitate assessment of practice patterns and development of professional education. The questionnaire included demographic questions, including gender, age, years in practice, board certification, and practice characteristics (type, location, patient characteristics, and time distribution). Only physicians who provided prenatal care were asked to complete the survey. To assess attitudes and practice patterns related to weight gain during pregnancy, respondents were asked about prenatal screening, knowledge of IOM recommendations (yes or no answers), and their degree of agreement with statements regarding weight management in patients, management of weight in patients, and their belief in their ability to help patients maintain a healthy weight (using five-point Likert scales). The selected CARN members received both paper mailings and emails with a link to an online version of the survey.

In January 2014, 1 year after the release of ACOG Committee Opinion 548,<sup>3</sup> a revised version of the 2012 questionnaire that included an additional question on insurance status of the patient population was sent to 546 ACOG Fellows and Junior Fellows in practice. Of these, 246 were CARN members (different from the previous 300) and the other 300 survey recipients were randomly selected ACOG Fellows and Junior Fellows who did not belong to CARN, to test the extent to which the results from CARN members could be generalized to practicing ACOG Fellows as a whole. The survey was mailed along with a cover letter explaining the purpose of the study and a postage-paid return envelope. Four follow-up mailings were sent to nonresponders.

Physician confidence in their ability to influence their patients' GWG was measured by two parameters using the questions listed in Table 2: a binary parameter based on the first question listed in Table 2 (0 for not confident and 1 for confident or very confident) to be used in  $\chi^2$  analysis, and a confidence score constructed using a principle component analysis (PCA) on all six questions listed in Table 2 to be used in correlation analysis.

Data were analyzed using a personal computer-based software package (IBM SPSS Statistics<sup>®</sup> 20.0; IBM Corp<sup>®</sup>, Armonk, NY). Descriptive statistics were computed for the measures used in the analyses. Group differences in responses on continuous measures were assessed with ANOVA analyses and linear regressions. Group differences on categorical measures were assessed with  $\chi^2$  tests. Pearson's correlations were used to describe correlations between continuous variables, and partial correlation was used when several variables were correlated to the same outcome.

TABLE 2. QUESTIONS USED TO CREATE THE PHYSICIAN CONFIDENCE INDEX

		Not confident 55.1%	Confident 38.8%	Very confident 6.1%
How confident are you in your ability to affect your patients' prenatal weight gain?				
How likely is it that				
...you will actually help your patients avoid excessive pregnancy weight gain?	Very unlikely 3.8%	Unlikely 51.0%	Likely 40.7%	Very likely 4.5%
...your patients will follow your advice on pregnancy weight gain?	Very unlikely 2.2%	Unlikely 48.6%	Likely 46.3%	Very likely 2.9%
...your patients will follow your advice on diet?	Very unlikely 1.6%	Unlikely 45.2%	Likely 51.0%	Very likely 2.2%
...your patients will follow your advice on physical activity?	Very unlikely 2.9%	Unlikely 55.1%	Likely 40.4%	Very likely 1.6%
I am successful at helping my patients gain an appropriate amount of weight during pregnancy				
Strongly disagree 1.0%	Disagree 23.2%	Neutral 42.5%	Agree 30.8%	Strongly agree 2.5%

The results are for pooled data from both surveys.

**Results**

Of the 175 CARN members who returned the 2012 questionnaire, 64 did not see pregnant patients and were excluded, resulting in 111 respondents (75 by paper questionnaire and 36 by electronic) for a response rate of 47%. Of the 546 ACOG Fellows (246-CARN, 300-nonCARN) in the 2014 study, 5 were unreachable and 273 returned questionnaires. Of these responding physicians, 67 did not provide prenatal care, including 4 who were retired. These respondents were excluded resulting in a sample size of 206 for a response rate of 43.5%. For the 2014 survey, we were able to compare the age and sex of responders versus nonresponders. There was no difference in age between responders (50.9±0.7 years) or nonresponders (49.8±0.7 years; *p*=0.287), but women (55.9%) were more likely to respond than were men (44.1%; *p*=0.014).

For most of the questions on the survey, there were no differences between the two studies in the responses, and data were pooled. Where there were differences, those findings are noted and the data presented separately. In the 2014 study

there were no differences in the responses between CARN members and Fellows that did not belong to CARN.

