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Journal

Obesity, 23(2)

ISSN

1930-7381

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Publication Date

2015-02-01

DOI

10.1002/oby.20956

Peer reviewed

HHS Public Access

Author manuscript

Obesity (Silver Spring). Author manuscript; available in PMC 2016 January 31.

Published in final edited form as:

Obesity (Silver Spring). 2015 February ; 23(2): 475–480. doi:10.1002/oby.20956.

Association of Breastfeeding with Maternal Visceral Adiposity Postmenopause Among Three Racial/ Ethnic Groups

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Abstract

Objective—We examined the association between breastfeeding and visceral adiposity postmenopause.

Design and Methods—Participants were community-dwelling women aged 55–80 from the Caucasian Rancho Bernardo Study, the Filipino Women's Health Study, and the Health Assessment Study of African-American Women who had visceral adipose tissue (VAT) measurements by computed tomography between 2000–2002. Linear regression was used to determine the association between average breastfeeding duration per child and VAT.

Results—In Caucasian, Filipino and African-American women, average number of live births was 3, 4 and 3; average breastfeeding duration was 4.3, 1.8 and 5.1 months, respectively. Filipino women had more live births, were more likely to breastfeed, and breastfed shorter durations. African-American women had lower VAT, despite higher subcutaneous adipose tissue (SAT), BMI and waist girth. Women who breastfed >3 months on average had 8.8 cm^3 lower VAT than women who breastfed ≤3 months, independent of covariates. Women who initiated breastfeeding had lower BMI and waist girth than those who did not, but did not differ by VAT unless they breastfed >3 months. Associations were independent of race/ethnicity.

Conclusions—Results suggest breastfeeding initiation is associated with reduced BMI and smaller waist girth and breastfeeding >3 month is associated with lower VAT postmenopause.

Keywords

Visceral adipose tissue; breastfeeding; obesity; race/ethnicity; postmenopause

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Competing interest: the authors have no competing interests.

Introduction

More than one-third of the adult population in the United States is obese and obesity is a well-known risk factor for type 2 diabetes and cardiovascular disease (CVD) (1). Body mass index (BMI), often used as a marker for obesity, is not always an accurate predictor of risk of diabetes or CVD (2, 3); body fat distribution also plays an important role (4). Increased visceral adipose tissue (VAT) has been associated with CVD risk factors, type 2 diabetes, and CVD (5, 6, 7, 8, 9). VAT varies by ethnicity and Filipino women have higher VAT and diabetes risk compared to Caucasian and African-American women, despite a smaller waist girth and lower BMI (3, 10).

Women experience weight gain and increased VAT during pregnancy (10, 11). Although previous studies suggest that breastfeeding may reduce obesity in the short-term, due to increased energy expenditure to produce milk (11, 12), few studies have examined the association of breastfeeding with VAT (13, 14). In one study, pre-menopausal and early perimenopausal women who breastfed all their children for ≥ 3 months had similar amounts of visceral fat compared to nulliparous women (14). In another study of premenopausal and early perimenopausal mothers, those who never breastfed had 28% higher visceral adiposity compared to women who breastfed all their children ≥ 3 months (13). Studies of the long-term benefits of breastfeeding for the mother, report an association of breastfeeding with reduced risk of type 2 diabetes (15, 16, 17) and cardiovascular disease (18, 19, 20, 21) among both pre- and post-menopausal women. However, prior studies had few non-Caucasian participants.

The purpose of the present study was to examine the association between lactation and VAT among postmenopausal parous 50- to 80-year-old Caucasian, Filipino, and African-American women to determine if duration of lactation is associated with a reduction in visceral adiposity, and whether any association varies by race/ethnicity.

Methods

Study Participants

This study includes data from three community-based San Diego cohorts: the Rancho Bernardo Study (RBS), the Filipino Women's Health Study (FWH), and the Health Assessment Study of African-American Women (HASAAW). The RBS is a longitudinal study of Caucasians that began in 1972–1974. Serial research clinic evaluations have been conducted approximately every five years since initiation of the RBS. During the 1988 and 1991 visits, information was collected on reproductive history and breastfeeding history for the RBS. Between 1994 and 1999, convenience samples of African-American and Filipino women selected to have similar socio-economic and education status as RBS participants and living in San Diego, CA were recruited as ethnic comparison groups to RBS (described in detail elsewhere (3)). Clinical assessments for the three cohorts were obtained by the same core research staff using identical protocols. Between 2000 and 2002, women from each racial/ethnic cohort with no known cardiovascular disease were invited to a study to measure coronary artery calcium, VAT, and subcutaneous adipose tissue (SAT) using

electron beam computed tomography (EBCT). All women were postmenopausal and aged 55–80 years. Overall, 220 Caucasian, 182 Filipino, and 194 African-American women completed the EBCT visit. A total of 80 Caucasian women were excluded because they did not attend the 1988–91 visit when data on breastfeeding was collected.

