

Psychosocial influences on weight gain attitudes and behaviors during pregnancy

JANET A. DIPIETRO, PhD; SARAH MILLET, MPH; KATHLEEN A. COSTIGAN, RN, MPH; EDITH GUREWITSCH, MD; LAURA E. CAULFIELD, PhD

ABSTRACT

Objective To examine pregnant women's weight-related attitudes and behaviors in relation to a constellation of psychosocial characteristics, prepregnancy body habitus, and gestational weight gain.

Participants One hundred-thirty women with low-risk, normal pregnancies.

Design Cross-sectional, observational study assessed attitudes about weight gain at 36 weeks' gestation. Psychosocial characteristics, including anxiety, depression, social support, emotionality, and pregnancy-specific and nonspecific stress appraisal were assessed between 28 and 36 weeks' gestation.

Statistical analyses performed Principal components factor analysis, Pearson correlations, *t* tests, and analysis of variance.

Result A range of positive and negative attitudes about weight gain was expressed. Twenty-one percent ($n=27$) of the sample endorsed at least one weight-restrictive behavior during pregnancy. Women who reported more weight-restrictive behaviors were more anxious ($r=.24, P<.01$), depressed ($r=.29, P<.001$), angry ($r=.29, P<.001$), stressed ($r=.23, P<.01$), and felt less uplifted ($r=-.21, P<.05$) about their pregnancies in general. Higher Positive Pregnancy Body Image scores were associated with feeling better about the pregnancy in general ($r=.35, P<.001$), fewer depressive symptoms, and less anger (both $r=.20$, both $P<.01$). Women who were self-conscious about their weight gain felt more hassled by their pregnancies ($r=.21, P<.05$), greater anger ($r=.21, P<.05$), and more support from partners ($r=.22, P<.05$). Prepregnancy body mass index was unrelated, but negative attitudes about weight gain existed even among women who gained within recommended ranges.

Conclusion Women's attitudes about weight gain in pregnancy are imbedded in their orientation toward pregnancy as well as their general psychological functioning. Effective nutrition counseling for pregnant women should include consideration of weight-restrictive behaviors, the degree to which the pregnancy is perceived as positive and uplifting, and whether weight gain attitudes may be associated with their relationship with a spouse or partner. *J Am Diet Assoc.* 2003;103:1314-1319.

Pregnancy presents unique positive and negative stresses that challenge overall psychological adaptation. Among these is the need to achieve sufficient but not excessive weight gain to promote fetal and maternal well-being. Excess weight gain during pregnancy has been associated with pregnancy complications (1), including Cesarean delivery (2), and later obesity (3). In contrast, the pervasive cultural influences that discourage weight gain in adult women outside of pregnancy must be surmounted for a healthy pregnancy. Such factors are central to the American Dietetic Association's position that appropriate weight gain is vital to healthy pregnancies (4).

Few systematic studies have examined the role of psychosocial factors in pregnancy weight gain. There are conflicting reports about whether positive attitudes predict actual weight gain (5-9). Some women with negative attitudes or a history of dieting gain in excess because pregnancy can serve to disinhibit restraint (5,10). Conversely, higher anxiety and depression and fewer personal resources (ie, self-esteem, mastery, and social support) are associated with poorer weight gain in low-income white, but not African-American, women (11). Similar associations among depression, family support, and negative attitudes about weight gain have been documented among pregnant adolescents (9), although a recent report of low-income women failed to detect an influence from depression (12).

Only one third of pregnant women gain weight within current guidelines (13). The current study was done to evaluate the intersection between a constellation of negative maternal psychosocial factors, including anxiety, stress, anger, and depression, and attitudes about weight gain during pregnancy. In contrast to most existing studies that focus on low-income groups, the current sample comprises predominantly well-ed-

J. A. DiPietro is a professor, Department of Population and Family Health Sciences, and S. Millet is a graduate student in the Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD. K. A. Costigan is a research nurse clinician, and E. Gurewitsch is an assistant professor, Division of Maternal-Fetal Medicine, Johns Hopkins Medical Institutions, Baltimore, MD. L. E. Caulfield is an associate professor, Center for Human Nutrition, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD.

