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Inconsistent Weight Communication Among Prenatal Healthcare Providers and Patients: A Narrative Review

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Importance: Gestational weight gain (GWG) is an independent and modifiable factor for a healthy pregnancy. Gestational weight gain above or below the Institute of Medicine Guidelines has been shown to impact both maternal and fetal health (eg, gestational diabetes, hypertension, downstream obesity). Healthcare providers (HCPs) have the potential to be reliable sources of evidence-based weight information and advice during pregnancy.

Objective: The aim of this study was to summarize the literature assessing GWG discussions between patients and their HCPs in a clinical setting to better understand the knowledge that is currently being exchanged.

Evidence Acquisition: A literature review was conducted by searching Ovid Medline, CINAHL, and Embase databases. All relevant primary research articles in English that assessed GWG discussions were included, whereas intervention studies were excluded.

Results: A total of 54 articles were included in this review. Although the overall prevalence and content of GWG counseling varied between studies, counseling was often infrequent and inaccurate. Healthcare providers tended to focus more on women experiencing obesity and excessive GWG, as opposed to the other body mass index categories or inadequate GWG. Women of higher socioeconomic status, older age, nulliparous, history of dieting, low physical activity, and those categorized as overweight/obese were more likely to receive GWG advice. Patients also reported receiving conflicting facts between different HCP disciplines.

Conclusions: The evidence regarding GWG counseling in prenatal care remains variable, with discrepancies between geographic regions, patient populations, and HCP disciplines.

Relevance: Healthcare providers should counsel their pregnant patients on GWG with advice that is concordant with the Institute of Medicine Guidelines.

Target Audience: Obstetricians and gynecologists, family physicians, midwives, and prenatal healthcare providers.

Learning Objectives: After completing this activity, the learner should be better able to critique the gaps in prenatal health education regarding GWG, assess the impact that various HCPs have on a patient's weight gain practices, and distinguish factors that contribute to useful and helpful GWG counseling.

Pregnancy is a critical period of growth and development.^{1,2} The intrauterine environment not only

contributes to long-term offspring health, but also the health of future generations.^{1,3-5} In fact, findings from

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a large epidemiological study by Barker and Osmond³ were the first to highlight the Fetal Origins of Health and Disease hypothesis. In 1986, Barker and Osmond³ observed a strong correlation between adult-onset ischemic heart disease and low birth weight. Subsequent studies conducted by Barker's group have provided support for the theory that nutritional deprivation in utero can alter fetal susceptibility to coronary artery disease, type 2 diabetes, overweight, and obesity later in life.^{2,6-9} Epidemiological⁶ and epigenetic⁷ studies beyond Barker's work have also linked fetal outcomes to in utero exposures. Environmental conditions have been shown to alter epigenetic markers of the fetus' DNA, which in turn predicts certain metabolic traits that become evident later in life.⁵ As a result of the research conducted around the Fetal Origins Hypothesis, this has given rise to the DOHaD concept (Developmental Origins of Health and Disease), which promotes research dedicated to understanding the mechanisms behind fetal programming.⁴ Together, the Fetal Origins Hypothesis and the more expansive DOHaD field effectively demonstrate the intricacy by which prenatal exposures impact early childhood development and disease trajectory. One such exposure that has seen tremendous growth in research focus is weight gain during pregnancy.

Weight gain during pregnancy, referred to as gestational weight gain (GWG), is an expected and important aspect of all pregnancies.¹⁰ The Institute of Medicine (IOM), first in 1990, and updated in 2009, provides an evidence-based guideline for appropriate and healthy GWG, which is based on a woman's prepregnancy body mass index (BMI) (Table 1).¹¹ Women on the lower end of the BMI scale have a far more liberal range of weight gain during pregnancy compared with those on the upper end of the BMI range. Researchers have found associations between gaining weight outside of the IOM recommendations and negative outcomes on both maternal and fetal health.^{5,10,11} For instance, inadequate weight gain has been associated with an increased risk of small-for-gestational-age babies and preterm birth.^{12,13} On the other side, excessive weight gain has been associated with an increased risk of large-for-gestational-age or macrosomic baby, as well as an increased risk of childhood obesity or

overweight, which propels the intergenerational cycle of obesity.^{5,13,14} For the mother, excessive weight gain during pregnancy has been associated with an increased risk of abnormal glucose metabolism, gestational or type 2 diabetes, hypertensive disorders, preeclampsia, and cesarean delivery.^{10,13}

Although the effects of inadequate GWG remain a priority clinically, more than half of today's pregnant women exceed GWG recommendations thereby contributing to the intergenerational cycle of obesity.^{5,13} In a recent systematic review and meta-analysis of 1,309,136 pregnant women, 23% of pregnancies gained below, and 47% of pregnancies gained above the recommended amount of weight.¹³ Currently, over two thirds of women are entering pregnancy at a higher BMI than previously observed,¹⁵ and globally the number of children and adolescents (aged 5–19 years) experiencing obesity has risen 10-fold in the past 4 decades.¹⁶ Based on current childhood obesity levels, trajectory models have demonstrated that the majority of today's youth will be obese at 35 years of age.¹⁷ Given the established relationship between discordant GWG and maternal-fetal health, a healthy weight gain trajectory in pregnancy has become a public health focus.

