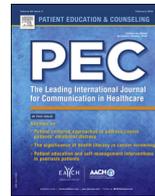




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Starting the conversation: Patient initiation of weight-related behavioral counseling during pregnancy

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ABSTRACT

Objective: To examine the relationship between patient initiation and weight-related behavioral counseling during pregnancy.

Methods: We examined audio recordings of prenatal visits between 22 obstetricians and 120 patients for behavioral counseling using the Roter Interaction Analysis System and the 5A's behavioral counseling framework. We used multivariate regression models to examine the relationship between patient initiation and communication outcomes.

Results: Overall, 55% of prenatal visits included any behavioral counseling. Patients initiated counseling episodes 45.5% of these visits. Patients were less verbally dominated by their clinicians in prenatal visits with patient-initiated behavioral counseling episodes (difference in clinician verbal dominance ratio = 0.73, 95% CI = 0.16–1.30). Patient-initiated counseling episodes included more socioemotional communication relative to those initiated by clinicians ($p = 0.02$). The total duration of counseling was 28 s longer (95% CI 0.27–56.0 s) and clinicians were more likely to use two or more 5A's strategies (OR = 3.61, 95% CI = 1.01–12.88) when patients initiated discussions.

Conclusions: Patient initiation may lead to behavioral counseling that is longer in duration and includes more 5A's strategies, possibly mediated by socioemotional communication.

Practice implications: Participatory prenatal care communication may lead to more effective counseling that is responsive to women's concerns.

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1. Introduction

Although pregnancy is widely regarded as teachable moment for health behavior change [1–3], studies suggest that obstetric clinicians do not routinely counsel pregnant women on weight, nutrition and physical activity [4–6]. Studies suggest that the majority of women do not recall being counseled about weight gain during pregnancy [4,7], and many clinicians report not providing their pregnant patients with behavioral counseling on nutrition, physical activity and weight management [5,6,8]. Clinicians cite many reasons for not providing counseling, including limited time, the perceived inefficacy of behavioral counseling, the complexity of health behaviors, a lack of training on nutrition and physical activity, and the perceived sensitivity of discussions about weight [5,8–13].

Although patient initiation of counseling topics has received limited attention in patient-provider communication research, it is an aspect of patient participation in prenatal visits that may affect the quality of behavioral counseling that patients receive [6,14,15]. In two studies in primary care, patients initiated the majority of discussions of weight, nutrition and physical activity [16,17]. In a qualitative study, clinicians providing care to pregnant women perceived that patient initiation was a cue of patient interest in behavioral counseling, and some clinicians reported that they would only provide counseling on nutrition, physical activity, and recommended weight gain to patients who raised the topic during their prenatal visits [6]. In a primary care study with non-pregnant patients, clinicians used more of the 5A's (*Assess, Advise, Agree, Assist, and Arrange*) behavioral counseling strategies (providing more referrals and coming up with plans for follow-up) when patients initiated discussions of weight, nutrition and physical activity [9,18]. Outside of the literature on weight management, researchers have found that clinicians perceive information disclosure to be more reliable, and patient-provider relationship

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to be stronger, when patients initiate discussions, rather than the clinicians themselves [15]. Participatory prenatal visit communication – that is responsive to women's concerns about nutrition, physical activity and weight management – may strengthen therapeutic relationships between pregnant women and their providers and facilitate teachable moments for health behavior change during pregnancy [1,3]. Moreover, behavioral counseling provided in response to patient-initiated discussions of weight, nutrition and physical activity may also include more complete use of evidence-based counseling strategies [18].

The objective of this study was to examine the relationship between patient initiation of behavioral counseling episodes and communication outcomes. We hypothesized that prenatal visits in which patients initiated behavioral counseling episodes would have a more patient-centered style and that clinicians would be less verbally dominant throughout these prenatal visits. We hypothesized that patient-initiated behavioral counseling episodes would include greater use of socioemotional communication (e.g. empathy, expresses worry or concern, etc.) compared to clinician-initiated behavioral counseling episodes. Finally, we hypothesized that patients who initiated weight-related behavioral counseling episodes would receive counseling that was longer in duration, with greater use the 5A's strategies.

