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Coming unmoored: Disproportionate increases in obesity prevalence among young, disadvantaged White women

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Abstract

Objective—Since the 1980s, older low-educated White women experienced an unprecedented decrease in life expectancy. We investigated whether a similar phenomenon was evident among younger women for obesity.

Design and Methods—Using the National Health and Nutrition Examination Survey, we estimated age-adjusted changes in prevalence of overall and abdominal obesity (BMI≥30 kg/m^2, waist circumference>88 cm) between 1988-1994 and 2003-2010 among non-Hispanic White women aged 25-44 years, stratified by educational attainment (<high school (HS), HS, some college, college degree). To address bias from secular increases in educational attainment, we compared White women's changes in obesity prevalence to changes among similarly educated Black women.

Results—Relative increases in overall obesity were disproportionately larger for low- educated (<HS) compared to college-educated White women: 12.3 (95% CI: 3.1, 21.5) percentage points (ppts). For overall and abdominal obesity, general trends indicated dissimilar racial differences by educational attainment. For instance, overall obesity increased more in Blacks than Whites among college-educated (9.9 ppts) but not low- educated (−2.5 ppts) women.

Conclusions—Contemporary young, low-educated White women showed indications of disproportionate worsening of overall obesity prevalence compared to more educated White and

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similarly educated Black women. Low education levels are more powerful indicators of obesity risk among contemporary White women than 30 years ago.

Keywords

Waist Circumference; Women; Trends; Socio Economic Deprivation; Body-Mass Index; BMI

In the U.S., educational attainment is a potent marker and even a “fundamental cause” of social inequalities in health (1). Over the past 30 years, White women's educational attainment has increased substantially, with prevalence of college completion nearly tripling from 13% in 1980 to 30% in 2010 (2). Educational attainment has increased for other groups as well. For instance Black women's percentage of college completion rose from 8.3% in 1980 to 21.4% in 2010. However, a substantial proportion of women from both groups (12% of White women and 15% of Black women) remain at the low end of the educational spectrum, having never received a high school degree (2).

Recent evidence indicates that the health status of low-educated (e.g., less than a high school credential) White women, in particular, may have deteriorated by an unprecedented amount over the past 30 years (3, 4). Since the 1980s, the life expectancy of low-educated White women has worsened in both absolute terms and relative to low-educated Black women (3-5). White women with the highest levels of education gained 3.3 years of adult life expectancy, while those with low educational levels lost an average of 5.3 years of life expectancy between 1990 and 2008 (4). Further, in an analysis of racial and educational influences on life expectancy between 1990 and 2000, Meara and colleagues found that White women with a high school degree or less were the only group to experience a statistically significant *decrease* in life expectancy (3). Put another way, life expectancy trends among low-educated White women have pulled away, or “come unmoored,” from those of other demographic groups. Additionally, Meara et al. reported that relative decreases in life expectancy for low-educated White women were concentrated among those aged 65 and older. They concluded that trends among those ages 25–44 years contributed little to growing educational gaps in mortality among White women (3).

To date there is limited research on whether the worsening health status of White women extends beyond mortality to morbidity, as well as whether this deterioration of health status is evident earlier in the life course. Analyses of life expectancy may not detect inequalities among younger White women because mortality risk is low in early and middle adulthood, particularly for women. We propose that the worsening health status of low-educated White women may not be limited to decreasing life expectancy or only evident at older ages. Instead, we hypothesize that this growing health inequality can be observed during early and mid-adulthood in indicators of morbidity, such as obesity. Obesity, as assessed by high body mass index (BMI) or waist circumference, is considered an indicator for general health status because it is an established risk factor for many chronic conditions, including cancer, type 2 diabetes, and cardiovascular disease (6). Particularly among younger women, who have relatively low rates of mortality and chronic disease, obesity is a sensitive indicator of general health status.