When considering GWG, it is crucial to recognize that discordant GWG is both an independent and a potentially modifiable risk factor for pregnancy complications.¹⁰ For motivated women, it is possible for GWG to be improved through conscious behavioral modifications by the mother, in consultation with a primary healthcare provider (HCP). Some examples of conscious behavioral changes include achieving adequate sleep,¹⁸ reducing sedentary activity, increasing physical activity (PA),¹⁹ and adjusting one's caloric intake appropriately based on pregnancy trimester to achieve a healthy lifestyle throughout pregnancy.²⁰ As discussed by Murphy et al,²¹ behavioral change counseling from primary HCPs has been effective in helping patients improve self-management of a variety of conditions. A meta-analysis on diet and PA counseling in pregnancy showed lower GWG in HCP intervention groups.²² Researchers have demonstrated the positive impact of behavior interventions

TABLE 1
Institute of Medicine Recommendations for Weight Gain in Pregnancy

Pre gravid Weight Category	Pre gravid BMI, kg/m ²	Recommended Rate of GWG in Second and Third Trimesters, Mean (Range), lb/wk	Recommended Total GWG, lb
Underweight	<18.5	1 (1–1.3)	28–40
Normal weight	18.5–24.9	1 (0.8–1)	25–35
Overweight	25–29.9	0.6 (0.5–0.7)	15–25
Obese (all classes)	>30	0.5 (0.4–0.6)	11–20

Adapted from the US Institute of Medicine and the US National Research Council Committee to Reexamine IOM Pregnancy Weight Guidelines. *Weight Gain During Pregnancy: Reexamining the Guidelines* (US National Academies Press, 2009).

in reducing GWG,^{22–24} which can help to mediate associated maternal-fetal health risks.^{5,25–28} A recent meta-analysis of 36 randomized controlled trials on diet and physical interventions in pregnancy showed a decrease in GWG and cesarean deliveries.²³ Similar results were also observed in previous meta-analyses.^{22,24} A woman's accurate knowledge of their specific GWG recommendation is positively associated with them achieving appropriate GWG,²⁹ and women that believe they will gain too much weight are in fact more likely to do so.³⁰ Specifically regarding HCP advice, there is evidence that GWG counseling may improve discordant weight gain.^{31–33} Results by Liu et al³¹ indicate that women being told to gain too much weight by their HCP are 2 times more likely to gain above the IOM guidelines, whereas women instructed to gain too little weight are 1.7 times more likely to gain below the guideline. This shows the magnitude of impact that an HCP may have on their patient's weight during pregnancy.

Still, it appears that women do not always receive accurate GWG information directly from their HCP. A study by Wilcox et al reported that women researching GWG information typically sought non-clinical and often non-evidence-based sources, such as the Internet (82.7%), books (55.4%), and friends (51.5%).³⁴ Similar results were reported in the study of Ferraro et al³⁵ about women's information channels for PA and dietary sources (DS) during pregnancy. Books and magazines (62.4% PA, 69.4% DS) and the Internet (43% PA, 53.7% DS) were the 2 most used sources among a list of options, which included a general practitioner, obstetrician/gynecologist, family, friend, registered nurse, personal trainer, or other. Although advice from HCPs would be expected to yield the most accurate and reliable information, a weak association between HCP advice and appropriate GWG exists,³⁶ suggesting a lack of consistent and clear guidance among HCPs or a lack of ability for patients to follow through on advice offered.

Pregnancy is a time point in the lifespan where women are in regular contact with the healthcare system, meaning that prenatal care providers have the potential to be reliable and valuable sources of evidenced-based information when counseling pregnant women about weight and its related behaviors. There is a need for better of understanding of patient-provider dialogue to elucidate the knowledge that is being exchanged during these discussions. Thus, the purpose of this narrative review is to summarize the literature assessing GWG discussions as they occur during the prenatal period between patients and their HCPs in a clinical setting. Specifically, patient perceptions and HCP perceptions of GWG discussions will be explored, along with barriers and attitudes toward GWG communication.

METHODS

A comprehensive literature review was conducted by searching the Ovid Medline, CINAHL, and Embase databases for subject headings and key terms, such as combinations and iterations of “pregnancy,” “weight gain,” “counseling,” and “health professional” up to June 8, 2017, and updated on November 15, 2017 (the search was not limited to a start date, therefore all literature was catalogued). All primary research and English articles were included, as well as articles reporting on GWG discussions between patient and HCP in everyday clinical settings. There was no limitation on the prenatal HCP disciplines, and subsequently included obstetricians, family physicians, nurses, maternal-fetal medical (MFM) specialists, midwives, doulas, and any other trained and certified prenatal care provider. Clinical intervention study designs and conference abstracts were excluded. The lead author (A.W.) scanned the titles and abstracts of articles identified by the search strategy described previously and obtained full-text copies of all that potentially met the inclusion criteria. In addition, the search strategy was passively verified by another author (Z.M.F.) using the same combination of key search terms. The second author (R.H.L.) reviewed the full-text articles to be included to confirm the final selection.