2. Methods

2.1. Design and participants

We conducted a cross-sectional, secondary data analysis using audio recordings, surveys and medical record reviews collected as part of a randomized control trial of a patient communication intervention. Details of the parent study are described elsewhere [19]. In brief, 23 clinicians and 130 of their patients were recruited from a single urban teaching hospital's obstetric outpatient clinic in Baltimore, MD. The majority of patients attending the participating clinic were eligible for Medicaid and the Women, Infants and Children (WIC) program. Clinicians were nurse practitioners, resident physicians, and attending physicians. At the time of recruitment, the revised IOM guidelines for gestational weight gain had been released and were intended to be the standard for behavioral counseling at the participating clinic [20].

Patients were recruited from consenting clinicians' panels, and agreed to have a single prenatal visit recorded [19]. We used 50 audio recordings of prenatal visits from the baseline cohort (June–December 2009) and 80 additional visits from the randomization cohort, in which patient participants received one of two communication skills programs (June 2010–January 2011). The first intervention was a computer-based communication activation program designed to encourage patients to engage actively in their prenatal visits. The second intervention was a facilitated review of relevant sections of *Baby Basics: Your Month by Month Guide to a Healthy Pregnancy* [21]. Clinicians were not aware of the patients' randomization assignments. Women randomized to the computer-based intervention were more verbally active, less verbally dominated by clinicians, demonstrated greater use of communication skills targeted by the intervention, and experienced visits that were more patient-centered. The interventions did not include specific discussions of nutrition, physical activity, gestational weight gain, or the 5A's [19].

For the current analysis, patients who did not have height or pre-pregnancy weight recorded ($n=3$) or were underweight ($BMI < 18.5 \text{ kg/m}^2$; $n=7$) were excluded. The final sample for the current study included 22 obstetrical clinicians and 120 of their patients. The Johns Hopkins University Institutional Review Board approved the study procedures.

2.2. RIAS-facilitated targeted transcription of behavioral counseling episodes

The Roter Interaction Analysis System (RIAS) was used to code each recorded prenatal visit. Two trained RIAS coders assigned each complete thought, expressed by the patient or clinician, to 1 of 37 mutually exclusive and exhaustive categories representing the functions of the medical dialogue. A 10% random subset of the audio recordings was double coded to establish inter-coder reliability of RIAS coding. Pearson correlation coefficients averaged 0.90 across clinician categories and 0.91 for patient categories. RIAS coders were not aware of the study hypotheses or group assignments for the parent or current studies.

RIAS lifestyle categories were used to identify and transcribe weight-related behavioral counseling in each of the recorded prenatal visits. A third coder, who was not aware of parent study group assignments, used RIAS coding logs to identify time stamps for all lifestyle statements (patient and clinician lifestyle questions, lifestyle information giving and clinician lifestyle counseling) in the recordings of each prenatal visit. The coder listened to the relevant sections of the recordings and transcribed all discussions about nutrition, physical activity and weight. The first and last RIAS lifestyle statements in a discussion were used to mark the beginning and end of each episode of behavioral counseling. The initiator of behavioral counseling was defined as the speaker who made the first weight-related lifestyle statement in the prenatal visit. The coder listened to the complete audio recording for a 25% random subset of the prenatal visits to confirm that the RIAS codes captured all relevant discussions of weight, nutrition and physical activity. No additional weight-related behavioral counseling was identified in this subset of prenatal visits.

2.3. Communication outcome measures: overview

The independent variable for this study was patient initiation of behavioral counseling episodes. The relationship between patient initiation and communication was examined using several different communication measures. First, the total patient and clinician statements, clinician verbal dominance ratio and patient-centeredness ratio were examined using all RIAS codes from the complete prenatal visit recordings (Section 2.3.1). Second, socioemotional valence was examined, using socioemotional RIAS codes within transcribed behavioral counseling episodes (Section 2.3.2). Third, the duration of counseling and clinicians' use of 5A's were examined within transcribed behavioral counseling episodes (Section 2.3.3).

2.3.1. Communication outcome measures: patient and clinician statements, clinician verbal dominance and patient-centeredness of overall prenatal visit communication

The total number of patient and clinician statements were used as an indicator of total dialogue throughout each prenatal visit. As in a number of other RIAS-based studies [22,23], clinician verbal dominance was calculated as a ratio of the total number of clinician statements relative to the total number of patient statements throughout the entire prenatal visit. Second, patient-centeredness was operationalized as a ratio of the psychosocial and socioemotional focus of the prenatal visit relative to the biomedical focus of the prenatal visit. The numerator included psychosocial and lifestyle disclosure, all patient questions and emotional statements plus the clinician's psychosocial questions, psychosocial and lifestyle information and counseling and facilitation statements. The denominator included clinician medical questions, clinician orientation statements, and both patient and clinician biomedical information.