Address correspondence to: Janet DiPietro, PhD, Professor, Department of Population and Family Health Sciences, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD 21205. E-mail: jdipietr@jhsph.edu

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Table 1
Maternal characteristics (n=130)

| | |
|---|------|
| Mean age (y) | 31.3 |
| Mean education (y) | 16.7 |
| Education category (%) | |
| High school degree only | 6 |
| 1-4 years college | 47 |
| Post-graduate study | 47 |
| Maternal occupation category (%) ^a | |
| Skilled trade | 3 |
| Clerical/technical | 28 |
| Professional | 69 |
| Primiparous (%) | 52 |
| Married (%) | 95 |
| Race (%) | |
| Non-Hispanic white | 86 |
| African American | 12 |
| Other minority | 2 |

^aBased on socioeconomic categories (26).

educated, middle class women, providing an opportunity to assess these relations independent of significant social and medical risk factors. We hypothesized that negative attitudes about weight gain and reports of weight-restrictive behaviors during pregnancy would be associated with a constellation of general psychosocial factors indicative of distress. In addition, we expected that women who experience pregnancy in a more positive manner would have more accepting attitudes about weight gain and body changes of pregnancy.

METHODS

Participants

Participants were 130 nonsmoking, healthy women with normal, singleton pregnancies. Eligibility was restricted to uncomplicated pregnancies delivered at term. Participant characteristics are presented in Table 1.

Procedure

The Johns Hopkins Institutional Review Board approved the study, and all women provided written consent. Psychosocial data was collected within a parent study of serial fetal assessments during the second half of pregnancy. Psychosocial data collected at three of six prenatal visits in the larger study were used in the current analysis. Assessments were distributed over visits to reduce subject burden. The study was observational and thus did not include any interventions that might have affected maternal attitudes about weight gain.

The following instruments were used:

Pregnancy and Weight Gain Attitude Scale (PWGAS) (7) comprises 18 items about weight-related attitudes (15 items) and behaviors (3 items) during pregnancy. A clinician who had developed significant rapport with the women during fetal testing verbally administered the scale to the women at 36 weeks' gestation. Item endorsement is on a 4-point scale ranging from "I don't feel this way at all" to "I feel this way strongly". The scale has internal reliability (7), construct validity (14), and stability over the latter half of gestation (6). A total score was computed by reversing the 9 negative items and averaging; higher scores indicated more optimal attitudes.

Psychosocial Measures

Spielberger State Anxiety Inventory (STAI) (15) is the most commonly used measure of state anxiety and has been exten-

sively validated. It was administered at 28 weeks' gestation; higher scores indicate higher anxiety.

Social support was assessed by an 18-item scale specific to pregnancy (16) at 28 weeks. Appraisal of support was rated on 5-point scales; higher scores indicate more support. Total social support (mean of all items) and partner support (items specific to partners) were computed.

Pregnancy Experience Scale (PES) measures maternal appraisal of exposures to 41 potential hassles and uplifts specific to pregnancy (eg, "physical discomforts", "discussions with spouse about baby names"); only 1 item concerns weight. Reliability and validity have been established (17). Appraisal of each item as a hassle and/or an uplift on 4-point scales was provided at 32 weeks. Hassles and uplifts were scored separately for intensity (sum ÷ total number of items).

Daily Stress Inventory (DSI) (18), administered at 36 weeks, comprises 58 stressors not specific to pregnancy. Higher values indicate greater perceived stress.

Profile of Moods States (POMS) (19) measures 6 affective states: fatigue, anger, anxiety, vigor, depression, and confusion, and has been extensively validated. Because anxiety was measured in depth by a dedicated scale, the anxiety subscale was omitted, as were two others (vigor and confusion) that were conceptually unrelated to the study questions. Higher scores indicate greater negative affect at 36 weeks.