RESULTS

Description of Articles

Study Characteristics

The literature search yielded a total of 724 articles, and 54 full-text articles were included after eligibility screening (Fig. 1). Of the studies assessing GWG communication between HCP and patient, 34 were quantitative, and 20 were of qualitative study design. The majority (85%) of quantitative studies were cross-sectional surveys, with sample sizes ranging from 42 to 9953 participants. Other quantitative study designs included one longitudinal cohort study, 2 prospective cohorts, and 2 retrospective cohorts. The qualitative studies had sample sizes ranging from 9 to 142 and consisted of focus groups, one-on-one interviews, and 1 analysis of observational audio recordings. For this narrative review, HCP disciplines included nurses, obstetricians, midwives, doulas, and family physicians. Definitions of “GWG discussion” varied or were absent in the included articles. Specifically, some authors defined weight gain discussions as providing information on a specific amount of weight to gain, whereas other authors stated terms such as “advice,” “counsel,” or “discuss” to define weight gain

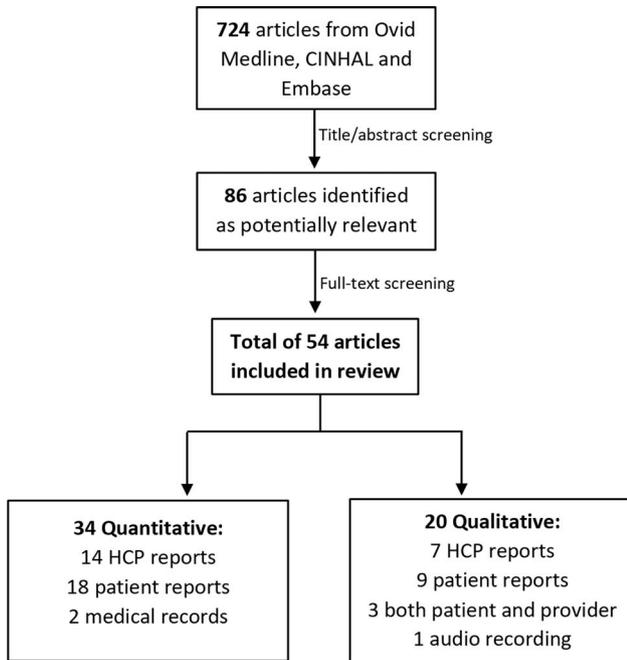


FIG. 1. Flowchart of included articles.

discussions between patients and HCPs. An executive summary of all findings can be found in Table 2. Summaries of the proportion of patients counseled on GWG can be found in Tables 3 and 4.

Historical Documentation

The first article identified assessing GWG conversations between prenatal patients and their HCP was published in 1986, which was the only study to analyze data from before the release of the first set of IOM guidelines related to GWG.³⁷ Most publications assessing GWG communication (84%) occurred after the release of the updated 2009 IOM guidelines.

Geographical Documentation

The majority of articles regarding GWG discussion between HCPs and patients were conducted in North America, with 22 from the United States and seven from Canada. Other studies were from Europe (seven studies from the United Kingdom and two from the Netherlands), Australia (eight from Australia and one from New Zealand), Asia (one from Japan and one from Sri Lanka), and one from Africa (Nigeria). Most studies (55.5%) followed the IOM guidelines for appropriate GWG, whereas others used country-specific guidelines or did not specify any guideline (see Supplementary Tables 1 and 2, Supplemental Digital Content, <http://links.lww.com/OBGYNSURV/A33>, <http://links.lww.com/OBGYNSURV/A34>).

Patient Perceptions (n = 30)

Among the included articles assessing patient perceptions of GWG advice, 18 were quantitative and 12 were qualitative studies. Key findings from articles examining patient perceptions are summarized below (Table 5).^{19,29–31,34,36–50,52–61}

Frequency of GWG Discussions Perceived by Patients

Patient reports of any GWG conversation varied considerably. The frequency of patients receiving GWG guidelines ranged from as low as 9.5%³⁴ to as high as 83%.⁴⁵ Most qualitative accounts reported that the majority of women did not receive any advice.^{38–43} Conversely, 2 qualitative studies reported that more than half (62%⁴⁶ and 63%⁴⁷) of women with overweight and obesity did, in fact, receive advice from their care provider. Few articles reported on the specific differences of approach or methods among different HCP disciplines; however, the articles that did discuss these differences were inconsistent. For instance, McDonald et al⁴⁴ reported that GWG communication was highest among midwives (64%) in a sample of 308 women, whereas Merckx et al¹⁹ reported only 13.4% of midwifery patients receiving any form of GWG advice in a sample of 455 women. In a focus group conducted by Tovar and colleagues,⁴² Hispanic women across all BMI groups reported receiving weight gain advice more frequently from a nutritionist or from the Women, Infants, and Children Program, than from their prenatal physician. In general, those who were significantly more likely to receive GWG advice were of higher socioeconomic status, older age, nulliparous, had a known history of dieting, had a lesser amount of PA in the first trimester, and were classified as overweight or obese.^{36,52,58} Overall, the frequency of GWG discussion shared from the patient point of view was often variable and inconsistent.

Content Themes and Accuracy Perceived by Patients

Along with conflicting patient perceptions of the frequency of GWG discussions, the patient-perceived content of the discussions also varied. For women receiving GWG advice, the two most common themes included being counseled on the risks associated with discordant GWG,^{44,45,50} and being given a specific amount of weight to gain.^{31,34,44,45,49,50,52,53} Most of the discussions related to the risks associated with discordant GWG focused on the risks of excessive weight gain, with fewer discussions about inadequate gain or weight loss during pregnancy. Of the articles reporting on specific weight gain ranges, the advice given by the HCP did not align with the IOM recommendations.^{52,53,58}

TABLE 2
Executive Summary of GWG Communication Between Prenatal Care Providers and Patients

