

I. Introduction

The prevalence of obesity in children and adolescents has nearly tripled over the last several decades, and remains high with 17.2% of children ages 2-19 currently obese (BMI \geq 95th percentile) and 5.8% fitting into the category of extreme obesity (BMI \geq 120th percentile) (Ogden et al., 2016). The risk for obesity can begin early in life and there may be disparities by race and ethnicity. According to national data, the prevalence of obesity was 8.4% and 6.6% among non-Hispanic black versus non-Hispanic white infants and toddlers ages 0-24 months, respectively (Ogden, 2014). Once established, obesity can be intractable (Stettler, 2003; Cameron, 2003; Chomtho, 2008; Mei, 2003; Traveras, 2009; Stettler 2005) leading researchers to identify early-life factors that contribute to excess weight gain in the first two years of life.

Indeed, several national surveys of dietary intake among infants and toddlers (Saavedra et al., 2013) have documented the early emergence of eating patterns associated with obesity among older children and adults (Abraham et al., 2012; Anzman et al., 2010; Dubois et al., 2007). This includes high intake of fast foods, fatty/sugary snack foods, and juice and sweetened beverages, and low intake of vegetables, whole fruits, and whole grains. One promising target for intervention is parent feeding style—the beliefs and behaviors that characterize approaches to maintaining or modifying children’s eating behavior (Birch & Fisher, 1995; Golan & Crow, 2004; Thompson, 2009)—as these have been associated with suboptimal dietary intake (Hoerr et al., 2009; Patrick et al., 2002; Kroll & Warschburger, 2008) and have been shown to be modifiable (Daniels et al., 2014; Spence et al., 2014; Harvey-Berino & Rourke, 2003).

Developed and validated by Thompson (2009), the Infant Feeding Style Questionnaire (IFSQ) assesses caregiver feeding styles across five domains: responsive feeding style and four variations of non-responsive feeding style (i.e., pressuring/controlling, restrictive/controlling,

indulgent, and laissez-faire). A responsive feeding style is defined as a caregiver being attentive to a child's hunger and satiety cues, and monitoring the quality of the child's diet. A pressuring/controlling style is when the caregiver is concerned with increasing the amount of food consumed by the infant and when food is used to soothe the infant. A restrictive/controlling feeding style is defined as the caregiver limiting the infant to healthful foods and/or limiting the quantity of food consumed. An indulgent style is practiced when no limits are set on the quantity or the quality of food consumed or provided. Finally, a laissez-faire feeding style is characterized by minimal interaction with the infant during feeding as well as few limits on the quantity or quality of food provided or consumed. Each of the non-responsive feeding styles has been associated with one or more outcomes among infants and toddlers, as well as preschoolers, including lower intake of fruits and vegetables (Hoerr et al., 2009; Patrick et al., 2005), higher energy intakes and dysregulation of appetite (Faith et al., 2004; Fisher & Birch, 1999), higher intake of junk-type foods (Thompson et al., 2013; Kroller & Warschburger, 2008), and greater adiposity (Hughes et al., 2008; Hoerr et al., 2009; Wardle et al., 2002; Farrow & Blissett, 2006; Worobey, Lopez, & Hoffman, 2009), with non-Hispanic black mothers reporting greater use of more restrictive and pressuring feeding practices (Spruijt-Metz et al., 2002).

Research on factors explaining variation in infant feeding style is needed to better target and/or tailor intervention efforts. One predictor of feeding style among women with older children is maternal body dissatisfaction. Gray et al. suggest that parents with high body dissatisfaction are more likely to participate in higher levels of restrictive feeding practices during childhood and adolescence than parents with low body dissatisfaction (Gray et al., 2010). Moreover, parental body dissatisfaction at childbirth predicts pressure to eat when the child is seven years old (Duke, 2004). While research observing the association between parental body

dissatisfaction and child feeding practices in childhood and adolescence is growing, minimal literature exists observing this relationship among mothers of infants and toddlers.

Some research has suggested that non-Hispanic black women display a unique cultural perception of body image, perceiving their BMI as nearly four times smaller than the measured value (Cox, Zunker & Wingo, 2010; Katz et al., 2004). However, findings are mixed. For example, Boyington, Johnson, and Carter-Edwards (2007), found that more than 75% of black women between 0 and 6 months postpartum exhibited dissatisfaction with their current body size, with over half desiring weight loss and only 19.5% desiring an increase in size. Non-Hispanic black women experience significantly lower levels of body dissatisfaction than non-Hispanic white women (Fitzsimmons-Craft & Bardone-Cone, 2012; Kronefeld et al., 2009). We find minimal studies examining body dissatisfaction among non-Hispanic black women during the early postpartum period, a factor that may be important to the establishment of infant feeding style.

The objective of the current study is therefore two-fold. First, we seek to assess the prevalence of maternal body dissatisfaction among a cohort of non-Hispanic black women early in the postpartum period, at 3- and 6-months of infant age. Second, we seek to determine the associations between maternal body dissatisfaction and infant feeding style at these two time points. We hypothesize that mothers dissatisfied with their current body size will have lower mean scores on the domain of responsive feeding style and higher mean scores on one or more of the domains of non-responsive feeding style, as compared to mothers who are content with their current body size.