Marlowe-Crowne Social Desirability Scale (SDS) (20) evaluates a respondent's tendency to provide socially desirable answers on psychosocial questionnaires; it was administered at 36 weeks.

Maternal Anthropometric Measures

Prepregnancy weight and height, self-reported at study enrollment (20 weeks' gestation), were used to compute body mass index [BMI, calculated as weight (kg)/height (m)²]. Total gestational weight gain during pregnancy was collected from the mother by telephone interview shortly after delivery.

Statistical Analysis

Principal components factor analysis with varimax rotation was performed. Items within each factor were averaged to yield factor values. Associations among factors and psychosocial measures were assessed with Pearson product-moment correlations; *t* tests compared values by maternal parity and ethnicity. Contrasts between women who undergained, gained appropriately, and overgained were based on Institute of Medicine recommendations according to BMI (21), and analyzed using one-way analysis of variance. Differences were considered statistically significant at *P* < .05 using a two-sided test. Analyses were conducted using SPSS (version 8.0, Chicago, IL).

RESULTS

Individual PWGAS item results are presented in Table 2, grouped by factor. Internal reliability was high (Cronbach α = .75). Analysis of item to total scaling indicated that two items loaded poorly ("I would like to gain between 11-20 lbs" and "I would like to gain between 21-30 lbs"); their exclusion increased the overall α to .84 and so they were dropped from further analyses. The total PWGAS score was 3.60 (standard deviation = .53).

Table 2
Percent of agreement and disagreement respondents to statements about pregnancy weight-related attitudes and behaviors (n = 130)

| | Disagree/Strongly Disagree | Neither Agree Nor Disagree | Agree/Strongly Agree |
|---|----------------------------|----------------------------|----------------------|
| | % | | |
| Factor 1. Positive Pregnancy Body Image | | | |
| I am proud of looking pregnant. | 11.5 | 24.6 | 63.9 |
| I think a pregnant woman is beautiful. | 10.8 | 36.9 | 52.3 |
| I like maternity clothes. | 49.2 | 27.7 | 23.1 |
| Factor 2. Negative Pregnancy Body Image | | | |
| I worry that I may get fat during this pregnancy. | 33.8 | 28.5 | 37.7 |
| I feel that women have to be especially careful about getting fat during pregnancy. | 49.2 | 29.2 | 21.5 |
| The weight I've gained during this pregnancy makes me feel unattractive. | 50.0 | 31.5 | 18.4 |
| I'm embarrassed whenever the nurse weighs me. | 69.2 | 15.4 | 15.4 |
| It bothers me that I can't wear what's in style while I'm pregnant. | 62.3 | 23.8 | 13.8 |
| I am embarrassed at how big I have gotten during this pregnancy. | 76.9 | 12.3 | 10.8 |
| Factor 3. Indifference toward Weight Gain | | | |
| I would gain 35 pounds if it meant my baby would be healthier. | 1.5 | 7.7 | 92.3 |
| I would gain 40 pounds if it meant my baby would be healthier. | 11.5 | 3.1 | 87.0 |
| As long as I'm eating a well-balanced diet, I don't care how much I gain. | 32.3 | 21.5 | 46.1 |
| I like being able to gain weight for a change. | 70.8 | 21.5 | 7.7 |
| Factor 4. Weight Gain Restrictive Behaviors | | | |
| If I gain too much weight one month, I try to keep from gaining the next month. | 76.2 | 9.2 | 14.6 |
| I tried to keep my weight down so I didn't look pregnant earlier on. | 82.3 | 8.5 | 9.3 |
| Just before going to the doctor, I try not to eat. | 92.3 | 1.5 | 6.1 |
| Items Not Included in Factor Analysis | | | |
| I would like to gain between 21-30 pounds during this pregnancy. | 22.3 | 10.0 | 67.7 |
| I would like to gain between 11-20 pounds during this pregnancy. | 79.2 | 6.2 | 7.7 |