Perception	Topic	Description of Theme
Patient	Prevalence of GWG discussion	Varied drastically among studies, but most prenatal patients do not receive GWG advice
	Patient characteristic	The following women were more likely to receive weight gain advice: <ul style="list-style-type: none"> • Higher socioeconomic status • Older age • Nulliparous • Known history of dieting • Low level of PA in the first trimester • Women with overweight or obesity
	Inconsistent advice	Patients reported receiving conflicting advice between different HCP disciplines. That is, midwife told them one thing and general practitioner told them another.
Prenatal HCP	Prevalence of GWG discussion	Varied drastically among studies, but most HCPs report discussing GWG more often than the patients perceived
	Patient characteristic	HCPs focused more on obesity and excessive GWG (as opposed to other BMI categories or inadequate weight gain).
	Weighing practices	Varied regarding frequency. Certain HCPs reported a reluctance to weigh their patients.
	Barriers	Commonly reported barriers include: <ul style="list-style-type: none"> • Lack of confidence • Lack of time • Lack of formal training • Assumption that counseling is ineffective • Concerns about the sensitivity of the topic (not wanting to offend) • Discrepancies regarding whose role it is to provide GWG advice
Agreed upon by both patients and HCPs	Content of GWG discussion	Primarily focused on the provision of a range of weight to gain and the risks associated with discordant GWG (specifically excessive weight gain). Lack details of behavioral modifications to achieve these goals.
	Accuracy of advice	Varied drastically among studies, but most patients were advised with low accuracy when compared with the IOM guidelines. Patients with overweight or obesity are more likely to be given incorrect weight ranges.
	Discipline of HCP	Varied, no agreement among the literature regarding which type of prenatal provider was most likely to give weight management advice.
Objective sources	Prevalence of GWG documentation	Very low frequency of documented GWG discussions in medical charts.

Multiple studies illustrated a lack of consistency with published guidelines and indicated that women who were overweight or obese were more likely to be told incorrect weight ranges.^{52,53,58} Interestingly, one study noted that women who were overweight or obese had an 18-fold higher likelihood of being told a recommendation that was more than the guidelines, when compared with women with normal weight.⁵² In another case, Tovar and colleagues⁴² noted drastic differences in target

weight recommendations among women of the same BMI category. In the focus group study performed by Tovar et al, normal weight, overweight, and obese women were each given inconsistent advice such that, some normal-weight women were told to not gain any weight and others were advised to gain up to 35 lb.

Variations within the content and the accuracy of advice among different BMI categories were apparent. This variation also extended to the type of HCP based

TABLE 3
Range of GWG Counseling and Accuracy in Studies Assessing Specific Populations

	Characteristic*	Number Assessing GWG Counseling	Given Any GWG Advice, %	Number Assessing Accuracy of Advice	Given Correct Advice,† %
Patient population	Hispanic	1	80	1	42
	Overweight/obese	16	15–100	3	0–29
	Black	3	50–66	0	—
	White	10	36–95	2	6–80
HCP population	Physician	12	28–98	3	0–10
	Midwife	4	13–43	1	16

*Defined as the majority of the population assessed in the study, >50%.

†With regards to IOM guidelines.

on patients' perceptions. In a qualitative study, one participant expressed that her doctors advised her not to gain any weight due to her overweight status. However, the participant's midwives subsequently told her that gaining over 22 pounds was normal.⁵⁵ The receipt of mixed messages regarding GWG was shared between studies. As an illustration, one participant in a study by Kominiarek and colleagues⁴⁷ highlighted, “one doctor tells you oh, you can gain 13 pounds, one doctor tells you oh, you can gain 25 pounds.” Similar mixed messages among different HCPs were also noted in an analysis of online parenting forums.⁵⁴ Overall, patients perceived receiving inconsistent GWG advice in content, accuracy, and from varying HCPs.

Specific GWG Counseling Advice Shared With Patients

Only two articles reported patients being counseled on how to gain within the guidelines.^{49,57} In a population-based study by Vinturache et al,⁵⁷ all patients reported receiving general advice about how to manage nutrition and exercise during pregnancy, yet identical advice about GWG was given, regardless of patients' prepregnancy BMI. Generally, women are interested in GWG discussions^{39,41,46,47,55}; however, they expressed not receiving enough information from their HCP.^{31,39,47,49,52} Participants noted feeling that their current discussions with HCPs were unclear or lacking in content such as how to gain an appropriate amount of weight during

pregnancy.^{31,39,47,49,52} As a result of the lack of clarity and specific weight counseling, patients noted feeling that HCPs were not concerned about their weight.^{45,48,49} Moreover, Nikolopoulos et al³⁹ mentioned that the lack of communication about weight and the confusion surrounding it lead some participants to question whether GWG was truly important to their HCP and for a healthy pregnancy. For example, one participant said.

“I thought that maybe the obstetrician didn't really care about the weight I'm gaining because she didn't tell me too much... Every time, just to go to the scale, she would look and tell me, ‘That's right’, every time. I don't know what's good or not.”

Likewise, Arden et al⁵⁴ found a similar theme in their analysis of parenting forums: “my midwife never weighs me, so I guess she's not too worried.” In some cases, women believed that prenatal patients would more commonly have to bring up weight gain to their HCPs themselves⁴³ or search the Internet on their own for weight advice during pregnancy.⁴⁰ Overall, patients perceived receiving unclear or a lack of tailored weight counseling advice from their HCPs, which lead them to question the importance of GWG during pregnancy.