A comparison of the demographics of the two groups of respondents is presented in Table 3. Men accounted for a higher proportion of the respondents from the 2012 survey (*p*=0.005), and the mean number of years in practice for the 2012 respondents was higher compared with the mean years in practice for the respondents to the 2014 study (*p*=0.01). There were no differences in practice structure, practice location, or the estimated ethnic/racial makeup of the patient population between the respondents to the two studies.

Virtually all of the respondents considered managing weight gain by their pregnant patients to be part of their clinical responsibility (98.7%). A majority of respondents calculate the BMI of their patients at the first prenatal visit often or always (79.1%) and use BMI to modify their weight gain recommendations often or always (78.5%).

Men and women differed on these questions, however. Women were more likely to calculate BMI at the first prenatal visit often or always (83.6% vs. 72.6%, *p*=0.020), and women were more likely to use prepregnancy BMI to modify their

TABLE 3. DEMOGRAPHICS FOR THE SUBJECTS FROM THE STUDIES IN 2012 AND 2014

	2012 study	2014 study
Gender breakdown	54 male; 53 female; 4 declined to state	70 male; 136 female
Years in practice	21.4±0.9, range=2–40 years; males = 25.1±1.2; females = 17.4±1.2; <i>p</i> <0.001	18.3±0.8, range=0.5–65 years; males = 24.3±1.3; females = 12.2±1.0; <i>p</i> <0.001
Specialty	90.7% OB/GYNs; 5.6% MFMs	91.7% OB/GYNs; 6.3% MFMs
Practice structure	Solo: 12.7% OB/GYN group: 48.2% Multispecialty group: 15.5%; University: 15.5% HMO: 3.6% other 4.5%	Solo: 14.0% OB/GYN group: 47.3% Multispecialty group: 14.1%; University: 15.1% HMO: 3.9% Other: 5.4%
Practice location	Inner city: 15.7% Urban, not inner city: 21.3%; Suburban: 40.7% Small town: 18.5% Rural: 2.8%	Inner City: 18.9% Urban, not inner city: 26.2%; Suburban: 33.0% Small town: 16.0% Rural: 5.8%
Patient racial/ethnic breakdown	White = 58.3%±2.7% Hispanic = 17.9%±2.2% African American = 15.9%±1.7%; Asian = 5.2%±0.6%	White = 57.5%±1.8% Hispanic = 15.6%±1.3% African American = 17.8%±1.3% Asian = 4.8%±0.5%

weight gain recommendations often or always (84.1% vs. 69.4%,  $p=0.001$ ). However, there was also a strong effect of years in practice for both calculating BMI and using BMI to modify weight gain recommendations (Table 4), which largely explained the male–female difference. Combining years in practice and physician gender, the only difference that remained significant was among physicians with 11–24 years in practice, with women in that group being more likely to use BMI to modify weight gain recommendations (Table 4).

Most of the physicians were aware of the 2009 IOM guidelines (81.8%). In general, the respondents agreed with the 2009 IOM guidelines (66.2% agreed or strongly agreed), but a large proportion (25.4%) were neutral. Physician awareness and opinion of the IOM recommendations did not differ between the two studies.

Being aware of the IOM recommendations was associated with both calculating BMI at the first prenatal visit often or always (83.9% vs. 64.9%,  $p=0.001$ ) and with using BMI to modify weight gain recommendations often or always (81.3% vs. 64.3%;  $p=0.001$ ). Physicians who were familiar with the 2009 IOM recommendations were more likely to counsel their patients about weight gain during pregnancy often or always than those who were not familiar (93.3% vs. 80.7%;  $p=.006$ ). They were also more likely to inform their pregnant patients that excessive weight gain increases the risk of pregnancy complications (83.2% vs. 61.5%,  $p=0.001$ ) and can negatively affect their baby's health (74.4% vs. 42.1%,  $p=0.001$ ).