Table 3
Pearson correlations for Pregnancy and Weight Gain Attitude Scale with psychosocial measures

| | Anxiety (STAI) ^a | Partner support | Pregnancy uplifts (PES) ^b | Pregnancy hassles (PES) | Depression (POMS) ^c | Anger (POMS) | Stress (DSI) ^d |
|--|-----------------------------|-----------------|--------------------------------------|-------------------------|--------------------------------|--------------|---------------------------|
| Total Attitudes Scale | -.08 | -.15 | .22** | -.14 | -.23** | -.27** | -.17* |
| Factor 1: Positive Pregnancy Body Image | -.11 | -.09 | .35*** | -.07 | -.20* | -.20* | -.06 |
| Factor 2: Negative Pregnancy Body Image | .06 | .22** | .01 | .21* | .10 | .21* | .13 |
| Factor 3: Indifference about Pregnancy Weight Gain | .01 | -.03 | .13 | -.01 | -.14 | -.04 | -.08 |
| Factor 4: Weight Gain Restrictive Behaviors | .24** | .05 | -.21* | .10 | .29*** | .29*** | .23** |

^aSTAI, Spielberger State Anxiety Scale

^bPES, Pregnancy Experience Scale

^cPOMS, Profile of Moods Scale

^dDSI, Daily Stress inventory

* $P < .05$; ** $P < .01$; *** $P < .001$

For presentation purposes, the 5-point response scale was condensed to three categories: disagree/strongly disagree; neither agree nor disagree; and agree/strongly agree. Factor analysis of the 13 items related to attitudes generated a three-factor solution that accounted for 55% of the total variance. The three behavioral items associated with restricting weight gain were included in a fourth factor. Examination of items were most highly associated with each factor suggested the following constructs: Positive Pregnancy Body Image, Negative Pregnancy Body Image, Indifference toward Pregnancy Weight Gain, and Weight Gain Restricting Behaviors.

There were few significant associations between sociodemographic characteristics and the PWGAS. Maternal age or education did not correlate significantly with any individual or factor score. Parity was significantly associated only with the Positive Pregnancy Body Image factor; primiparous women had more positive attitudes about their appearance ($t=2.03$, $P<.05$). There were no differences in factor scores between white and African American women.

Table 3 presents correlations between the total PWGAS and factor scores with psychosocial measures. Marlowe-Crowne scores were unrelated to PWGAS items, indicating participants' responses were not biased toward socially desirable answers. No significant relations were detected for fatigue or general social support. The total PWGAS score was positively associated with pregnancy-specific uplifts and negatively associated with depression, anger, and appraisal of daily stress. Factor specific results in Table 3 reveal more graded associations.

Entering pregnancy, participants were of average BMI (mean=24.9) and gained 15 ± 5 kg. Prepregnancy BMI was unrelated to all items and factors, although women with higher prepregnancy BMI gained less weight ($r=-.23$, $P<.01$). Women who gained more weight were more likely to express negative body image attitudes ($r=.26$, $P<.01$); this relationship persisted when prepregnancy BMI was controlled ($r=.28$, $P<.001$). There was a significant relation with only one psychosocial measure, controlling for BMI: women who felt more

