Body Weight and Fat Trajectories of Black and White Women in the First Year Postpartum

Xuewen Wang,[1] Erin E. Kishman,[1] Jihong Liu[2], Lauren A. Castleberry,[3,4] Alexander McLain,[2] Joshua R. Sparks,[5] James W. Cook[4]

[1]Department of Exercise Science, University of South Carolina School of Public Health, Columbia, SC; [2]Department of Epidemiology and Biostatistics, University of South Carolina School of Public Health, Columbia, SC; [3]Department of Obstetrics and Gynecology, Lexington Medical Center, West Columbia, SC; [4]Department of Obstetrics and Gynecology, University of South Carolina School of Medicine, Columbia, SC; [5]Reproductive Endocrinology and Women's Health Laboratory, Pennington Biomedical Research Center, Louisiana State University, Baton Rouge, LA;

Running title: Postpartum Fat changes in Black and White Women

Correspondence: Xuewen Wang, PhD, Department of Exercise Science, University of South Carolina, 921 Assembly St., PHRC 301, Columbia, SC 29208. Email: xwang@sc.edu

Table S1. Weight, waist and hip circumferences, and body composition (by dual-energy X-ray absorptiometry) during the first year postpartum by race. Weight at 6-8 weeks postpartum and other covariates were adjusted.

	Black			White		
	Mean (SE)	P values, overall trend	P values, compared with the previous time point	Mean (SE)	P values, overall trend	P values, compared with the previous time point
Weight, kg		0.280			<0.001	
6-8 weeks	85.7 (1.2)			77.3 (1.1)		
6 months	85.9 (1.4)		0.869	75.2 (1.1)		<0.001
12 months	87.9 (1.6)		0.185	74.1 (1.2)[a]		0.064
Waist circumference, cm		0.015			0.017	
6-8 weeks	93.2 (1.9)			90.3 (1.9)		
6 months	95.9 (2.0)		0.056	88.0 (1.9)		0.004
12 months	98.0 (2.2)[b]		0.204	88.7 (1.9)		0.454
Hip circumference, cm		0.152			<0.001	
6-8 weeks	111.5 (1.2)			109.8 (1.6)		
6 months	111.8 (1.3)		0.773	107.5 (1.6)		<0.001
12 months	113.8 (1.5)		0.110	106.8 (1.6)[a]		0.335
Fat mass, kg		0.196			<0.001	
6-8 weeks	34.5 (1.5)			29.8 (1.2)		
6 months	35.9 (1.6)		0.196	28.2 (1.2)		<0.001
12 months	36.7 (1.8)		0.538	27.2 (1.3)[a]		0.062
Lean mass, kg		0.332			<0.001	
6-8 weeks	48.4 (1.0)			45.1 (1.0)		
6 months	47.9 (1.1)		0.274	44.4 (1.0)		<0.001
12 months	48.5 (1.1)		0.186	44.2 (1.0)[a]		0.223
Body fat, %		0.681			<0.001	
6-8 weeks	38.7 (1.2)			37.9 (1.4)		
6 months	39.3 (1.3)		0.425	36.6 (1.4)		<0.001
12 months	39.3 (1.4)		0.993	35.8 (1.4)[a]		0.038
Appendicular fat, kg		0.438			<0.001	
6-8 weeks	16.7 (0.9)			13.8 (0.7)		

6 months	17.4 (1.0)	0.227	12.9 (0.7)	<0.001
12 months	17.3 (1.0)	0.926	12.1 (0.7)[a]	0.004
Trunk fat, kg		0.134		0.016
6-8 weeks	16.9 (0.9)		14.9 (0.8)	
6 months	17.7 (1.0)	0.240	14.3 (0.8)	0.010
12 months	18.4 (1.1)[c]	0.311	14.0 (0.8)[c]	0.419
Android fat, gm		0.164		0.001
6-8 weeks	2764 (194)		2445 (171)	
6 months	2903 (204)	0.253	2256 (170)	<0.001
12 months	3033 (218)	0.334	2226 (176)[b]	0.600
Gynoid fat, gm		0.806		<0.001
6-8 weeks	6063 (327)		5628 (274)	
6 months	6098 (347)	0.877	5105 (273)	<0.001
12 months	6229 (374)	0.605	4987 (282)[a]	0.219
*Visceral adipose tissue, gm		0.022		0.458
6-8 weeks	668 (67)		602 (82)	
6 months	698 (70)	0.466	573 (83)	0.217
12 months	809 (77)[b]	0.024	583 (85)	0.690