Using data from the National Health and Nutrition Examination Survey (NHANES), we examined whether young and middle-aged low-educated White women experienced deteriorating health status, indicated by obesity prevalence, between 1988 and 2010. We used a difference-in-difference approach, in which we compared the secular change in obesity prevalence among low-educated White women to that among more educated White women and low-educated Black women. As described below, the comparison to low-educated Black women in particular addresses methodological criticisms of previous analyses of life expectancy among low-educated White women (7).

Methods

Data

We used data from NHANES III (1988-1994) (8) and eight years of the continuous NHANES surveys (2003-2010) (9) to examine changes in prevalence of overall and abdominal obesity among low-educated White women. NHANES uses a multi-stage stratified probability sample design, selecting participants to represent the non-institutionalized, civilian U.S. population. We chose these specific waves of data to facilitate comparison with the life expectancy literature, as these NHANES waves most closely correspond to the time periods examined in most of that work.

We limited our analyses to self-identified non-Hispanic White and Black women aged 25-44 years. We excluded women younger than age 25 because many will not have completed their education. We chose age 44 years as an upper limit because age- related weight loss at older ages could cause bias. Further, previous work has focused on women older than 45 years (10) or concluded that White women aged 25-44 contributed little to growing educational gaps in mortality (3).

There were 2,534 White and Black women aged 25-44 in the 1988-1994 sample and 2,558 in the 2003-2010 sample. Women were excluded for being pregnant at the time of the examination (n=93 in 1988-1994, n=279 in 2003-2010), missing data on measured height, weight, or waist circumference (n=258 in 1988-1994, n=176 in 2003- 2010), or for missing data on education (n=6 in 1988-1994, n=2 in 2003-2010). Thus 2,484 White and 1,794 Black women were included in the final analysis (1,051 White and 1,126 Black women in 1988-1994; 1,433 White and 668 Black women in 2003- 2010).

Variables and measurement

BMI was calculated using measured height (in meters [m]) and weight (in kilograms [kg]). Overall obesity was defined as having a BMI ≥30 kg/m^2. Waist circumference was measured with a steel measuring tape to the nearest 0.1 cm at the high point of the iliac crest at minimal respiration. Abdominal obesity was defined as a waist circumference >88 cm (11). In both examination periods, body measurements were performed using standardized methods and equipment (12, 13).

Education was classified as a 4-level categorical variable, self-reported by the respondents: less than high school credential, high school degree or General Educational Development (GED) credential (14), some college or associate's degree, and college degree or more. Sex,

Hispanic ethnicity, and race (Black or White) were self-reported. We define "low-educated" as not having received a high school degree or GED credential (3, 4).

Analysis

To examine whether obesity prevalence has worsened for low-educated White women, we used a difference-in-difference approach (15). Since the 1980s, obesity prevalence increased for all population groups (16). To identify whether low-educated White women experienced a unique increase in obesity prevalence, we compared the trend in obesity prevalence for low-educated White women to trends in other groups, including more highly educated White and low-educated Black women. This difference- in-difference approach seeks to estimate whether the trend in low-educated White women outpaced the trends in other groups. In particular, to be as conservative as possible in our analysis, we focus on comparisons with low-educated Black women, another high-risk population. We chose another female group as a comparison because obesity determinants tend to be sex-specific (17-20). We chose low-educated Black women *a priori* because previous reports indicated that the life expectancy of this group had the weakest gains over time besides low-educated White women (3). Thus, we expect health to worsen more among low-educated Black women than any other group besides low-educated White women. If we compared low-educated White women to a group with good health trends, obesity increases among low-educated women would appear to be more pronounced. Thus, by focusing on comparisons to low-educated Black women, a group who have historically experienced high rates of obesity and large secular increases in obesity (21-24), we aim to produce conservative estimates of whether obesity is increasing more in low-educated White women versus other groups.