Healthcare Provider Perceptions (n = 24)

Of the included articles related to HCP perceptions of GWG advice, 14 were quantitative and 10 were qualitative studies. There was great diversity in the types of HCP disciplines that were evaluated on GWG discussions. Studies included perceptions by the following types of HCPs: obstetricians, midwives, family physicians, nurses, MFM specialists, allied health staff, prenatal dietitians, practicing members of the American College of Obstetricians and Gynecologists (ACOG), or a mix of more than one of these specializations. Below are key findings from HCPs' perspectives along with barriers and perspectives of their role in giving pregnancy-related advice (Table 6).^{34,38,40,60,62–81}

TABLE 4
Differences in Range of GWG Counseling Between HCP and Patient Perspectives

	Given Any GWG Advice, %	Given Correct GWG Advice,* % (n)
HCP perspective (n = 12)	28–100	4–80 (5)
Patient perspective (n = 23)	0–87	0–85 (7)

*With regards to IOM guidelines.

TABLE 5
Patient Perceptions of Prevalence and Content of GWG Counseling

Prevalence of GWG Counseling	
<50% of patients counseled	>50% of patients counseled
<ul style="list-style-type: none"> • No advice given.^{38–43} • 9.5% given GWG guidelines.³⁴ • 13.4% of midwifery patients reported recalling any form of GWG advice.¹⁹ • 39% family physicians discussed GWG at all.⁴⁴ • 36% GWG among Obstetricians.⁴⁴ • 40.2% weight gain conversation among Nurses.⁴⁵ 	<ul style="list-style-type: none"> • 62% given advice.⁴⁶ • 63% given advice.⁴⁷ • 64% GWG communication among midwives.⁴⁴ • 75% weight gain conversation among physicians.³⁶ • 83% given GWG guidelines.⁴⁵ • 87% of patients recalling high frequency of GWG conversations and advice given.⁴⁸ • Weight gain advice more frequently from nutritionists or from Women, Infants, and Children Program than from prenatal physician.⁴²
Content and accuracy of the GWG discussion and HCP practices	
Content of GWG discussion	
<ul style="list-style-type: none"> • Patients given a specific amount of weight to gain.^{31,34,44,45,49–53} • Counseled on risks associated with excess GWG (less on inadequate weight gain).^{44,45,50} • Inconsistent weight suggestions.^{47,54,55} 	
Aligns with IOM	
<ul style="list-style-type: none"> • 85% of pregnant women given advice within IOM.⁵² • 9% accuracy of advice given in line with IOM.⁴⁴ 	
Accuracy by HCP type	
<ul style="list-style-type: none"> • 16.3% midwives, 10% family physicians, and 9% obstetricians were accurate in prescribing GWG ranges.⁴⁴ 	
Advice on how to manage weight gain	
<ul style="list-style-type: none"> • 71.5% of HCPs rarely or never advised on how to manage weight in early pregnancy; 83.5% of HCPs rarely or never advised in late pregnancy.⁴⁶ 	

Frequency of GWG Discussions Perceived by HCPs

Although there was a wide range in frequency of GWG discussion, HCPs generally reported higher incidences of counseling than their patients perceived.^{64,65} The frequency of GWG discussions as perceived by HCPs ranged from 28% to 95.5%,^{70,71,75} yet the definitions of weight gain discussion differed throughout the studies. The qualitative reports about GWG advice frequency displayed greater variability. Select studies indicated very low frequencies of GWG discussion; one study⁶⁴ observed that only 33% of HCPs addressed GWG guidelines with their patients, and another study³⁸ indicated that less than 15% of obstetricians provided weight advice to each patient at every visit. In contrast, Oken and colleagues⁶⁵ reported that almost all clinicians provided advice during their first visit with the patient.

Work by our group, comparing self-reports of GWG discussions among different HCPs, found that the frequency of GWG conversations was highest among midwives (94%), followed closely by general practitioners (93%), obstetricians (84%), MFM specialists (73%), and nurses (60%).⁶⁸ Two studies showed minor variations in the frequency of GWG discussions by stage of pregnancy.^{43,65} For instance, Macleod et al⁶³ found that 39% of midwives reported offering verbal weight management advice at the patient's first prenatal appointment, but only 13% regularly offered this same advice later in pregnancy.

Overall, HCPs reported discussing GWG at a high frequency; however, this did not always occur at each prenatal visit across pregnancy and differed among HCP types.

Content Themes and Accuracy Perceived by HCPs

Similar to patient perceptions regarding the content of GWG discussions, HCP perceived that the content also varied. Of the HCPs that indicated providing GWG advice, the most common advice given was related to a specific target weight gain^{66,67,69,70,72,74,81} and the risks of discordant GWG.^{63,69,74} Despite a relatively high self-reported frequency of engaging in GWG conversation, HCPs did not always provide accurate GWG ranges in accordance with 2009 IOM guidelines. In one study of obstetricians and midwives, as little as 4% of HCPs correctly identified weight gain ranges for all prepregnancy BMI categories.⁷² Conversely, another article noted that the majority (80%) of a mix of HCP types counseled patients with the correct IOM recommendations.⁷⁰

There were also notable differences in the precision of GWG recommendations among higher and lower limits of individual prepregnancy weight categories.^{69,70,78} Findings from our group reported 69% of HCPs correctly identified the maximum IOM limit for women with obesity.⁶⁸ This same study noted that midwives tended to recommend 1.46 kg more weight