To be eligible for the present analysis, women had to have reported at least one live birth. Women who had never been pregnant (n=54) or who were pregnant but did not have a live birth (n=26) were excluded. Overall, 102 Caucasian, 165 Filipino, and 169 African-American women, a total of 436 women, were available for the analysis of the relation between breastfeeding initiation and VAT. Overall, 299 women reported that they breastfed. Analyses of the association between breastfeeding duration and VAT excluded 62 women who reported that they breastfed but had incomplete data on breastfeeding duration, yielding 61 Caucasian, 81 Filipino, and 95 African-American, or a total of 237 women. This study was approved by the UCSD Human Subjects Protection Program; all participants provided written informed consent prior to participation.

Procedures

Information on demographic and lifestyle characteristics including exercise three or more times per week (yes/no), alcohol use (two or more drinks per week, yes/no), smoking history (ever/never), physician-diagnosed diseases, hospitalizations, surgeries and medication use were obtained using a self-administered structured questionnaire during the 1988–1991 visit for RBS and the 1994–1999 visit for FWH and HASAAW. Self-administered questionnaires were also used to obtain information on reproductive history including number of pregnancies and number of live births. To assess lactation, participants were asked if they had breastfed any children; those responding affirmatively were asked how many children they breastfed and the total months they breastfed for all live births combined.

Height and weight were measured in the research clinic with participants wearing light clothing and no shoes. These measures were used to calculate body mass index (BMI; kilograms per meter squared), as an estimate of overall obesity. Waist circumference was measured at the narrowest point and hip circumference was measured at the largest point. Waist-to-hip ratio was used as an estimate of central adiposity. Total fat and truncal fat percentages were determined using whole body dual-energy X-ray absorptiometry or DXA scans (model QDR-2000 X-ray bone densitometer; Hologic, Inc. Waltham, MA).

Blood samples were obtained in the morning from all participants after a 12–16 hour fast. A 75-gram oral glucose tolerance test (OGTT) was administered; plasma glucose was measured fasting and 2-hours post-challenge using the glucose-oxidase method. Based on 1999 World Health Organization (WHO) criteria, women were considered to have type 2 diabetes if they had a fasting plasma glucose ≥126 mg/dl; a 2-hour, post-challenge glucose level ≥200 mg/dl; a history of physician diagnosed diabetes; or reported treatment with insulin or other diabetes-specific medications.

All clinical exams were completed by trained nurses and study staff. At the 2000–2002 EBCT visit, visceral fat and subcutaneous fat were measured using an Imatron C-150 Ultra-

CT scanner. Measures were obtained by completing a triple-slice CT scan of the abdomen between L4 and L5.

Statistical Analysis

Average breastfeeding duration per child was determined by dividing total months of breastfeeding by the number of children. Breastfeeding duration was then dichotomized based on the overall population using the cutoffs previously reported in the literature (≤3 months compared to >3 months).

Descriptive statistics and comparisons of demographic, behavioral, and anthropometric characteristics were conducted using student's t-tests, ANOVA, chi-square, and generalized linear models, with VAT analyzed as a continuous variable. Bivariate analyses were conducted to assess the associations between VAT and other obesity related variables, breastfeeding initiation, breastfeeding duration and potential confounders and covariates. Variables with a bivariate p-value ≤0.10 were considered for inclusion in multivariable models. To assess the relation between breastfeeding initiation, VAT and other obesity related variables, multivariable linear regression models included race/ethnicity in the model while adjusting for age and exercise. Similar methods were used to assess the relation between breastfeeding duration and other obesity related variables. Forward stepwise linear regression was conducted to determine the relation between breastfeeding duration and VAT. An interaction term between race/ethnicity and breastfeeding initiation and duration was used to determine if associations differed by race/ethnicity. Confounding was assessed in multivariable models by determining the percent change in the estimates; estimates that changed ≥ 10% were considered confounders and were maintained in final models regardless of their statistical significance. P-values ≤0.05 were considered statistically significant. All analyses were conducted using SAS 9.3.