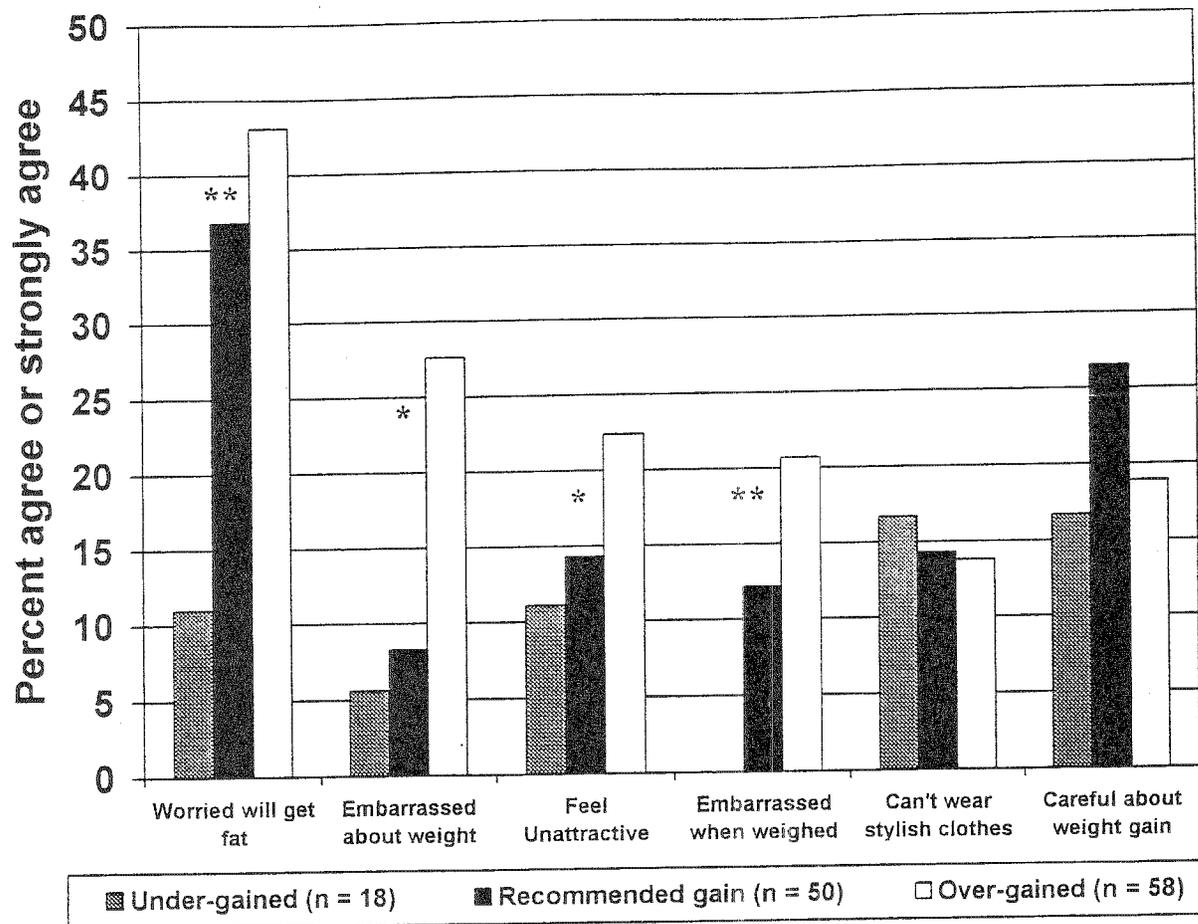


FIG. Percent of respondents in each weight gain recommendation group that "agreed" or "strongly agreed" with each statement. Note that none of the women in the undergain group answered "strongly agree" in response to any question. Significant differences indicated by * ($P < .05$) and ** ($P < .01$).

uplifted by their pregnancy gained more weight ($r = .20$, $P < .05$).

Stratification for weight gain indicated that 14% of participants undergained, 40% gained within guidelines, and 46% overgained. Adherence to recommendations did not differ by race, but did by maternal education ($t = 2.58$; $P < .05$), with greatest adherence to guidelines by the most educated. There was a linear difference among the groups on the Negative Pregnancy Body Image factor ($F(2,122) = 4.76$, $P < .01$). Women who undergained had the least negative attitudes (mean = 2.0), followed by appropriate gainers (mean = 2.4), and overgainers (mean = 2.6). To better understand the nature of this finding, items within this factor were analyzed individually; significant differences emerged on four of the six items. The Figure presents the percent of women in each category who strongly agreed or agreed with each statement.