II. Methods

Study Design and Participants

Data was collected through the Infant Care, Feeding and Risk of Obesity Study, an observational cohort study of 217 first-time non-Hispanic black mothers ages 18-35 years recruited through the North Carolina Supplemental Nutrition Program from Women Infants and Children (WIC). Mother-infant pairs were excluded from the Infant Care Study if the infant was delivered before 35 weeks gestation or had the presence of an illness or condition that may affect appetite, feeding or growth, such as Down syndrome, epilepsy, cleft lip/palate, mental retardation, failure to thrive, cerebral palsy, or severe food allergies. Mother-infant dyads were assessed during in-home visits when the infants were 3, 6, 9, 12, and 18 months of age. At each visit, interviewer-administered questionnaire and anthropometry were collected. The current study uses data from the 3-month (n=217) and 6-month (n=161) visits. Mother-infant dyads lost to follow-up did not differ significantly on any baseline characteristics (Wasser et al., 2013). Data were collected from 2003-2007. The institutional review board at the University of North Carolina at Chapel Hill approved this study.

Measures

Maternal Body Dissatisfaction

Maternal body dissatisfaction was assessed using the Body Image Assessment of Obesity (BIA-O), which has been validated against BMI among black women (Williamson et al., 2000). The BIA-O is composed of 18 silhouette figures of women ranging from very thin to very obese displayed on the front of 18 cards. Administration of the BIA-O includes shuffling the 18 cards and presenting them in random order. To assess current maternal body size, the woman is prompted to "Select the silhouette that most accurately represents your body size, as you

perceive it to be right now. Please be honest. You must choose only one silhouette and you may not rearrange the cards to directly compare the silhouettes.” The interviewer then records the number of the card selected (1-18). The number is written on the back of the card so the participant cannot use the number as an aid in selecting a body size estimate (Williamson et al., 2000). This number is the score for current body size (CBS). The cards are then reshuffled and presented in a new random order. The woman is instructed to “Select the silhouette that most accurately represents the body size that you would most prefer to be. Again, be honest. You must choose only one silhouette and you may not rearrange the cards to directly compare the silhouettes.” This recorded score is ideal body size (IBS). From these responses, a measure of body dissatisfaction is calculated as the discrepancy between maternal CBS and maternal IBS (i.e. CBS-IBS), which can range from -17 (desiring a silhouette 17 times larger than current silhouette) to +17 (desiring a silhouette 17 sizes smaller than current silhouette).

To distinguish women desiring to be smaller from those desiring to be larger, we created a three-level categorical variable: desiring to be larger ($\text{CBS-IBS} \leq -1$), satisfied with current size ($-1 < \text{CBS-IBS} < 1$), and desiring to be smaller ($\text{CBS-IBS} \geq 1$).

Infant Feeding Style

The Infant Feeding Style Questionnaire (IFSQ) (Thompson, 2009) was used to assess maternal feeding style at each visit. The IFSQ is a comprehensive measurement that uses 39 items to probe maternal beliefs regarding infant feeding (coded on a 5-point scale: disagree, slightly disagree, neutral, slightly agree, agree) and 24 items measuring feeding behaviors for all infants (coded on a 5-point scale: never, seldom, half of the time, most of the time, always), and an additional 20 items regarding solid feeding behaviors for infants above 6 months of age

(Thompson, 2013). The IFSQ assesses five feeding styles across 13 sub-constructs: laissez-faire (LF)-attention, LF-diet-quality; pressure/controlling (PR)-finish, PR-cereal, PR-soothing; restrictive/controlling (RS)-amount, RS-diet-quality; responsive (RP)-satiety, RP-attention; and indulgent (IN)-permissive, IN-coaxing, IN-soothing, and IN-pampering. Items related to each sub-construct were randomly distributed throughout the questionnaire, and a few items were inversely coded so that different responses would reflect “ideal” parenting.

Scores were created for each of the 13 sub-constructs by calculating the mean score of the items corresponding to each sub-construct. Construct scores were considered missing if an item response was missing in sub-constructs with 2 or 3 items, or when more than 1 item was missing in sub-constructs with 4 or more items. If only 1 item was missing in sub-constructs with 4 or more items, the sub-construct score was calculated without that item.

Covariates

The inclusion of covariates was based on the literature (Li X. et al., 2014; Durmus et al., 2012; Hurley, 2007; Hendricks et al., 2006) and theoretical importance. Maternal characteristics include maternal age, maternal college education, marital status, any breastfeeding, obesity and depression. Maternal anthropometrics were collected and body mass index was calculated as $\text{weight (kg)} / \text{height (m)}^2$. Maternal obesity was defined as a BMI $> 30 \text{ kg/m}^2$. The Center for Epidemiological Studies Depression Scale was used to measure maternal depression, with a score of 16 or greater indicating the presence of depressive symptoms (Radloff, 1977).

Statistical Analysis

Descriptive statistics were used to assess infant feeding style sub-constructs, CBS, IBS, maternal body dissatisfaction (CBS-IBS), and important maternal characteristics/covariates. Maternal body dissatisfaction was cross-tabulated with maternal BMI to observe the prevalence of dissatisfaction across the four BMI categories: underweight (BMI<18.5), normal (BMI 18.5-24.9), overweight (BMI 25-29.9), and obesity (BMI≥30) at 3- and 6-months postpartum. Bivariate logistic regression models analyzed the association between each of the infant feeding style sub-constructs (dependent variables) and each of the independent variables (maternal body dissatisfaction and covariates). Adjusted multivariable logistic regression models were run to test significance after controlling for important covariates. Covariates were included if found significantly associated with infant feeding style in the bivariate analysis or if its presence changed the beta-coefficient of maternal body dissatisfaction and infant feeding style by greater than 10%. Significance was set at $P<0.05$. Stata14 SE was used for all analyses.