TABLE 6
HCP Perceptions of Prevalence and Content of GWG Counseling

Prevalence of GWG Counseling	
<50% of patients counseled	>50% of patients counseled
<ul style="list-style-type: none"> • 28% of HCPs discuss GWG.⁶² • 42% of HCPs reported discussing appropriate weight gain “frequently/always” with obese pregnant women.⁶³ • 33% of HCPs reported provided GWG guidelines.⁶⁴ • <15% OBs providing GWG advice at each visit.³⁸ 	<ul style="list-style-type: none"> • All clinicians reported providing advice during first prenatal visit.⁶⁵ • 95.5% of OBs and physicians discuss GWG.⁶⁶ • 65.5%–95% “always” or “often” discuss GWG.^{67–72}
Content and accuracy of the GWG discussion and HCP practices	
Frequency by profession	
<ul style="list-style-type: none"> • 94% midwives, 93% general practitioner, 84% OBs, 73% MFM specialists, 60% nurses.⁶⁸ • 90% nurses, 86% dietitians, 17% family physician, 50% midwives, 42% OB.⁷³ 	
Frequency by pregnancy stage	
<ul style="list-style-type: none"> • 39% midwives in the first visit but 13% at subsequent visits.⁶³ • 19% at first visit, 22% at subsequent visits.⁶² 	
Content of advice	
<ul style="list-style-type: none"> • Provided advice about target weight gain or weight gain range.^{66,67,69,70,72} • Provided advice on the risks of discordant weight gain.^{63,69,74} • Japanese HCPs counseled patients to gain as little weight as possible.⁶⁰ • Behavioral advice for appropriate GWG (focus on PA and nutrition).^{67,69,74} • 83% OBs gave counsel on fruit and vegetable consumption, 73% discussed sugar-sweetened beverages, 94% discussed benefits of breastfeeding, 96% reported PA recommendations, 74% offering high fat and sugary foods advice.⁶⁷ • Midwives discussed PA and food requirements more frequently than all other disciplines.⁷⁴ • 15% midwives offered personalized advice on weight management based on current PA and diet levels.⁶³ 	
Accuracy of advice	
<ul style="list-style-type: none"> • 4% of HCPs correctly identified GWG range for all prepregnancy BMI categories.⁷² • 80% of HCPs correctly counseled based on IOM guidelines.⁷⁰ 	
Weighing practices	
<ul style="list-style-type: none"> • 19% of HCPs report frequent weighing.⁷² • 52% report frequent weighing.⁷⁵ • 92% general practitioners reported weighing, followed by OBs (88%), nurses (84%), and midwives (35%).⁷⁴ • There was reluctance from the HCP to weigh their patients.^{40,64,76,77} 	
HCP perceptions on the importance of weight management	
<ul style="list-style-type: none"> • 62% HCPs believed GWG was not important and 69% of midwives ranked GWG as least important component of care.⁷⁵ • 100% of HCPs believe GWG was important for patients with obesity.⁷³ 	

OB indicates obstetrician.

to gain for patients with obesity. In fact, midwives most commonly exceeded upper limit recommendations (60%), followed by nurses (50%), MFM specialists (32%), obstetricians (23%), and general practitioners (33%). Although the IOM guidelines use BMI as an indicator for GWG recommendations, it has been shown that obstetrician/gynecologists who completed their residency after 1996 were more likely to use their patient's BMI to screen for obesity during prenatal care than those completing residency before 1996.⁷¹

With regards to GWG-related content shared by HCPs, HCPs tended to focus more on obesity and excessive weight gain as opposed to inadequate weight gain.^{33,38,60} Interestingly in a study from Japan, the majority of HCPs counseled their patients to gain as little weight as possible to avoid excess weight.⁶⁰ Generally, there was a lack of consistency in the GWG content delivered by HCPs, either among HCPs or between care provider “types.”

Specific GWG Counseling Advice Provided by HCPs

A few studies reported details on the HCP's weighing practices and how they counseled their patients to gain weight within their recommendation.^{63,67,69,72–75} Weighing practices varied in terms of frequency^{40,44,70} and by HCP type.⁷⁰ Most prenatal patient weighing only occurred because of a known pregnancy complication, as opposed to routine weight gain surveillance.⁷² In fact, researchers noted that there was even a reluctance among some HCPs to weigh their patients.^{40,64,76,77} Knight-Agarwal et al⁷⁷ concluded that although once a popular occurrence, weighing women and advising about weight gain was no longer a standard practice among midwives. In an investigation by Olander and colleagues⁴⁰ assessing both patient and provider perceptions, HCPs believed or assumed that their patients did not want to be weighed, which may have contributed to discontinuing frequent weigh-ins. Moreover, the level of importance

on GWG during pregnancy varied by HCP type with some midwives (69%) ranking it as the least important component of care,⁴⁰ and another study noting that all HCPs (100%) believed that GWG was important for patients with obesity.⁷⁹

Regarding weight counseling, three studies reported on HCPs giving behavioral advice for appropriate GWG, and this advice focused on PA and nutrition.^{67,69,74} One study described HCPs' self-report on five weight-related actions during pregnancy including (1) giving counsel on fruit and vegetable consumption, (2) providing guidance on sugar-sweetened beverages, (3) giving counsel on breastfeeding, (4) giving counsel on PA, and (5) offering advice on high fat and sugary foods.⁶⁷ Morris and colleagues⁷⁴ reported that midwives discussed PA and food requirements more frequently than all other disciplines. Only a minority of midwives (15%) offered personalized advice on weight management based on the patient's current diet and PA levels.⁶³ One research group reported that the amount and consistency of the weight advice were determined by women's responses, women's motivation to change, and the midwives' self-perception as a role model.⁷⁹ It was also noted that certain midwives from the aforementioned study reported that their own body image and personal issues might have hindered their provision of weight advice. Generally, HCPs reported a high frequency of engaging in GWG discussions; however, there were inconsistent reports concerning the accuracy of GWG content and advice given during these conversations. In addition, HCP weighing practices and how they counseled their patients to gain weight within their recommendations were variable throughout the literature. At times, this variability and inconsistency of GWG counseling led patients to question the importance of GWG among their HCPs.