DISCUSSION

A key component of prenatal care is the monitoring of gestational weight gain. Considerable focus has been directed at determining and promoting optimal weight gain ranges. Re-

sults of this study provide information about how women actually feel about gaining weight and the resultant transformation in body size and shape. The overall PWGAS mean was consistent with that reported on another sample of similar sociodemographic composition (7). Participants were well-educated, relatively affluent women with wanted, low-risk pregnancies and receiving good prenatal care; in short, among women most likely to be knowledgeable about healthy nutrition and weight gain during pregnancy. Higher levels of education have been associated with weight gain within recommended ranges (13), and this was true in the current sample.

Given this, the number of women who expressed negative attitudes about body image during pregnancy may be surprising to some. In this sample, 21% endorsed one or more weight-restricting behaviors, including not eating before an obstetric visit, trying not to look pregnant early in the pregnancy, and modulating weight gain from month to month. Negative attitudes were not limited to women who gained more than recommended guidelines. Of those who gained within the recommended range, 37% were still worried about getting fat at the end of pregnancy, and 14% felt that their weight gain made

them unattractive. Although no woman who undergained during pregnancy reported embarrassment when nurses weighed them, 11% thought the weight they did gain made them unattractive.

Total and factor scores on the PWGAS were consistently associated with psychosocial measures. Women who regarded body changes as positive consequences of pregnancy had lower levels of psychological distress, and those who expressed negative attitudes or endorsed weight-restrictive behaviors exhibited higher distress. Two other studies have reported that prenatal depressive symptoms are associated with negative weight gain attitudes (9) and general health-related practices including diet (22). The unique feature of the current study is the inclusion of women's positive feelings about their pregnancy. The degree to which women perceive their pregnancies to be uplifting to their lives is associated with more positive attitudes about pregnancy body image, fewer weight-restrictive behaviors, and greater weight gain.

This study and others (5,6,9) failed to detect associations between the total PWGAS and actual weight gain. However, the Negative Pregnancy Body Image factor was significantly related, as were a subset of these items in another report (9). Because of the cross-sectional design and the administration of the PWGAS late in pregnancy, we can only assume that women who gained more weight felt more negatively, and not the reverse. Nonetheless, negative attitudes may be generated by the profound changes in eating behaviors that begin early in pregnancy, but may be only marginally related to ultimate weight gain. Such early shifts are important because maternal weight gain in the first trimester is most highly associated with newborn size (23).

Prenatal BMI has been the single characteristic consistently linked to attitudes about gestational weight gain, with leaner women having more positive attitudes than heavier women (6,9,24). We did not find this association. Given the level of concern expressed about weight gain even in those women who gained less than or the recommended amount, our inability to detect these associations may be due to heightened social pressures and/or personal expectations regarding weight maintenance in this socioeconomic group, regardless of prepregnancy body habitus. However, self-report of gestational weight gain is less reliable in overweight women (25), so it is possible that our methods underestimated this association. Our results do confirm the relative lack of influence of demographic factors, such as parity and ethnicity, on attitudes about weight gain during pregnancy, which have been noted by others (6,7,9).

APPLICATIONS

- Nutrition counseling for pregnancy that is narrowly focused on weight gain and dietary recommendations is unlikely to be successful unless the broader context of a woman's attitudes regarding pregnancy in particular and psychological well-being in general is considered.
- Negative attitudes about gaining even recommended amounts of weight during pregnancy are common even among relatively affluent and well-educated women. Probing for weight-restrictive behaviors should be a component of nutrition counseling. Disclosure of such activities can be fostered by creating an uncritical atmosphere and establishing rapport over several visits.
- The unexpected finding that negative pregnancy body image

was higher in women with greater partner social support suggests that women who express more intimate relations with a spouse may be less willing to alter their appearance. Discussion of partner attitudes about body changes during pregnancy provides an opportunity to address such influences.

■ Finally, assessing the degree to which women experience their pregnancy as joyful is as important an indicator of weight-related attitudes as is more generalized psychological distress. Encouragement of the positive aspects of pregnancy by practitioners may provide an alternative route to the promotion of healthy nutritional behaviors.

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