III. Results

The study sample consisted of 217 low-income, African-American mother-infant dyads. At 3 months postpartum, the mothers were young with the average age being 22.67 ± 3.81 (Table 1). Of the study population, 29.1% of the mothers were depressed, 44.2% were obese, and only 22.6% were breastfeeding. Few of the mothers were married (9.8%) and 42.5% had some college education. The demographic was consistent at the 6-month time point, except the percentage of mothers practicing any breastfeeding decreased to 14.4%.

At 3 months postpartum, 65.4% of the mothers were dissatisfied with their current body size; 9.2% wanted to be bigger in size and 56.2% wanted to be smaller in size. The percent of

mothers dissatisfied with their current body size was similar at 6 months postpartum in respect to mothers desiring to be bigger or smaller in size.

Cross-tabulation of maternal body size against maternal BMI found that 63.9% of the mothers desiring to be smaller in size were obese; 10% of the mothers that desired to be bigger in size were obese, and 21.3% satisfied with their current body size were obese at 3 months postpartum (Figure 1). There was a similar pattern of findings at 6 months with a slightly higher proportion (30.4%) of obese mothers satisfied with their current body size (Figure 2).

At 3 months, mean scores were highest for responsive satiety feeding style and lowest for indulgent feeding practices (i.e. permissive, coaxing, soothing, pampering); these findings were consistent at the 6 months postpartum. Bivariate analysis found that maternal depression, maternal college education, marital status, maternal age, any breastfeeding, and maternal obesity were significantly associated with infant feeding style sub-constructs ($P < 0.05$).

Among the cohort, maternal body dissatisfaction with a desire to be smaller in size was significantly associated with restrictive diet quality at 3 months postpartum ($p < 0.05$) (Table 2). As compared to mothers who were content with their current body, mothers desiring to be smaller in size had a 0.25 higher mean score on *restrictive-diet-quality*. This was observed in the unadjusted bivariate logistic regression model. This association remained significant in the adjusted multivariable model that controlled for important confounders ($p < 0.05$). When controlled for covariates, mothers desiring to be smaller in size had a 0.32 higher mean score on *restrictive-diet-quality* compared to content mothers. No other significant associations were found at the 3-month time period.

At 6 months postpartum, maternal body dissatisfaction with a desire to be bigger in size was significantly associated with *pressuring-to-finish* ($p < 0.05$) (Table 4). After adjusting for

covariates, in comparison to mothers content with their current body size, mothers desiring to be bigger in size had a 0.46 lower mean score in *pressure-to-finish* feeding style. A mother desiring to be bigger in size was also significantly associated with an *indulgent-permissive* feeding style ($p < 0.01$). As compared to content mothers, mother desiring to be bigger in size had a 0.63 higher mean score for *indulgent-permissive* feeding style. No other significant associations were observed at this time point.

IV. Discussion

The prevalence of obesity among infants and toddlers highlights the need to determine early-life factors that contribute to infant size. This study observed the association between maternal body dissatisfaction and infant feeding style, which has been associated with infant diet and size. At both time points, maternal body dissatisfaction was significantly associated with a non-responsive feeding style. Mothers desiring to be smaller in size were more likely to practice a restrictive feeding style with respect to food quality. A significant association was observed between mothers desiring to be bigger in size and pressure-to-finish and indulgent-permissive feeding styles, when adjusted for confounding variables. Notably, 65.4%, almost two-thirds, of the mothers were dissatisfied with their current body size, as observed in previous research (Boyington, 2007).

The analysis of maternal body dissatisfaction resulting in a restrictive feeding style is consistent with other literature (Gray, 2010). Mothers dissatisfied with their current body size, particularly those desiring to be smaller in size, may relay this dissatisfied perception into their infant feeding practices. If the mother practices dietary restraint for herself, this may carry over to limiting the infant to healthful foods.

Maternal body dissatisfaction postpartum was also associated with pressuring feeding practices, as noted in the literature (Duke, 2004). This current study demonstrated that body dissatisfaction is a determinant in parental feeding practices as early as 3-months of age, as opposed to being a foretelling factor of which effects are only observed in childhood. Particularly, mothers desiring to be bigger in size may pressure their infants to finish their food as a reflection of her beliefs and behaviors when eating. What has not been discovered within the literature, but was observed in this current study was the association between maternal body dissatisfaction and indulgent-permissive feeding practice.

As observed in previous research (Hendricks et al., 2006), maternal characteristics of age, college education, marital status, any breastfeeding, obesity, and depression had a significant association with feeding style in this sample of first-time, low-income, non-Hispanic black mothers. This highlights the importance of targeting this population with interventions that promote responsive infant feeding styles.

The current study had several strengths, including the analysis of a wide spectrum of feeding constructs, but also presents some limitations. Only two time points were observed within six months postpartum; future research would benefit by also exploring these relationships later in the postpartum period when mothers may have habituated to their normal/pre-pregnancy size. The sample comprised low-income, first-time non-Hispanic black mothers and infants, limiting the results to be generalized to this subset of the population. Non-Hispanic black women have presented sociocultural differences in some studies in comparison to other race and ethnicities with respect to body dissatisfaction and feeding styles. This uniform population may have limited current findings between the exposure and outcome in regard to what may be observed in a more varying population sample.