Results

Comparisons of characteristics for the three racial/ethnic groups are shown in Table 1. Among these participants, Caucasian women were significantly older than Filipino (p-value=0.03) and African-American (p-value=0.01) women (Table 1). Filipino women had significantly more live births, were more likely to breastfeed, and breastfed more children (p-value<0.05), but for shorter durations on average per child than Caucasian (p-value=0.03) and African-American (p=0.001) women. African-American women had lower VAT on average than Caucasian (p-value<0.001) and Filipino women (p-value<0.01), despite having larger BMI and waist girth and more SAT. Filipino women had significantly higher VAT than Caucasian women (p-value<0.05), but there were no significant differences in BMI or waist girth between Filipino and Caucasian women. Filipino women were also significantly more likely to have diabetes than Caucasian (p-value=0.02) and African-American (p-value=0.03) women. The majority of women in each group reported exercising three times or more times per week and there were no differences in exercise frequency between the cohorts.

There was no statistical evidence that the association of lactation measures with VAT and other obesity related variables differed by race/ethnicity (p-values for all interactions >0.10), thus subsequent results are presented for the combined cohorts.

Table 2 shows unadjusted comparisons of characteristics of women who did and did not breastfeed. Women who breastfed had significantly lower subcutaneous fat (p-value=<0.05), BMI (p-value=0.02), and waist girth (p-value=0.05) than women who did not breastfeed, but there were no differences in VAT (p-value=0.42) by breastfeeding status. Race/ethnicity, age and exercise adjusted comparisons of obesity related variables by breastfeeding status are shown in Table 3. Women who breastfed had lower BMI (p-value=0.01) and smaller waist girth (p-value=0.05) compared to women who did not breastfeed; however, there was no association between VAT and breastfeeding status (p-value=0.91).

Overall, 61 Caucasian, 81 Filipino, and 95 African-American women had complete data on breastfeeding duration. Table 4 reports race/ethnicity, age and exercise adjusted associations of breastfeeding duration and obesity related variables. Women who breastfed >3 months on average had a smaller mean waist girth (p-value<0.01), however, there were no significant differences in mean SAT, BMI, truncal fat percent, or body fat percent by breastfeeding duration (all p-values>0.15).

Table 5 shows the association of VAT with breastfeeding duration and covariates among women who breastfed and had complete data on duration. In unadjusted models, breastfeeding for >3 months compared to ≤3 month was significantly associated with lower VAT. Current use of estrogens was also associated with lower VAT. Separate comparisons showed that race/ethnicity was associated with VAT such that both Caucasian and Filipino women had higher VAT than African-American women. Number of births, BMI, and diabetes were each positively associated with higher VAT. Multivariable analysis adjusting for race/ethnicity, exercise, BMI, and diabetes status showed that breastfeeding for an average >3 months average per child compared to ≤3 month average per child was significantly associated with 8.8 cm^3 lower VAT (p=0.01, SE=3.5). A breastfeeding by race/ethnicity interaction term was not significant (p-value=0.93), suggesting the association between breastfeeding duration and VAT did not differ by race/ethnicity. In addition, when VAT was compared by breastfeeding duration in adjusted models within each race/ethnicity group, the differences in VAT were similar for each group, although nonsignificant given the small sample sizes (data not shown). Thus, women who breastfed >3 months had the lowest VAT, regardless of race/ethnicity.

Discussion

This study of three racial/ethnic groups found that breastfeeding duration was associated with reduced VAT in postmenopausal women. Women who breastfed over three months on average per child had significantly lower VAT than women who breastfed less than three months. These results did not vary by race/ethnicity and were independent of exercise, BMI, and diabetes.

Results from this study are consistent with others who report that breastfeeding for over three months is sufficient to reduce VAT (13, 14). Consistent with previous literature, our results were similar for women who breastfed longer than three months on average, as well as for women who breastfed all children greater than three months (data not shown). For instance, McClure et al. found that overall, women who lactated less than three months after the birth of each of their children had significantly more VAT than those who breastfed for longer durations (14); by seven years postpartum, they had 39.96 cm^2 (95% CI: 20.92, 53.01) greater VAT. Additionally, women who only breastfed some of their children ≥3 months had 20.38 cm^2 greater VAT (14). In another study, McClure et al. also reported that premenopausal and early perimenopausal mothers who were aged 45–58 years and breastfed all their children for at least three months had 28% less VAT than women who never breastfed, and VAT amounts similar to those of nulliparous women (13). In contrast, no association was reported between VAT and breastfeeding duration for late perimenopausal or postmenopausal women (14), possibly due to the relatively small sample size (n=125) of women in those groups. These studies also reported that women who breastfed >3 months had a smaller waist circumference and lower BMI (13, 14).