Means are least squares means from mixed-effects models. Weight at 6-8 weeks postpartum, parity, household income, education, spouse, Pittsburgh Sleep Quality Index score, breastfeeding, smoking, and physical activity were adjusted in the models. The visits at 6 and 12 months were within 4 weeks after the respective postpartum time point. Sample size for visceral adipose tissue (VAT): 43, 26, and 18 Black women, and 81, 70, and 54 White women, at 6-8 weeks, 6 months, and 12 months, respectively. [a], $p \leq 0.0001$; [b], $p < 0.01$; [c], $p < 0.05$, compared to 6-8 weeks.

Table S2. Weight, waist and hip circumferences, and body composition (by dual-energy X-ray absorptiometry) during the first year postpartum by race. Pre-pregnancy weight and other covariates were adjusted.

	Black			White		
	Mean (SE)	P values, overall trend	P values, compared with the previous time point	Mean (SE)	P values, overall trend	P values, compared with the previous time point
Body weight, kg		0.489			<0.001	
6-8 weeks	85.5 (1.0)			76.6 (0.7)		
6 months	85.3 (1.2)		0.885	74.4 (0.7)		<0.001
12 months	87.1 (1.4)		0.263	73.0 (0.8)[a]		0.027
Waist circumference, cm		0.043			0.035	
6-8 weeks	92.2 (1.2)			88.6 (0.8)		
6 months	94.6 (1.4)		0.110	86.5 (0.7)		0.010
12 months	96.5 (1.6)[c]		0.265	87.2 (0.9)		0.426
Hip circumference, cm		0.237			0.001	
6-8 weeks	113.6 (0.9)			108.5 (0.8)		
6 months	113.7 (1.0)		0.944	106.1 (0.7)		<0.001
12 months	115.5 (1.2)		0.134	105.0 (0.9)[a]		0.114
Fat mass, kg		0.384			<0.001	
6-8 weeks	35.3 (0.9)			30.4 (0.7)		
6 months	36.4 (1.1)		0.354	28.8 (0.6)		0.001
12 months	37.1 (1.2)		0.595	27.7 (0.7)[a]		0.030
Lean mass, kg		0.283			<0.001	
6-8 weeks	47.3 (0.5)			43.7 (0.3)		
6 months	46.7 (0.6)		0.152	43.0 (0.3)		<0.001
12 months	47.2 (0.6)		0.249	42.7 (0.4)[a]		0.116
Body fat, %		0.788			<0.001	
6-8 weeks	39.8 (0.7)			38.7 (0.6)		
6 months	40.3 (0.8)		0.542	37.5 (0.6)		<0.001
12 months	40.3 (0.9)		0.970	36.6 (0.6)[a]		0.024
Appendicular fat, kg		0.443			<0.001	
6-8 weeks	17.6 (0.5)			14.5 (0.3)		

6 months	18.4 (0.6)	0.224	13.6 (0.3)	<0.001
12 months	18.2 (0.7)	0.872	12.7 (0.4)[a]	<0.001
Trunk fat, kg		0.291		0.023
6-8 weeks	16.5 (0.5)		14.9 (0.4)	
6 months	17.0 (0.6)	0.470	14.3 (0.4)	0.012
12 months	17.7 (0.7)	0.337	14.1 (0.4)[c]	0.462
Android fat, gm		0.421		0.002
6-8 weeks	2551 (105)		2441 (77)	
6 months	2628 (122)	0.527	2255 (75)	<0.001
12 months	2734 (136)	0.430	2222 (84)[b]	0.577
Gynoid fat, gm		0.954		<0.001
6-8 weeks	6266 (178)		5649 (130)	
6 months	6266 (211)	1.000	5118 (128)	<0.001
12 months	6335 (238)	0.783	4971 (143)[a]	0.139
*Visceral adipose tissue, gm		0.063		0.476
6-8 weeks	485 (34)		564 (32)	
6 months	485 (40)	0.998	535 (31)	0.225
12 months	590 (46)[c]	0.032	542 (35)	0.778

Means are least squares means from mixed-effects models. Pre-pregnancy weight, parity, household income, education, spouse, Pittsburgh Sleep Quality Index score, breastfeeding status, smoking status, and physical activity were adjusted in the models. The visits at 6 and 12 months were within 4 weeks after the respective postpartum time point. *, Sample size for visceral adipose tissue (VAT): 43, 26, and 18 Black women, and 81, 70, and 54 White women, at 6-8 weeks, 6 months, and 12 months, respectively. [a], p ≤0.0001; [b], p < 0.01; [c], p < 0.05, compared to 6-8 weeks.