V. Conclusion

In conclusion, the prevalence of maternal body dissatisfaction was high during early postpartum among this sample of low-income, first-time non-Hispanic black mothers. Importantly, maternal body dissatisfaction was associated with several domains of non-responsive infant feeding styles; a desire to be smaller in size was significantly associated with restrictive-diet-quality and a desire to be bigger in size was significantly associated with pressure-to-finish and indulgent-permissive feeding styles. These findings are important for future interventions targeting the improvement of infant feeding and practices. Future research should examine this relationship across the first two years of life in larger, more heterogeneous samples.

VI. Tables

Table 1.	3 Months			6 Months		
Variable	N	mean±SD or n (%)	Min, max	N	mean±SD or n (%)	Min, max
<i>Outcome: IFSQ sub-constructs</i>						
LF attention	216	2.19±0.70	1, 4.4	160	2.22±0.71	1, 4
LF diet quality	197	3.04±0.59	1.25, 5	160	2.93±0.65	1, 4.5
RS amount	216	3.68±0.98	1, 5	158	3.67±0.93	1, 5
RS diet quality	217	3.31±0.85	1, 5	160	2.80±0.72	1, 4.6
RP satiety	216	4.48±0.51	2.29, 5	160	4.46±0.55	2, 5
RP attention	208	3.58±1.00	1, 5	153	3.47±0.90	1.2, 5
PR finish	209	2.21±0.71	1, 3.67	159	2.40±0.76	1, 4.25
PR cereal	216	2.75±0.97	1, 5	160	2.75±0.83	1, 5
PR soothing	215	2.19±0.82	1, 5	160	2.06±0.80	1, 5
IN permissive	172	1.94±0.73	1, 4.2	149	1.79±0.64	1, 3.75
IN coaxing	174	1.31±0.45	1, 3.8	149	1.38±0.46	1, 3.25
IN soothing	174	1.36±0.46	1, 3.6	149	1.32±0.43	1, 3
IN pampering	174	1.44±0.54	1, 3.4	149	1.37±0.49	1, 3.625
<i>Exposure: BIA-O discrepancy scores (continuous and categorical)</i>						
Current minus Ideal	217	1.52±2.35	-8, 9	160	1.74±2.39	-6, 7
Current minus Ideal						
Desire bigger size		20 (9.2)	--		15 (9.4)	--
At ideal size		75 (34.6)	--		56 (35.0)	--
Desire smaller size		122 (56.2)	--		89 (55.6)	--
<i>Covariates</i>						
Depressive symptoms	213	62 (29.1)	--	151	41 (27.2)	--
16 CES-D						
Obese	217	96 (44.2)	--	168	75 (44.6)	--
Maternal Age	217	22.67±3.81	18.06,35.61	166	22.80±3.79	18.33,35.85
Pregnancy Status	179	1 (0.6)	--	158	5(3.2)	--
Married	214	21 (9.8)	--	167	17 (10.2)	--
Any Breastfeeding	217	49 (22.6)	--	167	24(14.4)	--
Some College Education	214	91 (42.5)	--	168	75(44.6)	--

Table 2. Regression models of maternal body dissatisfaction and infant feeding styles at 3 months postpartum ^a													
Body Image Dissatisfac tion	Feeding Style Outcomes ^b												
	LF Attentio n	LF Diet Qualit y	RS Amoun t	RS Diet Qualit y	RP Satiety	RP Attentio n	PR Finis h	PR Cerea l	PR Soothin g	IN Permissiv e	IN Coaxin g	IN Soothin g	IN Pamperin g
3 Month Unadjusted													
Satisfied (Reference)	-	-	-	-	-	-	-	-	-	-	-	-	-
Desire smaller size	0.03	0.11	0.20	0.25*	-0.06	0.11	0.12	0.12	0.20	0.04	0.77	0.01	-0.02
Desire bigger size	0.17	-0.08	0.12	0.02	0.07	-0.24	0.19	0.36	0.08	0.16	-0.00	0.08	0.10
Adjusted													
Satisfied (Reference)	-	-	-	-	-	-	-	-	-	-	-	-	-
Desire smaller size	-0.07	0.20	0.21	0.32*	-0.04	0.15	0.12	-0.08	0.11	0.01	0.04	-0.00	-0.02
Desire bigger size	0.17	-0.12	-0.14	0.05	0.14	-0.15	0.09	0.05	-0.00	0.07	-0.06	-0.01	0.03
^a Models control for depressive symptoms, obesity, maternal age, pregnancy, marital status, breastfeeding, and college education.													
^b Feeding style are abbreviated: LF=laissez-faire, PR=pressuring, RS=restrictive, RP=responseive, and IN=indulgent													
*Significance: p<0.05													