Several studies assessed the impact of breastfeeding on postpartum weight loss (11, 12, 22, 23, 24, 25) with wide variability in the results. While some report an association between breastfeeding and a reduction in BMI (11, 22), and waist girth (11, 22), others do not report this association (23, 24, 25). Results of our study of postmenopausal women are in accord with others reporting that women who breastfed, regardless of duration, had significantly lower BMI and waist girth, although subcutaneous fat and visceral fat levels did not differ. However, while breastfeeding greater than three months was associated with smaller waist girth, there did not appear to be additional reduced BMI with longer durations of breastfeeding, suggesting that women who breastfed, regardless of duration, might adopt other healthy behaviors that help reduce BMI.

The present study also highlights significant differences in visceral adiposity by racial/ethnic group. African-American women had the lowest VAT even though they had a higher BMI and larger waist girth. In contrast, Filipino women had the highest VAT and a higher prevalence of type 2 diabetes, even though they had the lowest BMI and smallest waist girth. Other studies have also reported significant differences in VAT by race and ethnicity with Asian women generally having higher VAT than their Caucasian and African-American counterparts (3, 10). Our results show that the non-significant trend of lower VAT with longer duration of breastfeeding was similar in all three racial/ethnic groups. Studies with larger samples are needed to determine if the association holds for other racial/ethnic groups not assessed here.

Previous studies have suggested that breastfeeding is associated with a reduction in coronary heart disease (18, 19, 26) and type 2 diabetes (16, 17), diseases all related to obesity. The mechanism by which a longer duration of breastfeeding might reduce VAT and the potential long-term consequences is poorly understood. Studies report that during menopause, fat distribution tends to shift to the abdominal region and VAT increases (27, 28, 29, 30). However, the extent to which VAT increases, and whether changes in VAT differ by race/ethnicity is unknown. During lactation, fat is mobilized from the trunk and thigh regions.

While some studies have reported greater fat loss from the thigh region (29), studies using animal models have demonstrated a greater reduction in VAT, compared to subcutaneous fat (31, 32).

Several limitations and strengths of this study were considered. Only women from this cohort without known cardiovascular disease or revascularization surgery had an EBCT between 2000 and 2002. Our results may not generalize to all postmenopausal women since VAT measures were limited to women without known cardiovascular disease. The possibility of selection bias was also considered. Having a population-based sample of Filipino women was not possible in this study because 1990 census data did not report the Filipino race separate from Asian Americans. However, using college attainment as a marker for socioeconomic status, our sample is representative of all Filipino women in the US (33). The African-American women in HASAAW were also selected to minimize the effects of socioeconomic status and racial/ethnic differences in access to health care that often confound studies of women who are not Caucasian (34). Further, we were unable to evaluate the potentially important influence of diet on the link between breastfeeding and maternal visceral adiposity. Breastfeeding history was self-reported; thus, recall or reporting bias could have led to misclassification of breastfeeding history and duration. Previous research has shown that women who breastfeed for a short duration tend to over report, while women who breastfeed for a longer duration tend to underreport but overall, women recall their breastfeeding duration accurately (35, 36). Breastfeeding initiation among African-American women in our cohort was similar to national trends at the time these participants gave birth; however, African-American women in our cohort breastfed for the longest duration on average of the three racial/ethnic groups, which is different from current national data which shows shorter breastfeeding duration among African-American women (37). This could reflect secular trends or differences in the economy and environment during the time women in our cohort gave birth and initiated breastfeeding.

The American Academy of Pediatrics (AAP) recommends exclusive breastfeeding for six months followed by an additional six months of breastfeeding with complementary nutrition (39). Results of this study suggest that breastfeeding for a longer duration (>3 months), but not breastfeeding initiation by itself, may have a long-term association with reduced VAT in postmenopausal women, regardless of race/ethnicity. To our knowledge, this is one of the first studies examining the association of breastfeeding and VAT in a sample of women from three different race/ethnicities many years after childbearing and breastfeeding was completed. Further studies are needed to better understand how breastfeeding affects VAT and if there is an optimal duration of breastfeeding beyond which beneficial effects on VAT no longer increase. Studies are also needed to better understand the ethnic differences that lead to some women having increased VAT despite lower BMI and smaller waist girth and how diet affects this relation. A better understanding of VAT, and the relation between VAT and breastfeeding, may help reduce the prevalence of metabolic disorders in older parous women.