2.4.1. Communication outcome measures: socioemotional valence of behavioral counseling episodes

The RIAS coding logs were used to identify behavioral counseling episodes that included socioemotional statements (e.g. empathy, shows worry or concern, legitimizes, clinician self-disclosure, reassures, encourages, or shows partnership). Behavioral counseling episodes were classified as having socioemotional content if they included at least one RIAS socioemotional statement. To explore the association between patient initiation and the socioemotional valence of behavioral counseling episodes, each behavioral counseling episode was assigned to one of the following categories: 1) emotionally neutral, 2) clinician emotional expression, 3) patient emotional expression, or 4) mutual emotional expression.

2.4.2. Communication outcome measures: duration of behavioral counseling episodes and use of the 5A's strategies

We examined the association between patient initiation and each the following measures: 1) the total duration of counseling, 2) the number of distinct counseling episodes throughout the prenatal visit, and 3) the number of 5A's behavioral counseling strategies used. The 5A's behavioral counseling framework is an evidence-based model for behavioral counseling adopted by the U. S. Preventative Services Task Force (USPSTF) in 2002 [9]. The 5A's were coded from the transcripts of behavioral counseling using Atlas.ti, and included: 1) *Assesses* weight, nutrition, or physical activity, 2) *Advises* on topics of nutrition, physical activity or weight, 3) *Agrees* on a specific plan or course of action, 4) *Assists* in identifying barriers and supports for behavior change and 5) *Arranges* a specific plan for follow up. Table 1 includes definitions and examples of each of these counseling strategies. Two independent coders analyzed the transcripts and 20% were double coded to assess inter-rater reliability of 5A's coding. Coders discussed disagreements and made final decisions by consensus. There was substantial inter-rater reliability across all categories. For each category, inter-rater agreement ranged from 89% to 96%, and the overall kappa (a measure of inter-rater reliability that accounts for chance agreement) was 0.87.

2.6. Statistical analyses

Descriptive analyses were used to characterize the sample with respect to patient and clinician variables. One-way ANOVA and chi-

square tests were used to examine differences in demographic characteristics, comparing patients who received behavioral counseling to those who did not. We examined the relationship between patient initiation and all communication outcomes in the subset of prenatal visits that included any behavioral counseling (n=66). Chi-squared tests were used to explore the relationship between patient initiation and socioemotional valence typologies. Multivariate regression models were used for all other communication outcome measures. Multivariate linear regression was used to model RIAS patient-centeredness and clinician verbal dominance ratios and the total duration of behavioral counseling. Multivariate Poisson regression was used to model the total number of behavioral counseling episodes in each prenatal visit. Because the number of 5A's used by clinicians was not normally distributed multivariate logistic regression was used to model the use of one 5A's strategy vs. 2 or more 5A's strategies. We considered multilevel models, accounting for patient clustering within clinicians. However, multivariate regression models, without clustering, were chosen as the analytic approach, given the small sample size and negligible intraclass correlations (<0.001).

We adjusted for several variables, which were selected *a priori* for inclusion in the regression models, based on associations with the independent and dependent variables reported in the literature [6,24–30]. We calculated pre-pregnancy body mass index (BMI) using the height and weight reported in the medical record. As recommended by the American College of Obstetrics and Gynecology (ACOG), we used the calculated BMI to categorize patient participants into one of three groups: normal (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²), and obese (≥30 kg/m²). The other variables included in the models were patient age (<20 years vs. ≥20 years), pregnancy duration (first, second or third trimester), presence of diabetes (gestational and pre-gestational), presence of hypertension (gestational and chronic), number of prenatal visits at recorded prenatal visit (first visit vs. second or later visit), and clinician type (nurse practitioner vs. resident or attending physician). Multivariate models of the number of behavioral counseling episodes, the number of 5A's strategies, the total number of patient statements, the total number of clinician statements, patient-centeredness and clinician verbal dominance also included adjustments for visit length. All multivariate models included adjustment for parent study intervention group assignment (non-intervention, treatment or

Table 1
5A's coding framework definitions and examples.