Table 3. Regression models of maternal body dissatisfaction and infant feeding styles at 6 months postpartum ^a													
Body Image Dissatisfac tion	Feeding Style Outcomes ^b												
	LF Attentio n	LF Diet Qualit y	RS Amoun t	RS Diet Qualit y	RP Satiety	RP Attentio n	PR Finis h	PR Cerea l	PR Soothin g	IN Permissiv e	IN Coaxin g	IN Soothin g	IN Pamperin g
6 Month													
Unadjusted													
Satisfied (Reference)	-	-	-	-	-	-	-	-	-	-	-	-	-
Desire smaller size	0.13	0.07	-0.16	0.17	0.01	-0.03	0.04	0.11	0.27	0.16	0.04	0.05	-0.02
Desire bigger size	-0.16	0.02	-0.07	-0.01	-0.21	-0.36	-0.34	0.02	0.16	0.60*	0.11	-0.15	-0.13
Adjusted													
Satisfied (Reference)	-	-	-	-	-	-	-	-	-	-	-	-	-
Desire smaller size	0.15	-0.01	-0.23	-0.23	0.01	0.01	0.09	0.01	0.18	0.13	0.02	-0.00	-0.08
Desire bigger size	-0.06	0.03	-0.00	-0.00	-0.18	-0.43	-0.49*	-0.00	0.22	0.64*	0.13	-0.13	-0.11
^a Models control for depressive symptoms, obesity, maternal age, pregnancy, marital status, breastfeeding, and college education.													
^b Feeding style are abbreviated: LF=laissez-faire, PR=pressuring, RS=restrictive, RP=responsive, and IN=indulgent													
*Significance: p<0.05													

Figure 1. Cross-tabulation of maternal body dissatisfaction and maternal BMI at 3-months postpartum.

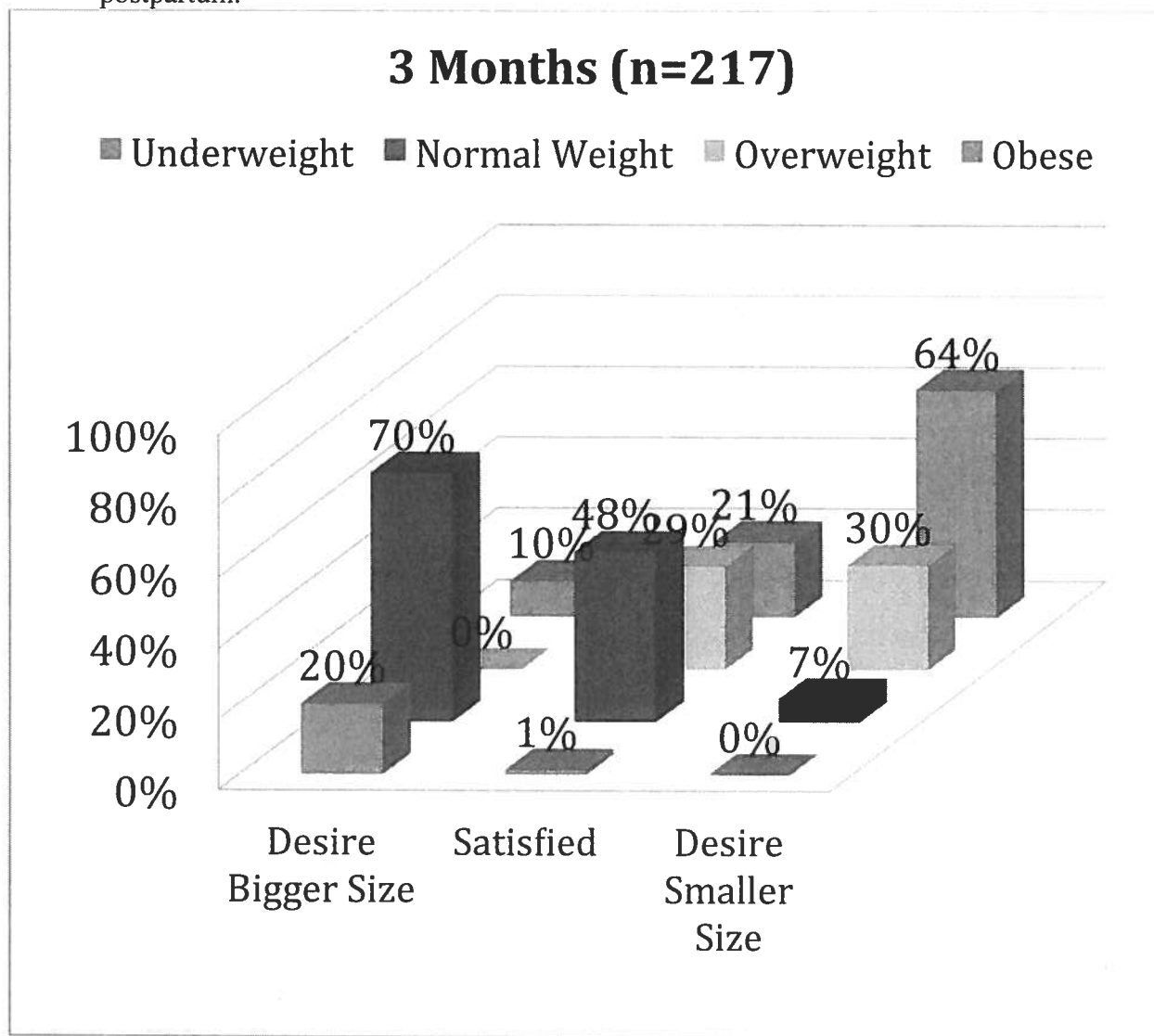
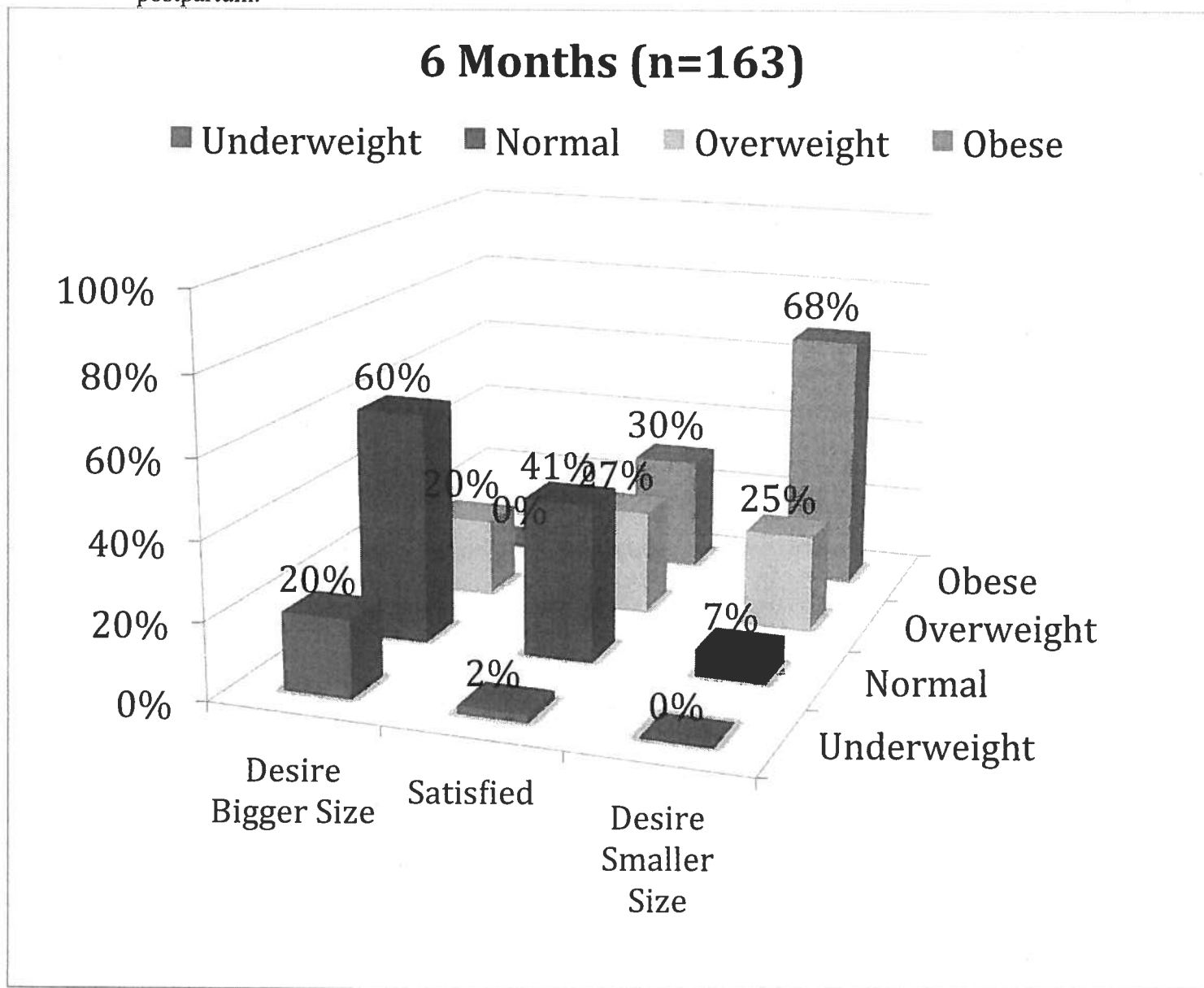


