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Unmet Social Support for Healthy Behaviors Among Overweight and Obese Postpartum Women: Results from the Active Mothers Postpartum Study

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Abstract

Background: In the United States, about two thirds of women of reproductive age are overweight or obese. Postpartum is a transitional period. Life changes during this time can put mothers under high levels of stress when interpersonal support is inadequate. This study sought to explore predictors of unmet social support (support inadequacy) for healthy behaviors among postpartum women who were overweight or obese before pregnancy.

Methods: Potential predictors of unmet social support for healthy behaviors were derived from baseline and 6-month postpartum data from the Active Mothers Postpartum (AMP) study. The Postpartum Support Questionnaire queried three dimensions of social support: (1) informational support, (2) emotional support, and (3) instrumental support. The main outcome, the overall Unmet Social Support Score (USSS), was the sum of the differences between the perceived need of support and perceived receipt of support in all three dimensions. Subscores were defined for each of the three support dimensions.

Results: One hundred ninety women completed the 6-month Postpartum Support Questionnaire. Depression ($p = 0.018$), unmarried status ($p = 0.049$), and postpartum weight gain ($p = 0.003$) were crude predictors for the overall USSS. After controlling for covariates, depression ($p = 0.009$) and living with a spouse ($p = 0.040$) were significant predictors for overall USSS. In adjusted analysis, depression remained a significant predictor for unmet emotional ($p = 0.035$) and instrumental ($p = 0.001$) social support.

Conclusions: Certain psychosocial factors predict support inadequacy expectations among postpartum women. Targeting the factors related to unmet social support may be a helpful way to promote healthy behaviors among overweight postpartum women.

Introduction

Almost two thirds of women in the United States are either obese or overweight.[1] The perinatal period and childbearing years are transitional periods that put women at higher risk for the development of obesity later in life.[2–4] A number of epidemiologic studies suggest that gestational weight gain is a major contributing factor to postpartum weight retention.[3,5,6] Other factors, such as parity, ethnicity, prepregnancy weight, and prenatal exercise, also correlate to weight retained in the postpartum period.[2] Nonetheless, weight retained after 12 months postpartum likely cannot be explained by physiologic factors; it is more likely related to psychosocial factors, such as employment, family time commitments, and maternal stress.[7]

Women entering the postpartum stage use such resources as skills, support, and knowledge from family, friends, and healthcare providers to prepare for child rearing and to adapt to new responsibilities.[8,9] Walker and Sterling[8] conceptualize this interplay of psychosocial factors in the postpartum period as dimensionality, which involves psychosocial distress, social support, lifestyle patterns, and body image. Orem's theory of self-care describes the postpartum stage as one in which women make adjustments to managing nutritional,

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psychosocial, and lifestyle transitions.[9] This concept of self-care is supported by that of thriving, in which women are able to draw from other sources to use the knowledge and resources for self-care.[9] Walker and Grobe[9] define the main factors of thriving in the postpartum period as lifestyle changes in dietary and exercise habits, such psychosocial and mental health factors as social support and depression, and nutrition as reflected in weight status.[9] Child rearing resources and skills and social support may be necessary but not sufficient factors to achieving role satisfaction and mitigating stress among postpartum women. Self-efficacy, the personal beliefs of being capable and confident to carry out tasks, may serve as the mediator between social support and role satisfaction among postpartum women.[10,11] Psychosocial factors, such as lifestyle changes, self-efficacy, and distress, appear to be pivotal to the transition of the postpartum period.