Strategy	Definition	Example
Assess	Clinician asks the patient about weight, nutrition and/or physical activity.	"How is your diet?" "How often do you exercise"
Advise	Clinician provides the patient with advice about weight, physical activity or nutrition.	"You should eat at least 3 small meals each day with nutritious snacks in between." "Your goal would be to gain between 15 and 25 pounds during the course of your entire pregnancy"
Agree	Patient and clinician agree to a specific course of action with respect to weight, physical activity or nutrition.	Clinician: "How can we work to make sure you are getting in the right fluids?" Patient: "I can stop drinking soda. I can also no more than a cup of juice and at least 5 or 6 cups of water every day."
Assist	Clinician and patient work together to identify barriers and/or supports for nutrition or physical activity.	Clinician: "Is there anyone at home who can help you with cooking?" Patient: "My mother cooks for me at least once per week."
Arrange	Clinician arranges for follow up with clinician, nutritionist or social worker.	"I know you're having trouble getting healthy food. Would you like to speak to a social worker about that?" "It seems like you are having difficulty figuring out what to eat. I'd like you to talk to a nutritionist about that."

comparison group). Regression analyses were completed using Stata 13.

3. Results

3.1. Descriptive characteristics

The final study sample included 22 obstetric clinicians and 120 of their patients. Tables 2 and 3 show a description of the study sample. The majority of clinicians were female (95.5%), White (59.1%), obstetrics and gynecology residents (81.8%). Sixty-nine percent of patient participants were between the ages of 20 and 35, and the mean age was 22.8 years (SD 5.1 years). The majority of patients were Black (84.2%) and in their second trimester of pregnancy (51.7%). Thirty-six percent of patients were being seen for their first prenatal visit. Overall, 32.5% of patients had normal pre-pregnancy BMI while 30.8% had overweight pre-pregnancy BMI and 36.7% had obese pre-pregnancy BMI. The mean prenatal visit length was 24.8 min (SD 11.1). Prenatal visits that included any weight-related behavioral counseling were 4.7 min longer (27 vs. 22.3 min) than prenatal visits that did not ($p=0.02$; Table 3). Patients who received behavioral counseling did not differ from patients who did not based on age, race, pregnancy duration, number of prenatal visits at index visit, BMI, or co-morbidities ($p>0.05$)

Table 4 describes the characteristics of weight-related behavioral counseling conversations. Sixty-six prenatal visits (55%) included any behavioral counseling on weight, nutrition or physical activity. In 66 visits that included any behavioral counseling, 30 patients (45.5%) initiated these discussions while clinicians initiated counseling in 36 prenatal visits (54.5%). The mean number of distinct counseling episodes per prenatal visit was 1.7 (SD 1.0). The mean total duration of behavioral counseling across all episodes was 64.9 s (SD 54.5 s). The majority of prenatal visits with any behavioral counseling included one of the 5A's (59.1%), with fewer visits including two (35.0%), three (3.0%) or four (3.0%) of the 5A's strategies. None of the prenatal visits included all 5A's.

3.2. Patient initiation and communication outcome measures: overview

We found significant differences between patient- and clinician-initiated behavioral counseling episodes for several communication outcome measures.

Table 2
Clinician characteristics for study sample (n=22 clinicians; 120 prenatal visits).

	Clinicians (n=22)
Gender; n (%)	
Female	21 (95.5)
Male	1 (4.5)
Race; n (%)	
White	13 (59.1)
Black	6 (27.3)
Asian	3 (13.6)
Profession; n (%)	
Resident	18 (81.8)
Nurse practitioner	2 (9.1)
Attending	2 (9.1)
Number of patients seen in the current study	
Mean (range)	5.5 (1–18)

3.2.1. Patient initiation and communication outcomes: total patient and clinician statements, clinician verbal dominance and patient-centeredness

Table 5 shows differences in total patient and clinician statements, clinician verbal dominance and patient-centeredness in patient-initiated counseling discussions compared to those initiated by clinicians. The sum of all patient statements was greater in prenatal visits with patient-initiated behavioral counseling episodes (183.8, 95% CI=163.2–204.5) compared to prenatal visits with clinician-initiated behavioral counseling episodes (139.6, 95% CI=120.9–158.2, $p=0.004$). Clinicians were less verbally dominant in prenatal visits that included patient-initiated behavioral counseling episodes (clinician verbal dominance ratio=2.89, 95% CI=2.51–3.26) compared to prenatal visits in which clinicians initiated behavioral counseling episodes (clinician verbal dominance ratio=2.16, 95% CI=1.74–2.57, $p=0.01$; Table 6). There was no significant difference in total clinician statements or patient-centeredness comparing prenatal visits with patient-initiated behavioral counseling episodes to those with clinician-initiated behavioral counseling episodes ($p>0.05$; Table 7).