Figure 2. Cross-tabulation of maternal body dissatisfaction and maternal BMI at 6-months postpartum.



References

- Abraham, E., Godwin, J., Sherriff, A., & Armstrong, J. (2012). Infant feeding in relation to eating patterns in the second year of life and weight status in the fourth year. *Public Health Nutr.*, 15(9), 1705-1714. doi:<https://doi-org.libproxy.lib.unc.edu/10.1017/S1368980012002686>
- Anzman, S. L., Rollins, B. Y., & Birch, L. L. (2010). Parental influence on children's early eating environments and obesity risk: Implications for prevention. *International Journal of Obesity*, 34(7), 1116-24. doi:<http://dx.doi.org/10.1038/ijo.2010.43>
- Birch, L. L., & Fisher, J. A. (1995). Appetite and eating behavior in children. *Pediatric Clinics of North America*, 42(4), 931-953.
- Boyington, J. a. b., Johnson, A. c., & Carter-Edwards, L. d. (2007). Dissatisfaction with body size among low-income, postpartum black women. *JOGNN - Journal of Obstetric, Gynecologic, and Neonatal Nursing*, 36(2), 144-151. doi:10.1111/j.1552-6909.2007.00127.x
- Cameron, N., Pettifor, J., De Wet, T., & Norris, S. (2003). The relationship of rapid weight gain in infancy to obesity and skeletal maturity in childhood. *Obesity Research*, 11(3), 457-460. doi:<http://dx.doi.org/10.1038/oby.2003.62>
- Chomtho, S., Wells, J., Williams, J., Davies, P., Lucas, A., & Fewtrell, M. (2008). Infant growth and later body composition: Evidence from the 4-component model. *Am J Clin Nutr*, 87(6), 1776-1784.
- Cox, T. L., Zunker, C., Wingo, B., Thomas, D. -, & Ard, J. D. (2010). Body image and quality of life in a group of african american women. *Social Indicators Research*, 99(3), 531-540. doi:10.1007/s11205-010-9602-y