Barriers to Discussing GWG Perceived by HCPs

As highlighted in Table 2, commonly reported barriers to discussing weight gain included lack of confidence, lack of time, lack of training, the perception that it was not part of their job, the assumption that counseling is ineffective, and concerns about the sensitivity of the topic or not wanting to offend patients.^{33,63,78} In the article by Stotland et al on HCPs' knowledge, attitudes, and practices regarding excessive GWG,³⁸ HCPs stated their uneasiness in the effectiveness of counseling and could not agree on an effective approach that was sensitive to the issues patients faced related to GWG. This often resulted in HCPs avoiding or delaying any weight gain counseling.³⁸ Physicians particularly identified their lack of knowledge and

formal training as a weakness in addressing weight management issues. Stotland et al also suggested that many of the different HCPs required additional evidenced-based behavioral counseling training to adequately address weight management issues.³⁸

A common theme that emerged among barriers to HCPs included discrepancies about whether GWG advice should or should not be the role of the primary prenatal HCP. In a study by Macleod et al,⁶³ certain midwives were unsure if it was their role to provide advice, and one participant even stated that "midwives cannot be a jack of all trades. They will end up a master of none." However, other researchers described that the majority of HCPs believed that it was, in fact, their role to provide GWG advice.^{68,78}

Objective Sources of Data (n = 3)

Most of the studies included on GWG discussions were from patient and HCP self-reports. Only a few studies have used objective sources of data, such as medical chart data and audio recording data to describe GWG discussions. Two studies identified in our search investigated the documentation of GWG conversations in medical charts.^{51,82} One review of 477 medical charts from prenatal patients with overweight and obesity noted that 15% of physicians documented a GWG discussion and only 10% documented giving the patient a specific weight gain goal.⁸² In this study, the resident physicians were more likely to document the occurrence of a GWG discussion, but the faculty physicians were more likely to document the patient's specific GWG goal. In one case, a patient received different GWG goals from a nurse and a physician. Another study using medical chart review examined 300 records and noted similarly low GWG documentation.⁵¹ Only 14% of prenatal patients had documentation of GWG recommendations in their medical chart. In particular, 14% of the documentation was observed in normal weight population, 9% in women who are overweight, and 17% in women who are obese. Despite low reports of documented GWG conversations, a total of 92% of the women studied were weighed at each of their antenatal visits. With regards to medical record documentation, it should be noted that it was unclear whether GWG counseling truly occurred and it went undocumented, or whether there was lack of counseling that occurred, concurrent with a lack of documentation.^{51,82,83}

Along with objective medical chart data, one study used audio-taped recordings to assess the occurrence and content of GWG conversations, another objective source.⁸³ Washington Cole et al tested the use of the 5As (*ask, assess, advise, agree, assist*) theoretical

framework during prenatal care conversations around GWG. These conversations were documented using audio recordings from obstetrician clinics. Approximately half (55%) of the prenatal visits included some variation of weight-related behavioral counseling. Among the visits that included discussions about weight, counseling usually involved the *ask* (49%) or *advise* (85%) steps of the 5As framework. Thus, it was more common to *ask* for permission to discuss weight and to *advise* prenatal patients on discordant weight gain risk and management options. Less frequent were *assessing* the causes of discordant weight gain, *agreeing* on a behavioral plan to manage weight, and *assisting* women with potential barriers and education follow-up. There were no prenatal sessions that incorporated all 5As. Overall, the studies that contained objective sources of data noted minimal frequency of GWG discussions and weight gain goals and approximately half of HCPs engaged in weight-related behavioral counseling.

DISCUSSION

Certain groups of women were more likely to report receiving GWG advice than others. Women of higher socioeconomic status, older age, nulliparous, with history of dieting, with low levels of PA in the first trimester, and women with higher BMI were significantly more likely to be counseled on GWG. Although speculative, women of higher socioeconomic status may have better access to healthcare, better means to address some of the contributing factors to weight gain, less risk of pregnancy complications, and may be more knowledgeable of health behaviors in pregnancy. In addition, Phelan et al⁵² discussed that HCPs may be faced with literacy barriers or more acute medical and psychosocial challenges when caring for women of lower socioeconomic status. It is possible that women of older age may receive more weight counseling as they may be followed more closely in pregnancy because of known age-related health risks. Healthcare providers may counsel nulliparous women more because they assume the women are unaware. For women with a low level of PA, HCPs may presume that their low activity is indicative of poor lifestyle habits thus increasing the susceptibility to excessive weight gain. It is likely that women with overweight and obesity are counseled more often because their weight gain range is smaller, and they pose a greater risk in the antenatal period than normal weight women. However, there may be other contributing factors such as stigma and assumption that these women aren't already engaging in healthy lifestyle behaviors.