Social support is one psychosocial factor of interest in the postpartum period. Social support is broadly defined; it encompasses the constructs of emotional concern, concrete instrumental assistance (money, time), and informational aid received from others.[12–14] Social support has been associated with successful behavioral change, specifically for weight loss and weight maintenance interventions.[15,16] Women with young children cite lack of social support as a barrier to both healthful eating and engaging in physical activity.[17] Additionally, social support, defined by Keller et al.[2] as having friends with whom to exercise, has a positive influence on the degree of physical activity for postpartum women. In a qualitative study including low-income overweight and obese mothers, social support was a major motivating factor for adopting healthful eating habits and engaging in physical activity.[18] Walker et al.[19,20] found that inadequate social support has an inverse relationship with weight status among low-income minority postpartum women. Postpartum blues and postpartum depression, which may manifest in the absence of adequate social support, were associated with increased or decreased caloric intake and a decline in physical activity and overall energy.[7,21]

Although studies address social support as a protective factor for health, social support may be better defined by the relationship between support expected and support received and how well these constructs are matched.[22–24] Viewing social support in this way reflects the more significant and measurable concept of unmet support needs (or support inadequacy); in contrast, examining only the degree of support needed or received explains little about a potentially discordant relationship.[24] Unmet social support may also be related to low perceived maternal self-efficacy.[25] Edrwins et al.[11] found low self-efficacy among postpartum women to be related to role strain and stress, which may manifest in the absence of adequate social support. Additionally, postnatal depression, sources of social support (e.g., mother, partner), and maternal employment have been shown to be related to maternal perception of social support.[11,25]

Despite factors known to be associated with postpartum social support, there remains a lack of knowledge about unmet social support and weight-related behaviors in the postpartum period. The current analyses may help to fill this gap in the literature, as it focuses on predictors of social support, specifically unmet social support needs for weight-related behaviors among overweight and obese postpartum women. Using data collected from the randomized controlled trial (RCT), Active Mothers Postpartum (AMP), this study sought to investigate perceived need for social support for healthy behaviors, perceived receipt of social support, the difference between the two (support inadequacy, unmet social support), and finally predictors of this inadequacy.[23] The overall aim of the current analyses was to explore predictors of unmet social support for healthy behaviors among postpartum overweight women. We examined predictors of overall unmet social support in addition to construct-specific social support (e.g., emotional, informational, instrumental social support). We hypothesized that depression, low socioeconomic status, and absence of a partner would be predictors of inadequate social support.

Materials and Methods

Study design

This study is a secondary data analysis of the AMP trial. AMP is a nonblinded RCT that investigated the influence of a diet and physical activity intervention on reducing weight in overweight and obese postpartum women.[23] We obtained approval from the Institutional Review Board (IRB) of Duke University and exemption for use of existing data from the University of North Carolina Chapel Hill IRB.

Study population

Four hundred fifty women who were overweight or obese before pregnancy were recruited and enrolled in the AMP study between September 2004 and April 2006. Women in the intervention group were comparable, in terms of baseline characteristics, to those in the control group.[26] Women were recruited at three large obstetric clinics and through posters in public areas, such as grocery stores and libraries in Durham, NC. Interested participants were telephoned at 4 weeks postpartum to determine eligibility. The women enrolled were aged ≥ 18 years, spoke English, were overweight or obese before pregnancy (body mass index [BMI] $\geq 25\,kg/m^2$), and did not have any health conditions that prevented them from walking a mile unassisted.[26] Prepregnancy height and weight were self-reported. Additionally, postpartum height and weight were measured at approximately 6 weeks using standardized devices (Seca portable stadiometer and Tanita BMB-800).[26]

Baseline assessments, which included demographic information and psychosocial variables, were obtained within the first 2 weeks of enrollment and before randomization. Women were randomized 1:1 to the intervention or control arms, stratifying to black vs. other and primiparous vs. multiparous, using block randomization.[26] The intervention was aimed at promoting healthy behaviors and lifestyle changes and reducing weight retained in the postpartum period.[26] The 9-month intervention included a health-related newsletter, physical activity sessions, nutritional sessions, a sports walking stroller, a pedometer, and counseling sessions.