The majority of respondents agreed (50.0%) or strongly agreed (26.6%) that excessive pregnancy weight gain is a major health concern for their practice. Most report that an increasing number of their prenatal patients gain too much weight (73.9% agreed or strongly agreed), and that excessive weight gain is more a problem than inadequate weight gain in their practice (86.6% agreed or strongly agreed). They disagreed that the health risks of excessive pregnancy weight gain are overstated (84.0% disagree or strongly disagree), and agreed that pregnancy weight gain contributes to the obesity epidemic (71.3% agree or strongly agree). Almost all agreed (51.9%) or strongly agreed (41.7%) that pregnancy weight gain can be modified by changes in diet and physical activity.

Based on their own criteria, the responding physicians reported that, on average, 7.8% of their patients gained too little weight during pregnancy, 47.3% gained an appropriate amount, and 45.1% gained too much. There was no differ-

ence between the two studies, men and women, or with years in practice for these opinions.

The 2014 study included a question asking the physicians to estimate the proportions of their patients with private insurance, Medicaid, or who are uninsured. The reported proportion of patients with private insurance was positively correlated with the physicians' perceived proportion of patients that gained an appropriate amount of weight ( $r=0.231$ ,  $n=198$ ,  $p=0.001$ ) and negatively correlated with the reported proportion of patients that gained too much weight ( $r=-0.205$ ,  $n=198$ ,  $p=0.004$ ). In contrast, a reported high proportion of patients with Medicaid or uninsured were both negatively correlated with the reported proportion gaining an appropriate amount of weight ( $r=-0.228$  and  $-0.181$ ,  $n=198$ ,  $p=0.001$  and  $0.011$ , respectively) and positively correlated with the reported proportion of patients that gained too much weight ( $r=0.206$  and  $0.187$ ,  $n=198$ ,  $p=0.004$  and  $0.008$ , respectively).

Most respondents reported counseling their pregnant patients about weight gain (91.2%) and exercise (85.8%) often or always. Only 3 of 10 respondents (30.7%) reported referring their pregnant patients for nutritional counseling often or always. A higher proportion of respondents from the 2012 survey reported informing their pregnant patients about possible harms to their baby (80.0% vs. 62.3% often or always,  $p=0.001$ ) and an increase in the risks of pregnancy complications (84.6% vs. 76.6% often or always,  $p=0.002$ ) due to excessive pregnancy weight gain. Respondents to the 2012 survey were also more likely to report they counseled their pregnant patients regarding sedentary behavior (49.5% vs. 36.1%,  $p=0.023$ ).

Only 6.1% of respondents were very confident in their ability to affect their patients' prenatal weight gain, and a majority (55.1%) were not confident (Table 2). Physician confidence declined with years of practice (52.7%, 46.9%, and 32.0% confident or very confident for 0 to less than 11 years, 11–24 years, and more than 24 years in practice, respectively,  $p=0.011$ ). Only 30.8% agreed and 2.5% strongly agreed with the statement "I am successful at helping my patients gain an appropriate amount of weight during pregnancy." Many reported it to be unlikely or very unlikely that they will actually help their patients avoid excessive weight gain, and that their patients are unlikely or very unlikely to follow their advice on weight gain, physical activity, and diet (Table 2). These opinions did not vary with years in practice.

TABLE 4. THE PROPORTIONS OF PHYSICIANS THAT CALCULATE BMI AT THE FIRST PRENATAL VISIT AND THAT USE BMI TO MODIFY THEIR PREGNANCY WEIGHT GAIN RECOMMENDATIONS, BY PHYSICIAN GENDER AND YEARS IN PRACTICE

	<i>Years in practice</i>	<i>All respondents (%)</i>	<i>Men (%)</i>	<i>Women (%)</i>	<i>p</i>
Calculate BMI at first prenatal visit	11 or fewer	91.2	91.0	91.2	ns
	11–24	78.8	72.1	82.8	ns
	More than 24	69.0	69.6	67.8	ns
All respondents	0–47	79.2	72.6	83.6	0.020
Use BMI to modify weight gain recommendations	11 or fewer	90.1	81.8	91.3	ns
	11–24	73.2	58.1	82.6	0.002
	More than 24	71.0	73.9	64.5	ns
All respondents	0–47	78.2	69.4	84.1	0.001

The physician confidence score created using PCA accounted for 58.5% of the variance in the six questions from Table 2. The confidence score was negatively correlated with years in practice ( $r = -0.128$ ,  $n = 300$ ,  $p = 0.026$ ). For data from the 2014 survey that included insurance status, confidence score was negatively correlated with the reported proportion of patients with either Medicaid or uninsured ( $r = -0.250$ ,  $n = 199$ ,  $p = 0.001$ ). The partial correlation of confidence index with the proportion of Medicaid/uninsured patients controlling for years of practice was significant ( $r = -0.263$ ,  $n = 190$ ,  $p = 0.001$ ), but years in practice was not related to confidence score after accounting for the effect of insurance status ( $r = -0.118$ ,  $n = 190$ ,  $p = 0.102$ ).