In the literature, prevalence and content of GWG counseling varied drastically, but was often low and inaccurate. A discrepancy also exists between patient and provider perspectives of GWG counseling. The few studies that use objective measurements likewise show a lack of weight documentation over the duration of pregnancy. Patients have even reported receiving conflicting advice between different HCP disciplines, which may be attributed to HCPs not being fully aware of the IOM recommendations. These mixed messages may impact the patient by making weight seem unimportant or making the patients too confused to attempt weight management. Among HCPs providing advice, an overwhelming majority were unable to identify the correct weight gain ranges based on a pregnant woman's prepregnancy BMI. The current body of research lacks thorough examination into how HCPs instruct their patients to manage their weight. Providing patients with a range and amount of appropriate weight gain may not be sufficient to manage GWG. Instructing patients on healthy behavioral changes may be more beneficial in managing GWG, such as providing references on caloric and PA requirements.

It was not surprising that reports of GWG discussion vary among different continents and countries. Globally, healthy maternal weight gain is of great concern for preventing the negative downstream sequelae associated with the low and high end of the spectrum. However, no international consensus exists across available maternal weight policies.⁸⁴ In the study by Scott et al examining global maternal weight policies, the majority of policies address the importance of monitoring GWG throughout the pregnancy; however, the content of the prenatal guidelines varied across countries. For instance, in North America, the 2009 IOM are typically used as maternal weight guidelines by HCPs,⁸⁵ whereas in Japan,⁸⁶ recommendations from the Japanese Ministry of Health, Labour, and Welfare for weight gain during pregnancy are used and tend to present smaller gains in comparison. Although this may be the case, it should be noted that the HCPs from the Japanese study made judgments based on their own experience rather than following any evidence-based guideline.⁶⁰ It is of equal importance to consider socioeconomic factors that may influence GWG discussions. In a study by Pinidiyapathirage and Wickremasinghe⁶¹ conducted in Sri Lanka, the researchers noted that although half of the patients reported being given GWG information, as a developing country, there are often more pressing health matters to address in the medical clinics like the lack of functioning toilets or safe water. Overall, practices related to establishing appropriate GWG and tailoring lifestyle counseling vary widely in different

country settings.⁸⁴ Given that ethnicity and socioeconomic status may have an impact on discordant weight gain, further research regarding the feasibility of a global GWG guideline across countries may be needed.⁸⁷

Likely barriers to achieving effective GWG knowledge translation between HCPs and their patients include: lack of time, lack of resources, and lack of education. It is also worth noting that the type of HCP discipline may pose as a barrier. As recently articulated by Morris and colleagues,⁷⁴ midwives by profession tend to take a more holistic approach to care compared with physicians, allowing them to focus on the overall wellness of their patients. Thus, by nature midwives tend to have more time to discuss health behaviors and GWG. In contrast, other physicians and prenatal specialists are perhaps more likely to see high-risk patients, where critical health problems may need to take priority over behavioral counseling practices. Healthcare providers also mentioned a lack of knowledge and lack of resources as barriers to engaging in GWG discussion. In fact, one participant in a study by Knight-Agarwal et al⁷⁷ discussed that if the guidelines for what professionals are supposed to do are not clear, then so too are the messages that they are giving their patient. Healthcare providers also mentioned the need for additional tools and resources, for example, the development of an electronic medical record application⁶⁵ that included a form for tracking GWG or patient handouts.

One such knowledge translation tool that may be of use is the Canadian Obesity Network's 5As of Health Pregnancy Weight Gain. This tool is directed toward prenatal HCPs and uses a modified 5As framework (*ask, assess, advise, agree, assist*) to help them sensitively and practically provide GWG advice.⁸⁸ Considering most women are interested in GWG and are willing to achieve a healthy weight during pregnancy for their health and that of their offspring, the 5As tool provides HCPs with a promising standardized communication guide to discuss GWG with all their patients.

Overall, this narrative review was the first to our knowledge to summarize the literature examining pregnancy weight counseling in prenatal care. Nevertheless, this review is subject to limitations as it was not a true systematic review. Our search strategy may not have accurately captured all available information relating to this subject, and there was no quality assessment for the included studies. In addition, the included literature consisted mainly of self-reports that are indeed subject to reporting bias. As a means to reduce bias in this review, it should be noted that both qualitative and quantitative reports were provided from both patients and HCPs so that different perspectives could corroborate the evidence presented. Lastly, the patient-HCP interface

is a complex interaction with interdisciplinary aspects that may extend further than just the clinic. For instance, healthcare delivery systems, clinical microsystem and macrosystem, government funding, and medical education may all indirectly influence the dissemination of prenatal health information to patients.⁸⁹ In contrast, patients may face interpersonal, educational, or socioeconomic barriers to understanding health information. There may be a need to examine broader intricacies that impact prenatal health education on both patient and provider ends. Future research should focus on using more objective methods to examine patient-provider interactions, assessing and overcoming underlying barriers to GWG communication, and on the development of clinical knowledge translation tools.

CONCLUSIONS

Although the sheer volume of literature on prenatal weight counseling practices has increased over time, the evidence remains variable and inconclusive. Many discrepancies exist in the literature, including differences between studies, different geographic regions, patient populations, and HCP populations. There exists a discord in weight gain knowledge translation between prenatal patient and provider. Common barriers to weight discussions included a lack of resources and education. There is an urgent need for care providers and patients alike to better understand ways to manage weight gain in pregnancy. Future research should focus on using more objective measurements to examine underlying factors relating to GWG counseling and on clinical guides to facilitate weight management throughout pregnancy.

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