Measures

We assessed the association between unmet social support at 6 months postpartum and indicators from the baseline questionnaire for the women in the intervention arm who were also seen at the 6-month follow-up ($n = 190$).[26]

Predictor variables

We determined demographic characteristics from baseline assessment. Other variables from the baseline data included measured BMI, marital status, child care arrangement, intention to work outside of the home at 6 months postpartum, parity, education, living arrangement, household income, insurance status, and results from the Edinburgh Postpartum Depression scale (EPDS).[27] Women scoring ≥ 13 on the EPDS were categorized as experiencing postpartum depression.[27] The predictor variables from the 6-month follow-up questionnaire (pertaining to the period from birth to 6 months postpartum) included breastfeeding status and measured postpartum weight change. Because the trends in postpartum weight change and breastfeeding status were established before the 6-month postpartum questionnaire, postpartum weight change and breastfeeding at 6 months were considered to be potential predictors of unmet social support despite being queried at the same time as the social support questionnaire.

Social support for healthy behaviors outcome variables

Using established definitions of social support,[12,13] social support was subcategorized into three dimensions: (1) informational support, (2) emotional support, and (3) instrumental support.[28] Informational support includes information on how to anticipate and solve problems and information on how to make healthy food and adopt a feasible physical activity plan. Emotional support includes receiving encouragement during the postpartum period and reinforcing feelings of approval. The domain of emotional support was included, as inadequate emotional support may preclude the adoption of healthy behaviors. Instrumental support includes direct assistance from others to complete such tasks as child care, cooking healthy meals, and time to spend exercising (Table 1). The social support questionnaire used in the AMP study was constructed based on the Logsdon Postpartum Support Questionnaire (PSQ),[28] which has been validated in multiple studies.[28–30] Specifically, the questions used from the Logsdon PSQ comprised exact and modified questionnaire items that reflected the three domains of social support for healthy behaviors.

Table 1. Social Support for Healthy Behaviors from 6-Month Postpartum Questionnaire

Dimension of social support	*Item in social support questionnaire*
Informational Support	Learn how to cook healthy meals
	Learn how to make healthy food choices when eating out
	Learn how to fit exercise into my life
	Learn how to manage my responsibilities to my family and me
Emotional Support	Others act as if I am special
	Able to talk with someone when I am overwhelmed or stressed
	Others are able to take my worries and concerns away
	Someone to talk to and listen to me about what is interesting to me
Instrumental Support	Time for cooking healthy meals
	Money for household bills
	Help managing my responsibilities to my family and me
	Time for exercise

In the 6-month postpartum questionnaire, we asked the women in the intervention group 12 questions about social support, which included 4 questions for each subcategory of support (Table 1). Women answered each question twice, the first time about need or importance of support, the second time about degree of support received. The responses were based on an 8-point scale (0, not important, little support received, to 7, very important, lots of support received). Although the degree of need of social support as well as the degree of receipt of social support are both interesting and informative, the overall outcome variable used in this investigation was the overall Unmet Social Support Score (USSS). The overall USSS is the difference between the sum of the need scores and the sum of the received scores from the 12 questions.

$$(\text{Sum support needed} - \text{sum support received}) = \text{Overall unmet social support score}$$

We also defined secondary outcomes using the three dimensions. The informational USSS was the difference between the informational support need scores and informational support received scores. The emotional USSS was the difference between the emotional support need scores and emotional support received scores. The instrumental USSS was the difference between the instrumental support need scores and instrumental support received scores.[28] We obtained Cronbach alpha values of 0.85 for the overall scale and a range 0.63–0.81 for the subscales.

Analysis

The analysis included only women in the intervention group because only these women completed the 6-month postpartum questionnaire ($n = 190$), which included the questions related to social support.

We used descriptive statistics to obtain means and frequencies for demographic data and baseline characteristics. In bivariate analyses, we compared the mean overall USSS by level of each of the predictor variables. We assessed the statistical significance of the differences of the means using the t test or analysis of variance (ANOVA). The covariates used for the bivariate analysis were age, race/ethnicity, child care arrangements, intention to work out of the home at 6 months postpartum, marital status, baseline BMI, postpartum weight change, parity, education, household income, breastfeeding status, and financial situation. Similarly, relationships between social support subscores and the same predictor variables were assessed. We considered $p < 0.05$ as statistically significant. To adjust for the effects of potential confounders, we used a stepwise regression with backward elimination ($p > 0.2$ used as threshold for elimination) to develop multiple regression models. As this analysis was exploratory, we employed a stepwise regression method in the absence of a well-established theoretical model for predictors of USSS. Variables used for the stepwise regression method included known predictors for postpartum depression,[31,32] low perceived self-efficacy,[11,25] and healthy behaviors among