Physician confidence had a significant effect on practice. Confident physicians (based on the binary parameter) were more likely to use prepregnancy BMI to make weight gain recommendations often or always (83.6% vs. 74.8%,  $p = 0.009$ ) and to counsel often or always regarding weight gain (95.7% vs. 87.3%,  $p = 0.001$ ), exercise (92.1% vs. 80.3%,  $p = 0.003$ ), and sedentary behavior (54.3% vs. 29.7%,  $p = 0.001$ ). They were more likely to inform their patients about the increased risk of pregnancy complications (90.8% vs. 69.7%,  $p = 0.001$ ) and possible harms to their baby (76.9% vs. 61.0%,  $p = 0.001$ ) due to excessive weight gain. They were also more likely to refer their pregnant patients for nutritional counseling (37.1% vs. 25.6%,  $p = 0.010$ ).

The physician confidence score was positively correlated with the physicians' estimate of the proportion of their patients that gained an appropriate amount of weight during pregnancy ( $r = 0.330$ ,  $n = 304$ ,  $p = 0.001$ ). When the effect of patient insurance status was controlled the association remained highly significant ( $r = 0.392$ ,  $n = 202$ ,  $p = 0.001$ ).

## Discussion

Gaining an appropriate amount of weight during pregnancy has been shown to be an important factor for neonatal and maternal health and well-being immediately postpartum and well into the future.<sup>1</sup> GWG in a woman's first pregnancy is a significant predictor of her weight gain in a subsequent pregnancy.<sup>16</sup> Excessive weight gain is associated with an increased risk for maternal hypertensive disorders and macrosomia for all maternal BMI categories,<sup>17</sup> although evidence indicates that even GWG within current guidelines for women above a BMI of 35 kg/m<sup>2</sup> is not protective against high birth weight in the baby.<sup>18</sup> Children of mothers with excessive GWG were at greater risk of being overweight.<sup>9,11,19</sup> The effect appears to extend into adolescence and beyond.<sup>20</sup> Daughters of mothers who gained weight above the IOM recommendations were more likely to be overweight or obese 40 years after their birth.<sup>21</sup> Excessive GWG appears to have the potential to propagate obesity into future generations.

There are some limitations to the study. Data are from physician self-report, and thus subject to concerns such as imperfect recall, among others. Although there was no difference in age between responders and nonresponders in the 2014 study, women were more likely to respond. Men and women generally did not differ in their responses to the questionnaires, suggesting that this sex difference in response rate may not matter. The number of respondents (317) is not large and a majority of the respondents (227% or 71.6%) belong to the CARN, which may limit the generalizability of

the results. However, the CARN group is actively maintained to match the demographics of practicing ACOG Fellows as a whole, and has consistently been shown to be similar in knowledge, practice, and opinions from randomly selected Fellows in numerous studies over the last 20 years. For this particular study, the CARN and non-CARN responders to the second survey did not differ on any question, increasing our confidence that these results reflect those of practicing obstetrician-gynecologists.

The results from these two studies indicate that obstetrician-gynecologists are cognizant of the dangers of excessive weight gain during pregnancy and consider it a serious health issue in their practice. On average, the responding physicians reported that in their opinion more than 4 of 10 pregnant women under their care will gain too much weight. Their estimate is consistent with national data regarding GWG, with a mean of almost 50% of women gaining above the IOM recommendations in 2012, 2013, and 2015.<sup>6,8</sup> In contrast, the responding physicians reported low rates of women gaining inadequate weight during pregnancy (mean = 7.8%), as opposed to the national data that reported a value of about 20%.<sup>6,8</sup> One possible interpretation is that these physicians, on average, consider the IOM lower limits on weight gain to be higher than is necessary. Another possibility is that these physicians, on average, are less concerned about inadequate weight gain, and therefore are less aware of it in their practice. However, we emphasize that these values for inadequate, appropriate, and excessive GWG reflect physician perception, and are not necessarily a true estimate of the values that would be obtained from comparing medical records with the IOM recommendations.