Further, as noted by Dowd and Hamoudi, increasing access to education over the 20th century is an important source of bias in analyses of trends in educational disparities (7). As educational access has expanded in recent decades, the U.S. population of low-educated adults has become increasingly dominated by individuals with the most disadvantaged childhoods, a risk factor for poor health outcomes in adulthood. Therefore, comparisons between low- and high-educated White women can show an decline among the low-educated group even if educational attainment has no independent relationship with health. By comparing trends among low-educated White women to trends among low-educated Black women, another group which has also experienced increasing educational access over the 20th century, we expect to mitigate effects of bias from this increasing socioeconomic inequality among educational strata.

Our analysis first estimated age-standardized prevalences of overall and abdominal obesity in women in 1988-1994 and 2003-2010, stratified by race and educational attainment. We pooled data from four continuous 2-year NHANES surveys (2003-2010) because stratifying by sex, race, and education resulted in small cell sizes when analyzing smaller time increments. All estimates were age-standardized using the 2000 U.S. Census age distribution (25). Next, for each stratum of educational attainment and race, we calculated the trend in obesity prevalence, taking the difference between 1988-1994 and 2003-2010.

Finally, for each stratum of educational attainment, we subtracted the secular change in obesity prevalence among the comparison group, e.g., Black women, from that among the

target group of White women. Estimating confidence intervals (CI) for differences in the differences was complicated by the different complex survey sampling of the two different surveys used. To produce a conservative 95% confidence interval for the difference in the differences, we used the larger standard error of the two difference measures as the standard error for the difference-in-difference. All analyses accounted for the complex clustered sampling design and survey weights of the NHANES data (26, 27).

Supplemental analyses of potential mechanisms

Further, we conducted several descriptive analyses to explore the hypothesis that young low-educated White women may be experiencing greater exposure to health-harming environmental contexts than they were 30 years ago (10). Because NHANES did not include contextual variables, we examined trends in and multivariable models including individual-level indicators of psychosocially and economically stressful living conditions (i.e., lower poverty-income ratio, higher parity [continuous number of children], earlier age at first live birth) and markers of health-promoting and health- harming coping resources, or "affordances" (28) (i.e., marital status, current smoking status [yes/no], poor Healthy Eating Index [HEI] score).

Results

Trends in overall obesity in low-educated White women

Between 1988-1994 and 2003-2010, obesity prevalence among low-educated White women increased by 19.4 percentage points (ppts), more than any other educational stratum of White women (see Table 1). For instance, over the same time period, obesity prevalence increased only 7.1 ppts among college-educated White women. Therefore, compared to college-educated White women, low-educated White women experienced a disproportionately greater increase in overall obesity prevalence: 12.3 ppts (95% CI: 3.1, 21.5) more than college-educated White contemporaries.

During the same time period, overall obesity prevalence among low-educated Black women increased by 16.9 ppts (Table 2), 2.5 (95% CI: −9.2, 4.2) ppts less than among low-educated White women. Although this estimate of difference was not statistically significant, the contrast with the differences-in-difference estimates for other educational groups was notable. For other educational strata, obesity prevalence appeared to increase more over time among Black women than among similarly educated White women. For example, obesity prevalence increased by 9.9 (95% CI: 5.1, 14.7) ppts more among Black women with a college degree than it did among similarly educated White women.

Trends in abdominal obesity in low-educated White women

We next examined trends in prevalence of abdominal obesity (Table 3). Prevalence of abdominal obesity increased more among low-educated White women than any other race-education stratum: 24.7 percentage points. The group with the next largest absolute increase was White women with a high school credential: 24.2 percentage-point increase. However, differences in trends between low-educated White women and their more educated White contemporaries were not statistically significant. For example, we estimated that abdominal

obesity prevalence increased 7.3 (95% CI: −2.9, 17.5) ppts more among low-educated White women than college- educated White women (results not shown).