Table 2. Sample Characteristics: Baseline and 6-Month Postpartum Data

Characteristic	n = *190*	*Frequency (%)*
Age, years mean (SD)		31.4 (5.5)
18–29.9	72	37.9
30–34.9	72	37.9
35–46	46	24.2
Race		
White	109	57.4
Black	75	39.5
Other races	6	3.2
Ethnicity		
Hispanic	4	2.1
Marital status		
Single, never married	28	14.7
Living with partner	15	8.0
Married	142	74.7
Divorced, separated, widowed	5	2.6
Education		
High school or less	27	14.2
Some college but no degree (vocational, associate degree)	43	22.6
College graduate, graduate education	120	63.2
Household income ($)		
Up to $15,000–$30,000	45	24.7
$30,001–$60,000	51	28.0
$60,001 or more	86	47.3
Child care arrangement		
Mother stays home with child	138	73.4
Relative stays home with child	16	8.5
Day care or provider comes to home to care for child	8	4.3
Combination of above	26	13.8
Expected employment at 6 months postpartum[a]		
Full-time	113	59.5
Part-time	39	20.5
Not work for pay	36	19.0
Parity, No. of pregnancies mean (SD)		2.4 (1.5)
Primiparous	78	41.1
Multiparous	112	58.9
Insurance type		
Private/employer based	147	77.4
Medicare/Medicaid	36	19.0
None	7	3.6
Living arrangement[b]		
Lives alone	20	10.5
Lives with spouse	156	82.1
Lives with adults other than spouse	15	7.9
Financial situation[a]		
"After paying the bills, you still have enough money for special things that you want."	75	39.5
"You have enough money to pay the bills but little spare money to buy extra or special things."	75	39.5
"You have money to pay the bills but only because you have cut back on things."	21	11.0
"You are having difficulty paying the bills, no matter what you do."	18	9.5
Depression[c]		
No (<13)	172	90.5
Yes (≥13)	18	9.5
Breastfeeding at 6 months		
Exclusive breastfeeding	51	26.8
Mixed feeding	37	19.5
Bottle feeding	102	53.7
BMI at baseline, mean (SD)		32.8 (6.6)
BMI category		
25–29.9	76	40.0
30–34.9	67	35.3
35–39.9	22	11.6
40+	25	13.1
Postpartum weight change (baseline to 6 months)[a]		
Lost or maintained weight	106	56.1
Gained weight	83	43.9

[a]Two women with missing data for expect to work for pay, one with missing data for financial situation, one with missing data for postpartum weight change.
[b]Results not mutually exclusive.
[c]Depression scores from Edinburgh Postnatal Depression Scale (EPDS).[24]
BMI, body mass index; SD, standard deviation.

mothers in the postpartum period.[15,33] We used Stata/1C 11.0 for statistical analysis.

Results

Sample characteristics

The age range of the sample at baseline ($n = 190$) was 18–46 years, with a mean ± standard deviation (SD) of 31.4 ± 5.5. More than half of the women identified as white (57%), and only 2.1% were Hispanic (Table 2). Seventy-four percent of the women were married, and during this early postpartum period (approximately 6 weeks postpartum), most mothers stayed at home to care for their children (73%). All women were overweight or obese before pregnancy, based on self-reported prepregnancy height and weight (mean BMI 31.1 ± 7.0). At baseline, the average BMI was 31.8 ± 6.6. In assessment of postpartum weight change, 55% of women maintained or lost weight from 6 weeks to 6 months postpartum.

The average overall USSS 26.7 (SD 18.3) and ranged from −10 to 82. The means for the informational, emotional, and instrumental USSS were 9.9 (SD 7.4), 5.4 (SD 7.9), and 11.3 (6.7), respectively. The possible range for the overall USSS was −102 to +102, and the possible range was −28 to +28 for the subscores.