Acknowledgments

All authors were involved in the conception of this project and analysis plans; RA carried out the analysis and wrote the manuscript. All authors were involved in interpreting the statistical analysis, writing and editing the paper and approved the submitted version of this paper. This work was supported by National Institutes of Health grants DK31801 and DK60575 from the National Institute on Digestive and Diabetes and Kidney Diseases, grants AG07181 and AG02850 from the National Institute on Aging, and grant 0070088Y from the American Heart Association.

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What is already known about this subject?

- Breastfeeding is associated with lower BMI and smaller waist girth
- Longer duration of breastfeeding is associated with lower visceral adipose tissue (VAT) in premenopausal women
- VAT is associated with increased risk for cardiovascular disease and type 2 diabetes

What this study adds?

- Breastfeeding, regardless of duration, is associated with lower BMI and smaller waist girth in postmenopausal women
- Breastfeeding >3 months is associated with lower VAT in postmenopausal women independent of covariates
- Postmenopausal women from all three racial/ethnic groups who breastfed >3 months had lower VAT than those who did not, although the differences were not significant; the relation between breastfeeding and VAT was similar for women from all ethnicities studied

Table 1

Comparisons of demographic, behavioral, and anthropometric characteristics between Caucasian, Filipino, and African-American women who had a live birth (n=436)

Variable	Caucasian n=102 Mean (sd)	Filipina n=165 Mean (sd)	African American n=169 Mean (sd)
Age at clinic visit	64.7 (5.1) *ac*	60.1 (6.4)	60.7 (7.3)
Age at EBCT	71.6 (5.7) *ac*	64.2 (7.9)	66.4 (6.9) *c*
# of births	3.0 (1.5)	4.3 (2.6) *ab*	3.1 (1.8)
Ever breastfed?	67(66)	131 (79) *ab*	101 (59.7)
# Children breastfed? *d*	2.2 (1.3)	3.9 (2.8) *ab*	2.5 (1.5)
Months breast fed (average per child) *e*	4.3 (3.5)*a*	1.8 (3.0)	5.1 (5.5) *c*
Visceral Fat (cm^3)	65.9 (34.1)	68.2 (28.7)	56.7 (29.1) *bc*
Subcutaneous Fat (cm^3)	148.0 (70.5)	154.6 (50.8)	224.5 (91.4) *bc*
BMI (kg/m^2)	25.3 (4.4)	25.4 (3.1)	29.7 (5.5)*bc*
Waist Girth (cm)	81.0 (11.3)	81.3 (8.6)	87.8 (12.4)*bc*
Body Fat (%)	34.4 (6.1)	33.1 (4.8)	36.9 (8.9)
Truncal Fat (%)	30.5 (7.1)	31.0 (5.6)	33.3 (8.8)
	n (%)	**n (%)**	**n (%)**
Diabetes	11 (11)	53 (32) *ab*	21 (12.4)
Smoking Status (Ever)	53 (52) *a*	21 (13)	82 (48.8) *b*
Alcohol (≥3 times/week)	95 (43) *c*	2 (1) *b*	22 (13)
Exercise (≥3 times/week)	71 (70)	116 (70)	104 (61.5)
Education (College Graduate) *f*	29 (28.7)	86 (52.4) *a*	75 (44.9)
Hysterectomy	42 (41)	46 (28)	95 (56) *bc*
Bilateral Oophorectomy	0 (0)	20 (12)	35 (20.7)*bc*
Current Estrogen Use	54 (53) *a*	40 (24)	76 (45) *b*

a p<0.05, Caucasian vs. Filipino

b p<0.05, Filipino vs. African American

c p<0.05, Caucasian vs. African American

d n=303,

e n=237,

f n=432

Table 2

Unadjusted comparisons of characteristics by breastfeeding initiation (n=436)