3.2.2. Patient initiation and communication outcomes: socioemotional valence of behavioral counseling

Four typologies of socioemotional valence were observed, based on RIAS communication categories: 1) emotionally neutral, 2) clinician emotional expression only, 3) patient emotional expression only, or 4) mutual emotional expression (Table 6). Patients tended to express worry and concern and ask their clinicians for reassurance as it related to weight, nutrition and physical activity. Clinicians most often reassured patients, expressed approval or expressed concern, as it related to weight, nutrition and physical activity. Patient-initiated behavioral counseling episodes tended to be more emotionally expressive, with patients expressing socioemotional content in 47.1% of patient-initiated counseling episodes (compared to 15.4% of clinician initiated episodes; $p=0.02$). In 31% of patient-initiated behavioral counseling discussions, patients and clinicians mutually expressed socioemotional content (compared to 10.3% of clinician-initiated episodes; $p=0.02$). Clinician-initiated episodes tended to be emotionally neutral (48.7%) compared to patient-initiated behavioral counseling episodes (22.6%, $p=0.02$).

3.2.3. Patient initiation and communication outcomes: behavioral counseling duration and use of the 5A's strategies

Table 7 summarizes the differences in behavioral counseling duration and clinicians' use of the 5A's strategies, comparing patient-initiated to clinician initiated counseling discussions. In prenatal visits that included any behavioral counseling (n=66), the number of behavioral counseling episodes was significantly higher when patients, instead of clinicians, initiated these discussions (IRR 1.53, 95% CI=1.03–2.26, $p=0.033$; Table 7). The total duration of behavioral counseling across all episodes was an average of 28 s longer (95% CI 0.27–56.0 s, $p=0.048$) when patients initiated discussions rather than clinicians. Clinicians were significantly more likely to use 2 or more of the 5A's strategies if patients initiated discussions compared to when clinicians initiated counseling episodes (OR=3.61, 95% CI=1.01–12.88, $p=0.046$).

4. Discussion and conclusion

4.1. Discussion

In this cross-sectional study, we found that patient initiation is associated with the total the duration of behavioral counseling, clinicians' use of the 5A's, as well as other communication outcome

Table 3
Patient characteristics for study sample (n = 120).

	Patients (n = 120)	Did not receive behavioral counseling (n = 54)	Received behavioral counseling present (n = 66)	p
Visit length (minutes)				
Mean (SD)	24.8 (11.1)	22.3 (10.7)	27.0 (11.1)	0.02*
Age				
<20 years old	32 (26.7)	12 (22.2)	20 (30.3)	0.20
20–35 years old	83 (69.2)	38 (70.4)	45 (68.2)	
>35 years old	5 (4.1)	4 (7.4)	1 (1.5)	
Race; n (%)				
Black	101 (84.2)	44 (81.5)	57 (86.4)	0.28
White	14 (11.7)	6 (11.1)	8 (12.1)	
Other	5 (4.1)	4 (7.4)	1 (1.5)	
Education				
Less than high school	39 (32.5)	18 (33.3)	21 (31.8)	0.55
Completed high school or GED	38 (31.7)	20 (37.0)	18 (27.3)	
Some college	28 (23.3)	11 (20.4)	17 (25.8)	
No answer	15 (12.5)	5 (9.3)	10 (15.2)	
Insurance				
Medicaid	93 (77.5)	43 (79.6)	50 (75.8)	0.72
Private insurance	7 (5.8)	4 (7.4)	3 (4.6)	
Self-pay	5 (1.7)	2 (3.7)	3 (4.6)	
No answer	15 (12.5)	5 (9.3)	10 (15.2)	
Pregnancy duration				
First trimester	24 (20.0)	7 (13.0)	17 (25.8)	0.09
Second trimester	62 (51.7)	27 (50.0)	35 (53.0)	
Third trimester	34 (28.3)	20 (37.0)	14 (21.2)	
Prenatal visit				
First visit	61 (50.8)	24 (44.4)	35 (53.0)	0.35
Second or later visit	59 (49.2)	30 (55.6)	31 (47.0)	
Body mass index				
Normal	39 (32.5)	19 (35.2)	20 (30.3)	0.85
Overweight	37 (30.8)	16 (29.6)	21 (31.8)	
Obese	44 (36.7)	19 (35.2)	25 (37.9)	
Co-morbidities; n (%)				
Diabetes	11 (9.2)	7 (13.0)	4 (6.1)	0.19
Hypertension	18 (15.0)	9 (16.7)	9 (13.6)	0.64