Predictors of unmet overall social support needs for healthy behaviors

Household income ($p = 0.026$), financial situation ($p = 0.004$), postpartum depression (PPD) scores as measured using the EPDS ($p = 0.018$), and postpartum weight change from baseline to 6 months ($p = 0.003$) were significantly associated with the overall USSs (Table 3). While simultaneously entering age, postpartum weight change, marital status, education, PPD scores, and living arrangement, depression had a significant relationship with the overall USSS ($p = 0.009$), as did

Table 3. Relationship of Unmet Social Support Scores: Bivariate Analysis

Characteristic	*Overall unmet social support (SD)*		*Informational unmet social support (SD)*		*Emotional unmet social support (SD)*		*Instrumental unmet social support (SD)*	
Age								
18–29.9	26.5 (17.5)	$p=0.564$	10.1 (7.2)	$p=0.369$	4.8 (8.3)	$p=0.601$	11.5 (6.1)	$p=0.779$
30–34.9	25.4 (16.9)		9.1 (7.4)		5.5 (6.5)		10.9 (7.1)	
35–46	29.1 (21.6)		11.0 (7.8)		6.3 (9.3)		11.6 (7.2)	
Race								
White	24.5 (17.5)	$p=0.053$	8.9 (7.1)	$p=0.020$	4.8 (7.3)	$p=0.179$	10.9 (6.7)	$p=0.279$
Nonwhite	29.8 (19.1)		11.4 (7.6)		6.4 (8.6)		11.9 (6.8)	
Marital status								
Single, never married	31.2 (20.8)	$p=0.126$	11.4 (7.9)	$p=0.521$	8.1 (9.7)	$p=0.091$	11.7 (7.0)	$p=0.136$
Living with partner	35.0 (14.7)		11.6 (6.5)		8.2 (7.8)		15.2 (6.5)	
Married	25.2 (17.8)		9.5 (7.3)		4.7 (7.5)		10.9 (6.6)	
Divorced, separated, widowed	22.0 (23.4)		8.8 (11.0)		2.6 (5.8)		10.6 (8.2)	
Education								
High school or less	29.8 (23.0)	$p=0.067$	12.2 (8.3)	$p=0.045$	5.3 (10.2)	$p=0.318$	12.4 (7.9)	$p=0.170$
Some college but no degree	31.6 (18.1)		11.5 (7.9)		7.1 (8.4)		12.7 (6.2)	
College graduate	24.5 (17.0)		8.9 (6.9)		4.9 (7.2)		10.6 (6.6)	
Household income								
Up to $15,000–$30,000	32.5 (19.9)	$p=0.026$	10.9 (8.4)	$p=0.271$	8.0 (8.7)	$p=0.038$	13.5 (7.2)	$p=0.027$
$30,001–$60,000	25.8 (17.4)		10.2 (6.8)		4.4 (7.7)		11.2 (6.3)	
$60,001 or more	23.4 (16.8)		8.8 (6.9)		4.4 (7.3)		10.1 (6.6)	
Child care arrangement								
Mother stays home with child	25.3 (17.4)	$p=0.085$	9.6 (7.1)	$p=0.305$	4.6 (7.5)	$p=0.027$	11.0 (6.6)	$p=0.294$
Other arrangement	30.6 (20.2)		10.9 (8.2)		7.5 (8.5)		12.2 (7.1)	