- Daniels, L. A., Mallan, K. M., Battistutta, D., Nicholson, J. M., Meedeniya, J. E., Bayer, J. K., and Magarey, A. (2014). Child eating behavior outcomes of an early feeding intervention to reduce risk indicators for child obesity: The NOURISH RCT. *Obesity*, 22: E104–E111. doi:10.1002/oby.20693
- Dubois, L., Farmer, A. P., Girard, M., & Peterson, K. (2007). Preschool children's eating behaviours are related to dietary adequacy and body weight. *European Journal of Clinical Nutrition*, 61(7), 846-55. doi:http://dx.doi.org/10.1038/sj.ejcn.1602586
- Duke, R., Bryson, S., Hammer, L., & Agras, S. (2004). The relationship between parental factors at infancy and parent-reported control over children's eating at age 7. *Appetite*, 43(3), 247-252. doi:http://doi.org/10.1016/j.appet.2004.05.006
- Durmus, B. A., LR, Ay, L., Hokken-Koelega, A., Raat, H., Hofman, A., Steegers, E., & Jaddoe, V. (2012). Parental anthropometrics, early growth and the risk of overweight in pre-school children: The generation R study. *Pediatric Obesity*, 8(5), 339-350. doi:10.1111/j.2047-6310.2012.00114.x
- Faith, M. S., Scanlon, K. S., Birch, L. L., Francis, L. A., & Sherry, B. (2004). Parent-child feeding strategies and their relationships to child eating and weight status**. *Obesity Research*, 12(11), 1711-1722. doi:http://dx.doi.org/10.1038/oby.2004.212
- Farrow, C., & Blissett, J. (2006). Does maternal control during feeding moderate early infant weight gain? *American Academy of Pediatrics*, 118(2), 293-298. doi:10.1542/peds.2005-2919
- Fisher, J., & Birch, L. (1999). Restricting access to palatable foods affects children's behavioral response, food selection, and intake. *Am J Clin Nutr*, 69(6), 1264-1272.

- Fitzsimmons-Craft, E., & Bardone-Cone, A. (2012). Examining prospective mediation models of body surveillance, trait anxiety, and body dissatisfaction in african american and caucasian college women. *Sex Roles*, 67(3), 187-200. doi:10.1007/s11199-012-0151-5
- Golan, M., & Crow, S. (2004). Targeting parents exclusively in the treatment of childhood obesity: Long-term results**. *Obesity Research*, 12(2), 357-361.
doi:http://dx.doi.org/10.1038/oby.2004.45
- Gray, W., Janicke, D., Wistedt, K., & Dumont-Driscoll, M. (2010). Factors associated with parental use of restrictive feeding practices to control their children's food intake. *Appetite*, 55(2), 332-337. doi:http://doi.org/10.1016/j.appet.2010.07.005
- Harvey-berino, J., & Rourke, J. (2003). Obesity prevention in preschool native-american children: A pilot study using home visiting. *Obesity Research*, 11(5), 606-611.
doi:http://dx.doi.org/10.1038/oby.2003.87
- Hendricks, K., Briefel, R., Novak, T., & Ziegler, P. (2006). Maternal and child characteristics associated with infant and toddler feeding practices. *Journal of the American Dietetic Association*, 106(1, Supplement), 135-148.
doi:http://doi.org.libproxy.lib.unc.edu/10.1016/j.jada.2005.09.035
- Hoerr, S., Hughes, S., Fisher, J., Nicklas, T., Liu, Y., & Shewchuk, R. (2009). Associations among parental feeding styles and children's food intake in families with limited incomes. *Int J Behav Nutr Phys Act*, 6(55) doi:10.1186/1479-5868-6-55
- Hughes, S., Shewchuk, R., Baskin, M., Nicklas, T., & Qu, H. (2008). Indulgent feeding style and children's weight status in preschool. *J Dev Behav Pediatr*, 29(5), 403-410.
doi:10.1097/DBP.0b013e318182a9

- Hurley, K. M. (2007). Maternal mental health and its relationship with child feeding styles and infant nutritional status in a statewide sample of WIC participants (Order No. 3240735). Available from ProQuest Dissertations & Theses Global. (304860788). Retrieved from <http://libproxy.lib.unc.edu/login?url=http://search.proquest.com/docview/304860788?accountid=14244>
- Katz, M. L. a. d., Gordon-Larsen, P. b., Bentley, M. E. b., Kelsey, K. b., Shields, K. c., & Ammerman, A. b. (2004). Does skinny mean healthy? Perceived ideal, current, and healthy body sizes among african-american girls and their female caregivers. *Ethnicity and Disease*, 14(4), 533-541. Retrieved from <http://www.scopus.com/inward/record.url?eid=2-s2.0-4644345589&partnerID=40&md5=8000e74f41dc3135fa34435af3c6c91d>
- Kröller, K., & Warschburger, P. (2008). Associations between maternal feeding style and food intake of children with a higher risk for overweight. *Appetite*, 51(1), 166-172. doi:<http://doi.org.libproxy.lib.unc.edu/10.1016/j.appet.2008.01.012>
- Kronenfeld, L. W., Reba-Harrelson, L., Von Holle, A., Reyes, M. L., & Bulik, C. M. (2010). Ethnic and racial differences in body size perception and satisfaction. *Body Image*, 7(2), 131-136. doi:<http://doi.org.libproxy.lib.unc.edu/10.1016/j.bodyim.2009.11.002>
- Li X, Memarian E, Sundquist J, Zöller B, Sundquist K. (2014). Neighbourhood deprivation, individual-level familial and socio-demographic factors and diagnosed childhood obesity: A nationwide multilevel study from sweden. *Obes Facts*, 7(4), 253-263. doi:<https://doi-org.libproxy.lib.unc.edu/10.1159/000365955>