measures. Overall, 55% of prenatal visits included any behavioral counseling, and of these, 41% included two or more of the 5A's strategies. Women who initiated discussions about weight, nutrition and physical activity did so in prenatal visits that had a more participatory style. These visits included a greater total number of patient statements and women were less verbally

dominated by their clinicians. The style of these prenatal visits may have provided patients with the opportunity to start these discussions. It is also possible that women who initiated discussions about weight, nutrition and physical activity were predisposed to assert themselves during their prenatal care.

Table 4
Descriptive characteristics of weight-related behavioral counseling conversations (n = 66).

Prenatal visits with any behavioral counseling (n = 66)	
Initiation of behavioral counseling	
Patient-initiated	30 (45.5)
Clinician-initiated	36 (54.5)
Number of counseling episodes per prenatal visit	
Mean (SD)	1.7 (1.0)
Total duration of behavioral counseling (seconds)	
Mean (SD)	64.9 (54.5)
Number of 5As strategies	
One	39 (59.1)
Two	23 (34.9)
Three	2 (3.0)
Four	2 (3.0)
Five	0 (0.0)

We used RIAS to explore the socioemotional valence of behavioral counseling episodes. Overall, patient-initiated behavioral counseling episodes included more socioemotional content than did clinician-initiated episodes. Socioemotional expression – including statements of worry or concern and requests for reassurance – may be a strategy employed by some patients to make their clinicians aware that behavioral counseling is important and relevant. Moreover, clinicians may have responded to patient socioemotional expression with behavioral counseling that is longer in duration with greater use of the 5A's strategies. In contrast, the emotionally neutral tone of clinician-initiated behavioral counseling episodes may have been perceived, by patients, as a signal of clinician disinterest, which may have discouraged patients from disclosing their concerns about weight; likewise patients' emotionally neutral response may have discouraged clinicians from pursuing a possibly sensitive topic [6,18,31].

We found that patient initiation was associated with the duration of behavioral counseling as well as clinicians' use of the 5A's strategies. There were a greater number of distinct behavioral counseling episodes in patient-initiated discussions, which

Table 5
Adjusted differences in the number of patient and clinician statements, clinician verbal dominance and patient centeredness in prenatal visits with clinician-initiated vs. patient-initiated behavioral counseling episodes.

	Clinician-initiated	Patient-initiated	p
Number of patient statements	139.6 (120.9–158.2)	183.8 (163.2–204.5)	0.004*
Number of clinician statements	343.2 (309.3–377.0)	363.8 (326.3–401.3)	0.44
Patient-centeredness ratio	0.65 (0.56–0.74)	0.78 (0.68–0.88)	0.07
Clinician verbal dominance ratio	2.89 (2.51–3.26)	2.16 (1.74–2.57)	0.01*

Multivariate linear regression model with adjustment for patient age, pregnancy duration, co-morbidities, pre-pregnancy BMI, number of prenatal visits, clinician type and intervention assignment.

* p < 0.05.

suggests that patients and clinicians returned to the topic of weight, nutrition, and physical activity at multiple points during the visit. The USPSTF adopted the 5A's as an evidenced-based framework for behavioral counseling in routine care, which

integrates several theoretical models of health behavior change [9,31]. Greater use of these strategies in response to patient-initiated discussions about weight, nutrition, and physical activity suggests that women's contributions to dialogue may lead to

Table 6
Socioemotional valence of patient- and clinician-initiated behavioral counseling episodes.