Expected employment at 6 months postpartum								
Full-time	26.5 (18.5)	$p=0.835$	9.7 (7.2)	$p=0.521$	5.4 (8.3)	$p=0.105$	11.4 (6.9)	$p=0.998$
Part-time	26.6 (17.2)		11.2 (7.9)		3.8 (6.7)		11.3 (6.0)	
Do not plan to work for pay	28.6 (19.1)		9.5 (7.6)		7.7 (7.7)		11.4 (7.2)	
Parity								
Primiparous	25.6 (16.5)	$p=0.476$	9.7 (6.9)	$p=0.711$	4.9 (7.6)	$p=0.443$	10.9 (6.3)	$p=0.524$
Multiparous	27.5 (19.5)		10.1 (7.7)		5.8 (8.2)		11.6 (7.0)	
Living arrangement								
Lives with spouse	26.6 (17.9)	$p=0.744$	9.8 (7.4)	$p=0.696$	5.3 (7.4)	$p=0.761$	11.4 (6.8)	$p=0.367$
Lives with alone or with other adults	25.5 (20.2)		10.4 (7.6)		4.9 (9.4)		10.3 (6.5)	
Financial situation								
"After paying the bills, you still have enough money for special things."	24.2 (17.7)	$p=0.004$	9.4 (7.5)	$p=0.023$	4.7 (7.2)	$p=0.263$	10.1 (6.7)	$p<0.001$
"You have enough money to pay the bills but little spare money to buy other things."	24.5 (16.1)		8.8 (6.4)		5.0 (7.3)		10.6 (6.2)	
"You have money to pay the bills but only because you have cut back."	34.7 (20.8)		12.7 (7.4)		6.8 (10.3)		14.7 (6.4)	
"You are having difficulty paying the bills, no matter what you do."	38.3 (21.9)		13.8 (9.3)		8.5 (10.2)		16.0 (6.5)	
Depression[a]								
No (<13)	25.7 (17.7)	$p=0.018$	9.8 (7.4)	$p=0.326$	5.0 (7.5)	$p=0.054$	10.8 (6.6)	$p=0.002$
Yes (≥13)	36.4 (20.9)		11.6 (7.4)		8.8 (10.6)		16.0 (6.5)	
Breastfeeding at 6 months								
Exclusive breastfeeding	26.9 (17.5)	$p=0.794$	9.8 (7.2)	$p=0.917$	5.4 (7.5)	$p=0.173$	11.6 (6.1)	$p=0.658$
Combined breastfeeding and formula	24.9 (18.7)		9.6 (8.2)		3.4 (7.0)		12.0 (7.5)	
Formula only	27.3 (18.7)		10.1 (7.3)		6.2 (8.3)		10.9 (6.8)	
BMI at baseline								
25–29.9	25.9 (17.7)	$p=0.707$	9.3 (6.9)	$p=0.433$	5.6 (7.9)	$p=0.964$	10.9 (6.1)	$p=0.525$
30–34.9	28.0 (19.7)		10.7 (8.3)		5.1 (8.1)		12.1 (7.2)	
35–39.9	28.8 (17.6)		11.1 (6.3)		6.0 (8.7)		11.7 (6.7)	
40+	23.7 (17.5)		8.4 (7.0)		5.3 (7.0)		10.0 (7.0)	
Postpartum weight change (baseline to 6 months)								
Lost or maintained weight	23.1 (17.0)	$p=0.003$	8.6 (6.9)	$p=0.005$	4.2 (7.2)	$p=0.022$	10.2 (6.8)	$p=0.016$
Gained weight	31.2 (19.1)		11.6 (7.8)		6.9 (8.6)		12.6 (6.5)	