Variable	Breastfed n = 299 mean (sd)	Did not Breastfeed n = 137 mean (sd)	P-value
Age	61.9 (6.5)	60.3 (7.0)	0.06
Age at EBCT	67.1 (7.7)	66.1 (7.2)	0.06
# of live births	3.9 (2.3)	2.9 (1.7)	<0.001
Visceral Fat (cm^3)	63.6 (28.7)	63.3 (33.7)	0.42
Subcutaneous Fat ($cm^{3)}$	173.5 (74.7)	194.9 (92.6)	0.05
BMI (kg/m^2)	26.5 (4.5)	28.1 (5.6)	0.02
Waist Girth (cm)	82.8 (10.4)	85.9 (12.8)	0.05
Body Fat (%)	35.8 (7.7)	34.5 (6.8)	0.24
Truncal Fat (%)	32.5 (8.0)	31.5 (7.1)	0.62
	n (%)	**n (%)**	
Race/Ethnicity Caucasian	67 (22.4)	35 (25.5)	<0.001
Filipino	131 (43.8)	34 (24.8)	
African-American	101 (33.8)	68 (49.6)	
Diabetes	63 (21.1)	22 (16.1)	0.22
Smoking Status (Ever)	96 (32.1)	60 (44.1)	0.02
Alcohol (≥3 times/week)	41 (13.8)	23 (16.9)	0.39
Exercise (≥3 times/week)	204 (68.2)	87 (63.5)	0.33
Education (College graduate, n=432)	133 (44.9)	57 (41.9)	0.55
Hysterectomy	120 (40.1)	63 (46.0)	0.25
Currently taking Estrogen	41 (13.8)	23 (16.9)	0.29

Table 3

Associations of measures of obesity with breastfeeding initiation after adjusting for race/ethnicity, age and exercise (n=436)

	Breastfed n = 299 Mean (SE)	Did Not Breastfeed n = 137 Mean (SE)	Adjusted Beta	P-value
Visceral Fat (cm^3)	65.6 (1.8)	65.2 (2.6)	0.36 (3.1)	0.91
Subcutaneous Fat (cm^3)	175.7 (4.6)	184.7 (6.5)	−8.9 (7.7)	0.24
BMI (kg/m^2)	26.9 (0.3)	28.1 (0.4)	−1.2 (0.5)	0.01
Waist Girth (cm)	83.4 (0.7)	85.6 (0.9)	−2.2 (1.1)	0.05
Truncal Fat (%)	31.7 (0.5)	32.5 (0.7)	−0.7 (0.8)	0.35
Body Fat (%)	34.7 (0.4)	35.4 (0.6)	−0.8 (0.7)	0.30

Table 4

Associations of measures of obesity with breastfeeding duration among women who breastfed after adjusting for race/ethnicity, age and exercise (n=237)

	Breastfed >3 months n = 82 Mean (SE)	Breastfed ≤3 months n = 155 Mean (SE)	Adjusted Beta	P-Value
Visceral Fat (cm^3)*	58.6 (2.8)	67.5 (1.9)	−8.8	0.01
Subcutaneous Fat (cm^3)	168.7 (8.9)	173.7 (6.4)	−4.9 (10.9)	0.65
BMI (kg/m^2)	26.5 (0.5)	26.8 (0.4)	−0.33(0.64)	0.60
Waist Girth (cm)	81.2 (1.2)	84.5 (0.9)	−3.2 (1.5)	0.04
Truncal Fat (%)	30.8 (0.9)	31.9 (0.7)	−1.1 (0.8)	0.36
Body Fat (%)	33.7 (0.9)	34.8 (0.7)	−1.1 (1.1)	0.31

*Additionally adjusted for BMI and Diabetes status

Table 5

Factors associated with visceral adipose tissue levels (CM^3) among women who breastfed (n=237)

	Unadjusted Beta (SE)	p-value	Adjusted Beta (SE)	p-value
Breastfed >3 months vs. ≤3 months	−15.2 (3.8)	<0.001	−8.8 (3.5)	0.01
Caucasian vs. African American	11.3 (4.6)	0.01	22.5 (4.1)	<0.001
Filipina vs. African American	18.4 (4.2)	<0.001	23.5 (4.2)	<0.001
Number of Live Births (2 birth increase)	1.5 (0.8)	0.06	-	-
Breastfed all children	−0.9 (2.9)	0.57	-	-
Exercise (≥3 times/week)	−5.2 (4.0)	0.20	−4.7 (3.4)	0.16
BMI (kg/m^2) (1 unit increase)	2.3 (0.4)	<0.001	3.1 (0.4)	<0.001
Diabetes	17.3 (4.6)	<0.001	8.6 (4.1)	0.03
Age (years)	−0.1 (0.3)	0.74	-	-
Alcohol (≥3 times/week)	0.9 (5.0)	0.85	-	-
Smoking (Ever vs. Never)	−3.3 (3.9)	0.40	-	-
Education (College Graduate)	−4.1 (3.9)	0.29	-	-
Hysterectomy	−4.3 (3.9)	0.27	-	-
Currently taking estrogen	−10.4 (3.9)	0.01	-	-