However, as with overall obesity, racial differences in abdominal obesity trends showed indications of differing by educational stratum. For example, among the low- educated women, abdominal obesity prevalence appeared to increase by less over time among Black versus White women (−8.1 [95% CI: −19.9, 3.7) ppts). Among college- educated women, there was no indication of greater increase among White women and some indication that abdominal obesity may have increased more among Black women (4.7 [95% CI: −5.1, 14.5] ppts).

Supplemental analyses of potential mechanisms

Further analysis (Table 4) indicated that low-educated White women may have experienced worse trends, i.e., disproportionately greater gains and smaller reductions, in markers of health-harming self-regulatory coping behaviors (i.e., poor dietary intake, smoking) and smaller gains in health-promoting environmental affordances (i.e., being married) than other educational strata of Black and White women. Poverty-income ratio and reproductive variables did not markedly increase for low-educated White women. However, in logistic regression models, adjusting for the stress and coping markers did not substantively explain Black-White differences in overall or abdominal obesity in either time periods (not shown).

Discussion

This is the first study to our knowledge to investigate whether the deteriorating health status of low-educated White women extends to indicators of morbidity among young and middle-aged women. We chose to focus on White women specifically because a growing literature has suggested that low-educated White women experienced declines in life expectancy between the early 1990s and late 2000s (3, 4, 10, 29). These findings did not consistently extend to men, Black women, or highly educated White women. However, this life expectancy literature reflects trends among older White women (3, 30). Taken as a whole, these results are consistent with the hypothesis that obesity prevalence, a more salient marker of health status in young women, may have increased disproportionately among low-educated White women over this same time period.

We know of few studies that have used population-representative data to investigate obesity trends in low-educated White women. One recent analysis of the National Health Interview Survey reported no differences in obesity trends between low- educated White women (ages 25-75 years) and other race-education-stratified groups between 1997 and 2008 (31). However, that study excluded respondents with histories of chronic illness and extremely high BMIs and also relied on self-reported data; at any given BMI, White women underreport their BMI more than other groups (32). We believe that our study of younger women using objectively measured data better reflects obesity trends in low-educated U.S. White women.

While our results are primarily descriptive, the overall pattern of results suggests a divergence in trends between younger White women who attained a high school credential

or less versus those with some post-high school education. If confirmed in future work, there are at least two possible explanations for worsening health for young low-educated White women. The first explanation is that these patterns are due to selection processes. That is, the contemporary low-educated White women may arise from more disadvantaged and homogenous circumstances than previous cohorts of low-educated White women. With increasing access to higher education, contemporary White women have much more opportunity to complete higher education than previous generations. This increased opportunity could result in an increasing concentration of women with poor health or functioning in the low-educated group (7).

An alternative explanation would be that that younger disadvantaged White women are more likely than past cohorts of low-educated White women to use health- harming self-regulatory behaviors to cope with environments increasingly characterized by stressors and limited financial and social resources (33, 34). Following this explanation, as education levels of White women have increased over time, opportunities for low-educated White women in terms of employment, housing, and social capital have become increasingly truncated. This truncation has meant that contemporary low-educated White women are constrained to live and work in more disadvantaged social and physical environments than in the past, and these environments in turn influence obesity risk. Unfortunately, our supplemental analyses of individual-level behaviors could not distinguish between these competing hypotheses. As recommended by others, diverse and innovative research designs, including simulation studies, using rich data grounded in social history and life course-based biological science, are needed to converge upon the underlying mechanisms possibly at work here (7).

Our findings are consistent with the findings of the life expectancy literature. Olshansky and colleagues found that even as educational inequalities increased among White women, racial inequalities narrowed (4). However, it is notable that, at every education level, Black women have much higher obesity prevalence than White women. In fact, the most educated Black women have higher obesity prevalence than nearly all White women, even those less educated. The markedly higher obesity prevalence of Black women is long-standing in the U.S. and has been extensively documented in the obesity epidemiology literature (21-24). If obesity is indeed increasing more quickly among low-educated White women versus low-educated Black women, it could be because Black women's past education levels were artificially depressed by historical patterns of racial discrimination and segregation even as this racial inequality conferred social and economic advantages on low-educated White women (35, 36). However, while social and environmental contexts may have improved for low-educated Black women over the past 30 years in absolute terms, Black women still have lower educational attainment than White women and continue to live in more segregated neighborhoods (2, 37).