Socioemotional valence	Clinician initiated	Number (%)	Patient initiated	N (%)
Emotionally neutral*	Clinician: And um, how is your, um, eating? Are you eating healthy? Patient: I mean it's pregnancy. Clinician: What do you eat, usually? Patient: Um. Like a burger, chicken, um, sometimes I have sandwiches. Clinician: Yeah, you getting fruits and vegetables? Patient: Yeah I eat a lot of spinach. I do eat spinach a lot. Clinician: Ok, yeah. Patient: Almost everyday. Clinician: Yeah you want to try to have the most fruits and vegetables, water and then sort of less dairy and you know carbohydrates, meaning like the breads. And then minimal, you want to have, like the sugars the sweets all that kind of stuff, ok? Alrighty.	19 (48.7)	Patient: Um, I didn't, I couldn't see the dietitian last time. Because um. Clinician: You think you can do it this time? Patient: Yes. Clinician: Let me write that on the front of your chart to make sure that you can see her. And you're eating ok? (pause) Ok, great.	7 (22.6)
Clinician emotional expression	Clinician: Yeah like how many extra pounds do you think you can gain during pregnancy that we would consider, oh that's normal? Patient: 15. Clinician: That's pretty good! That's pretty close. So I would say probably, let me see if I can pull up your weight here. That would be our recommended weight gain for you – 15–20 pounds – over the course of the next 9 months. Now by no means do we want you to diet or do anything like that. Ok?	14 (35.9)	Patient: I work around fast food. Clinician: Ok . . . that's ok. Just don't eat too much of it, and you'll be ok. Patient: Ok. Clinician: Ok?	9 (29.0)
Patient emotional expression	Clinician: Ok it's best for you and the baby if you can have a little bit [to eat] in the morning. Patient: I can't. They have breakfast way too early. Clinician: What time do they have breakfast? Patient: At um, between 6:30 and 7:30. Clinician: Oh. Patient: And I'm just not ready to get up to eat breakfast at 6:30 or 7:30.	2 (5.1)	Patient: I'm trying to find some energy. Clinician: What? Patient: I'm trying to find some energy. I don't know why I feel so weak. I ate a sandwich this morning. Clinician: Yeah. Patient: And I drank an apple juice. Clinician: You just feeling weak today or has that been going on for a while? Patient: Well I've been feeling weak a bit much. I feel weak a lot. Clinician: Are you eating ok? Eating enough? Patient: Yeah. Clinician: Ok. Good.	5 (16.1)
Mutual emotional expression	Clinician: And then, so I'm a little bit concerned about your weight gain. Right. You're kind of right. I mean you started off in like an "overweight" category. Patient: Yeah. . . Patient: So what would be the normal weight though? Clinician: Um let me see how much you weighed at the beginning of pregnancy. Patient: Ok. Clinician: So you want to have gained between 15 and 25 pounds. Patient: Yeah. Clinician: And you've gained 34 pounds right now. Patient: Wow.	4 (10.3)	Patient: Is it bad that I only eat once a day? Clinician: Yes. That would be problem number 1. Patient: I really don't be hungry. Clinician: I know, but even if it's a small something, but this is the way you look at it. Even if you eat a little small something, right? You don't have to eat one big meal. Patient: Yeah. Clinician: You can take what you eat in one big meal and do what? Separate it over the day right? Because babies need glucose throughout the day too, right? Patient: Yeah. Clinician: And so do you. And that's going to be important too for managing your blood sugar.	10 (31.0)
Total		39 (100)		31 (100)

*One representative example is provided for each category.

Table 7
Adjusted differences between clinician- and patient-initiated behavioral counseling episodes.

	Clinician-initiated	Patient-initiated	p
Number of behavioral counseling episodes per prenatal visit Adjusted IRR (95% CI) ^a	1.00 (ref)	1.53 (1.03–2.26)	0.033 [*]
Total duration of counseling Adjusted mean in seconds (95% CI) ^b	52.0 (33.5–70.5)	80.4 (60.0–101.0)	0.048 [*]
Use of 2 or more 5As strategies Adjusted odds ratio (95% CI) ^c	1.00 (ref)	3.61 (1.01–12.88)	0.046 [*]

^a Multivariate Poisson regression model with adjustment for patient age, pregnancy duration, co-morbidities, pre-pregnancy BMI, number of prenatal visits, clinician type, and intervention assignment.

^b Multivariate linear regression model with adjustment for patient age, pregnancy duration, co-morbidities, pre-pregnancy BMI, number of prenatal visits, clinician type and intervention assignment.

^c Multivariate logistic regression model with adjustment for patient age, pregnancy duration, co-morbidities, pre-pregnancy BMI, number of prenatal visits, clinician type and intervention assignment.

^{*} p < 0.05.

counseling that is linked to theoretical constructs with clear targets for intervention during future prenatal visits.