[a]Depression scores from EPDS.[24]

living arrangement ($p=0.040$) (Table 4). Women who live with a spouse report higher levels of unmet overall social support. Moreover, women who are at increased risk for PPD reported higher unmet overall social support than those who scored higher on the EPDS.

Predictors of three dimensions of unmet social support for healthy behaviors

For the informational USSS, race ($p=0.020$), education ($p=0.045$), financial situation ($p=0.023$), and postpartum

Table 4. Relationship of Unadjusted and Adjusted Unmet Social Support Scores: Multivariate Analysis

Characteristic	*Overall unmet social support scores* (p *value*)		*Informational unmet social support scores* (p *value*)		*Emotional unmet social support scores* (p *value*)		*Instrumental unmet social support scores* (p *value*)	
	Unadjusted means	*Adjusted means*	*Unadjusted means*	*Adjusted means*	*Unadjusted means*	*Adjusted means*	*Unadjusted means*	*Adjusted means*
Age								
25	20.3 (0.525)	22.0 (0.597)	8.8 (0.433)	8.6 (0.422)	1.7 (0.273)	0.85 (0.405)		
30	24.9	24.9	7.7	8.0	6.7	7.3		
35	25.1	24.5	8.3	8.3	6.8	6.6		
Postpartum weight change (baseline to 6 months)								
Lost or maintained weight	23.1 (0.003)	24.2 (0.078)	8.6 (0.005)	9.1 (0.115)			10.2 (0.016)	10.3 (0.066)
Gained weight	31.2	29.4	11.6	11.0			12.6	12.2
Depression[a]								
No (<13)	25.7 (0.018)	25.2 (0.009)			5.0 (0.054)	4.8 (0.035)	10.8 (0.002)	10.6 (0.001)
Yes (≥13)	36.4	37.1			8.8	8.8	16.0	15.9
Education								
High school or less	29.8 (0.067)	30.3 (0.128)	12.2 (0.045)	11.9 (0.203)				
Some college	31.6	30.6	11.5	11.0				
College graduate	24.5	24.1	8.9	9.1				
Marital status								
Married	25.2 (0.049)	24.4 (0.058)						
Not married	31.4	33.1						
Living arrangement								
Lives with spouse	26.6 (0.744)	28.1 (0.040)					11.4 (0.367)	11.7 (0.018)
Lives with alone or with other adults	25.5	19.0					10.3	8.5
Race								
White			8.9 (0.020)	9.1 (0.118)				
Nonwhite			11.4	11.0				
Household income								
Up to $15,000–$30,000					8.0 (0.038)	7.6 (0.090)	13.5 (0.027)	13.5 (0.052)
$30,001–$60,000					4.4	5.0	11.2	11.2
$60,001 or more					4.4	4.3	10.1	10.0
Child care arrangement								
Mother stays at home					4.6 (0.027)	4.4 (0.026)		
Other arrangement					7.5	7.4		

[a]Depression scores from EPDS.[24]

weight change to 6 months ($p = 0.005$) were significant predictors (Table 3). While simultaneously entering education, postpartum weight change to 6 months, age, and race, the relationship between informational USSS and education, postpartum weight change, and race were no longer statistically significant (Table 4).

Income ($p = 0.038$), child care arrangements ($p = 0.027$), and postpartum weight change ($p = 0.022$) were statistically significant predictors of the emotional USSS in bivariate analyses (Table 3), but in the multivariable analysis, while simultaneously entering age, income, child care arrangements, and depression scores, only child care arrangements ($p = 0.026$) and depression scores ($p = 0.035$) remained statistically significant predictors (Table 4). Women who stay at home to care for their children reported lower levels of unmet emotional social support than did women who have other arrangements of child care, such as day care or having another adult care for the child in the home. Similar to the overall USSS, women who had higher scores on the EPDS for depression reported higher levels of unmet emotional social support.

Household income, financial situation, depression, and postpartum weight change at 6 months were statistically significant predictors of the instrumental USSS ($p = 0.027$, $p < 0.001$, $p = 0.002$, $p = 0.016$, respectively); after controlling for income, living arrangement, depression scores, and postpartum weight change to 6 months, only living arrangement ($p = 0.018$) and depression scores ($p = 0.001$) remained statistically significant predictors. Women with higher PPD scores reported higher levels of unmet instrumental social support. Moreover, women who live with their spouse reported higher unmet instrumental social support than those who live alone or with an unmarried partner.

Discussion

The aim of this study was to examine predictors of unmet social support for healthy behaviors among overweight and obese postpartum women. Depression and living arrangements of the mother appear to be associated with overall unmet social support as well as all three subcategories of unmet social support. The predictors for the specific types of unmet social support differed. For instance, the relationship between depression and unmet emotional social support and that of income and unmet instrumental social support were intuitively matched. The relationship between living arrangement and overall USSS was somewhat unexpected. The women who lived with their spouse had higher overall and instrumental unmet social support. As discussed by Belsky,[34] the concept of "violated expectations" may be at play here. Women who are living with a spouse may expect more social support, and the discordance occurs when these high expectations are not met.