There were several limitations to our study. We had no direct measures of environmental context and therefore could not directly investigate mechanisms underlying the disproportionate increase in obesity in low-educated White women. Further, we were not able to distinguish between causal explanations of observed trends and selection processes. Additionally, in accordance with the life expectancy literature, we used education as a proxy

for socioeconomic disadvantage. While education is not a comprehensive measure of socioeconomic status, it is a high-quality indicator of SES when studying health (1). In particular, educational attainment is a better measure of SES than income when investigating obesity because weight status is documented to affect income, especially in White women (38); effects of weight on educational attainment are much weaker. Unfortunately, we were not able to examine those with a high school degree separately from those who received a GED credential (14). Additionally, we pooled the 2003-2010 data from four continuous NHANES surveys; however, obesity prevalence in women was stable over that time period (16). Finally, even after pooling the data in order to increase statistical power, our study was not well-powered to detect disproportionate differences in obesity prevalence stratified by sex, race-ethnicity, and educational status.

Our study had several notable strengths. We used nationally representative data collected over several decades. Additionally, we examined health status using two objectively measured assessments of obesity. Examining BMI-based obesity allows comparability across studies. Alternatively, abdominal obesity may be a superior marker of stress- and inflammation-related processes leading to poor health (39, 40). Another strength of examining health status using obesity rather than an outcome that typically occurs at older ages is reduction of bias from the temporal lag between educational attainment and when the outcome manifests (7). Finally, we used a novel difference-in- difference approach with an *a priori* low-educated Black referent group to address bias from secular trends in educational attainment. Although some of the mechanisms underlying trends in educational attainment differed for Black and White women over this time period, this analysis does begin to address changing dynamics of high school completion that could bias results from these types of analyses.

Previous research has shown that life expectancy may have declined for older low-educated White women (39, 40). The present analysis suggests, for the first time, that worsening trends may also be apparent among younger women for a different outcome. As our analyses are descriptive in nature and not optimally powered to detect subgroup differences, it remains unclear whether observed trends reflect causal processes or selection processes. In either case, overall, the findings suggest that trends for young White women without high school credentials may be diverging from those of other groups. Low levels of education may be a more powerful indicator of health risk among contemporary young White women than they were in the early 1990s. By monitoring the health status of young, low-educated White women now, the public health community has the opportunity to potentially intervene to prevent further increases in socioeconomic disparities in the future.

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‘What is already known about this subject’:

- In recent decades, there has been an unprecedented decrease in life expectancy among older, but not younger, low-SES White women in the U.S.
- It remains unclear whether younger low-SES White women also experienced deteriorating health status.

‘What this study adds’ (up to three short bullet points for each):

- We examined obesity rather than life expectancy to investigate health disparities for young low-SES White women; whereas mortality is uncommon among younger U.S. women, obesity is a prevalent condition in this age group
- We used novel difference/in/difference approach seeks to address bias from secular increases in educational attainment
- This is the first study to provide evidence that health status of younger low-SES White women, as assessed by obesity status, may be disproportionately worse than past cohorts

Table 1

Educational differences in age-adjusted overall obesity prevalence[a] in non-Hispanic White women aged 25-44 years in two time periods: the National Health and Nutrition Examination Survey[b]