Table S3. Significant associations (p < 0.05) between covariates of sociodemographic, behavioral, and lifestyle factors and outcomes of weight and body composition in the adjusted mixed-effects models in Black women.

Black	Parity	Household income	Education	Spouse	PSQI	Breastfeeding status	Smoking status	Physical activity, counts per minute
Reference	Primipara	≤$40k	Grade 12 or lower	Living with spouse	--	Not breastfeeding	Never smoking	--
Weight, kg								
Waist circumference, cm								-0.015 (0.006)
Hip circumference, cm			*Ref: Some colleague Graduate school: -5.0 (1.6)				History of smoking: -4.8 (1.8)	-0.011 (0.004)
Fat mass, kg								
Lean mass, kg		$60-80k: 3.0 (1.5)		Not living with spouse: 2.8 (1.3)				
Body fat, %								-0.009 (0.0034)
Appendicular fat, gm								
Trunk fat, kg								
Android fat, gm							Currently smoking: 873 (375)	
Gynoid fat, gm								
VAT, gm			Some college: -184 (85)		22.6 (6.5)		History of smoking: 203 (89) Currently smoking: 502 (120)	

Data are regression coefficients (SE). VAT, visceral adipose tissue. PSQI, Pittsburgh Sleep Quality Index. Covariates adjusted in the models include pre-pregnancy weight, weight retention at 6-8 weeks postpartum (weight at 6-8 weeks minus pre-pregnancy weight), parity, household income, education, spouse, Pittsburgh Sleep Quality Index score, breastfeeding status, smoking status, and physical activity. Associations of pre-pregnancy weight and weight retained at 6-8 weeks postpartum with outcome variables are not reported in this table. *Ref, reference level used in this comparison is some college.

Table S4. Significant associations (p < 0.05) between covariates of sociodemographic, behavioral, and lifestyle factors and outcomes of weight and body composition in the adjusted mixed-effects models in White women.

White	Parity	Household income	Education	Spouse	PSQI	Breastfeeding status	Smoking status	Physical activity, counts per minute
Reference	**Primipara**	**≤$40k**	**Grade 12 or lower**	**Living with spouse**	**--**	**Not breastfeeding**	**Never smoking**	**--**
Body weight, kg								
Waist circumference, cm	Not primipara: 2.4 (1.1)							
Hip circumference, cm						Exclusive: -1.96 (0.90)		
Fat mass, kg		>$80k: -3.0 (1.1)						
Lean mass, kg		$60-80k: 2.7 (1.1) >$80k: 2.7 (0.9)						1.68 (0.76)
Body fat, %		>$80k: -3.0 (1.3)						
Appendicular fat, kg		>$80k: -1.4 (0.7)	Some college: 2.3 (1.1) Graduate school: 2.9 (1.2)			Exclusive: -0.7 (0.3)		
Trunk fat, kg	1.2 (0.5)	>$80k: -1.6 (0.7)						
Android fat, gm		$60-80k: -441 (199) >$80k: -351 (160)						
Gynoid fat, gm			Graduate school: 973 (478)			Exclusive: -272 (134)		
VAT, gm		$60-80k: -252 (95) >$80k: -199 (77)					Currently smoking: 355 (134)	

Data are regression coefficients (SE). VAT, visceral adipose tissue. PSQI, Pittsburgh Sleep Quality Index. Covariates adjusted in the models include pre-pregnancy weight, weight retention at 6-8 weeks postpartum (weight at 6-8 weeks minus pre-pregnancy weight), parity, household income, education, spouse, Pittsburgh Sleep Quality Index score, breastfeeding status, smoking status, and physical activity. Associations of pre-pregnancy weight and weight retained at 6-8 weeks postpartum with outcome variables are not reported in this table.