Predictors of social support in the postpartum period have not been well researched in the literature. This may be in part because lack of social support is viewed not as an outcome but as a predictor for PPD and stress.[29] Nonetheless, some studies have employed the principle of social support discrepancy. Logsdon et al.[35] explored the relationship between social support and depression among postpartum adolescents. Using expectation of support and received support, the authors explored the relationship of fulfilled social support as matched (i.e., expected need is adequately met) and unmatched (i.e., the expected need differs from received support). Davis et al.[22] further applied this concept of support expected and support received among mothers with infants in the neonatal intensive care unit. Logsdon and Usui[29] found that expected and received social support, when viewed together, were associated with depressive symptoms if not appropriately matched.

In the context of the overweight population, Kumanyika et al.[36] found that including social support as a factor in a weight-management intervention was associated with weight loss of overweight participants when partners participated and lost weight. Additionally, overweight women enrolled in a weight loss program cited social support as an important element of their participation and continuance with the weight intervention program.[37] In a review of the constructs necessary for treatment of overweight and obesity, social support from family and peers helped women to integrate healthy lifestyle changes.[37] Moreover, the overweight status of a peer may have a significant impact on a person's weight status as a result of the influence of social ties and interpersonal behaviors.[38]

In relation to the postpartum period, inadequate social support may manifest in many forms, including stress, anxiety, and depression. Carter et al.,[39] who explored the relationship between BMI and depression and anxiety in the postpartum period, found that overweight and obese women had higher levels of depression and anxiety than did normal weight women. Although difficult to prove causality, it is important to note that overweight and obese women may be more at risk for developing depression or anxiety.[39] In another qualitative study, postpartum women who were overweight reported lack of self-efficacy and control in regard to changing postpartum weight.[40] This study highlights not only the importance of identifying a vulnerable population but what seems to be the comorbid nature of depression and postpartum weight retention.[40] Ensuring that overweight and obese women have adequate social support may be one way to mitigate the burden of mood and anxiety disruptions in the postpartum period. There are few studies that investigate social support in the postpartum period much less as social support as matched constructs of needed and received support. Thus, there is a need to further explore the nuaness and manifestations of inadequate social support in the postpartum period.

Strengths and limitations

The use of a social support instrument, the PSQ, which was altered to reflect social support for healthy behaviors, is a strength in this study. First, our survey queried multiple dimensions of social support, including domains that align with established constructs of social support.[12,13] Second, asking the questions to reflect both perceived importance of support and the degree of receipt of social support allowed us to explore unmet social support and the concept of unfulfilled expectations. Third, instruments, such as the Norbeck's Social Support Questionnaire[41] and the Arizona Social Support Interview Scale,[42]are not based on social support tailored to life situation as is the Logsdon PSQ.[35] These instruments are instead based on global questions related to social support, which may not yield as specific results because the postpartum period is a special transitional period.

Nonetheless, the method of assessing unmet social support may be improved upon. Future work may be necessary to determine specific parameters of risk for social support inadequacy. This would add to the utility of the social USSS and comparison to other outcomes. Another limitation of this study is that it does not consider the relationship among unmet social support and weight-related behaviors and postpartum weight changes. Despite these challenges, exploring social support inadequacy is important because a feeling of good social support, especially during high stress periods, has a value in and of itself, and few studies have examined predictors for unmet social support needs.

Conclusions

Postpartum weight retention remains an important antecedent to long-term overweight and obesity for women of reproductive age. Data from the overweight and obese women in the AMP study indicate that some women may be more vulnerable than others to having unmet social support relating to healthy behaviors. The present study could prompt further exploration into the relationship of social support inadequacy and weight-related behaviors in the postpartum period. Achieving adequately matched social support may be one way to increase self-efficacy, mitigate maternal stress, and impact overall health behaviors. By identifying women during this transitional postpartum period, health providers may be able to seize an opportunity for intervention to prevent further stress and, potentially, PPD. Future research may focus on investigating and improving overall social support by targeting not only the woman but also those within her social support network.

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Disclosure Statement

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