There appeared to be an effect of insurance status, with uninsured and Medicaid patients estimated to be more likely to gain excessive weight. This finding must be interpreted with care, as it is based on physician self-report. Because the weight gain categorization was based on physician opinion, we cannot rule out that physicians with high rates of Medicaid or uninsured patients may be more concerned about excessive weight gain, possibly have stricter upper limits on what they consider appropriate GWG, or simply have a biased impression of the likely GWG of their patients. What we can say is that physicians with high Medicaid/uninsured patient populations perceive excessive GWG to be more frequent. To test this hypothesis, studies utilizing patient medical records would be required.

Most of the physicians were aware of the 2009 IOM recommendations for weight gain based on prepregnancy BMI, although almost one of five was not. In general, the respondents agreed with the IOM recommendations. Being aware of the IOM recommendations was associated with better practice regarding counseling patients and using BMI to modify weight gain recommendations; however, we cannot distinguish between more knowledgeable physicians have better practice patterns versus knowledge of the IOM recommendations improves practice.

Publication of ACOG Committee Opinion 548 appeared to have no effect on knowledge of the IOM recommendations or on practice. Whether this result is due to practice effort and patterns by physicians being set more by factors other than guidance from respected institutions (e.g., IOM and ACOG), such as personal experience regarding success at influencing

their patients weight gain, or by a subset of physicians that appear not to be aware of guidance in this area (e.g., about 18% of the responding obstetrician–gynecologists reported they were unaware of the IOM recommendations for weight gain during pregnancy) cannot be determined from these data. It is disappointing that publication of ACOG Committee Opinion 548 did not even increase awareness of the IOM recommendations.

Physicians confident in their ability to influence their patients' weight gain during pregnancy exhibited greater and more appropriate practice effort regarding counseling on weight gain during pregnancy. Physician confidence declined with years in practice. We cannot determine whether this effect is due to younger physicians receiving more training in this area or physician experience decreases their expectation of being able to influence their patients' behavior. This finding is consistent with previous findings regarding managing weight in nonpregnant patients, in which physician confidence was a significant predictor of practice effort for weight management of patients.<sup>22–25</sup> This finding also suggests that providing physicians with effective tools to improve their knowledge of GWG recommendations, enhance their ability to monitor GWG relative to recommendations, and to facilitate better communication with patients regarding weight gain recommendations might be rewarded with greater physician efforts in this area in a virtuous cycle. A focus group study found that providers were aware of and concerned about the risks associated with excess GWG, but were concerned that their training was inadequate. A common motivation for participating in the focus groups was "...to find out what other people are doing," indicating an interest in learning new counseling methods.<sup>26</sup> A recent pilot study found that plotting a pregnant patient's weight against a recommended prenatal weight gain curve appeared to increase the quality of counseling on weight gain and the patient satisfaction with counseling,<sup>27</sup> suggesting that developing simple tools could improve GWG counseling and effectiveness.

In summary, the majority of obstetrician–gynecologists is cognizant of the dangers of excessive weight gain during pregnancy for women and their babies, are aware of the 2009 IOM recommendations for GWG based on prepregnancy maternal BMI, and appear to have a realistic impression of the GWG patterns of their patients (although they possibly may be underestimating low GWG). However, it is disconcerting that almost one in five were not aware of the IOM guidelines, and that ACOG's 2013 Committee Opinion endorsing those recommendations appears to have had no effect on awareness or practice. Physician confidence in their ability to influence the GWG of their patients is a strong predictor of their practice efforts, similar to findings on weight management of nonpregnant patients.<sup>22–25</sup> This suggests that efforts to produce tools to assist providers in communicating the importance of appropriate GWG to their patients would be well accepted, and possibly result in enhanced provider efforts to monitor and manage GWG.

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#### Author Disclosure Statement

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