	NHANES 1988-1994[c]		NHANES 2003-2010[c]		Difference-in-difference (95% CI)
	White	Difference (95% CI)	White	Difference (95% CI)	
< High school credential	24.7 (3.6)	ref	44.1 (4.6)	ref	
High school diploma/GED	24.0 (2.4)	0.7 (−5.6, 7.0)	36.0 (2.5)	8.1 (−2.7, 18.9)	7.4 (−3.4, 18.2)
Some college/associates	24.4 (2.8)	0.3 (−8.7, 9.3)	34.5 (2.6)	9.6 (−0.4, 19.6)	9.3 (−0.7, 19.3)
College degree or more	11.2 (1.6)	13.5 (6.1, 20.9)	18.3 (1.9)	25.8 (16.6, 35.0)	12.3 (3.1, 21.5)

[a] Obesity defined as BMI≥30.0 kg/m^2

[b] Age-adjusted estimates and standard errors were computed based on the 2000 U.S. Census population taking into account survey weights and the complex sampling design.

[c] Sample sizes in 1988-1994: Whites n=1,051; Samples sizes in 2003-2010: Whites n=1,433

Table 2

Black-White difference in age-adjusted overall obesity prevalence[a] in non-Hispanic Black and White women aged 25-44 years in two time periods: the National Health and Nutrition Examination Survey[b]

	NHANES 1988-1994[c]			NHANES 2003-2010[c]			Difference-indifference (95% CI)
	White	Black	Difference (95% CI)	White	Black	Difference (95% CI)	
< High school credential	24.7 (3.6)	33.1 (3.2)	−8.4 (−12.9, −3.9)	44.1 (4.6)	50.0 (5.0)	−5.9 (−12.6, 0.8)	−2.5 (−9.2, 4.2)
High school diploma/GED	24.0 (2.4)	40.1 (2.7)	−16.0 (−20.0, −12.0)	36.0 (2.5)	53.9 (4.9)	−18.0 (−23.6, −12.4)	2.0 (−3.6, 7.6)
Some college/associates	24.4 (2.8)	37.4 (1.8)	−12.9 (−16.2, −9.6)	34.5 (2.6)	57.9 (2.8)	−23.3 (−26.8, −19.8)	10.4 (6.9, 13.9)
College degree or more	11.2 (1.6)	26.8 (3.0)	−15.6 (−19.0, −12.2)	18.3 (1.9)	43.8 (4.3)	−25.5 (−30.3, −20.7)	9.9 (5.1, 14.7)

[a] Obesity defined as BMI≥30.0 kg/m^2

[b] Age-adjusted estimates and standard errors were computed based on the 2000 U.S. Census population taking into account survey weights and the complex sampling design.

[c] Sample sizes in 1988-1994: Whites n=1,051 and Blacks n=1,126; Samples sizes in 2003-2010: Whites n=1,433 and Blacks n=668

Table 3

Black-White difference in age-adjusted prevalence of abdominal obesity[a] in non-Hispanic Black and White women aged 25-44 years in two time periods: the National Health and Nutrition Examination Survey[b]

	NHANES 1988-1994[c]			NHANES 2003-2010[c]			Difference-indifference (95% CI)
	White	Black	Difference (95% CI)	White	Black	Difference (95% CI)	
< High school credential	39.9 (4.5)	53.0 (2.8)	−13.1 (−22.9, −3.3)	64.6 (4.4)	69.6 (3.6)	−5.0 (−16.8, 6.8)	−8.1 (−19.9, 3.7)
High school diploma/GED	34.4 (2.8)	58.1 (2.6)	−23.7 (−33.5, −15.3)	58.6 (2.8)	72.1 (4.4)	−13.5 (−24.1, −2.9)	−10.2 (−20.8, 0.4)
Some college/associates	37.5 (2.8)	51.3 (2.7)	−13.8 (−21.8, −5.8)	56.4 (2.3)	71.2 (2.8)	−14.8 (−20.9, −8.7)	1.0 (−7.0, 9.0)
College degree or more	20.9 (2.3)	40.1 (3.3)	−19.2 (−20.5, −5.7)	38.3 (2.6)	62.2 (4.2)	−23.9 (−33.7, −23.9)	4.7 (−5.1, 14.5)

[a] Abdominal obesity defined as waist circumference>88 cm

[b] Age-adjusted estimates and standard errors were computed based on the 2000 U.S. Census population taking into account survey weights and the complex sampling design.