Other studies have reported a relationship between patient initiation and behavioral counseling. Flocke et al. [18] found that clinicians counseled patients with greater use of the 5A's if patient raised the topic of weight management during primary care visits. Moreover, in a qualitative study, obstetric clinicians reported providing behavioral counseling on nutrition weight control in response to patient initiation [6]. Specifically, clinicians participating in the study reported that, rather than providing routine assessment and counseling, they would not discuss weight, nutrition or physical activity unless the patient raised the topic or if patients were gaining more or less weight than recommended by the IOM.

Our study builds on the existing literature, demonstrating an empirical association between patient contributions to prenatal visit dialogue and behavioral counseling that is longer in duration with more complete use of the 5A's strategies. As women experience changes in social roles, perceptions of risks, and emotional responses to the experience of pregnancy and childbirth, participatory prenatal visits that are responsive to women's concerns may facilitate and enhance teachable moments for health behavior change [1].

Our study has several limitations. First, study participants may not be representative of other clinic populations or prenatal care settings, and the study findings may not be generalizable to other settings. Additionally, we analyzed a single prenatal visit for each patient. Since most patients had multiple prenatal visits throughout their pregnancies, this analysis may not be representative of all of the weight-related behavioral counseling each patient received. However, since we recruited women across pre-pregnancy BMI categories, whose pregnancies represented a range of pregnancy durations, and who saw a number of different clinicians, we believe that our study captured wide cross section of routine prenatal practice. In the current study, we did not address the accuracy of counseling that women received. However, in a separate analysis we found that patients were advised to gain a specific amount of weight in only 7 prenatal visits (6% of the total sample), although the amount of weight recommended was always consistent with the range of the ACOG and IOM guidelines (unpublished data). We did not account for clustering of prenatal visits by clinician in our regression models. Although the overall sample size for the study was 120, these analyses were limited only to the 66 prenatal visits that included any behavioral counseling. Multilevel models may not provide reliable point estimates or standard error estimates in samples of this size. Additionally, the intra-class correlations for this sample were negligible (<0.001), suggesting that multivariate models without clustering produced valid statistical inferences [32].

Finally, the reliability of behavioral counseling transcription (including the determination of patient or clinician initiation) was not assessed, independent of RIAS codes. Because RIAS coding logs were systematically used to facilitate transcription of weight-related discussions during prenatal visits, we believe that the high inter-rater reliability of RIAS coding (≥ 0.90) provides a robust foundation for the targeted analysis of behavioral counseling discussions.

Our study also has several strengths. To our knowledge, ours is the first study to examine the relationship between patient initiation of discussion of weight, nutrition and physical activity and the duration and content of behavioral counseling received during routine prenatal care. Additionally, our study uses recordings of prenatal visits – rather than clinician or patient self-report – to operationalize our measures of behavioral counseling and other communication outcomes, eliminating recall bias. We were also able to account for a number of potential confounders (including BMI, age, pregnancy duration, co-morbidities, number of prenatal visits, and clinician type), which supports our conclusion of an independent association between patient initiation and the communication outcome measures in this study.

4.2. Conclusion

Researchers have explored the concept of patient participation and engagement extensively. However, patient initiation of specific counseling topics has received limited attention in the literature. This study suggests that patient initiation influences the duration and content of behavioral counseling that patients receive. Additionally, the findings suggest that patients and clinicians may be socioemotionally expressive when patients initiate discussions of weight, nutrition and physical activity. The socioemotional content of the behavioral counseling episodes seems to be communicated by patients – and heard by clinicians – as cue of interest and motivation to improve nutrition, physical activity and weight gain.

4.3. Practice implications

Clinicians should consider devoting more time to topics raised by patients during prenatal care. Additionally, more participatory prenatal visits may encourage patients to raise topics that are of particular concern to them throughout their pregnancies. It may also be valuable to provide more consistent behavioral counseling to patients, even if the patients themselves do not initiate these discussions. The findings suggest that strategies to increase patient participation in prenatal care may lead to more effective behavioral counseling.

Author contributions

KOWC and DLR contributed to the study design and conception, as well as data interpretation. KOWC was responsible for data analysis and drafting the manuscript. DLR was responsible for data acquisition in the parent study and critical revision of the manuscript. Both KOWC and DLR gave final approval of the version of the manuscript for submission.

Disclosures

The authors have no relevant financial relationships to disclose.

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