- Mei, Z., Grummer-Strawn, L., & Scanlon, K. (2003). Does overweight in infancy persist through the preschool years? an analysis of CDC pediatric nutrition surveillance system data. *Soz Praventivmed*, 48(3), 161-167. doi:10.1007/s00038-003-2022-x
- Ogden, C., Carroll, M., Kit, B., & Flegal, K. (2014). Prevalence of childhood and adult obesity in the united states, 2011-2012. *311*(8), 806-814. doi:10.1001/jama.2014.732
- Ogden, C., Carroll, M., Lawman, H., Fryar, C., Kruszon-Moran, D., Kit, B., & Flegal, K. (2016). Trends in obesity prevalence among children and adolescents in the united states, 1988-1994 through 2013-2014. *315*(21), 2292-2299. doi:10.1001/jama.2016.6361
- Patrick, H., Nicklas, T. A., Hughes, S. O., & Morales, M. (2005). The benefits of authoritative feeding style: Caregiver feeding styles and children's food consumption patterns. *Appetite*, 44(2), 243-249.
doi:http://doi.org.libproxy.lib.unc.edu/10.1016/j.appet.2002.07.001
- Radloff, L.S. (1977). The CES-D scale. A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1(3), 385-401.
doi:10.1177/014662167700100306
- Saavedra, J. M., Deming, D., Dattilo, A., & Reidy, K. (2013). Lessons from the feeding infants and toddlers study in north america: What children eat, and implications for obesity prevention. *Annals of Nutrition & Metabolism*, 62, 27-36.
doi:http://dx.doi.org/10.1159/000351538
- Spence, A., Campbell, K., Crawford, D., McNaughton, S., & Hesketh, K. (2014). Mediators of improved child diet quality following a health promotion intervention: The Melbourne

InFANT program. *Int J Behav Nutr Phys Act*, 11(137) doi:10.1186/s12966-014-0137-5

Spruijt-Metz, D., Lindquist, C., Birch, L., Fisher, J., & Goran, M. (2002). Relation between mothers' child-feeding practices and children's adiposity. *Am J Clin Nutr*, 75(3), 581-586.

Stettler, N., Kumanyika, S., Katz, S., Zemel, B., & Stallings, V. (2003). Rapid weight gain during infancy and obesity in young adulthood in a cohort of african americans. 77(6), 1374-1378.

Stettler, N., Stallings, V., Troxel, A., Zhao, J., Schinnar, R., Nelson, S., . . . Strom, B. (2005). Weight gain in the first week of life and overweight in adulthood. *Circulation*, 111(15), 1897-1903. doi:10.1161/01.CIR.0000161797.67671.A7

Taveras, E., Rifas-Shiman, S., Belfort, M., Kleinman, K., Oken, E., & Gillman, M. (2009). Weight status in the first 6 months of life and obesity at 3 years of age. *Pediatrics*, 123(4), 1177-1183. doi:10.1542/peds.2008-1149

Thompson, A. L., Mendez, M. A., Borja, J. B., Adair, L. S., Zimmer, C. R., & Bentley, M. E. (2009). Development and validation of the infant feeding style questionnaire. *Appetite*, 53(2), 210-221.
doi:http://doi.org.libproxy.lib.unc.edu/10.1016/j.appet.2009.06.010

- Thompson, A. L., Adair, L. S. and Bentley, M. E. (2013). Pressuring and restrictive feeding styles influence infant feeding and size among a low-income African-American sample. *Obesity*, 21: 562–571. doi:10.1002/oby.20091
- Wardle, J., Sanderson, S., Guthrie, C. A., Rapoport, L., & Plomin, R. (2002). Parental feeding style and the inter-generational transmission of obesity risk. *Obesity Research*, 10(6), 453-462. doi:http://dx.doi.org/10.1038/oby.2002.63
- Wasser, H., Thompson, A., Siega-Riz, A., Adair, L., Hodges, E., & Bentley, M. (2013). Who's feeding baby? non-maternal involvement in feeding and its association with dietary intakes among infants and toddlers. *Appetite*, 71, 7-15. doi:http://doi.org/10.1016/j.appet.2013.06.096
- Williamson, D. A., Womble, L. G., Zucker, N. L., Reas, D. L., White, M. A., Blouin, D. C., & Greenway, F. (2000). Body image assessment for obesity (BIA-O): Development of a new procedure. *International Journal of Obesity and Related Disorders*, 24(10), 1326-1332. doi:http://dx.doi.org/10.1038/sj.ijo.0801363
- Worobey, J., Lopez, M., & Hoffman, D. (2009). Maternal behavior and infant weight gain in the first year. *J Nutr Educ Behav*, 41(3), 169-175. doi:http://doi.org/10.1016/j.jneb.2008.06.005