[c] Sample sizes in 1988-1994: Whites n=1,051 and Blacks n=1,126; Samples sizes in 2003-2010: Whites n=1,433 and Blacks n=668

Table 4

Distributions of stress- and coping-related markers for White and Black women aged 25-44 years without a high school credential versus those who completed college, the National Health and Nutrition Examination Survey, 1988-1994 and 2003-2010

	< High School credential				College degree or more			
	1988-1994		2003-2010		1988-1994		2003-2010	
	White women (n=142)[a]	Black women (n=254)[b]	White women (n=182)[c]	Black women (n=128)[d]	White women (n=268)[e]	Black women (n=138)[f]	White women (n=466)[g]	Black women (n=123)[h]
Age (years)	33.7 (0.6)	34.5 (0.3)	35.0 (0.4)	34.8 (0.4)	35.6 (0.4)	35.5 (0.7)	35.2 (0.3)	34.4 (0.7)
Currently married (%)	69.9	33.7	65.0	33.1	71.2	44.5	74.9	51.5
Poverty-income ratio	2.0 (0.1)	1.1 (0.1)	1.9 (0.1)	1.5 (0.1)	4.0 (0.1)	3.2 (0.1)	4.0 (0.1)	3.4 (0.1)
Parity	2.2 (0.1)	2.6 (0.1)	2.0 (0.1)	2.3 (0.1)	1.0 (0.1)	1.4 (0.2)	1.0 (0.1)	1.3 (0.1)
Age at first live birth (years)	19.4 (0.3)	18.7 (0.3)	20.4 (0.5)	18.3 (0.3)	26.6 (0.4)	23.8 (0.7)	27.7 (0.3)	24.9 (0.6)
Current smoker (%)	67.7	50.3	60.7	41.4	15.2	11.4	10.8	5.1
Health Eating Index score	56.2 (0.9)	56.6 (0.9)	42.9 (1.5)	44.4 (1.1)	67.4 (0.8)	63.5 (1.6)	54.9 (0.6)	53.0 (1.9)
Mean BMI (kg/m^2)	25.4 (0.5)	28.4 (0.5)	29.1 (0.6)	31.8 (0.8)	23.8 (0.3)	27.6 (0.6)	26.0 (0.4)	29.8 (0.6)
Mean WC (cm)	85.8 (1.4)	92.3 (1.2)	96.5 (1.5)	100.3 (1.7)	81.3 (0.7)	88.6 (1.5)	87.4 (0.8)	93.7 (1.4)

[a] n=134 for poverty-income ratio; n=140 for parity; n=126 for age at first live birth; and n=139 for Health Eating Index score

[b] n=229 for poverty-income ratio; n=246 for parity; n=222 for age at first live birth; and n=242 for Health Eating Index score

[c] n=175 for poverty-income ratio and parity; n=138 for age at first live birth; and n=174 for Health Eating Index score

[d] n=119 for poverty-income ratio; n=126 for parity; n=96 for age at first live birth; n=127 for current smoking; and n=121 for Health Eating Index score

[e] n=260 for poverty-income ratio; n=266 for parity; n=149 for age at first live birth; and n=262 for Health Eating Index score

[f] n=126 for poverty-income ratio: n=135 for parity; and n=97 for age at first live birth

[g] n=460 for poverty-income ratio; n=446 for parity; n=226 for age at first live birth; and n=433 for Health Eating Index score

[h] n=116 for poverty-income ratio; n=115 for parity; n=71 for age at first live birth; and n=116 for Health Eating Index score